

CHAPTER 1

USING WRITING TO NEGOTIATE KNOWLEDGE AND POWER

For the last several years, I have wondered about the relationship between knowledge and writing, particularly as it occurs in the work of engineers (see Winsor 1990a, 1990b, 1992, 1994). What is the relationship between the ability to create knowledge and the ability to represent that knowledge in various symbol systems? For instance, how do engineers use verbal, mathematical, graphic, and other symbol systems in their day-to-day work? What is the relationship between the ability to embody knowledge in an object, to represent knowledge in texts, and to generate knowledge in a group? In one sense, the answer to this question is obvious. Engineers use texts to think with both individually and, much more often, in groups (Henderson 1999). They share disciplinary texts such as data curves and test reports so that they can jointly determine the meaning of those texts and thus understand the object they are designing and testing. In vignette 1, we see the engineers Alan and Bob jointly focusing on an engineering drawing in order to achieve exactly this kind of common understanding. Presumably, in this use of texts, engineers are typical of most people who work together in groups. Texts function not only to record and share what is already known but, perhaps more importantly, to help writers and readers generate and agree on what is to count as knowledge.

Indeed, engineering is a prime example of what we have come to call “distributed cognition.” Edwin Hutchins (1993, 1996) provides the most commonly cited example of distributed cognition in his study of crew members navigating a ship. (See also Freedman

and Smart 1997.) As Hutchins makes clear, distributed cognition does not mean just that different people accomplish different parts of a task, but that people and their tools acting in concert can interact to accomplish a kind of cognition that no individual could achieve separately, and indeed that such interaction is probably necessary for some cognition to occur at all. For instance, people acting jointly can provide a more complicated kind of reasoning than any one person could maintain. Thus, a group of engineers can maintain a variety of theories that contribute to their design work, whereas an individual would have trouble seeing from a similar multiplicity of perspectives at once. Distributed cognition can also make cognition more robust, so that if one person is unable to accomplish a task (e.g., to interpret a data curve), in some cases someone else can step in and complete it. So in vignette 1, Greg is able to help a coworker select a part that will work well in a design, making that design better than either engineer could have accomplished on his own. Thus Hutchins argued, “cognitive accomplishments can be joint accomplishments, not attributable to any individual” (1993, 35).

Moreover, in watching a group of people navigate a ship, Hutchins came to recognize “the extent to which the computational accomplishments of navigation are mediated by a variety of tools and representational technologies” (1993, 35). Tools such as maps are not incidental to navigation, but rather are essential to it. We think in conjunction with other people and with our mediating tools, and if we are engaged in complex, distributed cognition, such tools are indispensable because they mediate between things and people (the map mediates between the navigation team and the port), between various groups of people (the map mediates between the harbormaster’s crew and the crew of the ship), between individuals (the map mediates between the crew member plotting the ship’s position and the crew member on deck taking a positional reading), and within the activity of individuals (the map guides the crew member’s understanding of his or her own activity). That is, texts, in this case maps, can be crucial mediating tools for thinking even in an individual. We see such a mediating text in vignette 1 when Mark, the summer intern, uses a set of spreadsheets to guide his understanding of the progress being made on remodeling the Pacific Equipment labs. In addition, for people who are working

jointly, texts can serve the additional important function of communicating and encouraging people to think together. Indeed, Hutchins concluded that communication was a crucial factor in allowing a system of distributed cognition to function. So quite clearly, one aspect of the relationship between text and knowledge is that the former is a tool for the production of the latter.

However, such an analysis is incomplete because it ignores the circumstances in which much knowledge work is done, that is, in for-profit, hierarchical corporations. Certainly, most engineering knowledge is generated within such systems of power and profit. While Hutchins's (1993, 1996) examination of distributed cognition calls our attention to the fact that knowledge is often communally held and thus depends on communication, we must remember that systems of distributed cognition are not always collaborative, egalitarian, and harmonious. Hutchins's own shipboard example is obviously a hierarchical one. Thus in addition to asking how texts and knowledge interact, we also need to ask how both of those factors interact with power. How does an organizational hierarchy affect how people at various levels can cooperate to create knowledge? Within a hierarchy, people in more powerful positions are often able to determine what knowledge is valuable and even what facts or ideas are to count as knowledge for the organization. So vignette 1 shows us the manager Ken making it clear that knowledge about competitors and cost is to be valued and acted upon. We need to ask how people in a hierarchy create and use texts such as reports, drawings, budgets, and E-mail to build knowledge together and to have it validated by those in positions of power within the organization.

