TECHNOLOGY, LITERACY, AND THE EVOLUTION OF SOCIETY

Implications of the Work of Jack Goody

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The Writing of Social Organization and the Literate Situating of Cognition: Extending Goody's Social Implications of Writing

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Writing is a means of communicating between people across time and space. Writing can serve to mutually orient attention, align thoughts, coordinate actions, and transact business among people who are not physically copresent as well as among those who are. These social accomplishments depend on the text inducing appropriate meanings in the minds of the receivers, so literacy activates psychological mechanisms by which we make meaning and align ourselves to the communications of others. These psychological operations activated by literate practices may induce pleasures in themselves and evoke attention to our own inner processes of feeling and thought, such that we may find reading and thinking to be ends in themselves. Nonetheless, reading and writing are deeply social processes, connecting people's thoughts, perceptions, experiences, and projects into wider collectivities of organized action and belief.

The scholarship on the consequences of literacy that Jack Goody helped initiate over 40 years ago reminds us that these inscription and interpretation practices affected the people who engaged in literate practices, that there was more to literacy than was to be found in the text. Goody as anthropologist was aware that cultural practice affects the development of individuals and their forms of thinking as well as the communal life and so was willing to contribute the discussion of the cognitive consequences of literacy. But he never forgot the important social and cultural consequences of literacy. His account of how literacy has influenced the organization of society provides the starting point for understanding the complexity of modern social life and

how it is maintained and evolves through literate practices. Such a social account of literacy as I develop in this chapter helps us understand the kinds of meanings produced in the course of our social and cultural life and how those meanings foster activity within and between social groups. Further, such an account suggests how forms of literate participation shape our attention and thought in ways even more profound than first proposed concerning the cognitive consequences of literacy.

Because we live in a social world pervaded by literate practice transacted in semiprivacy, it is understandable that early inquiry into consequences of literacy focused on cognition. Although reading and writing can be group activities with high degrees of interaction, contemporary forms of literate practice are carried out while insulated from people immediately around us to attend to the words of people distant in time and space. Reading and writing consequently are closely linked to the contents of our minds, and we are likely to view the greatest effects of literacy to be psychological. We associate the historical growth of literacy with the cultural growth of interiority and individuality of conscience and consciousness. Moreover, because texts may travel in time and space, far from the heat of face-to-face interaction, we tend to attribute the changes literacy brings to our minds as cognitive, even though we are ready to recognize some texts as quintessential statements of passion. Further, because written communication takes such a different form than spoken communication, inscribing a visual and often enduring medium rather than transiently reorganizing air to momentarily catch the attention of another, we are rightly fascinated by the affordances of the medium and the processes by which we interact with it. Finally, because of our concern for literacy instruction, we rightly worry about how each person interacts with text through writing and reading.

The development of literate, educated individuals with extensive interiority is itself a sociocultural development that in turn creates new social formations and communal ways of life—whether in monasteries consisting of individuals living in the aura of the same book, in bureaucracies where individual work is regulated by textualized procedures and directed toward creating documentary records for future action, or in universities that bring together in dialogue people of varied, extensive reading. Though written words move minds, minds move people, and people move in the social and material worlds. Changes in our communicative lives have consequences for our lives in these worlds, and these changes, rather than the changes inside our minds, were the central interest explored by Jack Goody in his germinal 1963 essay with Ian Watt, "The Consequences of Literacy." This essay discusses how literacy affects such social and cultural issues as collective memory, communal self-image, political participation, complexity of cultural knowledge and available cultural repertoire, division of labor, complexity of institutions, and social differentiation and stratification. The various essays col-

lected by Goody (1968) in the follow-up volume *Literacy in Traditional Societies* also examine the particular sociocultural formations within which literacy takes its unique shape.

REMEMBERING THE SOCIAL

After the more cognitive book *The Domestication of the Savage Mind* (Goody, 1977), Goody rearticulated and expanded an analysis of the social and cultural implications of literacy in *The Logic of Writing and the Organization of Society*. This 1986 book synthesizes archeological data of early literate societies with ethnographic studies of recently literate societies to delineate literacy-based transformations in economics, religion, law, and government. In each domain, Goody sees literacy supporting class stratification, extended reach of institutions, and change in the self-conscious definition of the institutional entities and their practices. These changes are not determinative—they do not happen in all cases, nor do they always work out in the same ways. Further these four domains do not stand fully apart and distinct. In different societies the relation between the church, the economy, law and government work out differently, with alliances, combinations, and dominations of different orders and flavors. Nor are these major institutional domains comprehensive; for example, Goody does not examine separately the later-developing systems of scholarship, knowledge maintenance, and knowledge production that grew out of collections of documents in the domains he does examine. Nor does he examine the later systems of secular cultural production that grow out of both public sphere and commercial interests.

Some of the social consequences Goody identifies may be seen as direct changes enabled immediately by writing—such as the facilitation of common sets of beliefs to be held constant over time and across distance, or the stabilization and extension of legal regimes based on a written legal code, or the generalization of moral principles abstracted beyond local judgments in local conditions, or the ability to collect records. These consequences, however, soon ramify in complex ways. Bureaucracies develop to maintain the records and to exercise the monitoring powers afforded by the records. Religions form using the text as a center of identity, ritual, schooling, and proselytization. Reform and heretical movements form on the basis of dialectically written countertexts. To provide for participation in bureaucracy, economy, or religious hierarchy, schools then begin to take a special place within the community, with consequences for family life and the development of the young. These new institutions, particularly with the introduction of schooling, depending on how they play out, may become vehicles of social mobility or the reproduction of class advantage. These changes follow increasingly different paths of cultural creativity and differentiation. The complexities of

history breed the particularities of each way of life in constantly changing and differentiating societies. But each evolving way of life incorporates an infrastructure based on literacy. That literate infrastructure provides, I believe, the greatest implication of the social story Goody tells. The scholar's task then is not to find the universal social consequences of literacy but to understand how each society has elaborated a way of life on the matrix of literacy, with the consequence that each participant in the society to some degree participates in the particularized literate systems, whether or not each participant reads or writes.

