# USEFUL KNOWLEDGE

## THE VICTORIANS, MORALITY, AND THE MARCH OF INTELLECT

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manuscript for their intelligence and acumen. Joseph Brown's attention to this manuscript has been extremely helpful.

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I regret that my father, to whose memory this work is dedicated, could not see me complete it. A man guided by a sense both of the importance of knowledge and of moral responsibility, his influence is reflected on every page of this book.

Without the honest commentary of my wife, Amy Dykeman, I am not certain that any chapter would or could have been written or revised. As my first and last reader, she has performed the remarkable task of providing both the criticism and the encouragement that I needed in order to see this book through to completion. Her support, friendship, intelligence, and love have not only helped the book but also put it in perspective.

# INTRODUCTION

## Knowledge and the Novel

*"He* crammed *for it, to use a technical but expressive term; he read up for the subject, at my desire, in* The Encyclopaedia Britannica."

*"Indeed!" said Mr. Pickwick; "I was not aware that that valuable work contained any information respecting Chinese metaphysics."*

*"He read, sir," rejoined Pott, laying his hand on Mr. Pickwick's knee, and looking round with a smile of intellectual superiority, "he read for Metaphysics under the letter M, and for China under the letter C, and combined his information, sir!"*—Charles Dickens, *The Pickwick Papers (1837)*

Immersed as we currently are in what is typically called *the Information Age,* it is easy to forget that the obsession with knowledge is deeply rooted in the nineteenth century. Driven by remarkable changes in technology and science, knowledge was both inspirational and irresistible in terms of its potential for social and cultural transformation. Some sense of the role of knowledge is reflected in the confident response of Mr. Pott, editor of the *Eatanswill Gazette* in Dickens's *Pickwick Papers.* In defending the integrity of a piece of highly questionable knowledge produced by one of his hack writers, Pott smugly invokes the *Encyclopædia Britannica,* perhaps the greatest icon of the knowledge industry and certainly one of the most significant products of the English Enlightenment. Pott can draw on the *Britannica* emphatically—if not convincingly—as England's latest and greatest cultural monument to knowledge. The imposing *Britannica,* only one of many encyclopedias to emerge in the early nineteenth century, reflected the growing value of knowledge in an era marked by an increase in both literacy

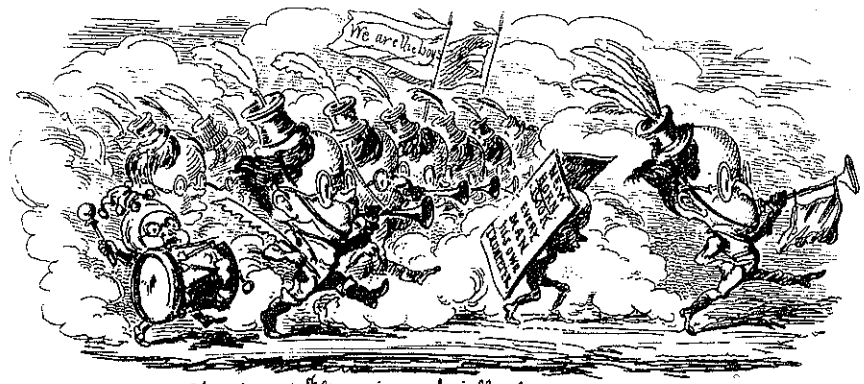
and scientific interest. It was also a text that, in current parlance, could be "surfed" for scraps of knowledge and information that might, with the right kind of presentation, be made to appear coherent. Such scraps were important rungs in the social-climbing ladder, and Dickens satirizes the extent of "intellectual superiority" promised by compendiums of knowledge; but the activity of Potts and his underlings underscores the very real importance of knowledge as a new kind of social and cultural currency. The *march of intellect,* as it was commonly called, and just as frequently parodied (fig. 1), was proceeding at full speed, and it was becoming clear that, to be successful in this new age, one had to keep pace or risk falling behind.

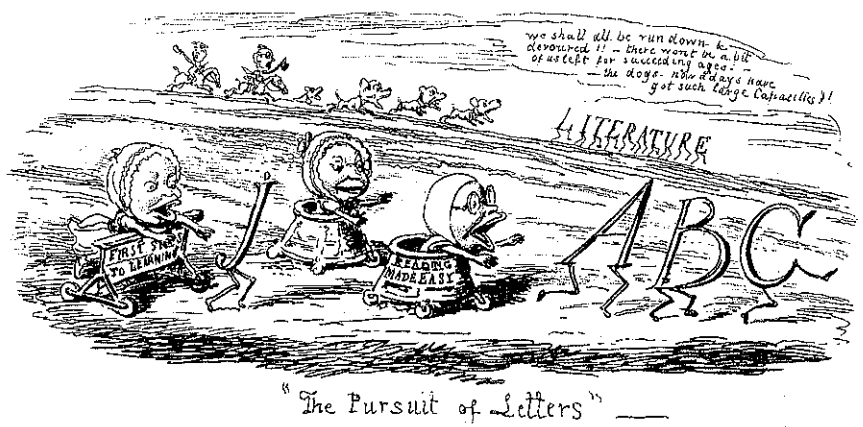
The most prominent disciplines of knowledge production—science and technology—had already found their way into the increasingly industrialized provinces and, having done so, moved into the realms of popular discourse.[1] Knowledge, particularly "useful" knowledge, was understood to add an attractive veneer onto even the most rough-hewn of individuals, who would otherwise have to claim ignorance about China or metaphysics, much less "Chinese metaphysics." A few facts, or even the semblance of facts, were beginning to go a long way in a culture devoted to knowledge, to establishing a rudimentary level of authority, credibility, and status.