Moreover, if, as Michel Foucault (1980) claims, power is not a quality that anyone can "hold" but a relationship that is always locally generated using means that include, but are not limited to, positions in a hierarchy, then how are the generation of knowledge and text connected to the generation and enactment of power? Hutchins's work implies that in systems of distributed cognition, social arrangements are also knowledge work arrangements. The creation of knowledge is enabled to proceed in some ways and constrained from proceeding in others by the way in which people interact. As part of those social arrangements, the power arrangements that flourish in any organization affect how both text and

knowledge are produced and used. Conversely, we should expect that knowledge and text are among the resources that can be deployed to create relations of power. So, for example, we see in vignette 1 that, at Pacific Equipment, the routine use of work orders makes it far easier for an engineer to tell the technician Jim what the engineer wants than for Jim to tell the engineer about problems with the procedures he or she requested.

In other words, knowledge, text, and social structures are intertwined. Over the last fifteen years, rhetoricians have increasingly treated the intertwining of text and social structures in terms of genre. Carolyn R. Miller (1984) was the first to define genre as a form of social action, a typified textual response to a typified social situation, and not simply a collection of repeated formal characteristics. Her work has been developed by such scholars as John Swales (1990), Aviva Freedman and Peter Medway (1994), and Carol Berkenkotter and Thomas N. Huckin (1995). Their work and that of others (e.g., Pare 1993; Schryer 1993; Smart 1993; Blakeslee 2000) has provided us with an increasing number of studies describing how genres function in various social situations. However, rhetoricians have only begun to explore the way in which power is a factor in the creation and dispersal of genres. JoAnne Yates's (1989) historical study of railroad companies deploying various forms to control their employees is an early example of such work. Yates demonstrated that "regular flows of upward, downward, and lateral communication as well as detailed record-keeping procedures played a critical role" in establishing the systematic management toward which companies aspired at the turn of the nineteenth century (1989, 2). More recently, Bernadette Longo (2000) has also conducted a historical examination of the way in which scientists used technical writing to generate its position as our era's dominant knowledge. She argues that the fact that technical writing is designed to divert attention from itself to the subject matter is one of the factors giving it power: "The invisibility of technical writing attests to its efficiency as a control mechanism because it works to shape our actions without displaying its methods for ready analysis" (2000, ix). In many studies of writing in the workplace, questions of power are implicit (and here I would refer to most of my own work). However, increasingly they are explicitly examined, as in Anthony Pare's (2000) study of the way in which social workers' reports must

remain subservient to those of physicians in hospitals, Susan M. Katz's (1998) examination of how an organizational newcomer was able to generate a powerful position for herself, or Carl G. Herndl's (1996) discussion of a biologist's resistance to the dominant discourse in his workplace.

Freedman and Medway exemplify this interest in genre's relation to power when they argue that we need to ask questions such as these:

How do some genres come to be valorized? In whose interest is such valorization? What kinds of social organization are put in place or kept in place by such valorization? Who is excluded? What representations of the world are entailed? The absence of such questions is the ideological limitation we see as most needing to be addressed in the next stage of genre studies. (1994, 11)

In this book, I respond to Freedman and Medway's call for a more ideologically aware examination of genre by arguing that part of the social action implicit in using a genre is related to power. By this I mean that the typified nature of genres encourages certain actions and discourages others. For example, when companies require periodic activity reports from engineers, the latter make every effort to have activities to report. Similarly, when performance review forms include space where supervisors can comment on the actions of subordinates but not vice versa, the expectations built into the genre discourage looking to inept management as a reason for poor performance by a subordinate. And as we see in vignette 1, when the written genres that Pacific Equipment associates with testing are limited to the work order the engineer writes to start the tests and the test report the technician returns when the testing is complete, there is no routine way for the technician to send written notice about problems in a test's design. Thus technicians must rely on oral communication and information is more easily lost as a result.