AN EXAMPLE OF SOCIOCULTURALLY LOCATED LITERATE PRACTICES AND SENSIBILITIES

Niko Besnier's (1995) study *Literacy, Emotion and Authority: Reading and Writing on a Polynesian Atoll* describes the literate practices that have emerged in the last century and a half as an oral society came in colonial contact with Western literate forms of religion, economy, and governance. The forms of literacy the islanders of Nukulaelae developed reflected the local interests, motives, and affiliations of the inhabitants at the same time as accommodating to imposed orders. The new forms of literate life reorganized the islanders' intragroup relations as well as relations with surrounding communities of those who left the island in search of employment. Literacy is now such an essential part of the cultural life that by Besnier's report all the inhabitants of Nukulaelae are literate—a remarkable 100%. This universality of literacy attests to the fact that one cannot live as part of the contemporary community without participating through reading and writing. Yet the forms of reading and writing are limited, mostly to Bible reading, sermon preparation and delivery, and letter writing with overseas community members.

The local genre of letter writing draws on traditional preliterate community values, traditional leave-taking emotionality, as well as Christian themes of charity to remind the off-islanders emotionally of their bonds to those at home and the obligation to provide material support and goods, placing great obligations on the off-islanders who work hard with limited earnings. Similarly the practices of sermon writing are local reinterpretations of traditional island oratorical genres with Western sermonizing genres, as evolved within local cultural struggle within the community and with Western proselytizing mediated through missionaries recruited from different Pacific island communities. In both cases the forms are local and particular, serving the immediate needs of islanders and part of the evolution of the personalities, affect, and social roles of islanders. But they are also located within much larger systems of literate religions, economy, and governance, reshaped in local form.

These are just the kinds of transformations of societies, cultures, and people that Goody identified as the consequences of literacy.

Remarkably, however, Besnier (1995) positions his work as theoretically opposed to Goody's. Besnier attributes to Goody an autonomous view of literacy as a form of technological determinism, something Goody denied from the beginning. But I think the larger misunderstanding is that Besnier so focuses on the local agency and the formation of locally constructed sensibilities that he misses the larger structural importance of the history and institutions that he includes in the admirable ethnographic completeness of the account. These islanders make their own lives and their forms of subjectivities but not in the conditions of their own making, to paraphrase Giddens (1984) paraphrasing Marx (1963). That is the import of Goody's history of the role of literacy in shaping the social institutions.

In such examples we see the indirect psychological, cognitive consequences of literacy through restructuring the cultural and social environment within which each person experiences, thinks, and acts with available cultural tools and socially available responses. In Besnier's (1995) account, one of the key mechanisms for the structuring of messages and action within cultural forms is genre. Both primary genres of local writing that Besnier studies—letters and sermons—mix Western and local elements of expression, action, and role. Both also draw on Western and local genres. These recognized forms of social communication provide hybrid spaces that allow local action within reproduced elements of social structure and organization of action. They are a means by which society is reproduced and changed simultaneously by new individual acts drawing on culturally available communicative opportunities, much in the way suggested by structurational sociologists, such as Giddens (1984) and by phenomenological sociologists, such as Schutz and his students (Bergmann, 1993; Bergmann & Luckmann, 1994; Luckmann, 1992; Schutz & Luckmann, 1973). The role of genres in structuring social situations, relations, and actions has been a major theme of genre theory, as I discuss later.

The particular cultural communicative opportunities of these genres were made possible by literacy. Letters and preparatory inscription of an intended speech and its use in guiding future sermons are in a direct sense made possible by writing. Although paler equivalents may have been accomplished in societies without literacy by sending brief messages along with travelers in the hope that they would meet the desired receiver and would remember something like the intended message or by mental rehearsal of planned speeches,[1] writing made such activities more convenient, elaborate, reliable, and frequent. It is not just the particular textual forms that emerged with

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[1]Rhetoric's interest in memory has its origin in the need to be able to remember prepared topics for delivery.

writing; it was the entire set of cultural and social circumstances that surrounded the communications that had writing built into them. The letters were located in systems of commerce, property, immigration, cash economies, wage labor, scheduled ship traffic, and a thousand other literately supported systems that made possible and desirable just such a particular use of letters by these participants at the same time. The sermons sat within histories of scriptural religion and missionary activities to spread the book and to set up bureaucratic systems of governance. They further sat within the Western tradition of published sermons imported onto the atoll as well as the traditions of clerical training bodily carried by the missionary preachers. Complex politics among British missionaries, Samoan missionaries, and the inhabitants of Nukulaelae further influenced the particular hierarchical structures on the island and the particular sermon writing and delivery practices on the island.

AGENT, AGENCY AND THE INFLUENCE OF LITERACY

The example of Nukulaelae suggests that literacy's influence on social interaction (as well as attention and thought) is pervasive but does not operate in a direct and determined causal way. Rather literacy is part of the stuff out of which a way of life is made—it is an essential element of the experiences and acts of individuals, but it is not the cause of them. Literate action is always a situated choice by people in particular circumstances. But the use of literacy within the action facilitates some developments and makes less likely others. Literacy does not determine a fixed path of consequences, not just because events are complexly multicausal but because the uses of literacy depend on agentive, strategic choices of actors. Can we say wood causes or implies a chair? Can we say the chair is the consequence of cutting and carving tools, or a tradition of design, or an interstate system of commerce that encourages the production of manufactured goods, or cultural patterns that encourage eating at a table, or cultural tastes for well-turned matched sets of furniture in rooms designated for dining? Of course not. But each contributes to the particular chairs in my dining room. But also required are the actions of many people to harvest the wood, make the tools and use them to cut and carve the wood, design and construct the chair, invest in the factories, organize the front office, merchandise and sell, move that chair, and so on. These actions may be carried out in purely typical ways but ways that nonetheless require intention and commitment; other actions may involve innovations or adaptations to local situations that will have consequences for changes in chairs, their costs, and distribution. The wood or the saw haven't caused any of this, but it couldn't have happened without some material of construction and means of manufacture.

