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Rebecca Barr, Michael L. Kamil, Peter B. Mosenthal, P. David Pearson

The Development of Literacy in the Industrialized Nations of the West

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Richard L. Venezky

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Literacy represents both a national aspiration and a set of human practices anchored in space and time. From this dual existence literacy has acquired both a sociopolitical dimension, associated with its role within society and the ways in which it is deployed for political, cultural, and economic ends; and a psychological dimension, associated with cognitive and affective properties that lead to greater or lesser individual motivation for and competence with writing and print. These dimensions have developed over the past 1,000 years as literacy in the Western world changed from being the private possession of scribes and clerics, practiced primarily within the circumscribed domains of religion and government, to a near-universal tool of the masses, utilizable within every facet of daily life.

In parallel with this downward and outward spread of literacy within society have also occurred changes in literacy practices. As the manuscript page, with its often perceptually complex graphical style, its unspaced arrangement of words, and its irregular orthography was replaced over time by the printed page, with its increasing legibility of print and regularity of spelling, and as exposure to literacy practices began at earlier ages and received more regular and intensive practice through a lifetime, reading for the average literate changed from a slow, oral production to a more rapid, silent practice.

The goal of this chapter is to trace these complex changes within the histories of the Western industrialized nations, primarily from the rise of feudalism until the end of the first quarter of this century, when most of these nations had attained—or were close to attaining—universal literacy. This is not intended to be a comprehensive chronicle of literacy within the countries of interest, but instead a perspective for viewing literacy development, with emphasis on those issues of theory and methodology that are of interest to readers of this text. The primary focus here is the practice of literacy, its expansion over time, and the evidence for both the quantity and quality of literacy at different periods in Western history. Little attention is given to speculations on the consequences of literacy (e.g., Goody & Watt, 1968; Stock, 1983; Eisenstein, 1979) or on conspiracy theories, particularly those that posit manipulation of children through reading practices or of the masses through literacy expectations (e.g., Graff, 1979).

This chapter, like a classical symphony, is divided into four major sections. In the first, Preliminaries, the major theme of the chapter is introduced and a few secondary themes played out: how literacy has been defined over time, what threads can be
stretched between the modern psychological study of reading and the history of literacy, and an obligatory note on the sources for this work. In the second section, Problems of Evidence, the forms of evidence that can be adduced for the study of literacy are classified and dissected, their values and foibles laid bare. The third section, General Development, finally gets down to the progression of literacy across the centuries, leaping, sometimes like falling water across the rocks, from country to country and time period to time period, through religious influences, the Renaissance, the rise of the vernaculars, the Industrial Revolution, and the modern era. Then, in a brief coda, a research agenda is offered for closing the many gaps uncovered in the earlier sections.

Preliminaries

Common Threads in Literacy Expansion

The perspective adopted here, in brief, is that literacy is a response to the needs of collective society; and therefore the most immediate social change that promotes wider literacy is the expansion of writing and print into areas of everyday life where previously it did not exist or where its role was more restricted. Therefore one of the most important goals of historical studies on literacy is to understand the mechanisms by which first handwritten and later printed materials were generated, distributed, and used. Scholarship centered on what the French call L'histoire du livre. What has come to be called the "history of the book" in Anglo-American circles has quickened in the past decade; and a large body of material on Western print culture, including new theories on the nature of print and its use, has appeared (e.g., Kaestle, 1985; Darnton, 1983; Spufford, 1981; Marker, 1985).

But the expansion of writing and print is only the first part of this perspective. Equally important to this notion is the answer to the question of what has driven this expansion over the past 1,000 years or so. What are the differences between, for example, the English worlds of King John (of Magna Carta fame) and the last years of Queen Victoria, or the French worlds of King Philip and Georges Clemenceau that make print more important in the 20th century than in earlier times? In other words, "The problem . . . is not simply how and why people became literate. It is rather why the printed word in its various forms assumes significance in the lives of individuals and societies" (Laqueur, 1983, p. 44).

Among the changes most often cited as direct causes of the spread of literacy are the development of the market economy (Thomas, 1986), the Reformation (Haile, 1976, p. 817), and the expansion of schooling (Spufford, 1981, p. 19; Craig, 1981, p. 171). All three are important components of the transformation of Europe from feudalism to modern, industrial nationhood, but they cannot fully explain the profound change that has occurred in the role of literacy in individual lives. The Reformation, the market economy, schooling, industrialization, and many other factors contributed to the outward expansion of the physical and mental space of the ordinary citizen and thus have driven the continual incursion of print into everyday life. So long as most individuals saw their lives as permanently rooted to an ancestral farm or village, their occupations and social statuses determined inexorably by heredity, and their relationship to Scripture and the supernatural mediated by others, there was little need for literacy. What happened at a distance from the daily perimeter of their existence was usually not of major interest, and if it were it could easily be transmitted orally by local officials, clerics, or travelers who might happen by.
But as political awareness and power developed, the desire to know what was happening in distant political centers increased. Similarly, the market economy created a need not only to communicate with shippers and merchants who were far away, but also to monitor events in those places that might affect the nature or quantity of what one produced. The change in relationship between individual and Scripture that resulted from the Reformation expanded the mental world of the devout. Where once the village priest provided verse and interpretation, now each individual, at least within the new Protestant faiths, was directly responsible for these. These and other changes expanded continually the mental and physical space within which the ordinary person lived, making communication beyond the immediately observable world both necessary and desirable. The printing press and schooling were important components of this change process, but they did not by themselves drive the spread of literacy; instead, their separate importances derived also from the outward expansion of personal space, as will be discussed more fully below.

An alternative view to the one presented here could be created around the idea of empowerment: that each stage in the expansion of literacy among the masses gave power to yet another group of people—that is, entrée to social, political, or economic benefits that previously had not been enjoyed. But this is too general and too hasty a conclusion. Literacy may have been acquired in some instances to maintain position in a changing environment, rather than to acquire new privilege. Literacy may then have been only one of a number of skills required for promotion in society; or it may have been an enabling skill that, if not followed by the acquisition of additional skills, gave no special returns. The notion of personal space, although not yet as precise as it might be, is neutral towards power, control, and even advantage, at least in the traditional senses of these terms. The use of literacy for personal enjoyment, for example, gives no special powers to the reader, yet represents a major expansion of personal space and a large step for the integration of print into everyday life.

This, then, is the framework within which almost 1,000 years of literacy development will be traced. This perspective might, in a loose sense, be called a theory of literacy expansion. It predicts that social changes which enlarge individual space offer the greatest opportunity for the spread of print culture and that where print culture expands, literacy expands. The domain to which this theory applies is Europe and America, from feudal times until the 19th and early 20th centuries, when almost all industrialized nations had accepted basic education and universal literacy as national interests.