As structures, genres are one of the resources that Anthony Giddens refers to when he talks about how people exercise power within social systems such as organizations. Resources, he says, "are structured properties of social systems, drawn upon and reproduced by knowledgeable agents in the course of interaction. . . . Resources

are media through which power is exercised, as a routine element of the instantiation of conduct in social reproduction” (1984, 15–16). As social actions, and as typified responses to typified social situations, genres are a “routine element of the instantiation of conduct.” In organizations, they usually preexist the user, although any user can vary them and thus contribute to their slow change. As part of the historical being of any organization, genres are a resource that can be deployed, manipulated, contested, and regulated. They are thus a way in which power is constructed, organized, and put into effect. In this book, I will suggest that organizations tend to institutionalize genres that reinforce existing power relationships so that not all of the writing that people do is equally likely to be recognized as part of an organizational genre. I will also claim that in their institutionalized form, organizational genres are not equally available to everyone in an organization. Rather, they become resources only for those who are authorized to use them.

In the chapters that follow, I talk about how power, generic texts, and knowledge interact in an engineering organization, hoping that understanding a single case will aid us in creating a picture of how they may interact in other settings. While I believe that engineering organizations share many characteristics with other kinds of workplaces, I also believe that they are particularly interesting sites in which to examine the connections of knowledge, power, and text, because they straddle the boundary between science, which is usually identified as knowledge work, and commerce, where relationships of power are taken for granted. Thus they are an ideal setting for examining the questions I am raising:

- How do texts, and particularly generic texts, help people in various organizational roles to generate knowledge?
- How are texts used to create and occupy positions of power? What does this use of texts tell us about genre?
- How does power affect the generation of text?

In examining these questions, I take a somewhat different tack from much of the literature on organizational communication. This literature often seems to fall into one of two camps. On one hand, much literature in business communication seems to assume that

organizational communication is primarily a unidirectional, top-down dispersal of information and instructions that shape the actions of subordinates. This literature often takes the organizational chart as a representation of power relationships that are not open to question. Many of the articles in the *Journal of Business Communication*, for instance, seem to operate from this assumption. For example, recent issues include articles on how companies can most effectively introduce quality programs so that subordinates will accept them (Lewis 2000) and how organizations can communicate strategically to maintain their legitimacy in times of crisis (Massey 2001). Research on such topics is useful if organizations are to function well, but if our research is limited only to such topics, we miss much of the reality of how texts function in organizations. The study I describe in this book departs from this work in that it examines organizational communication happening at many levels, in all directions, with a variety of purposes that sometimes conflict and may all be seen as valid. In other words, I want to argue that the generation of power through discourse should be examined, that its existence (and rightness) should not be assumed, and that texts play a role in the way in which power is created and deployed.

In contrast to this first strain of work that seems to assume the legitimacy of hierarchical action and to ignore communication initiated by subordinates, a second strain of work grows out of critical theory and treats capitalist organizations as exploitative and power as automatically oppressive. In rhetoric, this strain of work shows up most often in journals like *College English*. For instance, recent issues have included articles assuming that “resistance” to current social structures is automatically desirable (Muckelbauer 2000; Wehner 2001). I believe that capitalism’s primary valuation of profit often does lead to inhumane behavior on the part of organizations and that power can be misused. But I also believe that for-profit organizations often do useful work and that power is a way to accomplish that work. To quote Giddens, “structure is not to be equated with constraint but is always both constraining and enabling” (1984, 25), and “power is the means of getting things done, very definitely enablement as well as constraint” (175). Thus power has a dual nature, a fact that much of the research on organizational communication ignores. In this book, I assume that power always exists and that understanding the textual operations of power in organizations

will be useful for everyone involved. This study aims at clarifying how power and knowledge are textually created and controlled in the material reality of the social system within which we live.