Thus in looking at how people may have used literacy in social interaction and in organizing and structuring ongoing activities and institutions we need not attribute the agency to literacy itself. The agency remains with the human actors who developed and carry out life activities using literacy, even if there were unforeseen consequences to their choices, with literacy fostering something different from what they anticipated. Literacy is a constitutive part of a matrix of complex cultural and social formations of modern society where we respond to institutions, beliefs, and groups of people located far from our daily life and that encompass far more people than you can shake a stick at, as the old saying goes.

GENRE: GIVING SHAPE TO LITERATE INTERACTIONS

To understand how new literacy-based social structures created new literacy-saturated situations calling for literate forms of action, let us return to the issue of genre. A group of theorists and researchers largely based in rhetoric and composition studies has elaborated an extended genre theory that explains why genres would take a central visible role in contemporary society. This group, following the lead of Carolyn Miller (1984), has combined genre theory with Schutz's ideas of typification in the production of the everyday life world.[2] The recognizable genres of a society provide an available repertoire of forms, actions, and motives. The forms are ways of seeing which acts are available that are appropriate to the moment as you see it—what you can do, what you might want to do. For example, you may perceive a moment in a disagreement as offering possibilities of either a rejoinder or an apology. Your motives, goals, and plans will take shape within those two constructions of potential action. You would not even consider appropriate filing a legal brief—and if somehow you found a motive and means to pursue that path, that would radically change the nature of the situation and your counterpart's set of genred options. Such a theory of genre, consistent with that of Volosinov (1986), differs from most other theories of genre in focusing on the positive force of the utterance enacted within generic form more than the limitations, regulations, or textual features. Accordingly, this theory also emphasizes the strategic agency of the user of the genre, attempting to carry forward his or her interests through one of the recognizably appropriate forms of response. Both utterer and auditor draw on their experiences of kinds of utterances to make sense of the situation and typify the moment and

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[2] For a review of the literature on genre studies in this tradition, see Russell (1997). More recent collections within this approach include Coe, Lingard, and Teslenko (2002) and Bazerman and Russell (2003).

response. The personal archive or repertoire can be drawn on, evaluated, re-shaped, recomposed for both utterer and auditor in light of their perspectives and interests, but the degree of congruence between the genres invoked in production and reception determine the degree of congruence of the mutual understandings of situation and utterance. This is why the development of a socially shared repertoire of situations, forms, actions, and motives—embod-ied in genres—is essential for high degrees of mutual understanding, coordi-nation, and cooperation—even as part of creating opposed or differentiated positions.

Although genre is important for the organization and interpretation of face to face talk, the rich and complex embodied signaling of mutual intelli-gibility or lack thereof and the constant unfolding of interchange by which the situations evolve provide real-time guideposts for constant adjustment of sense making and adjustment of future utterance. In written language the writer–reader relationship is much more tenuous and uncertain.[3] Messages rather than arising in recognizable physical surroundings come from a dis-tance, stripped of some of the embodied context that provides orientation clues. In the earliest days of letter writing, a messenger bearing the identity of the king carried the letter, and the message was delivered with some cere-mony to reproduce the royal presence. Now most texts sit in among other texts or with few external orientation clues. The reader and writer need the genre to create a communicative meeting place legible from the very form and content of the text. Further, once that place is recognizably presented, readers may easily lose their place if the text starts doing something different. Thus, the push to remain within genre and use it for positive effect in writing is much greater than in face-to-face interaction, where footing may be changed rapidly and subtly and the success of the change can be monitored in real time.

Even when communicated in familiar genres, writing is in some ways more fragile than face-to-face interaction. Written communication is easily dis-rupted through loss of attention, imposition of alternative unintended frames, multiple proliferation of alternative meanings, or the construction of hostile, unsympathetic countertexts. Even sympathetic extended interpreta-tion can lead to proliferating meaning, especially as motivated by different interests—both cognitive and material. Thus, interpretive professions, such as law, philosophy, theology, or literary studies, rarely lead to definitive meanings except through some hierarchical ruling, such as in the courts or a supreme religious body.

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[3]This thinness of situational markings in written texts led some in the first generation of consequences of writing scholars to call written texts contextless. Rather, I claim that re-moval from an immediate set of circumstances require special kinds of textual work by writ-ers and readers to establish the communicative situation.

These frailties of written communication create an even heavier burden on genres to define the situation and align participants to congruent roles, so that they can reach some degree of coordinated sense. This is especially true in fields where there is much at stake or bureaucratic consistency is required. Thus, well-worn, well-typified language is used in legal contracts, police reports, and similar documents, where the only novel portions are the particulars of the case. Similarly, highly structured questionnaires are used to direct and constrain the gathering of bureaucratic information. Also in situations where attention is likely to be distracted or peripheral, information is presented in easily recognizable forms with redundant information and text organization devices, as in news stories. Every additional degree of novelty requires higher degrees of attention and alignment from the audience as well as introduction of possibilities for divergent sense making. The divergence in sense making of any text often does not surface to socially recognizable disagreement because few opportunities arise to compare or make accountable different readings of a text, except for situations specifically structured for that purpose, such as reading comprehension exams, classroom discussions of the interpretation of a text, or courtroom disputes over the applicability of specific laws to the case at hand. But even in most classrooms or monitoring of job performance, references to text meaning are so broad-brush as to not uncover focused differences of interpretation. To avoid difficulties that might come from interpretation, students and employees often stick closely to the authoritative words of textbooks, company documents, teachers, or supervisors. Sticking close to the received word encourages shallower readings that do not get one into deeper waters by wondering what the words might actually mean.