The simple reality that all new knowledge is built on a foundation of prior knowledge (and therefore relies on encapsulation, misinterpretation, and—to use Mr. Pott's term—cramming) seems obvious in a postmodern world, where it has become commonplace to think of *truth* and *fact* as socially constructed concepts. Yet *knowledge,* especially scientific knowledge, was held in high esteem in the post-Enlightenment period, and, although not always "pure," it was generally viewed as a worthy, perhaps even virtuous, objective. The value attributed to the idea of *knowledge* in the early nineteenth century is apparent merely by looking at the huge quantity of works that were produced—the period was marked by hundreds of what, throughout this book, I will call *knowledge texts* (encyclopedias, instruction manuals, and didactic works for children). But it was also evident in the growing number of museums and public institutions.[2] What is more, the cultural significance of knowledge is evident, as the following chapters will demonstrate, in the very emergence of realism as the dominant genre for nineteenth-century fiction. The positive status of knowledge rendered its production, at least in the early years of the knowledge industry, a morally responsible activity. For Thomas Dick (1774–1857), the popularizer of science and knowledge, there could be no question about "the beneficial effects of knowledge on moral principle and conduct." The topic is pursued relentlessly in his book *On the Improvement of Society by the Diffusion of Knowledge* (1833), in which Dick offers an argument from design for the benefits of knowledge and of its diffusion: "If it were not calculated to produce a beneficial effect on the state of morals and the intercourses of general society, the utility of its general diffusion might, with some show of reason, be called into question. But there cannot be the slightest doubt, that an increase of knowledge would be productive of an increase in moral order, and an improvement in moral conduct. For truth, in *thought and sentiment,* leads to truth in *action.*"[3] Uplifting, improving, and consistent with the prevailing world order, knowledge was, unproblematically for Dick and most of his contemporaries, a boon to all members of English society. Surely, all could benefit by knowing more and, as a result, by being able to *do* more as both science and technology became a part of daily life. But the implications of knowledge often extended beyond simple usefulness in household and workplace; when systematized and advanced by scientific inquiry, knowledge provided the means to question social, religious, and political structures. And, while knowledge was still held in high esteem and considered emblematic of advanced British culture, the moral ground on which it stood was shifting. In the following chapters, which deal with knowledge texts in their own right as well as the fiction of the period, I want to examine the changing status of knowledge and the efforts that were made to reinforce the status of knowledge and to sustain its moral force.

By exploring nineteenth-century knowledge texts, I want to draw attention to a broader cultural logic that, in many ways, still persists in Western societies. Clearly, knowledge, then as now, can represent a content-based set of "facts" that are useful in the construction and development of disciplines. But, on another level, knowledge has been—and continues to be—fetishized as something valuable for its own sake. Encyclopedia salesmen have understood the cultural fascination for knowledge and traded on it quite well by suggesting that a family deprived of an encyclopedia is a family that is willing to limit its children. And, while traditional salesmen may be a dying breed, their products are alive and well in the form of Web encyclopedias, many of which are often old text-based encyclopedias that have been digitized and repackaged for personal computers. The expression *instruction and amusement,* which has been used to tout knowledge texts since


FIGURE 1 George Cruikshank was a frequent parodist of the "knowledge culture," particularly the accelerated pace of instruction for children. These illustrations are from his *Scraps and Sketches* (1828). (From a copy in the Rare Book Collection, University of North Carolina at Chapel Hill.)



the very early nineteenth century, has a contemporary analogue in the newly coined word *infotainment*.

The preoccupation with the value of knowledge also endures in the many debates over cultural, scientific, and technological literacies. Often these debates engage issues of consequence in contemporary culture and education, but just as often they reflect an anxiety about what counts and what *should* count as proper knowledge. This anxiety, still drawing energy from the so-called culture wars, has resulted in such modern texts as E. D. Hirsch's *A First Dictionary of Cultural Literacy* (1996) and James Trefil's *1001 Things Everyone Should Know about Science* (1992). Hirsch's preface invokes, as his nineteenth-century predecessors did, the civic value of knowledge; with a sense of material pragmatism, he reminds the reader that "a solid foundation of shared knowledge [is] the necessary basis of good schooling and effective citizenship."[4] Joseph Guy's rationale for knowledge in the preface to his youth-oriented *Pocket Cyclopaedia* (1812) is very similar. "Let *useful knowledge*," he writes "accompany polite literature. It will give intelligence to youth, it will accustom them to habits of reflection and inquiry, and teach them to look on the objects around them with the EYE OF REASON."[5] And, then as now, the publishing industry capitalized on this cultural concern by flooding the market with pocket encyclopedias, compendiums of knowledge, and didactic works for children. Needless to say, the politics of knowledge in contemporary discourse, to say nothing of the electronic proliferation of knowledge, is an ambitious topic in its own right and warrants an entire study rather than passing mention.[6] As intriguing as these subjects are, my project here is to engage an *earlier* form of knowledge production that may nevertheless prove useful in understanding current trends and interests.