GENRES IN ACTION IN AN ENGINEERING CENTER

The specific site for this study was the engineering center of Pacific Equipment, a large manufacturer of off-highway equipment.¹ Pacific Equipment's engineering center contains the development facilities for two different divisions: Off-highway Equipment Engineering, which designs and develops the vehicles that the company produces, and Engine Engineering, which designs and develops the engines that are installed in various company vehicles. An imaginary tour of the engineering center will give us a preliminary glimpse of some of the genres in action there.

The Test Labs

When we enter the engineering center on our imaginary tour, we first encounter the cafeteria that is conveniently located in the center of the building. After we sign in at the security desk, we turn to our right and enter the labs that extend in a sprawling, single-story area that constitutes two thirds of the facility's floor space. In this space, lab technicians build and test prototype vehicles, engines, and components. For instance, the labs contain dynamometers, a sort of treadmill for engines that can be used to test a new or improved engine's durability or to measure its emissions. They also contain a huge cold room, where vehicles can be left for several days at below zero temperatures and then (the designing engineer hopes) started, and an equally large sound room, where the technician can measure how loud a vehicle is. As we walk through this area, we see many signs painted on walls, doors, and floors. They admonish us, for instance, to wear hearing protection or to walk only inside certain lines so that we avoid being hit by the small carts and fork trucks that occasionally cruise down the hallway. However, the genres that are the focus of the most attention by people in this area are those that circulate between it and the engineering area

that is on the other side of the cafeteria. These are the work orders that come from the engineers, laying out the technicians' tasks, and the test reports that technicians return to the engineers, giving the results of various procedures. As we walk through the labs, we see technicians consulting work orders and entering test results into their computers for shipment back to the engineers.

This book will be looking at three technicians who performed a variety of tasks in the lab:

- Gary,² who ran tests on new Pacific Equipment products,
- Jim, who constructed experimental parts, and
- Rich, who ran a supply center from which other technicians could get parts and built custom-designed test equipment.

Gary, Jim, and Rich all used work orders. Gary and occasionally Jim also submitted test reports to the engineering area.

The Engineers' Cubicles

On our tour, we follow these electronically submitted reports back across the cafeteria and into the engineering area. The engineers' cubicles are arranged in a three-story structure, with the top two floors devoted to vehicle engineering and the bottom floor to engine engineering. In this area, engineers create designs and analyze data from the labs. The cubicles for members of any engineering group are usually arranged in the same area making it relatively easy for engineers to overhear and observe one another's work. Additionally, in the areas of most engineering groups, a table is also available for informal group meetings.

The typical cubicle overflows with paper. Texts are filed, posted, and stacked on desks. As we walk along an aisle of cubicles, we see engineers studying their computer screens, which display texts in a variety of genres that have been E-mailed to them. Most crucially for the generation of engineering knowledge, we see them studying the data from lab tests that technicians have shipped to this side of the engineering center or the drawings of parts they are designing and will eventually instruct the lab tech-

nicians to build and test. While some engineers are doing this individually, many work jointly with colleagues to create or interpret these engineering genres. They crowd around a single computer screen or sit across from one another at the same desk and jointly arrive at some sense of what a drawing should look like or of what data tell them.

Thus creating and interpreting texts serve as ways for engineers to negotiate joint knowledge with one another that they will then attempt to persuade their colleagues or supervisors to accept. They prefer to communicate their conclusions orally in meetings, but to their dismay, must periodically lay aside the ongoing work in which they are currently interested to prepare written reports for their managers. Drafts of these reports, too, are displayed on some of the engineers' computer screens. While engineers usually don't like to write these reports, they know they need to take care with them if they are to persuade managers to allow them to do the work they would like to do.

This book will focus on five engineers:

- Dan, who designed and analyzed the results of tests of drivetrain problems;
- Greg, who served as a consultant advising other Pacific Equipment engineers who might want to use “compliant” material (i.e., material such as rubber that can be deformed without losing its properties) in parts they were designing;
- Dave, who analyzed the structures that design engineers had created and verified whether they were strong enough;
- Alan, and
- John, who were both engineers designing new vehicles.

Additionally, like most engineering organizations, Pacific Equipment commonly employed college students to work for them in the summer, intending, if all went well, to hire the students once they graduated. On our tour, we occasionally see one of these summer students laboring over drawings or data and consulting with the more experienced engineers who mentor them.