THE ABSTRACTION OF SITUATIONS AND SITUATED ACTIONS

Despite the difficulties of interpreting texts from a distance, today we have many highly specialized forms of communication that are embedded in specialized practices, beliefs, knowledge, and stances of particular social formations. Academic disciplines and subdisciplines, such as rational choice economics; professions and subprofessions, such as patent law; bureaucracies, such as social services; religious and philosophic communities, such as Christian existentialists; and participants in elite cultural activities, such as postmodern poetry, can orient toward and make sense of texts that are unfamiliar and opaque to those outside of those social groupings. Ability to understand the genres of these fields—including the kinds of roles and stances one adopts, interpretive procedures, forms of contention, and uses to be made of the texts—is the result of substantial enculturation and apprentice-

ship that make these odd and particular forms of communication familiar, meaningful, and intelligible in detail and nuance.

These texts no longer are situated in familiar forms of face-to-face interaction but rather create new meeting places that are embedded in a world of literate interchange. Taxpayers communicate with their government in some abstracted space of machine-enhanced accountancy. In most cases, the tax form is "read" by a machine, with only a few samples ever coming to the attention of a human reader or what is called an auditor. In reading and writing philosophy, the professional philosopher joins in the great conversations of philosophy in an imagined place situated above and beyond any seminar room free from real-time but still respecting the chronology of authorship.[4] Of course, this discussion uses skills honed in classrooms and is rehearsed in numerous seminars but acknowledges contributions beyond those face-to-face locales to become part of the discussion in the literature.

But when literacy began 5,000 or so years ago, the only places that were recognizable were the actual places of face-to-face communication. A number of written genres originated as transcriptions or reproductions or reenactments or transformations or preparatory scripts for recognizable public events—such as recitations of odes and epics, or dramatic performances, or philosophic dialogs, or commands of the king. Or they were records of the counting house, to be contained within the accounting and record-keeping practice of the church or royalty or rich. Texts at first were often used for memory purposes so that the original person could reconstruct the meaning, intent, and situational purposes behind the inscriptions. But another means of making writing socially intelligible is for it to take on the voice of direct address while providing all the situational information necessary for the scene, relationship, and occasion to be reconstructed by the reader. This is the form of a letter, headed by a date and place of origin, specifying an addressee who is directly spoken to (typically in the second person), and undersigned by the speaker. The letter is then taken to be in the voice and name of the undersigned who is often represented in the first person. Even when a king's letter is drafted by an advisor and read aloud by a nuncio, the voice of the king remains. The body of the letter typically narrates the specific situation that occasions the correspondence and often refers to the current well-being or activities of both correspondents. Further greetings, closings, internal compliments, and personal statements and other devices build goodwill between the parties. This establishing of social roles and the building of goodwill so as to reinforce the relationship necessary for the commission of the business of the letter was a particular concern of the medieval guides for letter writing, the *ars dictaminis*, even though social relations were already embedded within hierarchies of church and state (Murphy, 1971; Perelman,

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[4]See Geisler (1994).

1991). From letters' overt representations of social situations, relationships and actions, more abstracted forms of interaction gradually emerged that take place only in the world of written communication. Letters have had a role in the formation of military and governmental directives and reports, philosophic treatises, church doctrinal documents, business and bureaucratic records, organizational communication, newspapers, scientific journals, financial reports to stockholders, contracts and deeds, and many other kinds of documents (Bazerman, 1999b).

THE EMERGENCE OF ABSTRACTED MEANING SYSTEMS: THE CASE OF FINANCIAL INSTRUMENTS

The most striking example of specialized genres emerging from letters is the emergence of financial instruments, including checks and paper currency. These documents still bear residual markings of letters, including date, signature, and some message to the bearer or a financial agency. Financial instruments had their origin in communications from wealthy folk who had deposited holdings with bankers, for those specific bankers to release or transfer precious to particular parties. Bonds, letters of credits, promissory notes, loans, and eventually redeemable currency became abstracted from these specific forms of correspondence that depended on personal trust of all the parties concerned. Eventually banks and then governments issued paper to make up for a lack of circulating metal, with promises that those certificates would be redeemed. In the last century trust in the general solvency of governments replaced specific promises of redemption. Increasingly the currency has been abstracted to electronic storage of digits in accounts, which we take to be meaningful and valuable, as long as we retain trust in the solvency of the government that backs the currency—which is no longer tied to gold or notes.

This case is striking not only because of the extreme reduction and transformation over less than 1,000 years of a rather concrete and particular genred communication into an abstract meaning that has only the slightest inscriptive trace to which we attribute great meaning. But the case is also striking in that the meaning we attribute to these inscriptions depends on an increasingly complex social system, consisting of many institutions. Governments, banks, interbank transfer agencies, national monetary policy boards, accountancy professions, laws, police, courts, bond markets, credit card companies, electronic technology companies and a host of other socially organized activities are part of the maintenance and operations of our financial system. All these socially organized systems must operate sufficiently reliably so that people can trust that their bank account will record their holdings

and will maintain its value—just so that people can earn and spend their limited resources. Every other person and organization with whom a financial transaction is made, locally and internationally, must also have similar trust in those systems, so that people can carry out our exchanges. Not only that, there are many other kinds of documents on which these systems are built and which are the life-blood of the flow of information by which they work. The statement of an account, though important to the account holder, is one of the most marginal of documents in these systems. Such systems range from commercial law and files of contracts to economic data gathered through questionnaires and processed through many reports and analyses to wind up with statements of federal monetary policy (Smart, 1993, 2000). Each of the systems and subsystems has its own flow of a set of genres that constitute its work (e.g., see Devitt, 1991, on tax accounting). The sets of documents are systematically organized with temporal and intertextual relations with each other and in relation to the activities and roles of the various socially organized participants (Bazerman, 1995). In the contemporary professionalized financial world, moreover, there are philosophic, political, and economic literatures that provide rationales, means of conceptualizing, and theorized methods of calculation for the management of the complex system of international economies and monetary policy.[5]