In *any* historical period, it would be a mistake to dismiss the seemingly peripheral constructions and popularizations of knowledge, such as encyclopedias and children's books, without giving them their due as both cultural signifiers and cultural forces. An approach to an understanding of the cultural context of knowledge has been addressed by Jacques Rancière, whose term *the poetics of knowledge* characterizes the "study of the literary procedures by which a discourse escapes literature [and] gives itself the status of a science." "We forget too easily," Rancière warns, that "the age of science is also that of literature."[7] Rancière's admonition is well taken in that it reminds us that both science and literature were driven by what I am calling *the growth of knowledge* and the consequential need to arrange genres of representation around both.



The concept *knowledge* may strike the reader as too sweeping, particularly given the breadth of its meaning, not to mention contemporary concerns about the validity of knowledge as a reifiable entity.[8] But no better term exists; *knowledge* resonated with profound significance and was treated with great reverence as England moved from the Enlightenment into the Victorian period, which saw the development of new branches of knowledge and inquiry, including sociology, psychology, and anthropology. This work will explore the substance and the accessibility of *knowledge* in its more general sense and consider its impact on the culture of which it was a part.

Much of the discussion in this book will focus on the period between 1818 and 1837, a span of time that, in literary terms, is often neglected, ignored, or tacitly considered "post-Romantic" or "pre-Victorian"; in either case, its very namelessness marks it as a neglected period in the nineteenth century. Whatever the canonical reasons for the orphaning of these decades, they constitute an important period in the growth of literacy, in the rise of industrialization, and in the growth of a mercantile class. The Regency (1811–20) and subsequent reign (1820–30) of George IV clearly dominated the style and attitude of the early part of the century. The period does have a distinct identity that, *even* if taken only as a transitional phase, is crucial to an informed reading of more canonical periods. I will simply refer to these years as *the early nineteenth century,* saving the more familiar *Romantic* and *Victorian* for traditional usage. References to the Regency should be understood to have broad implications beyond the scope of the dates 1811–20, given the looming presence of George IV as Prince of Wales, prince regent, and finally king (fig. 2).

In setting out some of these ground rules, which may strike some readers as arbitrary, although probably not unreasonable, I am intensely aware of the theoretical dilemmas surrounding literary history. Paul Armstrong, writing specifically about the issues created by interdisciplinary research, has addressed the theoretical problems inherent in the interpretation of diverse texts. "Interpreters," he writes, "must accept on faith various inherently contestable presuppositions if they are to be able to generate hypotheses."[9] David Perkins, one of the most active voices in the ongoing theoretical debate about literary history, frames literary history in terms of a

FIGURE 2 George IV depicted as prince regent in Robert Huish's *Memoirs of Her Late Royal Highness, Princess Charlotte Augusta* (1818). George served as regent from 1811 to 1820, when, after the death of George III, he succeeded to the throne. (Collection of the author.)

paradox. "We cannot write literary history with intellectual conviction," he writes, "but we must read it." Perkins recognizes that literary history is dependent on whether "a construction of a literary past can meet our present criteria of plausibility."[10] Plausibility is not simply driven by whim; it reflects social consensus and, as such, represents what might be called a *best estimate* in terms of understanding a past culture. In preparing this book, I have tried to be guided by a sense of plausibility and a desire to achieve a best estimate in terms of understanding a period of nineteenth-century culture. My approach is complicated by the conviction that the term *culture* requires an appreciation of science and literature all at once. Here, a return to Jacques Rancière's study is useful. Rancière elaborates a set of what he terms *contracts* that are compounded into the "single discourse" of contemporary history. Rancière's contracts are worth reviewing if only because they begin to suggest some of the problems and theoretical issues that have emerged in writing literary history. The three contracts—scientific, narrative, and political—are inextricably linked. The scientific contract "necessitates the discovery of the latent order, beneath the manifest," the narrative



contract "commands" structures into the "readable forms of the story with a beginning and an end," and the political contract "ties what is invisible in science and what is readable in narration to the contradictory constraints of the age of the masses."[11] The discourse that results from these contracts in the form of history is itself—as David Perkins has persuasively argued—subject to yet other histories and thus highly problematic.