Exceptions to the theory of literacy expansion presented here can be found, particularly where literacy was promoted for limited ends. In late 17th-century Sweden, for example, reading ability was pressed on the population by church and state to ensure that everyone could "read, sing, and pray the holy 'Word' of God from books printed in Gothic type" (Johansson, 1987, p. 65). Through regular parish examinations, fines for parents who failed to teach their children, and denial of Communion and marriage rights to those adults who could not read and recite the catechism, reading ability rose above 90 percent by the mid-18th century. This form of literacy, like the semiliteracy based upon reading that the Catholic Church promoted in 19th-century France (Furet & Ozouf, 1982, p. 220), did not represent an individual response to social needs. It was imposed from without to preserve tradition rather than to adjust to new needs. Even today, however, literacy is used by some primarily to confirm cherished beliefs rather than to gain access to new ideas and information (e.g., Heath, 1980, p. 129). However, the literacy expansion theory can account for the major trends that have accompanied literacy development in the West, at least up to recent times. Perhaps more important, it also provides a perspective through which testable hypotheses can be generated and better theories built.
What is Literacy?

Literacy has meant different things at different times and in different places. The modern terms "literate" and "illiterate" both derive from the Latin literatus, which for Cicero was a learned person. In the Middle Ages a literatus was one who could read, write, and perhaps speak Latin, regardless of what his competence might have been in the vernacular (Stock, 1983, p. 27). After 1300, however, literacy in the vernacular became increasingly more common (Clanchy, 1979, pp. 182 ff.). In addition, due to the breakdown of learning during the Middle Ages, literatus came to mean minimal ability in reading. Although the term "literacy" does not occur in the English lexicon until near the end of the 19th century, the modern concepts of literate and illiterate date from the last half of the 16th century. Remnants of the classical definition survived, nevertheless, until at least the end of the 18th century, when Lord Chesterfield wrote that an illiterate was one "ignorant of Greek and Latin" (cited in Oxford English Dictionary, 1933, s.v. "illiterate").

Unfortunately, the literate/illiterate dichotomy that pervades the historical literature on literacy disguises the continual nature of literacy ability. Almost no attempt has been made to estimate the actual levels of reading or writing ability that might have resulted in the past from different exposures to instruction and practice, or that might have been required at different times, in spite of Schofield's (1968, p. 314) call to do this in an oft-cited paper on the evidence for historical literacy. Cremin (1970, pp. 448-449) suggested a beginning to this discrimination by differentiating between marginal ("inert") literacy and self-sustaining ("liberating") literacy, but the techniques for making this distinction have not been explored.

The exclusion of writing from the early definitions of literacy resulted primarily from the complexities inherent in the preparation of writing surfaces, inks, and quills. Furet and Ozouf (1982, p. 76) point out that "We are inclined to forget, today, that for a long time writing was really a technical exercise, involving instruments, muscular gymnastics and a knack." (Whether writing today requires significantly more than eye-hand coordination, plus mastery of appropriate graphical conventions, has not been properly addressed by the current research on writing.) According to Cippola (1969, p. 8), writing over the past 500 years "is strictly and almost inevitably connected with the condition of urbanization and commercial intercourse." In 15th-century England, for example, where literacy had begun to spread to the masses, writing (and accounting) remained the possession of a small group of professionals (Fisher, 1977, p. 896).

The addition of writing to the definition of literacy appears to be a contribution of the Reformation. Without writing, literacy is restricted to a passive activity, dependent upon the will of others. Entry to the market economy requires writing, as do those other activities that mark the modern person—for example, pursuit of personal efficacy and self-directed relationships with the traditional sources of social and political influence (Inkeles & Smith, 1974, p. 290).

For those who read but cannot write, Cipolla (1969, p. 11) proposes the term "semiliterate." Cipolla also uses this term for those who read and write poorly, but this suggests that sufficient information is available to distinguish at least two levels of reading ability for earlier times, an issue that will be discussed more fully below. In this chapter, literacy, unless qualified otherwise, will assume both reading and writing.

Psychology and History

Literacy qua literacy is a cognitive skill, categorically similar to numeracy, bookkeeping, and chess playing. This is not to deny literacy’s sociopolitical dimension, but instead to reinforce the relevance of psychology to the study of literacy acquisition and literacy.
performance. As a cognitive skill, literacy can be viewed as two related complex processes: reading and writing. For the former an enormous research literature is available, from which a few empirically derived conclusions can be drawn. For example, the process of reading involves (1) a set of lower-level skills for detecting and recognizing letters and other word parts and for assembling these into wholes for matching against an internal lexicon, and (2) a set of higher-level skills for deriving and integrating meanings. For efficient reading the lower-level skills must work rapidly and autonomously, although how much so for different reading tasks remains to be explored. The higher-level skills must integrate local and global text information with information from long-term memory, although the degree of such integration depends upon the text and the task (Perfetti, 1985).

We also invoke developmental data on reading, but these apply primarily to children. From these data we can estimate such reading characteristics as oral and silent reading rates, degree of subvocalization, average eye fixation span, and types of oral reading errors for learners at different points in their reading development (e.g., Taylor, 1937; Hardyck & Petrinovich, 1970; Judd & Buswell, 1922; Biemiller, 1970; Barr, 1975). One of the challenges in the historical analysis of literacy is to relate such conclusions from the modern psychological study of reading to the estimation of reading ability in earlier times. For example, what oral reading rate might we expect of a 6-year-old child in 16th-century Paris after 20 to 30 hours of tutoring with a Latin Psalter as the only reading text? How well would the average accountant in late 15th-century Milan, trained in reading black-letter Gothic script, read documents written in roman script or printed in the then emerging roman italic font (Febvre & Martin, 1958, pp. 80 ff.).

Thomas (1986, pp. 100 ff.) hypothesizes that during the 16th to the 18th centuries an ability to read Gothic did not necessarily guarantee an ability to read roman, and that some could read print but not handwriting. A professional in early 16th-century Europe might be expected to read documents written in either Latin or the local vernacular, and either handwritten in any of the four popular scripts of the time or printed, with a comparable number of options for type styles. For such an individual, how much exposure to these various graphic forms would be required before word recognition became automatic in each? Would the Stroop effect be equally strong across all forms of writing and print, or would it reflect differential exposure (Stroop, 1935)? And would frequency effects in word recognition be unique to each writing/printing style, or common within a language?

These questions and many others are generally not answerable with the marginal trace that remains of earlier reading habits. Dead men neither give interviews nor do they respond to tachistoscopic exposures of letters and words. Even the gross characteristics of reading in earlier times are not well understood. Oral reading predominated at least to the time of Chaucer among proficient readers, and perhaps to the end of the 19th century for most elementary schools (Hendrickson, 1929–1930; Saeger, 1982; Crosby, 1936; Venezky, 1987). Whether this was the result of limited practice opportunities, low legibility of script and early print, or social convention, we do not know. For most modern readers, continually bombarded with print, word recognition is overlearned for all but the least common words. But the nobility of pre-Gutenberg Europe might not encounter more than a page or two per day of handwritten text, containing perhaps not more than 400 words total, on the average. These pages might be in a highly legible hand or in a barely decipherable scrawl, and they might be in Latin or in a vernacular. Under these conditions it is unlikely that any but a small minority of copyists, scholars, professors, and the like would gain sufficient exposure to writing to read silently.

Certainly the perceptual conditions for reading were different from today, but
how different they were has not been carefully studied. For example, eyeglasses were introduced into Europe in the late 13th or early 14th century (Rosen, 1956), but their acquisition by the masses probably came much later. Artificial lighting for sustained reading on overcast days or at night was severely limited until at least the 1780s, when the Argand lamp was invented. However, as late as the third quarter of the 19th century, many university libraries in America did not utilize artificial lighting for safety reasons and therefore closed at or near sundown.