Team Leaders' Cubicles

The supervisors for these engineering groups, whom Pacific Equipment calls “team leaders,” are in cubicles adjacent to those of their groups. In their cubicles, we see them reading reports from various engineers in their group, drawing together the information, and preparing presentation visuals that they will use as part of their technical progress reports they must submit to their managers. In these presentations, they will also ask for resources and justify the use of the resources they already have. If they are not in their cubicles, they are probably in one of the meeting rooms ranged in a row down the center of each floor of the engineering area. We will see two team leaders in the pages of this book:

- Brad, who was a team leader for sensor development although when I observed him, there were no other members of this group, which was only six months old; and
- Paul, who was a team leader for electronics and led a group of approximately six people.

Managers' Offices

Near the meeting rooms where team leaders spend much of their time, we also see the offices of upper-level managers. Both the managers' offices and the meeting rooms have doors and walls that extend to the ceiling and thus offer more privacy than the cubicles do. Managers are sometimes in their offices, reading a wide variety of texts that almost all arrive via E-mail. For upper-level managers, most of these texts have to do with allocating resources of various kinds. These resources include personnel (Whom shall we hire? How should we evaluate this employee? Into which group should we place this engineer?) and the time and money represented in budgets. Like team leaders, these managers are frequently absent from their offices attending meetings where they decide how work at the engineering center will progress.

We will see two upper-level managers in this book:

- Ken, who was a director at the engineering center and performed a similar function for a Pacific Equipment development center in another state; and
- Doug, who was a manager of Technical and Engineering Services, an area with almost three hundred employees.

When we look at all of the people in all of the areas, we see a system of distributed cognition held together partly by generic texts. As I already noted, Miller (1984) has argued that genres are social actions; they are typified rhetorical responses to typified social situations. In Pacific Equipment's engineering center, genres such as work orders, test reports, reports to managers, and budgets are used to carry out the center's mission to create engineering knowledge. They are simultaneously used to regulate the way in which various people interact to carry out that mission. The typification we see in most of these texts is actually mandated by the organization. Miller argues that people's perception that a situation is recurring leads to the formation of a genre. But when a genre has been institutionalized, as most of those at Pacific Equipment have been, then the recurring form of the genre can also be used to encourage people to perceive situations as similar and to behave in ways that the genre calls for. That is, genres can invoke a situation as well as result from it. Genres are always re-created in the way in which each person uses them, but in order to be a genre, they also have to hold onto structure tightly enough for colleagues to mutually recognize them. At Pacific Equipment, that structural repetition is often not accidental, but rather represents the belief of people in positions of relative power that some situation is and should be recurring. To some extent, genres are deployed to enforce that perception of repetition. Thus the genres that flow through the various areas of the engineering center represent a confluence of the creation of knowledge and the enactment of power.

KINDS OF CAPITAL IN ENGINEERING

This book, then, presents a case study focused on how one engineering organization uses texts to create and maintain its knowledge

structure and the related question of how it uses texts to create and maintain its power structure. I use the word *structure* here, but it is important to remember that neither knowledge nor power is stable; rather they are both dynamic and shifting. There is no structure unless people constantly engage in structuring (Giddens 1984); there is no order unless they engage in ordering (Law 1994). Social actors are not simply puppets responding to the forces around them. The technicians, engineers, and managers I describe are not helpless pawns. Rather, they act, albeit with incomplete freedom, to shape the structures within which they then function. As this book will demonstrate, texts are one of the means by which people generate and stabilize both knowledge and power.

Because engineering knowledge and organizational power seem to reflect two different authority systems, data generated in the lab and hierarchy established by the corporation, we might expect that they would conflict. It would theoretically be possible, for instance, for a manager to ignore the recommendations that engineers generate from data and mandate that a cheaper but less sound product be built. However, in this book, I will argue that, at least in the highly successful Pacific Equipment Corporation, managers did not customarily use their authority in this potentially problematic way. Rather, power and knowledge tended to be converted into one another; according to Pierre Bourdieu (1991) different kinds of capital can be converted into one another. According to Bourdieu, capital or credit exists in different forms that can be expressed in terms of economic logic, although they are not reducible to money. In addition to monetary capital, for instance, he speaks about “social capital,” which refers to prestige (e.g., to hierarchical positions within an organization),³ and “cultural capital,” which refers to cultural knowledge or competency (e.g., engineering knowledge). Under the right circumstances, Bourdieu says, these kinds of capital can be converted into one another. That is, for example, managers could use their authority to enable the generation of engineering knowledge and then use that knowledge to solidify their own positions as valued employees.