Current anxiety about literary history, prompted by the work of Foucault, Jameson, Fish, and others, is partly what makes it compelling. In the process of shaping an analysis, in order to develop what mathematicians call *a line of best fit,* we worry and deliberate over the miscellaneous cultural material that lies outside our analytic scope. It is that outlying material, when identified, that ironically warrants a new analysis altogether. That tension is addressed in Tom Stoppard's extraordinary play *Arcadia,* which describes the efforts of two contemporary literary historians to determine the precise events surrounding a visit made by Byron to a private country estate. By showing us the historical events in question, Stoppard highlights the errors made by the contemporary interpreters, but not at the expense of interpretation itself. "It's wanting to know that makes us matter," argues one of the characters, and of course the play itself makes that very point.[12]

My interest in the extent and influence of "the growth of knowledge" in the early nineteenth century was motivated by "wanting to know" how post-Enlightenment English culture was influenced by the widespread dissemination of a commodity called *knowledge.* The questions that led me to this study are, of course, my own, but the analysis that those questions have generated may be useful, helpful, or simply interesting to others with similar sets of questions. As both a foray into constructions of knowledge and an attempt to contribute to an area of knowledge, this study has been both challenging and demanding. I have tried to be rigorous and accurate (in the most conventional sense of those words), without being narrow or prescriptive. In short, I have tried to combine a number of different approaches in this study but have tried to resist, taking a warning from *Pickwick,* "cramming" them together.

### *Literature, Science, Culture*

There is a temptation, perhaps the residue of disciplinary training, to trace the lines where science and literature intersect neatly. But the notion that

science (or technology for that matter) "meets" literature only in certain clearly identifiable spots is as old a notion as it is mistaken. "Science," as George Levine argues persuasively, is "embedded in culture"; science and literature are, he writes, "mutually shaped by their participation in the culture at large—in the intellectual, moral, aesthetic, social, economic, and political communities which both generate and take their shape from them."[13] Richard Yeo, drawing on the work of Habermas, argues that in the "first half of the nineteenth century public discourse on science . . . not only conveyed scientific discoveries to the public, but also legitimated science as part of a cultural discourse."[14]

Yeo's approach reflects a growing interest, even among historians of science, in looking at culture, using the perspectives of literature and science, as a kind of amalgam. The notion that science and scientists are somehow isolated within their cultures has been eroded by the work of such critical theorists and sociologists of knowledge as Michel Foucault, Bruno Latour, Stephen Woolgar, Steven Shapin, and Simon Schaffer in order to give way to a kind of dialectic where science, literature, and culture are understood to borrow freely from each other.[15] In nineteenth-century studies, for example, Charles Darwin is no longer a figure in splendid isolation; he is now seen as someone whose work was deeply influenced by the culture around him.[16] Gillian Beer has traced the stamp of literature on Darwin's work, and George Levine has highlighted his reliance on natural theology.[17] In a more historical context, both Peter Bowler and Robert Young have placed Darwin within the broad context of the history of nineteenth-century thinking on the species question in an effort to debunk the notion of revolutionary transitions in the history of ideas.[18]

By closing this study in 1860 with a brief look at George Eliot's *The Mill on the Floss,* I tacitly acknowledge the substantive impact of the publication of Darwin's *Origin of Species* (1859) on Victorian intellectual history. Many other scholars have taken up the project of Darwin's "influence"; my project here is to explore the cultural and intellectual milieu prior to Darwin. The dilemma of both approaches is that they establish Darwin as a kind of pivotal figure who seems destined to emerge. "Charles Darwin is thus made to stand out," Robert Young argues persuasively, "as a figure of comparatively unalloyed scientific status and is treated in relative isolation from the social and intellectual context in which he worked and into which his theory was received."[19] Although now over a decade old, Young's warning is still



relevant for many newcomers to literature and science and to the Darwin industry in general. Nevertheless, a number of recent works have taken up Darwin in order to explore a more comprehensive view of intellectual culture in the nineteenth century. Contemporary studies have provided new insights into the impact of Darwin's theory as formulated in *The Origin of Species;* they have also subtly analyzed Darwin's work as a product of its culture. Perhaps the most important such study has been Gillian Beer's *Darwin's Plots,* which discusses Darwin's thought and language so as to suggest the intricacy of the relation between literature and science in Victorian England. Beer's book and the studies by Sally Shuttleworth, Tess Cosslett, and Redmond O'Hanlon share a common interest in Darwin's impact on literature.[20] Although Darwin is an imposing figure in the Victorian cultural landscape, the culture was intensely aware of the impact of the growth of knowledge on its development. Public debate about transmutation, for example, was active well before 1859 in response to the work of such Continental theorists as Cuvier and Lamarck. Darwin had worked out a good deal of his theory by 1842 and, like other scientists, was asking challenging questions about the origin of the earth and of man in the 1830s. The more public achievements of such scientists as Charles Lyell, William Herschel, Humphry Davy, Adam Sedgwick, Roderick Murchison, and Michael Faraday had already begun to challenge conventional beliefs about the nature of matter, life, and the history of the earth.[21] Moreover, their work was widely read and just as widely discussed. In one way or another, the idea of *origins* was becoming a topic of popular as well as scientific concern. And, inasmuch as science was finding materialist answers to what had previously been metaphysical questions, science was relying less on scriptural authority to make its claims.