With sometimes no more than signatures as evidence for literacy, we can at best make crude comparisons across regions and times. Converging evidence can sometimes be marshalled, however, to make estimations beyond these crude comparisons; and the modern psychological findings can probably be applied significantly more than they have been so far to establish upper and lower bounds on abilities.

A Note on Sources

Among the sources of information on the development of literacy in the West, Cipolla (1969) remains the most comprehensive, in spite of its age and limited size. Kaestle (1985) provides an introduction to current scholarly thinking on the development of literacy plus a sketch of its development in the West. Clanchy (1979) is essential for understanding the transition of English society from memory to written record during the period from 1066 to 1307; it is exemplary for its documentation of the expansion of writing into public and private life. Also useful, especially for alternative viewpoints, are Houston (1983) and Graif (1986). Other works exist on specific countries, generally limited to a few centuries; and some, like Brooks (1985), which covers the rise of literacy in Russia from 1861 to 1917, and Chartier (1987), which deals with print in early modern France, attempt to explore the uses of literacy in society. The majority, however, are concerned primarily with the quantity of literacy as revealed by signatures on official documents, and therefore reveal little about the ways in which literacy entered peoples’ lives. Almost all of the works cited here are in English and are generally available. For direct quotations, paraphrases, and data, and for ideas that might be difficult to locate within a work, page references are given; otherwise, only the work itself is referenced. No up-to-date bibliography on the history of literacy in the Western industrialized countries is available, but Graff (1981) covers a large percentage of what was available up to the time he published.

PROBLEMS OF EVIDENCE

The archaeologist works with remnants of physical objects, revealing over time both products and the technologies that produced them. From a few postholes and a charcoal deposit, a pit house is reconstructed and its construction techniques identified; from a few pot shards, a complete vessel is drawn, its construction and firing procedures determined, and often even the sources of its constituents located. The historian, working with both the archaeologist’s findings and written records, reconstructs societies and cultures, traces their growth and decline, the raising of their young, and the other everyday events that stitched their lives from awakening to bedding down. From these assemblages of materials, people, and events, the more adventuresome attempt to recover mental capacities, attitudes, and beliefs.

It is at this point that the student of historical literacy enters. His or her task, at least as defined so far, has been to determine the presence or absence of a specific
learned ability in specified populations that arrayed themselves across the historical landscape. But since reading is an ephemeral act that leaves no discernible trace, the evidence for earlier literacy levels must be gathered from indirect indicators and connected to the process of interest by inference, presumption, and other tenuous threads of faith. While this evidence presents many difficulties in interpretation, it does not appear so weak as to justify Eisenstein's (1979, p. 414) decision in her study of the printing press "... to sidestep problems associated with literacy rates whenever possible since inadequate data and uncertain criteria make all general statements suspect."

The central weakness in the marshalling and deployment of evidence for historical literacy has been in the restricted goal that most historians of literacy have accepted, that of assigning a single statistic to each group of interest, representing percentage of literacy or illiteracy. Most commonly, this single statistic has been based on the number of people who signed a will, court deposition, marriage certificate, or other document with a signature rather than a mark. While some like Auwers (1980, p. 206) have noted that the use of signatures as literacy indicators reduces a continuous variable to a dichotomous one, most studies have focused on quantity rather than quality of literacy (e.g., Lockridge, 1974; Cressy, 1980; Furet & Ozouf, 1982). A small number of studies, as will be discussed later, have attempted to reconstruct the uses of literacy in everyday life for particular periods and groups, and thus demonstrate actual literacy practices rather than simply the potential ability to read or write.

**Types of Evidence**

Historical indicators of literacy ability can be classed in three groups, based upon whether they are evidence for literacy ability, or for opportunity for literacy practice, or for exposure to literacy training. For convenience these will be referred to as *ability*, *practice*, and *training*. Each draws upon different sources of information, and each presents its own problems not only of linkage to actual literacy but also of validity and reliability.

**Ability**

*Direct assessment.* Performance data ostensibly give the most direct evidence of literacy abilities; however, until the development of mental testing in the early part of this century and literacy testing in particular, direct assessment measures of literacy were crude at best. The earliest reading assessments on record were done for benefit of clergy, beginning in 14th-century England but probably earlier in France (Gabel, 1928–29, p. 67). Since clerics charged with certain crimes (mostly felonies) were to be tried in ecclesiastical rather than secular courts, a crude test of clericy was developed, based upon the reading aloud of a verse from the Bible. One who passed this examination was assumed to be a cleric, since clerics were the vast majority of the literate in medieval and feudal England. Presumably, one escaped the gallows through satisfactory reading ability. It was possible, especially when the same passage was used repeatedly for benefit-of-clergy tests, to pass through memorization rather than true reading ability; and cases are reported where such memorization was revealed (Gabel, 1928–1929, p. 71n).

Reading aloud, generally from a religious text or school reader, was the most common direct assessment technique for reading ability until the end of the 19th century. It was, for example, the principal technique used in Sweden in the 17th
through the early 19th century for nationwide reading tests (Johansson, 1987). While the Swedish records do not note any criteria for judging reading ability, some parish records indicate more than simple literate-illiterate; one even divides reading ability into five levels: cannot read, has begun to read, reads a little, reads acceptably, and can read (Johansson, 1987, p. 83). Rice (1893), who tested schoolchildren in the major U.S. cities during the 1880s and 1890s on a variety of school subjects, also used oral performance as his test of reading ability.

Tests for writing were rare prior to the 20th century. The Swiss military was among the first to assess writing ability, beginning in the last decades of the 19th century (Cipolla, 1969, p. 12). Writing of letters, along with understanding of newspaper articles, were among the tests given by the U.S. military during World War I to about 1.5 million soldiers and sailors (Gray, 1925, p. 14; Gray & Munroe, 1929, pp. 21-22). In these tests, about 25 percent of all tested failed the reading and writing components.

Self-report. Besides direct assessment techniques, two indirect methods have been used by historians: self-report and analysis of writing samples. The U.S. Census has used self-report to determine literacy since 1840, although the questions asked and the criterion levels employed have varied. Self-report was also used in other national censuses and by the French military in the 19th century (Furet & Ozouf, 1982). While self-report may overestimate reading ability, limited empirical data are available on this issue. In addition, we have incomplete information in many cases on the questions asked and on the scoring procedures.

Analysis of writing samples. Writing samples, particularly signatures from wills, court depositions, pensioner rolls, oaths, and the like, are the most often used evidence for literacy levels. Other writing samples such as diaries, letters, graffiti, and epitaphs are rarer and generally not comparable across countries and time periods. They are, therefore, difficult to use for quantitative comparisons, but are invaluable for tracing the general spread of literacy practices.

On the validity and reliability of signatures as predictors of literacy, a vigorous debate has developed over the past 20 years (Schofield, 1968; Cremin, 1970; Lockridge, 1974; Cressy, 1980; Rachal, 1987), even though they were used as evidence for literacy rates at least as early as the first decade of this century (e.g., Bruce, 1910). The issues in this debate, aside from the quality of literacy that might be implied and how it might have been utilized, center on (1) whether or not signing was always learned after reading was acquired, and (2) whether or not those who could write always signed rather than marked. Although the issues specific to signatures will be discussed more extensively in a following section, certain problems pertain both to signatures and to the other forms of writing.