Subordinates, too, could trade power for knowledge and vice versa. For instance, at Pacific Equipment, the technicians responded to work orders that had to originate in the engineering area. No matter how good an idea the technician had for how work should

be completed, he or she was not authorized to issue a work order. Such a situation is consistent with Bourdieu's (1991) assertion that some words will be effective only if the speaker or writer has been institutionally authorized to deliver them. However, engineers did sometimes consult technicians about how testing should be done so that the latter could affect work orders even though they were not authorized to write them. In vignette 1, the engineers Alan and Bob are admiring an improvised solution that technicians have created to a problem in building an experimental part. Engineers could sometimes use their engineering knowledge in reports that persuaded managers to allocate funds to carry out research in which they were interested, even though the engineers were not institutionally authorized to decide on the use of resources.⁴ Thus knowledge and power were converted into one another. In this book, I will demonstrate that texts were often one of the means by which knowledge and power were converted at Pacific Equipment.

CONVERTING CAPITAL BETWEEN FIELDS IN THE ENGINEERING CENTER

In order to introduce the notion of using texts to convert different kinds of capital at Pacific Equipment, I want to draw upon Bourdieu's (1993) notion of "field." According to Bourdieu, a field is an arena of structured positions whose interrelationships are determined by the distribution of various kinds of capital. The distribution of capital can be formal (as when one person in an engineering area is designated a team leader), or informal (as when all members of an engineering group agree that one member is exceptionally knowledgeable). Bourdieu demonstrates that fields can be nested inside one another. For instance, the cultural field of art and literature exists inside the field of power (by which Bourdieu means economic or political power), except that the cultural field reverses the signs of success that exist in the larger field. That is, the value of literature and art in the cultural field is generally inversely related to their commercial success because highly sophisticated or cutting edge work is likely to have a small audience. A similar dynamic seems to exist at Pacific Equipment, in that the field of engineering exists inside the field of the for-profit organization but places value

on well-designed objects even when they would be unprofitable to produce.

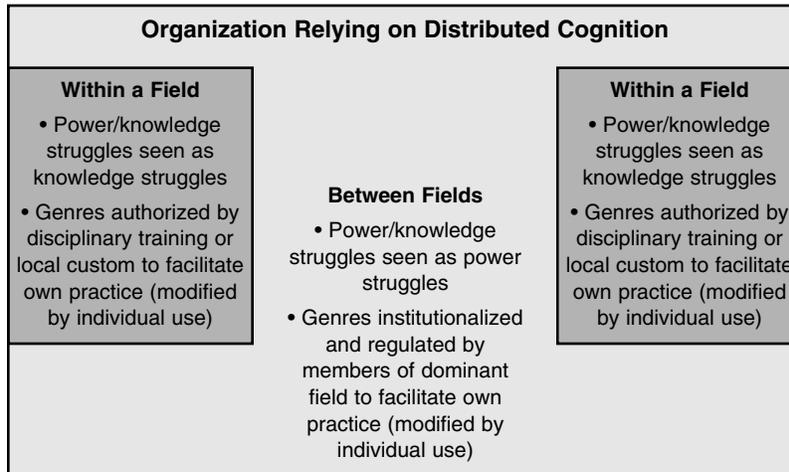
The engineer's interest in what my participants generally referred to as "quality" is both a resource and a problem for a corporation struggling to gain economic capital. It is a resource because a quality product will usually sell better. It is a problem because it needs to be made answerable to corporate concerns about cost and schedule. The problematic nature of the engineer's devotion to quality is reflected in the half-joking engineers' saying that it is sometimes necessary to Shoot the Engineer if a company wants to get a product out the door. Engineers are notorious for making costly improvements to products that managers have decided are good enough in their current incarnation. If we define a "successful corporation" as one that generates significant sums of economic capital, then such a corporation needs to manage the engineering value of quality so that it contributes to, rather than obstructs the accumulation of, economic capital, the means to power within the corporate world.⁵