The general uneasiness about how to interpret the world prompted elaborate efforts to reconcile the secular and the spiritual. Often, as in Tennyson's *In Memoriam* (1851), science was rejected or, at least, set aside to accommodate the more comforting "truths" of faith. But, in any event, science could not be ignored, even if it was conscripted to the service of religion. The controversy provoked by *Vestiges of the Natural History of Creation* (1844), which Robert Chambers had ostensibly written "to connect the natural sciences into a history of creation," engaged virtually every thinking person in Victorian England.[22] While serious critics of the anonymously published *Vestiges* could dismiss its argument because the work reflected an

amateurish, if not inadequate, understanding of current scientific debates, the reality was that Chambers appreciated how central the subject was to both scientific and popular debates. Darwin observed the cultural debate and kept the *Origin* safely away from scientific and public scrutiny for over a decade. Finally, in the midst of an already-growing crisis of faith, Darwin published his carefully tended book and gave the Victorian world a text that would not be easily refuted or dismissed.

Darwin's theory neatly summed up a view of the natural world that did not privilege any living thing over another. Instead, all organisms (including, by implication, humans) were subject to the physical forces of nature and, of course, to each other. Combined with new perspectives on space, time, and matter, this view removed man from centrality in the universe. The age-old idea that man was a creature revered by nature and favored by God could no longer be professed without serious misgivings. But Darwin's impact is also striking because of the manner in which he helped create this new worldview. By accumulating bits of knowledge from here and there and assembling them in the encyclopedic *Origin* to form his evolutionary argument, Darwin demonstrated that knowledge was itself material.[23] In other words, knowledge, on its own, did not "reveal" a divine plan; nor did it provide "evidence" of an a priori argument. William Paley's world, described in *Natural Theology* (1802), where knowledge was both clearly ordered and designed by Providence for best effect, was gone. Now, knowledge existed in a new landscape that, inevitably, was less comforting and less secure than the one that preceded it.

### *Knowledge in Context*

As I have already indicated, the terms *knowledge* and *the growth of knowledge* are used somewhat loosely throughout the book, and that may concern a number of readers. In its historical context, *the growth of knowledge* suggested an increase in both the quantity and the quality of knowledge.[24] The positivistic implications of *growth* are worth keeping in mind, but my own usage implies nothing more than the propagation of knowledge. The question of what the term *knowledge* actually means is, I must confess, a more difficult one. For the sake of this study, it is worth thinking of the term in the framework of Fredric Jameson's notion of the *ideologeme*. Knowledge, as we shall see, provides what Jameson calls a *narrative paradigm* and is at the same time a



concept structured by social and cultural forces that recognize the value of the term as a political device.[25] The fluidity of the term, or, in other words, its dialogic or heteroglossic character, is entirely contingent on the modes of appropriation that control it at any single moment.[26] In current times, when opinions of what *the canon* should look like or what *cultural literacy* actually means in practical terms, knowledge continues to have a sharp political edge. The edge was equally sharp in the early nineteenth century when it first became clear that knowledge could serve as a commodity of exchange and of power. The broad question, as Lyotard frames it, is: "Who decides what knowledge is, and who knows what needs to be decided?" Viewing the issue in a contemporary context, Lyotard believes that the "question of knowledge is . . . a question of government," but surely knowledge is also a tool that can be turned on government and institutional authorities.[27] The wresting of knowledge from one group to another can be addressed only if we ask what were the historical and cultural circumstances that shaped what we call *knowledge*. In his *Fallen Languages,* Robert Markley attempts to frame the concerns of this kind of analysis even more broadly by calling attention to the ways in which both methodology and theory—the tools of cultural analysis—are themselves "structures that presume that ideological values are reasonably consistent, if not coherent, and that they are produced by agents cognizant of the implications of their actions, beliefs, and strategies." Our approach to understanding the cultural role of science, Markley argues, should rely not on efforts "to promote a new orthodoxy or to recover a pristine wisdom but in a collective—and dialogic—attempt to develop new forms of critical intervention in the discourses of history, theory, and culture."[28] Those interventions require broad and inclusive definitions of what constitutes both knowledge and science as well as the ways in which they are represented in culture.

The close link between knowledge and *science* can be traced to the empirical foundations of the Scottish Enlightenment and the materialist tradition that it helped advance. The word *science* had not yet developed the disciplinary meaning that we now attribute to it. In the nineteenth century, it still retained much of its literal meaning from *scientia:* to "know" a subject was to understand its science. Theory was the stepchild of this empirically based tradition and retained, as it often still does, a rather suspect character. The language of public science emerged, as Larry Stewart has noted, in a manner "that linked theory with practice, thereby providing the moral

foundation that ultimately made industrialism possible."[29] What is essential here is that knowledge stood apart from mere belief or opinion and somehow had validity grounded in the actual world. In *Leviathan and the Air-Pump,* Steven Shapin and Simon Shaffer elaborate the structures, particularly in science, that emerged in the seventeenth century to create rule-governed practices of knowledge that resisted external criticism.[30]

Needless to say, I am aware that some of the ontological issues in the practices of knowledge production prior to my specific period of focus are—to say the least—compressed here. And, while I do not want to undermine the continuity of intellectual currents in England, it is impossible to review the history of knowledge production at length. The work of Shapin and Shaffer, as well as that of Larry Stewart, Jan Golinski, and Margaret Jacob, provides a useful background for the emergence of issues of the culture of knowledge in the nineteenth century.[31] All these authors explore the performative aspects of science that place knowledge in the public eye, and all underscore the concept, as Shapin and Schaffer frame it, that "solutions to the problem of knowledge are solutions to the problem of social order."[32] What distinguishes the nineteenth century is that direct access to knowledge, through popular, cheap, and readable texts, became a central factor in both the production of knowledge and the structuring of social order.