One problem is ascertaining whose literacy is reflected by a signature, letter, or other form of writing: that of the ostensible owner or that of a scrivener, copyist, or other surrogate. Another is deciding which literacy skills are reflected by a particular literacy act. A letter, diary entry, or other connected text can with high certainty be taken as evidence for both reading and writing ability. A signature, on the other hand, becomes an indicator of writing only through the assumption that signing is acquired only after full writing ability is learned; and it becomes an indicator of reading ability only through the assumption that signing is learned after reading ability is acquired. These assumptions, as will be discussed in the section on signatures, may have been true for some eras and some countries, but not for others.
Contemporary reports. Finally, literacy performance has been judged by contemporaries who have recorded their observations about the characteristics of a people. The Frenchman Alexis de Tocqueville, traveling through the United States in the early 1830s, was one such observer, recording that New Englanders were better educated than those from the West and the South (Tocqueville, 1840/1963, p. 315). Similarly, Sir Joshua Fitch, an English inspector of training colleges, reported from visits to the United States in the 1880s that American schools stressed silent reading (Fitch, 1900, pp. 46-47). Altick (1957, ch. 7) reports similar evaluations for 19th century England, as does Brooks (1985, ch. 1) for late 19th- and early 20th-century Russia. But without knowing the capabilities, interests, and audience of the reporters, little credence can be given to such reports.

Opportunity for Practice

A second approach to estimating the extent or quantity of literacy is through assessment of opportunity for literacy practices, such as purchase or possession of books, subscriptions to newspapers and magazines, or borrowing of books from a library. Gilmores (1982) study of literacy in the Connecticut Valley in the late 18th and early 19th centuries uses, among other indicators of literacy, references to books in probate inventories. Similar evidence for England has been reported by Johnston (1983), who analyzed the contents of wills from the diocese of Worcester from 1699 to 1713; Jayne (1956), who surveyed private book collections in England from 1500 to 1640; and Dyer (1973) and Clark (1976), both of whom studied book ownership in parts of England in the period from the mid-16th to the mid-17th century.

Evidence centered at greater and greater distances from the readers' hands has also been adduced. The development of libraries and their spread throughout Europe and the United States is often cited as evidence for the spread of literacy. Other types of distant evidence center around the production and distribution of books. Spufford (1981, ch. 4), for example, uses sizes of publisher inventories for chapbooks and the extent of the distribution network for cheap printed materials as two of several types of evidence for the extent of reading in 17th-century England. She recognized, nevertheless, the lack of a critical link between production/distribution and ownership. “What we cannot do, however, is to close the argument convincingly by showing the humble reader actually in possession of ballads and chapbooks” (Spufford, 1981, p. 45).

As important as book ownership is for demonstrating the spread of literacy practices, it has limitations as a quantitative indicator of literacy. Book ownership has varied through the centuries not only according to the interests and reading abilities of any population, but also according to income levels, church and government censorship, prices, and distribution. Clark (1976), is analyzing book ownership in the county of Kent (England) in the period from 1560 to 1640, concluded that expansion of ownership during this period was due to three factors: a rising standard of living, increased literacy skills, and an improved sales network for books. Clark found, for example, that the chances for book ownership were uniformly high throughout this period for estates with goods valued £500 or above, and uniformly low for those valued below £24. Book ownership in the United States rose after the Revolutionary War due to increases in discretionary income and time, as well as to an improved transportation system for commercial goods.

Even the possession of books, when it can be clearly established, does not guarantee reading ability. Bibles, in particular, might be possessed as totems or obtained as gifts, or even purchased by illiterates with the expectation that literate visitors might read aloud from them (Bauml, 1980). Probate inventories as evidence of book
ownership offer a number of special but not necessarily debilitating problems for determining the extent of literacy. They are class biased and highly selective for the types of books mentioned, particularly in the United States and England. Expensive texts are often mentioned but ephemeral items (e.g., almanacs, primers, ballads, chapbooks) rarely are. Then, books of especial value to a family might be distributed before the death of the owner of the household and therefore escape mention in the probate inventory.

Of equal interest to books for demonstrating the spread of literacy but more difficult to locate are those indicators of reading and writing that are by-products of these acts or are adjustments to the environment that result from them. Among the most innovative uses of such evidence is Clanchy’s (1979, p. 43) compilations of the amounts of sealing wax used by the English Royal Chancery in the 13th century. From an average of 3.63 pounds per week in the interval 1226–1230, consumption increased to 31.90 pounds per week for the interval 1265–1271. If we assume that the average amount of wax required to seal a document remained constant over this period (and also assuming constant weight and wastage), then the Chancery increased by ninefold its document production from 1226–1230 until 1265–1271.

Environmental evidence for change in literacy practices is described by Thomas (1986, pp. 112 ff.), who claims that church congregations in Europe began to read in churches in the 15th century. Part of the evidence for this is found in design changes in church interiors from this period that made them brighter and therefore more conducive to reading of manuscript and print, including the replacement of stained glass with clearer glass after the Reformation. Saeger (1982, pp. 396 f.) also describes architectural change as evidence for shifts in literacy practices, but in this case changes in library interiors that signaled a switch from oral to silent reading.

In summary, opportunity-for-practice evidence rarely can be used alone to establish quantity of literacy. It does, however, provide convergent evidence for the spread of literacy into specific areas and classes of society.

Training

Exposure to literacy training is, next to ability measures, the most often used evidence for literacy. In general, the assumption is made that the spread of schooling, as marked by numbers of students in attendance, number of teachers employed, expenditures for education, or other tangible markers of schooling indicates a spread of literacy. The U.S. Census, for example, has assumed at various times that a fixed number of years of schooling (e.g., four) was a sufficient indicator of literacy, a practice used in a number of other countries (UNESCO, 1957; Furet & Ozouf, 1982). Spufford (1981, ch. 3) presents data on the numbers of schoolteachers in 19th-century England as evidence of increased literacy abilities. The relationship of schooling and literacy in the history of industrialized countries is discussed by Anderson (1965), who cites various types of evidence for the existence in earlier times of schooling, including community complaints over the short supply of teachers and controversies over who has the right to be a teacher (1965, p. 352). Cipolla (1969, pp. 24 ff.) discusses at length the use of formal education statistics as estimators of literacy levels, including proportion of economic resources allocated for education and ratio of teachers to population. Similar issues on the schooling-literacy relationship are discussed by Rachai (1987).

Although schooling records can provide positive evidence for capacity to read and write, a variety of cautions need to be observed. First, quality of schooling varied considerably across and within countries, regions, and time periods. For example, the quality of schooling for the English working class in the first half of the 19th century, and
for the Papal States in the middle of the 19th century was generally low; but for Holland and Prussia at roughly this same time, it was considered good (Cipolla, 1969, pp. 31 ff.). After extensive study of the American district school of the 18th and 19th centuries, opinion is still divided on its quality (cf. Greene, 1965; Fuller, 1982; Johnson, 1904/1963; Cremin, 1970). Similar problems attend the evaluation of the rural schools in Scotland (Webb, 1954). Craig (1981, p. 179) speculates that urban schooling was probably more effective than rural schooling, perhaps because of higher attendance rates and a longer school year. Years of formal schooling, particularly from the middle of the 19th century (in most industrialized countries), may be a reasonable predictor of literacy; but in some countries like Russia, compulsory schooling was not instituted nationally until the 20th century (Brooks, 1985).