These documents are said to bear information. To successfully use information in the modern world one needs to know which documents bear the information one seeks. This suggests another underlying component of the textual systems. Information is created by inscription. And inscription of specific types only takes place in certain forms in certain documents and is stored for retrieval in other particular documents. For example, my salary gets reported in a few primary documentary systems. One set is internal to my university's budget and financing office, consisting largely of what are called the books, but also several subsidiary communications that have to do with particular adjustments, summer salary, change of health plans, and so on. Another set of documents are the communications between employer and employee, such as hiring letters and notices of pay increase. Because I am in a merit-based promotion system, current and proposed salaries are also represented in the documents surrounding academic evaluation and merit reviews. Another place where salary appears is in the transfer to my bank accounts, and another is in reports to the state and national tax systems. Each of the taxing agencies has complex sets of documents for the calculating, recording, and processing of my taxes—which then generates another set of correspondence between myself and the taxing authorities. The salary as a

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[5]See McCloskey (1986) for an analysis of the typical discourses of economics and Bazerman (1993b) for analysis of an important moment in the founding of the ideology and conceptual basis of the modern financial and economic world.

piece of information resides in particular documents in these systems. The numbers of course must be coordinated, otherwise someone will discover their accounts run short. However, the numbers and event concepts are not the same because my bank receives only my net salary minus various health tax and other deductions. The government receives several different numbers, such as gross income and net taxable income. The academic evaluation system as well as the pension system only communicate with the base salary, without extra payments, such as summer pay or administrative stipends. The information, however, exists only in the documents of the system, and I need to know which document to retrieve to make comparisons with any particular number in any of the other documents used by different systems. Following Bakhtin (1981), we can in fact identify the particular chronotopes of each document in terms of the kinds of information each holds and each manipulates or tells a particular kind of story about. Bakhtin develops the idea of chronotope in relation to literary texts, where each kind of story typically takes place in a certain time and place, with certain kinds of objects, and certain kinds of characters and activities. But such typicality of objects, agents, setting, and actions is equally true of any kind of document. Fill-in forms are highly explicit about this, with the institutional general categories specified in the printed parts that then direct the person responding to fill in particulars, to create a certain kind of task-specific self-representation. The general categories and particulars in an application for college admission are quite distinctive from those on a loan application, and people would be quite surprised or even shocked to find some of the questions on one misplaced on the other. Even in a newspaper, people know the kinds of particulars, kinds of stories and actors and settings that would appear on page 1, on the sports pages, and on the entertainment pages, and we would find it strange to find a description of an interview with an actor about a new movie in the news section, just as we would find it strange to see a head of state's speech to the United Nations on the sports page, or battlefront reports in the entertainment section.

SCIENTIFIC MEANING AND THE EMERGENCE OF THE SCIENTIFIC LITERATURE AND COMMUNITY

What is true so strikingly of the meanings of the financial information we have created is also true of most of the activities of modernity. For example, the experimental article in science was born in the early epistolary exchanges among mid-17th-century natural philosophers. This combined with another emergent form of scientific communication, when Henry Oldenburg, secretary of the Royal Society and center of a correspondence network, read from

his correspondence at Society meetings. These reports of correspondence formed the basis of the *Philosophical Transactions of the Royal Society of London*, first published in 1665. The earliest issues of this journal were descriptions and excerpts of his correspondence, but soon the pages were filled with the full text of letters composed directly for general distribution. Within a few years the articles dropped the trappings of a letter as well as the appearance of addressing a meeting of the Royal Society; articles instead became free-standing communications to the readers, contexted only by their appearance in the journal. Once the scientific article was recognized as being of its own type, it rapidly developed features that spoke to the rhetorical argumentative dynamics of the new social formation—meeting only in the literature. By 1800 the experimental article had many of the recognizable features of modern scientific article (Bazerman, 1988, chap. 3).

A particularly interesting example of this transition from letter to scientific article is Newton's letter sent to Oldenburg and the Royal Society describing his new theory of light and colors. When this was read to a meeting of the society on February 8, 1672, it met with general approbation and was published in the February 19 issue of the *Philosophical Transactions*. Robert Hooke, however, took a copy of the letter home and wrote a reply, which he read to the February 15 meeting of the society. Other criticisms arrived by letter and were published in the *Transactions*. Newton began answering all the objections in the journal. A controversy broke out in the pages of the journal that lasted 4 years and comprised almost 20 articles. In the course of this exchange Newton developed a new style of mathematical argument that was to be highly influential for the future of the scientific article (Bazerman, 1988, chap. 4).

Simultaneous with the emergence of the format, contents, and style of the experimental article, the scientific community developed roles, values, activities, and intellectual orientations organized around the production and reception of such articles. As the genre began to take its modern form, a readership had emerged that looked to the journals for the advance of knowledge. This audience read critically against their own knowledge and attempted to fit the latest findings into what they knew. They could actively respond by writing letters back or articles presenting contrary evidence. The readers also knew about experiments and were performing them more on their own. Around the production and dissemination of such knowledge a new profession had grown, often supported in educational institutions or other places of higher learning. These same professionals who also produced their own research took on roles of editors and referees as well as critical readers and consumers. The role conflicts that emerged in their multiple complex roles led to several characteristic values and social organizational features of modern science. These conflict-mediating mechanisms include the differentiation between professional and amateur audiences; the retreat

of the experiment to private laboratory, rather than public demonstration; scientific specialization; and the commitment to the advancement of knowledge over personal gain (Bazerman, 1988, chap. 5; Merton, 1973). Journal science describes more than just a means of communication; it indicates people who share significant beliefs, orientations, and commitments to this system of knowledge making, distribution, and use. The natural philosophers' commitment had been abstracted from regular attendance at meetings to a scientific production of an evolving literature, or rather in each person's mental projection of a dynamic discussion in the literature (Bazerman, 1988, chap. 8). One of the last major elements of modern scientific publication to come into place was the explicit intertextuality of reviews of the literature and citation practices. These intertextual practices placed the discussion within published findings of the accumulated experience of all scientists no matter what time or place they lived in (Bazerman, 1991). This literature was to become increasingly structured around dominant theories (Bazerman, 1988, chap. 8). Even critiques that wished to take fundamentally different theory positions had to characterize and reframe current theory to create a new place to meet their audience (Bazerman, 1993a).