Taken on very basic terms, then, popular conceptions of knowledge were less problematic in the eighteenth century, unless, of course, they challenged belief systems outright. In its most conventional form, as a loose aggregate of facts or information, knowledge was a thing to marvel at, like a cabinet of curios. But the nineteenth century did nothing if not systematize the aggregation of knowledge, first in compendiums of knowledge, and later in the creation of scientific theories and disciplines. In the process of being organized, knowledge began to suggest patterns and trends that challenged traditional belief systems. The challenge was not always apparent, but, as the knowledge industry generated cheap tracts and popular texts, moral dilemmas were inevitable.

Once merely a grab bag of interesting facts and figures, knowledge, as it became a middle-class commodity, was being organized into coherent works that often addressed important questions. As more and more scientific information became accessible, the most serious question was how to reconcile new scientific facts with religious belief. The question posed itself



not only to scientists and clerics, who had professional concerns, but to a broad reading population, who had relied on comfortable, if not timeworn, assumptions about the nature of their world. One of the scientists/clerics whose life and work reflect the full extent of these debates was William Whewell (1794–1866); his long and active career, ranging from his *Treatise on Mechanics* (1819) to an essay on "Comte and Positivism" in 1866, traces out—as Richard Yeo has amply demonstrated—the status of morality in terms of both the growth of knowledge and the specialization of science.[33]

Endorsed by institutional powers ranging from the aristocracy to the clergy, the advantages of knowledge seemed clearly to outweigh the risks. Knowledge retained a privileged status in the nineteenth century because it enriched the mind while inculcating a greater appreciation for God. That the growth of knowledge might also lead to materialism and atheism elicited some concern, yet that concern was either lost or dismissed in the enthusiastic push to broaden the limits of knowledge. As the importance of knowledge increased, so did the questions that seemed inevitable in a world where providential mysteries were giving way to human understanding and scientific discovery. Science was particularly problematic as it gained a position of authority within the culture. For those who adhered staunchly to religion as the basis of all understanding, the problem was minor, but the remainder found themselves facing serious concerns: What can science offer by way of spiritual and moral consolation? Does the materialism of science necessarily mean that if one is "scientific" one is no longer subject to the moral and ethical laws insisted on by religion? And is there a way of finding within science a source of hope that, as in religion, distinguishes man from other forms of life? Implicit in all these questions is a need to sustain some moral and ethical standards while, at the same time, accepting scientific knowledge.[34] The fact that an external Providence, whether in the form of nature or God, could no longer be "trusted" to orchestrate what was "right" (or to mete out "just" punishment and reward) made individual choices even more important.

That this emerging crisis of faith took place in the erratic political climate of the early part of the century is also worth noting. Trapped between the two Georges, the throne was locked into a succession of neglectful rule, mismanagement, and self-indulgence with no end in sight. As traditional institutions of government abandoned the posture of ethical concern

and disinterest, the social responsibility of the individual was heightened.[35] While neither the Spa Fields nor the Peterloo Riots raised middle-class English sensitivity toward the appalling conditions under which the working class lived and worked, they made the specter of revolution very real. The growing levels of a class of people steeped in poverty was a constant reminder that economic prosperity in England, always an ideal prospect for Britons, would not be realized any time soon.[36] With no evidence of any concern from the crown—not to mention God—about the resolution of England's problems, the middle class was extremely uneasy about the immediate future. The need for socially responsible individuals in a world with a passive or nonexistent God was a potent challenge that was not being responded to in the political sphere.

The world of letters presented a different story. Unlike their political contemporaries, novelists seemed particularly sensitive to the changing times and the need for a fictional style that offered more than simple situations and triumphant heroes. Neatly satisfying plots gave way to more bitter realities and more plausible narratives. In these, the righteousness or integrity of the hero was no guarantee of survival or appropriate reward (indeed, in such novels as Thackeray's *Pendennis,* the distinction of the eponymous hero is the *absence* of virtuous qualities). As the century developed, serious novelists struggled to reconcile the hard realities of science, economics, and religion. By examining several novels from 1818 to 1860, I will trace the reworking of the themes of knowledge and responsibility in the light of this changing social and intellectual climate. The significant advances in science and technology were already apparent in the early part of the century. The challenge for the novelist was to create societies that responded to these inevitable developments without succumbing to a cynical dismissal of moral responsibility.