Schooling also applied differentially within and across populations. Except for Sweden (Johansson, 1987), boys were more likely than girls to receive schooling prior to the middle of the 19th century. Even when girls were sent to school, they often encountered a different curriculum from boys. For example, in William Gilpin’s school in Hampshire parish (England) in the late 18th century, boys were taught reading, writing, and arithmetic, while girls were taught reading, knitting, and sewing (Adamson, 1929, p. 38). In the American South prior to the end of the Civil War, slaves received little or no education, and in most of the slave states the teaching of reading and writing to them was outlawed (Webber, 1978).

Whatever the outcomes of formal schooling, it is important to consider the percentages of any population that received their literacy instruction out of school. In one province of Moscow in 1883–1884, among 7,123 literate factory workers, only 38 percent reported learning to read in a village, town, or district school. The remainder learned to read outside of school (36%), or in a factory school (10%), or were taught by clergy (9%), or during military service (Cipolla, 1969, p. 25). Increases in the supply of teachers or in expenditures for education will be misleading as indicators of increased literacy if high proportions of the population are learning to read outside of school. Nevertheless, assuming a reasonable constant-quality factor, education and literacy are closely linked in most industrialized countries, at least from the middle of the 19th century.

Signatures as Evidence

The general case in favor of signatures as a measure of literacy is that (1) they are the only historical data that meet Schofield’s (1968, pp. 317 ff.) requirements of a widely applicable and standard measure; (2) they are useful for comparative studies regardless of what their exact relationship to literacy is (Schofield, 1968); and (3) when other indicators of literacy are available along with signatures, the latter appear to change in relation to changes in these alternative variables (Cressy, 1980, pp. 42 ff.). Both Cressy (1980) and Schofield (1968) draw upon signatures in English records from relative modern times, but Furet and Ozouf (1982) arrive at similar conclusions from French data, based on comparisons of (1) self-report of literacy among army conscripts, (2) census data on reading and writing ability in the general population, and (3) signatures on marriage certificates (actes de mariage).

Schofield’s (1968) requirements are by modern standards of scholarship overly conservative. What is required is comparability across regions, people, and time, which could be accomplished with different measures if they could be reliably anchored. Signatures, although they may represent the same skill across people, place, and time, may not bear the same relationship to what they proxy—that is, reading and writing—and therefore may not be comparable across all points on the historical spectrum.
Other reservations about the value of signatures come from a variety of sources. Data from a number of countries and a number of time periods demonstrate that high reading ability coexisted with low writing ability. This is especially true of the Scandinavian countries from the late 17th through the early 19th centuries, when state and church combined to enforce the teaching of reading but not of writing. Johansson (1987) has published extensive evidence on the separate developments of reading and writing in Sweden prior to the middle 1800s; and Smout (1982, p. 122) makes similar claims for Denmark, where most could read by the late 18th century, but where writing was not taught extensively until after the educational acts of 1814. In these situations signatures would grossly underestimate reading ability. Data on the disparity between reading and writing ability are also provided by West (1970, p. 130) for northern England in the year 1840. In a tabulation of the literacy abilities of 843 miners, only 67 percent of those who could read could also write. Since the number who could write represented about 50% of the total population, West suggested using a multiple of 1.49 to convert writer totals to reader totals when writing ability is in this same range.

The source of signatures is an additional factor in considering the reliability and validity of this form of evidence. Bruce (1910), who studied signing patterns in 17th-century Virginia, preferred signatures on court depositions to those on jury inquests and deeds of conveyance because the former tended to include all classes in society except slaves, while the other two were biased toward members of the middle and upper classes. Schofield (1968) prefers English signatures resulting from the Protestation Oath of 1642 (males over 18), the Test Oath of 1723 (everyone over 18), and the Anglican marriage register, although the latter omits several religious groups.

Auwers (1980), who studied female literacy in Windsor, Connecticut, 1640–1799, used mainly signatures on deeds; while Lockridge (1974), who studied literacy in pre-19th-century New England, used signatures on wills exclusively. Cressy (1980, p. 62), a strong advocate of signatures as evidence for literacy, nevertheless warns against the use of signatures from documents that are typically endorsed by nonrepresentative samples of the population. Wills, in particular, he found to be "chronically afflicted by social bias" (1980, p. 106), as were marriage license records (1980, p. 109). While using a variety of document types, Cressy agrees with Bruce (1910) that court deposition records, at least those produced by the ecclesiastical administration in England, offer the least bias for signatures of all available records.

Data on schooling practices in several countries show not only a read first-then write instructional pattern, but also disparities in writing ability based on sex. In Scotland in the middle of the 18th century, for example, among 109 men and women who indicated that they could read, many more men than women could write (Smout, 1982). Eklof (1983, p. 117) reports that the 19th-century Russian peasant showed little interest in educating girls, thus leading to the assumption that Russian women, at least until compulsory schooling was enforced, lagged behind Russian men both in reading and writing.

Adding to the uncertainty about the value of signatures is the distinction made by Gilmore (1982) between signing and writing. From data collected on book possession, signatures, and other indicators from the Connecticut Valley in the late 18th and early 19th centuries, Gilmore concluded that signing was learned first, followed by reading and then writing. If this were true, then signatures could grossly overestimate literacy levels. Although Gilmore's sequence has been challenged (cf. Monaghan, 1983), his separation of signing and writing still raises questions about the assumption made in most other studies that signing and writing are identical.

Missing from the discussion so far has been any concern for changes over a lifetime in literacy abilities and practices. The modern practice of beginning schooling between
the ages of 5 and 7 should not be assumed for earlier times. Prior to mass public schooling, people acquired schooling when they needed it or when it was convenient. A family in a remote area of the American Tidewater of the late 18th century might hire a tutor for a few months of the winter to teach all of its children at once, and a 15-year-old in preindustrial Italy might be taught to read and write through an apprenticeship that requires by contract that these skills be taught along with the specified trade. Thus, some of those who marked marriage certificates in 17th-century France may have learned to read and write later in their lives. But alternatively, some of those who signed their names may have lost the ability to read and write later on through disuse. We have little empirical data on loss of these abilities in healthy individuals, but suspect that there is a level of reading and writing that must be reached before literacy becomes self-sustaining. In studies done for UNESCO in the 1950s, a fifth-grade level was claimed to be necessary for this stage of literacy (UNESCO, 1957). Soltow and Stevens (1981) claim that four years of formal schooling was required in mid-19th-century Ohio for literacy to become self-sustaining. Nevertheless, the rise of literacy levels throughout Europe and North America at times when formal schooling for most was far less than four years might be interpreted as an indication that literacy practice and not formal instruction per se is the critical factor in literacy attainment and literacy maintenance. In a recent study of the literacy abilities of young adults in the United States, Kirsch and Jungeblut (1986) found that literacy abilities improved with practice outside of school, regardless of the amount of schooling received. For the rise of literacy in Russia prior to World War I, Brooks (1985) holds that the types of literature available for the general population had a significant influence on the improvement of reading skills.