How, then, do managers place engineering knowledge in the service of economic capital at Pacific Equipment? That is, how do they convert these kinds of capital into one another? In order to answer this, I want to draw on Bruno Latour's discussion of centers of knowledge and power (1987, 232–33). Latour says that Western Europe became a center of power because it had the technology to send explorers around the world and to bring back knowledge that could be amassed in one place. The technology to do this included not only ships and navigational tools, but also technologies of representation, such as writing and map drawing. By these technologies of representation, explorers were able to create "inscriptions" (64) whose force came from their ability to serve as "immutable mobiles" (227). That is, they were mobile because they could be moved from place to place and thus be amassed, but they were also immutable, so that when a map was moved from the South Pacific to England, it did not change. Knowledge had been temporarily stabilized so that it could be used. Power drawn from technologies of representation led to stabilization and accumulation of knowledge that in turn built power in centralized locations. Knowledge was converted into power that could then be reconverted into forming more knowledge.

Similarly, at Pacific Equipment, engineering knowledge is placed at the service of monetary capital by means of representations, that is, by means of texts. Engineers submit reports and various other documents to managers, a task that most of them find burdensome because it seems to be irrelevant to the work they are doing within the engineering field. Managers, however, operate in the corporate field and, from their point of view, these reports and similar texts allow them to decide what knowledge is to be generated and how knowledge is to be used, depending on whether a course of action will be profitable for the company. Requiring and controlling representations becomes a way to generate power for managers. And moving in the reverse direction, managers can deploy monetary capital to enable the generation of engineering knowledge if they believe that such an investment will return a profit to the company. This deployment of capital is regulated by means of another text, the budget sheet to which engineers must match their expenditures, so that managers do not lose control of capital even after it has been converted. Thus, we see an exemplification of Bourdieu's (1991) claim that, under the right circumstances, which here includes the presence of texts, various kinds of "capital" can be converted into one another, although the conversion will tend to be made to benefit the interests of those in positions of power. Monetary capital can be converted into cultural capital like knowledge or social capital like prestige that is intended in turn to yield greater monetary capital. Power is not used to trump engineering knowledge and to ignore its implications. Instead, power and knowledge become the means to create one another with texts as the mediating tools.

Indeed, Michel Foucault (1980) argues that power and knowledge are two ways of looking at the same thing, that they are, in fact, the same thing, which he calls "power/knowledge." Half of this insight is echoed in the cliché that knowledge is power, but Foucault also argues that power must exist if we are to recognize something as knowledge. Brenton Faber articulates Foucault's position in his analysis of discursive factors leading to organizational change. For Foucault, he says, "power comes before truth and before knowledge. We 'know' something only because we consent to the authority presenting the information. Accordingly, things are not objectively true or false, and knowledge cannot exist apart from relations of power" (2002, 114).

Fig. 1.1. Institutionalized Genres and Power/Knowledge



INSTITUTIONALIZED GENRES AND POWER/KNOWLEDGE

In this book, then, I will draw upon my observations of Pacific Equipment's engineering center to explore the relationship between genres, knowledge, and power illustrated in figure 1.1. The theory I illustrate grows from the fact that, within a large organization, people from various fields need one another in order to provide the distributed cognition that makes organizations more productive than individuals. Engineers need lab technicians and they also need managers despite the fact that neither of these groups shares the engineers' knowledge and disciplinary value systems. Within a given field, people tend to share disciplinary training and work experience. They therefore hold many assumptions in common. The generic texts they work with inside their field tend to be those they have learned in school or created with like-minded coworkers. So, for instance, engineers find it relatively easy to negotiate about texts such as an engineering drawing or a data curve. They don't necessarily agree about how the drawing should look or what the data mean, but they do agree on what counts as a valid argument and what evidence should be valued. In other words, they see the

power/knowledge struggles internal to their field as struggles over knowledge.