These newly emerged scientists developed specialized means, stances, sites, and organizations of interaction and thought. They became socialized into arcane communities with specialized practices and long apprenticeships excluding others who don't learn to communicate and act according to the standards of the field. Nonetheless, in these transformations of the community and individuals, neither the individual nor the group loses agency. Rather, the socialization provides them the tools of agency to become powerful and authoritative actors on a highly specialized social stage of the scientific literature. They are the ones that have the right to speak and the means to speak forcefully so as to project new views into the virtual world of the literature and to thereby transform the knowledge produced by the fields and the very standards, organizations, procedures, and commitments of their fields. As well, their authority within scientific communications can lend authority in other areas of communication that grant respect to science and scientists.

AN AGENT: THOMAS EDISON

Power aggregates in these socially organized literate systems. Particularly, those who have the authority and means to communicate within such systems have access to power, as Goody pointed out in his analyses of the power and social mobility that flowed to the emergent scribal elites in the church, law, and state (Goody, 1986). However, this power is not an abstraction but only exists in its specific exercise in specific projects. These literate systems

are means of doing things through influencing others who are somehow tied to or beholden to these literate systems. Only through the active use of the systems through active production, reception, and use of particular texts is the social power of literacy realized. However, that agency may take many forms given the great variety of literate activity systems, their different configurations and evolutions, the different resources available to each particular agent who is differentially located in each system and has different access to resources of other systems, the different objectives and goals to be achieved in each case, and the inventiveness of each agent in pursuing communicative goals.

The communicative work that Thomas Edison and his colleagues did in multiple social systems to bring electric light and central power into being makes this case strikingly (Bazerman, 1999a). To gain cooperation of people in multiple social spheres—financial, technical, scientific, legal, governmental, and organizational—Edison had to communicate within many highly elaborated literate activity systems. But each system was configured differently, and Edison had different resources and aims in dealing with each. Patent law had stabilized almost half a century before Edison began working on incandescent lighting, so he had to work with his patent agents to file patent applications in standard formats for examination in a well-developed system of the patent office with highly typified criteria, procedures for appeal, and litigation. Nonetheless he and his agents strategically framed his patents, as all savvy applicants do, to give the broadest and most secure protection to the emergent work he was protecting. To enforce these patents, he and his lawyers contended within the well-structured and document-laden world of the courts. On the other hand, at the time of Edison's work, newspapers were undergoing rapid change and growth as a consequence of new print and paper technologies, urbanization, transportation, and telegraphy. Edison's career developed in the midst of these changes, so he was able to understand the power of the press and the means to get it; in particular, he saw early the advantage of the new forms of human interest story and quickly figured out how to be a good interview subject and gain publicity. He also identified moments when favorable press reports were so valuable as to warrant well-placed bribes. In the forefront of changing invention from an individual to a group activity at his Menlo Park labs, he transformed the personal discovery notebook into a mechanism for coordinating the work of his team. In each of these areas and others he needed different kinds of communicative work to establish presence, meaning, and value for his proposed technology so that it would gain the necessary support and cooperation of the various groups on which it depended. Then, as the material technology emerged, he needed people to attribute favorable meanings and value so as to firmly plant the technology in the daily life world. Only through complex accommodations and strategic actions within the many communicative systems could Edison

become the powerful actor, the powerful agent of change and social reorganization that he became.

THE INFORMATION AGE
AS A LITERATE PHENOMENON

Today much of our sense of literacy's influence on life has been displaced onto the concept of information, which is said to surround us, rather than the texts, documents, files, and other inscriptions in which information is recorded, stored, and made accessible. The term "information" seems to decontextualize information and make it a pure abstract substance that rises above particular human uses and motives. But because information is produced within particular kinds of documents, it is embedded within the ideology of those genres (Beebe, 1994; Volosinov, 1986), even though we may forget the genres and the activity systems that give rise to it. Because information is produced and stored in literate systems of social activity and is then accessed from its inscribed storage for specific uses, it carries with it the motives of its collection, preservation, and dissemination, on which are superscribed the aims and motives of the new activities it is accessed for and enlisted within, as new sets of calculations. To understand what information is, how we use it, and how we compare and calculate and come to conclusions about it is to understand much about how we think today.

The examples of financial information I have already discussed exhibit how one common kind of information people use is quite concretely embedded within activity systems. Reports of prices of transactions exist only on the basis of existing markets, with their genres of bidding, offering, and coming to terms. But these prices only become available information of the kind we read about in the newspaper if the market has a bureaucracy of recording and reporting exchanges, turning them into information. Further, dissemination of the information requires genred media of ticker tapes, financial news pages, television screen-bottom crawls, or brokerage web pages. Typified documents make the information accessible to those with a stake in the market and provide the means and material of calculative thought. Whenever one uses a market-determined price, one invokes the whole ideological weight of the market system, which produced that information, and one enters into the regimes of calculation facilitated by the documents designed as part of the systems of use. For such reasons, the introduction of electronic spreadsheets that facilitated certain kinds of displays and calculations brought about major changes in many realms of financial action. The statement that the right to emit into the atmosphere a ton of carbon pollutants is now trading for a certain number of dollars is only informative because of recent laws that define rights to pollute and create the transferability of those rights,

thereby setting the conditions for a market, which is then formed. I may object to pollution being commodified, any person or organization being granted a right to pollute, even more to that right being transferable, and worst of all a profit being made from the trade; nonetheless, my invocation of the current market price invokes the existence of that entire system. It takes a second set of communicative acts to then wash my hands of the ideology and social understandings and institutions I have just invoked.