GENERAL DEVELOPMENT

From Church Monopoly to Lay Property

The general development of literacy in the industrialized West is a diffusion from a church monopoly to a possession of the nobility, from the nobility to the higher professions, from the higher to the lower professions, and eventually to the laboring class. Overlaid with this spreading out, like a subordinate theme in a symphony, are the patterns that characterize most of the progression to modernity: literacy came first to men and then to women, and it came to the towns and cities before it came to the rural areas. And its progress was neither steady nor linear. Up to the 19th and early 20th centuries, the expansion of the written word, whether by manuscript or printed form, drove the expansion of literacy. Then, beginning mostly in the 19th century, governments found it within their best interests to provide a basic education to all their citizens as a necessity for productive participation in civic, economic, and military affairs.

While the expansion of print into everyday life was driven at all times by complex needs, bureaucratic, economic, and religious pressures dominated at different times. In medieval Europe literacy was a closely guarded monopoly of the church, which used it sparingly for religious and government affairs. Pockets of lay literacy existed among the nobility, and an exceptional ruler like King Alfred in 9th-century England could read and perhaps write (Galbraith, 1935); but the need for lay literacy was highly limited and made all the more difficult by the dominion of Latin throughout most of Europe (Havelock, 1976).

But already in the 9th century, a gradual expansion of reading ability could be discerned as the higher and lower nobility began to access written information in charters, royal writs, medicinal recipes, and the like (Bauml, 1980). This process was greatly accelerated in the 11th and 12th centuries as towns and cities came to dominate
over the countryside. With the increased division of labor that is intrinsic to urban society, daily life became increasingly more complex, requiring greater amounts of record keeping, administration, and communication. This in turn created a greater need for literate semiprofessionals to fill economic, administrative, and military positions (Bishop, 1968, pp. 42 f.; Strayer, 1965, p. 63). Education at all levels expanded to meet this need, resulting in a higher percentage of the young learning basic reading on one end of the ability scale, and the establishment of universities to meet training needs on the other end of the scale.

The origins of modern mass literacy have been located in these developments, particularly in the 12th and 13th centuries, when society shifted from reliance on memory to reliance on written records—or in Clanchy's (1979) words, "from sacred script to practical literacy." According to Clanchy (1979, p. 263), "Only in the 12th century did the number of documents, and the number of persons who understood them, begin to increase at a fast rate under the pressures of emerging bureaucracy. Practical business was the foundation of this new literacy."

This increase in practical literacy can be gauged not only in the increase in bureaucratic and economic documents that appear decade after decade from this period onward, but also in such indirect indicators as the simplification and standardization of document forms; a changeover from tedious, time-consuming monastic hands to faster cursive hands; and the use of seals to authenticate royal documents. Perhaps under the pressure of this large increase in the demand for writing materials, papermaking plants began to appear in Europe. Paper was known in Europe since the 12th century, when it was brought by merchants from China via the Arab countries. In spite of occasional edicts against its use (due to its fragility compared to parchment), the use of paper spread; and by the early 14th century several papermakers were established near Fabriano (Febvre & Martin, 1958, p. 30). At about the same time the art of grinding glass for spectacles was perfected in Europe (Cipolla, 1980, p. 175). With the decline of feudalism in the late 13th century, a new reading public developed, consisting of state officials, lawyers, lay advisors at court, and later, rich merchants. They, along with the nobility and the clergy, created a demand for subject matter texts, moral treatises, literature, romances, and other genres (Febvre & Martin, 1958). One dimension of this demand can be estimated by the more than 2,000 copies of Aristotle's works that have survived from the 13th and 14th centuries alone.

Literacy spread rapidly in the 14th, 15th, and 16th centuries in selected professions and in selected areas of Europe. By 1332, for example, judges in Venice had to be able to read and write; and by 1338 approximately 40 percent of the children in Florence between the ages of 5 and 14 attended school (Cipolla, 1969, pp. 42-46). By 1478 English goldsmiths would no longer accept apprentices who could not read and write (Anderson, 1965, p. 347). In the 15th century, wealthy tradesmen began to establish schools unattached to religious orders, thus accelerating the secularization of education; and by the middle of the 16th century school systems had expanded dramatically in Germany (Strauss, 1984), England (Adamson, 1929), and northeastern France and the Low Countries (Cipolla, 1969). Literacy continued through this period to be driven by practical utility, appearing first and to the highest degree in those trades most closely associated with the market economy (Thomas, 1986), and in areas where new technologies were forcing change, such as navigation and warfare. Early evidence for the entry of print into commercial life can be seen in the news-reporting service that developed in 14th- and 15th-century Nuremberg, bringing written accounts of news from places with commercial ties to the city (Houston, 1983). Yet economics was not the only impetus for literacy. In Scotland, Sweden, and Switzerland, for example, illiteracy was low in spite of backward economies (Houston, 1983).
The Role of Vernaculars

One of the complicating factors in determining literacy until roughly the end of the 17th century is the role that Latin played in religion, government, and the higher professions. As was mentioned earlier, a literate person, or literatus, was one who read, wrote, and perhaps spoke Latin regardless of his competence in the vernacular. So long as Latin remained the official language of church and government, the chasm between the ruling class and those ruled was maintained, resulting in what Havelock (1976, p. 75) calls craft literacy. Beginning around 1300, the vernacular languages, both in speech and in writing, began to acquire increasing importance in everyday life and slowly began to challenge Latin in the more regulated areas.

The movement towards the acceptance of vernacular for official use began in Italy before the Renaissance and spread quickly to France, where by 1539 French had become the official language of the Courts of Justice (Feuvre & Martin, 1958). In England, where French (which dominated after the Norman Conquest), Latin, and English were all in use, the court language after 1300 was increasingly spoken English and written French (Fisher, 1977, p. 873). Parliament was addressed in English as early as 1362, and probably earlier; and English began to be used for the official administrative transactions of Chancery after 1420. The period from 1420 to 1460, according to Fisher (1977, p. 898), was crucial for the adoption of English in government, business, and private transactions. The Brewers’ Company of London, which decided to switch its record keeping in 1422 from Latin and French to English (Adamson, 1929, p. 40 f.), was typical of many English enterprises that found this switch necessary because few of the middling ranks could read Latin or French.

The replacement of Latin by the vernaculars can be traced also through book titles, which provide a conservative estimate of vernacular popularity. In early 16th-century France, as an example, two-thirds of all books published were written in Latin. By the 1780s only one book in 20 in France was written in Latin and only one in 11 in Germany (Gray, 1969, p. 60). The legitimacy that Dante’s *Divina Commedia* gave to Italian and Chaucer’s *Canterbury Tales* gave to English in the 14th century spread over the centuries from popular literature to business and government and finally to science and religion. Hobbes’s use of English for philosophical works and Descartes’ use of French for science mark the distance that the vernaculars had traveled from the medieval dominion of Latin to the 17th century. The triumph of the vernacular languages in the 16th and 17th centuries appears to have been aided by the diffusion of literacy among the middling ranks as well as the nobility, but at the same time served as an impetus to the further spread of literacy among the lower classes.