The rationale for using the novel as the vehicle for this exploration stems first from an interest in using a popular genre that reflects a diversity of both practitioners and audiences. I have tried to focus on individual authors who differ in age, experience, and intellectual background, but I also draw on a wide array of novels, novelists, and other prose writers. The realism of the nineteenth-century novel does, of course, figure prominently here as well. Writing about the form of the nineteenth-century novel, George Levine has noted that fictions expose the culture's deepest assumptions (or



desires) and that it is in such quite fictional elements that the "nonfiction" of science makes its presence felt. "Novels are not science," Levine continues, "but both incorporate the fundamental notions of the real that dominate the culture."[37] In structuring perceptions of the "real," novels function, as D. A. Miller has observed, as elaborate knowledge systems.[38] Novels establish elaborate guidelines of knowledge to direct the reader through the system; the narrative thread that emerges from comparisons with the "real" or from gaps in the knowledge-structure relies on the confusion that exists (if only briefly) between fact and fiction.[39]

Novels are, to use *Frankenstein*'s terminology, "chimerical," and I hope that it will become clear that, as they incorporate science, novels are also transformed by it. *Frankenstein,* for example, becomes a "log" or documentary of a scientific event no less significant than Frankenstein's own journal; and Brontë's *The Professor* is itself as important a lesson as Crimsworth ever teaches. The affinity between the "knowledge" generated by fiction and the "knowledge" generated by science is strong, but it is only slowly being addressed by contemporary scholarship. But, even as we begin to acknowledge the role of narrative in scientific texts, there is still a great deal of confusion about how knowledge functions in literary texts. This is due, in great measure, to the claim that the sciences have made for authority. Science asserts its reality by narrative means while, at the same time, denying that it relies on qualities of narrativity. As Lyotard reminds us in his *Postmodern Condition,* "Scientific knowledge cannot know or make known that it is the true knowledge without resorting to the other, narrative, kind of knowledge, which from its point of view is no knowledge at all." "Narration," according to Lyotard, "is the quintessential form of customary knowledge." Whether scientific or literary, narration is a device that helps a society "define its criteria of competence and to evaluate according to those criteria what is performed or can be performed in it."[40] It is tempting to argue that *all* fiction involves an attempt to define competence, establish authority, and assert knowledge, perhaps in an effort to recoup what has been *lost* to scientific narration, or perhaps as part of a "natural" effort to gain intellectual credibility. I am not prepared to make such sweeping claims or, worse, to subject the novel to the very kind of scientific analysis that explains itself by narrative. A simpler claim, that knowledge, narrative, science, and the novel are inextricably entwined, will have to do.

*Dissemination and Diffusion in Fiction*

Although the primary focus of this book is the novel, I take it as an important part of my task to consider how science was mediated to novelists and their readers. To that end, I explore, in the first chapter, the ways in which *knowledge,* as a commodity, penetrated the culture. We need to turn to popular knowledge texts (once considered ephemera) because, as Barbara Gates has argued forcefully, they are "legitimate aspects of cultural knowledge."[41] Only by examining the growth of encyclopedias, of scientific societies, and of scientific children's literature do we get a sense of the centrality of science and of the idea of knowledge becoming what Susan Faye Cannon has called a "norm of truth."[42] "The acquisition of knowledge," wrote the philosopher Samuel Bailey in 1829, "has become an object of immense interest and importance . . . the welfare of society in a thousand ways is deeply implicated in the rectification of error and the discovery of truth."[43] Not only was the enthusiasm for knowledge enormous, but, as the quote from Bailey demonstrates, the belief in it as a "norm of truth" was equally strong.

The succeeding chapters deal with a range of fiction from 1818 to 1860. In their attempt to resolve social conflicts, these novels reflect prevailing attitudes of the early nineteenth century. Although the first novel, from a chronological perspective, should be Mary Shelley's *Frankenstein* (1818), I begin, instead, by looking at Jane Webb Loudon's *The Mummy!* (1827). Loudon's novel is not well known and will be new to most readers. It provides a useful starting point from which to introduce some of the issues that will run throughout later discussions. Although apparently well connected, Loudon did not have the benefit of Mary Shelley's parentage or acquaintances. Her novel is less philosophical than Shelley's, offering instead a moral tale in terms of politics combined with a fanciful look at science and technology. I will argue that in many ways *The Mummy!* is an allegory of Regency England, a society that is collapsing from the lack of moral standards. As a believer in the benefits of progress, Loudon tacitly accepts science and technology as positive and important forces in the future of mankind. Her world is threatened, not by scientific change, but by the erosion of morality, good governance, and thoughtful leadership. With morality restored at the end of the novel, Loudon establishes a scientific utopian world that still respects traditional social hierarchies as well as conventional attitudes about order and discipline.