In contrast, when people from different fields interact, they often operate from different assumptions about the importance of knowledge or action. They thus find it more difficult to agree on what standards should be applied to settle any disagreements by means of negotiation. In other words, in a situation that is the opposite of what occurs within a field, they see the power/knowledge struggles between their fields as struggles over power. In this situation, the genres in use can't very well grow out of disciplinary training or common experience. Rather, they are often those that the more dominant field has institutionalized and now requires. In using these institutionalized genres, however, people from other fields can try to use various rhetorical tactics to maintain control over their own work, a goal that everyone at the Pacific Equipment engineering center seemed to have in common.

ORGANIZATION OF THE BOOK

In the chapters that follow, I will examine the interconnected generation of knowledge, power, and text in various parts of the Pacific Equipment engineering center. In each part of the organization, I will look at the genres in use and the way in which those genres work to generate knowledge and power. This study is unusual in that I was able to look at writing done by people at many different levels and examine how the writing worked to connect them to others in the organization. I begin by looking at managers, the study participants who held organizational positions conventionally believed to be the most powerful, and move to groups that would be successively lower on an organizational chart. As the careful wording of the previous sentence suggests, being "most powerful" or "lower" are conditions that are complicated. People can generate different kinds of power at all levels of an organization, although managers' organizational positioning can provide some of them with resources for such generation that are not universally available. Moreover, I had some trouble deciding on the relative ranking of technicians (whom I discuss in chapter 4) and summer engineering interns (whom I discuss in chapter 5). The technicians

often knew more than the interns did about the working of Pacific Equipment vehicles, but the interns were positioned as engineers even when they were not yet ready to do engineering. On the other hand, the technicians were fully fledged employees while the interns were not. I discuss the technicians before the interns primarily because doing so makes more obvious some of the ambiguities of the interns' positioning.

The discussion will also move from more abstract genres such as project schedules and budgets to those such as work orders that are more tied to the details of daily work and action. It is no accident that managers used the more abstract genres because their task was to determine the general direction that the work of the engineering center should take. Subordinates were responsible for supplying managers with information that helped them to decide on this direction and for transforming these general plans into specific actions that they carried out or delegated and then reported on. Thus their texts tended to be more concerned with designing and interpreting the work of individual people and devices. The further one moved through the engineering area and out into the lab, the more specific the texts tended to be.

Chapter 2 will look at the way in which managers used texts to shape and regulate the work of engineers so that various kinds of capital—symbolic, cultural, and monetary—were kept in balance. Its primary claim will be that people value and seek to enact genres that allow them to control the kind of capital that matters most to them. Chapter 3 will examine how engineers saw the processes of gathering data from the laboratory technicians, of generating knowledge among themselves, and of validating it with their managers. It thus shows people selecting different genres depending partly on the relation between their own organizational positions and those of their readers. It also shows them trying to shape genres that managers have institutionalized to serve their own purposes. In other words, it considers power relationships as part of the generic situation. Chapter 4 will show how a particular text—the work orders that engineers wrote for lab technicians—was used to draw on the knowledge of the technicians while reasserting the corporate hierarchy that tended to treat the technicians as tools. As part of showing how hierarchy was preserved, it will also show that the work orders' representation of the technicians' labor misrecognized

the way in which technicians did their work. Chapter 5 will examine how summer interns gained access to knowledge by becoming members of the social structure of the organization. In other words, it shows how social structures and knowledge structures overlap and how newcomers' assumption of roles in these structures inherently involves questions about power. This chapter also takes up the question of the role of tools in shaping genre and other aspects of organizational life. In chapter 6, the concluding chapter, I will then summarize the way in which the material in these chapters relates to the questions I am asking.

Between the chapters are vignettes of life in the engineering center that are edited versions of my field notes. They focus on the parts of the engineering center that will be examined in the chapters following them, and, in those chapters, I draw on the preceding vignette to illustrate my points. I hope that these more narrative accounts of life at Pacific Equipment will provide a different kind of understanding than the more analytic chapters and will provide further examples of material that can be examined. In vignette 2, we see a manager using texts to work through issues having to do with personnel and budget and thus directing the efforts of subordinates toward goals that have been determined.