Religious Factors

The introduction of printing in the middle of the 15th century and its rapid spread throughout Europe over the next decades had an impact on literacy, the full extent of which has yet to be determined. But whatever this might have been, printing was not a cause for increased literacy so much as it was an expediter for other pressures that led to a greater need for access to written materials. One of these pressures was clearly religion. Beginning with Luther’s Reformation in the first quarter of the 16th century, which substituted the Word of God for the authority of the church, access to print became not only a requirement for the Protestant faithful but a necessity for those caught up in the ensuing ecclesiastical disputes.

Most writers on the history of literacy place the Reformation at or near the top of their lists of the causes of literacy expansion in Europe after the early 1500s (e.g., Stone,
1969; Cipolla, 1969). Haile (1976, p. 817) summarizes this consensus with the claim that "From a secular viewpoint surely the most far-reaching effect of Luther's activities was the radical increase in literacy from the 1520s on through the rest of the century."

Luther's views were circulated quickly throughout Europe in pamphlets, posters, handbills, and broadsheets, all of which were in use before this time for the circulation of information to the masses. Some of Luther's works were reprinted as early as 1519 in France, leading two years later to the French Parliament's ban on the printing or sale of unauthorized writings on Scripture (Febvre & Martin, 1958, p. 297). In time the Protestant areas of Europe acquired significantly higher literacy than the Catholic areas, with the exception of certain German-speaking Catholic enclaves. By the late 19th century in Prussia, Catholic illiteracy was twice as high as that of Protestants; and in Ireland and Italy the disparities were as great, if not greater (Cipolla, 1969, pp. 72 ff.).

Where Protestantism appeared, literacy and learning were seen to thrive. "Calvinist states like Geneva and the Dutch Republic were avid for learning, and England, with its vigorous Puritan strain, already had developed a substantial reading public in the seventeenth century" (Gay, 1969, p. 58). The influence of the Lutheran church in the Scandinavian countries, which was described earlier, brought near-universal reading ability there by the middle of the 18th century (Johansson, 1987). Nevertheless, the tidy causal chain leading from Luther to Protestantism to literacy does not lie unchallenged. Strauss (1984) points out that after about 1525 Luther began to doubt the wisdom of allowing the general population to interpret Scripture on its own. After this time, Luther advocated "expert guidance" in such matters and in 1529 published his Greater Catechism and Smaller Catechism, which introduced a more authoritative approach to scriptural interpretation than individual Bible reading. Nevertheless, the groundwork for mass literacy had been established, and Luther's shift in emphasis probably did little to stall its expansion to the Lutheran faithful.

The expansion of the German school system with both local and national assistance was, according to Strauss (1984), the main cause of the spread of literacy in 16th-century Germany. Similarly, Houston (1982) disputes claims that Calvinist Protestantism was the primary cause of increased literacy in Scotland, claiming instead socioeconomic causes (but cf. Smout, 1982). In general, the areas that embraced Protestantism tended to be economically well-off compared to the areas that retained Catholicism. Then, some areas (e.g., Italy) displayed regional differences in literacy that far exceeded religious differences, thus confounding any simple relationship between religion and literacy in preindustrial Europe.

Whether or not religious differences can account for variations in literacy abilities, by the middle of the 17th century religious works represented almost 50 percent of all titles printed in Europe and religious reading had become a powerful impetus to the acquisition of literacy for all faiths. Long after the forces of the Reformation and Counter-Reformation had quieted, religion continued to provide a motivation for the spread of print. Lockridge (1974) argues that conservative Protestantism was the primary impetus for increased literacy in 17th- and 18th-century New England, and Spufford (1981) makes similar arguments for the expansion of the English reading public in the 17th century. In the late 18th and early 19th centuries Bible and religious tract societies sprang up in Europe and the United States, driven by the evangelical spirit of religious regeneration (Bronner, 1967). Between 1804 and 1819 the British and Foreign Bible Society printed over 2.5 million copies of Testaments and Bibles; by 1861 the Religious Tract Society in England was annually printing over 20 million copies of tracts and over 13 million copies of periodicals (Altick, 1957, pp. 99 ff.). Most of these were distributed door to door throughout England by local tract and Bible societies, but many in the early part of the 19th century were supplied to American tract societies (Nord, 1984).
Altick (1957, p. 99) considers evangelical religion, along with utilitarianism, to be the “most potent influences upon the social and cultural tone of nineteenth-century England.” To the evangelicals Bible reading was an end unto itself, requiring only limited reading ability. Pronunciation without comprehension was sufficient. The intent of the tract societies was to bring approved reading materials to the masses, rekindling their lagging faith in the revealed word and its contemporary prescriptions for the conduct of their daily lives. However, those who accepted and read these little pamphlets may not have been as attracted to the wholesome messages of Christian virtue as they were to the opportunity to practice reading with cheap materials that were written in a simple style.

Religious curiosity as an individual motivation for access to print fits the general hypothesis presented here for the expansion of literacy. The thirst for new religious experiences or for challenging what one already believes can expand one’s personal space. But reading and rereading for confirmation of firmly held belief, and the teaching of reading for the sole purpose of conversion to a particular faith, as practiced by many missionary societies, are problematic for this framework. In the latter case, literacy is taught to constrain rather than to expand, just as in early 19th-century France, where the Catholic church allowed what Furet and Ozouf (1982, pp. 308 f.) called semiliteracy based on reading alone for promotion of religiosity rather than for modernization. Nevertheless, literacy once attained becomes a personal property with the potential for deployment wherever and whenever the individual desires.

The Commercial Revolution and the Printed Book

With the Renaissance, Europe gained a renewed interest in learning and in secular learning in particular. During the period from roughly 1450 until the end of the first quarter of the 17th century, education expanded throughout most of Western Europe and literacy increased, at least as evidenced by dramatic increases in signature rates. The remainder of the 17th century, however, was marked by economic and educational stagnation, particularly in France, England, Germany, Italy, and Spain, where wars (civil and otherwise) and economic declines limited resources and administrative support for schooling. Only the Low Countries and Scandinavia appear to have been unaffected by these forces (Cipolla, 1969). But the bases upon which modern European literacy is established continued to develop throughout this period. The importance of trade forced the entry of practical matters into the classical curriculum, and practical texts such as handbooks and almanacs, which first appeared in volume in the 16th century, were printed and distributed in increasingly large numbers. Information, which once had been a monopoly of the clerics and the nobility, became common property through the availability of such cheap materials, thus widening further the world to which the common person had access (Anderson, 1965).

The rapid spread of printed materials after the middle of the 15th century and the concomitant rise in the size of the reading public led in the 16th century to widespread attempts to restrict access to particular types of information. In England Henry VIII forbade laborers and women to read an English Bible (Adamson, 1929, p. 46), while in France at roughly the same time a variety of methods for information control were attempted, including hanging for those caught publishing a seditious book (Darnton, 1972, pp. 252 ff.). By the end of the 16th century, England had restricted the number of commercial presses allowed to operate in the country, limited the number of impressions that could be made from a single setting of type (for most types of books), and had
begun issuing *patents* or *rights of privilege* to selected booksellers, giving rights for selling specified categories of print. Both secular and ecclesiastical control of printing and of book distribution continued in Europe and the United States for a number of centuries; and while the United States eliminated interference with the press with the First Amendment to the Constitution (1791), England did not drop government control until the 1830s, France until 1870, and the area now occupied by West Germany, not until after World War II (Feather, 1986).