INFORMATIONALIZING THE ENVIRONMENT

Perhaps the commodification of pollution was a likely outcome within our modern world, where monetary value determined in markets is the ultimate form of communication. As Adam Smith proposed, market value has become the least common denominator of information for social exchange, such that all social systems are under pressure to translate their values and motives into financial terms in pursuit of individual ends (Bazerman, 1993b). But at least another element was necessary for this particular commodification and market to occur. The environment also had to be turned into various kinds of information. For many centuries information had been collected on the atmosphere, weather, and even toxic substances for various purposes, but the concept of the environment as something to be monitored because it was at threat really emerged only in the last half century. In the United States the concept of environmental information grew out of activist concern fostered both by Rachel Carson's polemic on the effect of DDT and other pesticides and by the antinuclear testing movement that identified public information on nuclear fallout as necessary for citizens to counter the government monopoly on confidential military information. The concept of scientifically based public information for the protection of citizen interests carried with it a number of ideological assumptions that framed the gathering, presentation, and interpretation of the information (Bazerman, 2001). As alarm over the harmful effects of pollution and the degradation of the environment increased, there came a more general call, not just by activists, to gather information about the environment so that decisions could be made on it. These calls took their most forceful shape in congressional hearings and associated documents and crystallized into laws calling for the production of environmental impact statements. This new genre and associated genres of monitoring the state of nature funded new research and gave shape to forms of reporting (Bazerman, Little, & Chavkin, 2003). In some cases new scientific specialties arose with new research methods to carry out new tasks with different theoretical grounding (Bazerman & De los Santos, forthcoming). Among the new methods was complex modeling of the atmosphere, enabling predictions about greenhouse gases and global warming.

Large literatures emerged on this subject within which new tools of inscription and calculation arose in the form of computerized programs. These programs further increased the need for specific kinds of information as input to the calculation and resulted in new kinds of output information reported in scientific circles as well as in newspapers, politic forums, legislatures, international diplomacy, and world conferences attempting to negotiate mitigations of the worst consequences projected by these calculations.

Many industries saw these calculations and the proposed remedies arising out of the several activity systems directed toward the monitoring and protecting of a threatened environment as having a negative impact on their own forms of accounting and calculation to serve the goals of their economic financial activity systems. Those industrial forms of calculation had few means, places, or genres in which to inscribe the effect of climate change, except in the form of casualty loss from extreme weather events that might affect some industries. Such casualty losses, however, would be insured and would turn up primarily as insurance cost. Further, the measures suggested to mitigate the global warming often had anticipatable accountable increases in the cost of doing business. One industry, however, is differently structured in its accounting, as it bears the burden of extreme weather and natural disasters—the insurance industry. Natural disasters, extreme events, and loss of property to rising sea levels are inscribed in their systems as major costs in payouts. The profitability and viability of insurance companies depend on complex forms of actuarial calculations and risk assessments, based on data gathered in various historical reports and supplemented by other inscriptional and calculative methods of projecting future conditions. By the early 1990s some insurers, especially in Europe, examining their own payouts recorded in their books and reading the press accounts and scientific literature concerning global warming, began to become concerned that global warming would have heavy impact on their industry (Mollin, 1993). Some insurers, particularly the large reinsurers such as Munich Reinsurance Company that served the industry by offsetting risks incurred by separate insurers, became so concerned as to hire their own meteorologists and climatologists to prepare internal reports (Mills, 1998). Each of the kinds of collected data, development of procedures for calculation and modeling, presentation and transmittal of findings, determination of effects, and recommendations are realized in particular genres of documents with associated activities, roles, and other socially organizing concomitants. Further, the translation and recalculation of the environmental conclusions and projections into the systems of economic calculation of risk imply whole new sets of documents and organizational structures.

Of course, all this is just talking about the weather that we can sense without words by walking outside. But the inscription and aggregation of particular forms of data and the development of calculative and reporting gen-

res, as well as all the other action genres that create the large institutions of science, environmentalism, governments, and finances as well as the insurance industry, all that is built on literacy and the invention of complex forms of literate interaction and literacy-based activity systems.

These inventions of genres and forms of socially organized activities that rely on them, the data inscribed within them, and the calculations and conclusions and recommendations made on the bases of what is inscribed, elaborated, and thought through in documentary spaces are unanticipated, unusual, and complex in ramifications. Contingency, exigency, and creativity lead to the emergence of constantly evolving literate social systems and the documents that represent the inscribed meanings that coordinate and contend the relationships and activities. These literate social systems through the agency of humans come off the page into the formations of the social world and the material actions that form our relationship to the material world. These documents aid in the negotiation, planning, and construction of the built material environment and themselves form a built symbolic environment that shapes our understanding and approach to almost all aspects of the daily life in the contemporary literate world. But there is nothing determinative in exactly how we have used literacy in relating to each other and to the world. It is not implicit within the earliest use of counting tokens to keep track of livestock that an insurance industry 5 millennia later in the 18th-century would meet the needs of expanding capitalism by using new tools of mathematics to develop particular forms of record keeping and actuarial calculations to determine risks and insurance rates. Nor is it a necessary consequence that two centuries later, once insurance had become a major international industry, an environmental movement emerged that would encourage new forms of science that would then provide calculations that would explain changes in disaster payouts and would predict future increased risks. But out of such agency of many individuals and organizations we grow the changing literate environment, the intertextuality, which we use to orient to life in the 21st century.