The focus of Mary Shelley's *Frankenstein* is narrower than that of *The Mummy!* Instead of a sweeping novel of society, Shelley made *Frankenstein* the paradigm for a social dilemma. Like Loudon, Shelley sees the advantages that science can offer mankind, but her enthusiasm is tempered by the concern that science—or, more accurately, the scientist—has the ability to strip the natural world of its mystery. The distinction between science and the scientist is a crucial one since the decision to abandon mundane science, however beneficial to humanity, in order to pursue science for its own sake (not to mention for the sake of self-glorification) is the scientist's alone. Shelley attacks self-indulgence and the notion of scientific prerogative by challenging them with the concept of moral integrity. Victor Frankenstein abandons his original intention to be a restorative or curative agent among men in order to create life anew and, in doing so, places his own concerns ahead of his moral obligation to society. Unlike Frankenstein, however, his friend Walton *is* socially concerned; without abandoning the principle of intellectual inquiry, he accepts his moral responsibility as captain of the crew and returns his small community to safety. In saving his crew, Walton also saves his story and passes it on to posterity. Walton's legacy is noteworthy since Shelley makes it clear that science will persist with or without him. By returning, Walton asserts himself, via his narrative and his behavior, as a judicious blend of scientific curiosity and moral restraint. The world that produced both Walton and Frankenstein undergoes—with Walton's return—a kind of normative correction in order to restore harmony to society and to the pursuit of knowledge.

Where Mary Shelley is concerned with the more abstract probings of scientific inquiry, Charlotte Brontë is interested in the effects of science and technology on social order. In *The Professor,* Brontë uses the potentially discordant elements of her world to shape a world of cooperation and discourse. The aristocratic Crimsworth, the working-class Frances, and the entrepreneurial Hunsden combine to create Victor Crimsworth, a child suitable for the time. With scientific principles of development as a backdrop, all the characters make moral and ethical decisions about themselves and their obligation to a larger community throughout the course of the novel. Rather than operate outside the trying social and economic forces in En-

gland, Brontë's characters confront and overcome them. The novel argues against both radicalism and conservatism by suggesting, in terms borrowed from contemporary science, that the most promising future can be achieved through adjustment and adaptation.

Although the structure of *The Professor* can seem contrived, Brontë creates a natural and believable reconciliation between what might otherwise be conflicting social forces. In *Alton Locke,* Charles Kingsley conceives of a similar kind of reconciliation but in a much more polemical manner. As a widely known cleric and reformer, Kingsley, ever the polemicist, is more deliberate in characterizing the forces that he sees in conflict. As the title alone suggests, *Alton Locke, Tailor and Poet* awkwardly yokes disparate thematic elements in order to establish the book as a novel of issues and ideas. Kingsley, who was unstinting in his acceptance of both religion and science as sources of absolute truth, was convinced that others would, by following his example, integrate religion and science freely. In the end, however, Kingsley passionately forces issues together in a way that is both unsatisfying and unconvincing. The introduction of Alton's evolutionary dream is heavy-handed, and its tone of progressionism is an unconvincing attempt to make recent scientific discoveries consistent with church doctrine. Alton undergoes a "transformation" that takes its language from science but its purpose from religion in a way that finally satisfies neither. In short, Kingsley's attempt to reconcile opposing intellectual forces actually draws attention to how irreconcilable they really are. *Alton Locke* is finally both driven and undone by Kingsley's sincerity and passion.

The contrast between Kingsley and George Eliot, the last novelist that I will consider, is interesting because of the intellectual capacity of both. Both faced a wealth of emerging knowledge, scientific, social, and economic, that was inevitably undermining the received ideas and opinions of the times. Eliot had been through her own crisis of faith and opted to discard religion rather than to attempt repairs. The promise of a bright—or at the very least a predictable—future, provided by Kingsley, Brontë, Loudon, and even Shelley, forms no part of Eliot's novels. While her predecessors try to exclude the uncertainty that comes with rigorous inquiry, Eliot welcomes the unknown into her novels.

In *The Mill on the Floss,* published a year after Darwin's *Origin,* George Eliot focuses our attention on the very elements that Kingsley tries to ignore: the existence of natural laws that have nothing to do with human or supernatural will. Maggie and Tom are not permitted the pious death of Alton Locke; rather, they are brutally killed by the debris of technology that, like them, has been caught up in the overwhelming natural power of the flood. Where Kingsley takes on the role of apologist for religion, nature, and scientific inquiry, Eliot distances herself from the forces that she describes in the novel. By reworking those forces—described in the images of the mill and the river Floss—she forges an understanding of their operation and of the possibility of the efficacy of human action in the world. Although Eliot's is the only "godless" world that I discuss, her insistence that human intellect and moral responsibility must continue to have a place in society is consistent with all the novels being considered here and thus neatly marks the transition to a post-Darwinian sensibility.



My purpose here is not to define a unidirectional trend in the novel that progresses inexorably with time.[44] Rather, I want to suggest the manner in which the early nineteenth-century novel reflects important cultural attitudes and how, in general, it responded to an ever-increasing supply of new, and often challenging, knowledge. The task is meaningful because of the high status given to science and to the knowledge industry in the nineteenth century. The enthusiasm for the capacity of the human mind to learn and discover was virtually unchecked and, in fact, to many stood for what was best about Britain. Every member of society had some kind of stake in the knowledge industry, whether as a proponent, a detractor, a marketer, or merely a consumer. Knowledge was being produced and consumed at such an unprecedented rate that few could ignore its growing impact on the culture. The novelists discussed in the following chapters represent only a handful of those who tried to imagine the consequences of that change but suggest its significance in the culture at large.