The progression of the masses towards literacy should not be viewed as an unbroken movement forward, however, with unrelenting pressure for access to print. For centuries after print became the primary communication medium of most facets of government, economics, and the higher trades and professions, illiterates could still manage their daily lives without major inconvenience. Scriveners and semiprofessional letter writers could be hired. Proclamations were read aloud in public places, as were newspapers in taverns, military barracks, and in the workplace (Scholfield, 1968, pp. 312–313; Webb, 1955, pp. 33–34; Chartier, 1987, pp. 230–231). Between the illiterate, who was print-unaware, and the literate there existed (and continue to exist) those who neither read nor wrote, but who were aware of many of the functions of print and who engaged in some of them through intermediaries. These people also were aware of many of the spatial properties of print and of documents: they recognized books, posters, newspapers, and the other common text types, and may even have recognized fields within these, although they were not able to read their contents (e.g., the title of a newspaper). Learning to read in a preliterate society and learning to read in a society awash in print may be vastly different experiences and have different cognitive consequences. Part of the agenda for understanding the spread of literacy should include more careful attention to the mediation of literacy for the illiterate, including the growth of negative attitudes towards illiterates, which are recorded for England from at least the end of the 17th century (Thomas, 1986, pp. 117 f.).

The Industrial Revolution

The Industrial Revolution, which began in Europe in the middle of the 18th century, had a multifaceted relationship to literacy. On the one hand the countries with the highest literacy rates were the first to foster industrialization, yet one of the first effects of the early phases of the Industrial Revolution was to stagnate education and the spread of literacy (Craig, 1981, p. 178). Cipolla (1969, p. 102) sees the Industrial Revolution as the direct result of the efforts of "literate craftsmen and amateur scientists." Economists tend to agree that a modest level of literacy was a necessary condition for the early stages of Western industrialization, but they do not agree that it was a sufficient condition (Anderson & Bowman, 1976, p. 4). They argue, in addition, that only those at the center of technological and organizational change were required to have practical and intellectual skills.

The early factories required few technical skills from the majority of their workers, and therefore industrialization in its early stages produced little pressure for higher literacy. In towns where factories located, the migration of low-literacy rural workers to the new jobs led in some cases to noticeably lower overall literacy rates. In addition, by offering employment for children, the new factories raised the opportunity cost for education—that is, the amount of income that a family would lose by sending a child to school rather than to work in the factory (Cipolla, 1980, p. 931). This in part explains the stagnation in education that accompanied the Industrial Revolution, at least until the mid-19th century. In time, the increased complexity of production led to a higher
demand for literate workers. But literacy was also encouraged by many factory owners on moral grounds or out of the belief that literacy would be the "route to obedience and docility" (Thomas, 1986, p. 118).

Opposing these latter trends were overt attempts to restrict mass access to print, particularly in France and England. In England opposition to both education of the masses and the unconstrained distribution of print was strong during the first half of the 19th century (West, 1970, ch. 9). Advertising duties on newspapers and excise taxes on paper were not removed until the 1860s; and free, government-sponsored education was not instituted until 1870. Censorship of specific titles and authors continued, carried to its most absurd extreme in Vienna in 1777, where the *Catalogue of Forbidden Books* listed itself. This Habsburg Index had apparently become for some a reliable guide to the most interesting reading (Gay, 1969, p. 70). Nevertheless, private support for education continued, and the net effect of the opposition to literacy was apparently small.

The Transition to the Modern Era

Urban and rural education expanded in the 19th century throughout Western Europe and North America, spurred on both by local and national governments and by private organizations. In concord with increased schooling, new papermaking, printing, and transportation techniques dramatically reduced the costs for producing and shipping books, thus improving access to print for the masses (Barbier, 1983; Barnes, 1983; Brooks, 1985; Moran, 1978; Nord, 1984). Cheap literature (e.g., the French *feuilleton*, the British "penny dreadful," the American "dime novel") flooded the boarding houses, military camps, railroad stations, and general stores (Denning, 1987). By the end of the third quarter of the 19th century, Denmark, Sweden, The Netherlands, Germany, and Switzerland had near-universal enrollment in primary schooling, a position reached by most of the other industrialized countries by World War I (Craig, 1981).

By the early 20th century, the United States, England, Scotland, Switzerland, Scandinavia, the Low Countries, France, and Germany were approaching universal literacy. Northern Italy was headed in this direction, but southern Italy, the countries of eastern Europe, Russia, Spain, Portugal, Greece, and Turkey lagged far behind (Cipolla, 1969, p. 97). UNESCO (1957, pp. 13–17) estimated that in 1950 illiteracy for those 15 years old and older was below 5 percent for North America and all of Europe—except the southern portion, where it averaged around 20 percent. Russian illiteracy was estimated to be between 5 percent and 10 percent, but limited data were available for making this judgment.

A RESEARCH AGENDA

We cannot recover any more of the past than what has been bequeathed us, but we can make better use of available historical data and of opportunities for new research. The research literature on literacy is nearly blank on the skills required for writing and their normal development through and after schooling. It is also deficient on the development of reading and writing in adults. Should we assume the same stages of development for reading ability in adults as we do for children, or are different paths taken? The research literature also is silent on learning to read handwriting, and about the loss of literacy abilities through disuse.

From the historical record we can strive for a clearer picture of the uses of literacy in everyday life from period to period and region to region. What did a typical
shopkeeper in 16th-century London read on a daily basis? What were the document types, their syntax, their discourse structures, and their vocabulary? Were shopkeepers in 16th-century Milan and Mainz confronted with significantly different literacy tasks? What is needed is a coherent picture of everyday writing and print and their uses throughout the history of the West. Studies are needed on the spread of eyeglasses among the masses and on the development of artificial lighting for reading, as well as on signatures and book inventories. Besides knowing how many might have been able to read, we should attempt to learn what people read, where they read, and under what conditions.

For the period before printing, imitative experiments might be used to gain insight into the complexities of reading manuscripts under prevailing lighting conditions; of preparing quill, ink, and parchment; and in reading documents for different types of information. The general outlines of literacy growth are probably as well established now as they can be, given the limitations on available evidence. The remaining challenge is to understand the functions of literacy at different periods and among different people, and how handwritten and printed materials entered into these worlds.

NOTES

1. The consequences of such literacy programs, however, were probably not significantly different from those with more open-ended goals.

2. The Stroop effect refers to the interference that printed color words cause in naming ink colors. In a typical experiment, several lists of words are prepared, with each list word printed in a selected color. Typically, several lists are composed of color terms and several of noncolor terms. Some of the color term lists are printed with ink colors that disagree with the words and some with ink colors that agree (word by word). The noncolor words are printed in randomly selected colors. For control, a list of ink bars roughly the size of printed words is often used. The task for each subject is to name the ink colors in each list as quickly as possible. The words themselves are not to be read. The time for reading each list is recorded. Almost all subjects can name the ink colors more quickly for either noncolor words (e.g., chair, floor) printed in different colors, or color words printed in agreeing colors (e.g., the word "blue" printed with blue ink) than for color words printed in nonagreeing colors (e.g., the word "blue" printed with red ink). This effect is remarkably persistent across age groups and resists extinction with training.

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