EACH WORLD HAS ITS LIMITS: RETHINKING RESTRICTION

Goody (1968) was right to point out there are differences in the ways different societies and cultures use literacy and the kinds of organizations and actions they build out of the integument of literate interaction. Although the term "restricted literacy" implies far too simple a dichotomy between two classes of societies, one of which is defamed, it does open up the question of how the individuals and groups have found different uses for literacy. Some

societies have found uses for literacy primarily within scriptural religions and few other places of life, and at some moments it has served interests of some powerful people to put obstacles in the way of other individuals who want to gain the power of literacy or want to apply it to other domains. But so too in the political and economic realms individuals and groups have sought to restrict the access of others or the reconfiguration of literacies that would shift power to other activities, groups, and individuals. Further, the kinds of habits and typifications necessary to make written communication intelligible, particularly at a distance, encourage people to reproduce the kinds of typified practices and behaviors that constitute the literate order. It takes acts of invention and creativity, tempered by intelligible extension, to find new ways and uses for literacy. Such creativity is incited by some perceived exigency that would motivate individuals to discover new ways to communicate to people on different matters and to foster different sorts of actions. Such exigencies constantly appear in human life, as each person and group attempts to respond to their ever-changing conditions of life using, reconfiguring, and extending the particular set of cultural resources available in their world. Thus, each culture will appear particular in its set of literate resources and practices and each will develop on novel lines in its uses of literacy. Every literate community does some things in some ways and not other things in other ways. As one looks to the history, distribution, and variation of literate practices, one finds remarkable diversity, striking inventiveness, and unanticipated conjunctions and alliances. At the same time, texts are portable, and textual practices are constantly moving from one cultural context to others, but even then, the uptake, interpretation, and use may be different in the new sociocultural environment. So as in all cultural practice there is both dissemination and difference.

But to notice unanticipated difference is not to say that the uses of literacy are random and unsystematic. The operations of literacy tend toward systematicity because of the need for intelligibility at a distance. By understanding that systematicity, we can make sense of the varied literate configurations found in the world, how they emerge, how they are sustained, and how they evolve or collapse.

THE WORLD WE LIVE IN GETS OUR ATTENTION: RETHINKING COGNITIVE CONSEQUENCES

Understanding the social consequences of literacy may also help us move beyond an impasse that occurred in the cognitive consequences of literacy inquiry. Once Scribner and Cole (1981) forcefully established that the conse-

quences were variable based on social, institutional, and historical factors, cognitive consequences of literacy became recognized as particular and situated rather than general. This left cognitive studies of literacy only to look at individual situated cases. But if there is order to society, and that order has something to do with what has been done with literacy, perhaps the orderliness of literate practices and the way they enter into social structure can provide ways to sociologically characterize the orderliness of each literate situation, and thus begin to find order within the variety of literate situations. To understand the consequences of a commercially used literacy, we can go about understanding the ordered history and organization of a society's commerce and how it has built literate activity into its agreements, negotiations, conflicts, resolutions, record keeping, assignment of value, and distribution of property. If such structures are built on literacy not only will they use literacy, but also those uses will be consistent with, or symbiotically developed with, what we have discovered we can make literacy do.

Even more, because literacy does travel between minds and is a means for one mind to influence or orient the attention and operations of another, then the social organization will have cognitive components that are particularly related to the forms of social relation that are part of the literate way of life. That is, the social embodies meaning—particularly the more durable and widely traveling meanings evoked by literate artifacts.[6] And those meanings, to gain congruency among readers, must be those kinds that can be conveyed by literacy and cast into the forms that literacy offers. The mechanisms of meaning are also socially effective mechanisms. To understand the cognitive consequences of literacy we need to look at the social consequences, but to understand the social, we need to look at how texts can come to be meaningful to different people, and thus must look at the cognitive. Ultimately we find that the cognitive consequences are more about the new meaning systems and activities that occupy our minds than they are just about the character of work with symbols. Coordinately, society is more affected by the systems of meanings it is saturated with through literate formations than it is just by the initial monopolies one or another class may have had on literacy. Whether one form of inscription is more efficient or more easily learned than another (the asserted alphabetic advantage) may be less consequential in its cognitive consequences than if a society has developed a large bureaucracy, literary culture, philosophic tradition, technology, commerce, and educational system using whatever form of inscription it has historically developed. It is those things that people will think about and that will be cognitively and affectively consequential for them.

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[6]John Mohr (1994) is a sociologist trying to look at the social order through the structured social meanings represented by institutional texts.

THE LITERATE ACCOMPLISHMENT
AND THE BUILT SYMBOLIC ENVIRONMENT

Over the last 5,000 years we have created new ways of life, new forms of social organization, new structures of commerce, new ways of knowing, new ways of growing up. Children of the forest since prehistory have learned to find their way in the natural environment they grow up in; as well they learn to find their way in the social environment of the people around them and in the symbolic environment created in their dialogue with others and the artifacts of the culture.[7] But now children not only must learn to find their way in the built environment of the cities, suburbs, farms, and schools, but they also must learn to find their way in the built symbolic environment of books, media, and signs on the walls. And this built symbolic environment is inextricable from the extended social world they must come to understand. Full participation in many of the social domains of the modern world requires high levels of literacy skills as well as extensive knowledge relevant to that domain transmitted through literacy. The world we know, think about, and act within is saturated by and structured on the texts that travel from place to place and have some durability over the years. The built symbolic world on which we have elaborated new social meanings and relationships and that is the object of our thought and attention as we try to live our lives as successfully as we can within it, in that we find the consequences of literacy.

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[7]Olson (1994) explores some of the challenges that people face as readers in navigating the world of texts.

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