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0521836379 - Science in the Nineteenth-Century Periodical: Reading the Magazine of Nature

Geoffrey Cantor, Gowan Dawson, Graeme Gooday, Richard Noakes, Sally Shuttleworth, and Jonathan R. Topham

Excerpt

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CHAPTER I

Introduction

Gowan Dawson, Richard Noakes, and Jonathan R. Topham

In an early essay, the physicist James Clerk Maxwell pondered the intelligibility of the universe, contrasting the reassuring image of the book of nature with an intriguing, if somewhat disturbing alternative, the magazine of nature:

Perhaps the ‘book’, as it has been called, of nature is regularly paged; if so, no doubt the introductory parts will explain those that follow, and the methods taught in the first chapters will be taken for granted and used as illustrations in the more advanced parts of the course; but if it is not a ‘book’ at all, but a *magazine*, nothing is more foolish to suppose than that one part can throw light on another.¹

This epistemological reflection is both suggestive and rather surprising. If nature is like a book, Maxwell suggests, or better, a well-constructed textbook, then the explanation of its several parts will form a unified and coherent whole. However, this assumption is far from self-evident, and may well be false. Nature may instead be like a magazine. Just as a magazine contains a miscellany of unrelated articles, argues Maxwell, so the various parts of nature may be unrelated to each other. What is surprising about Maxwell’s claim that on this basis it would be ‘foolish to suppose . . . that one part can throw light on another’ is that he was later outstandingly successful in exploiting such relationships in his research. Using mechanical models of the ether he spectacularly illuminated the analogies between electricity, magnetism, and light. In much the same way, as this book will show, important relationships can be found between the disparate articles which make up a magazine.

Science, technology, and medicine permeated the content of general periodicals in nineteenth-century Britain, appearing not only in avowedly scientific articles, but also in other forms of narrative including fictional representations, glancing asides in political reports, and caricatures and allusions in comic magazines. From the perspective of readers, science was omnipresent, and general periodicals probably played a far greater role than

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books in shaping the public understanding of new scientific discoveries, theories, and practices. The object of this collection of essays is to analyse the representation of science, technology, and medicine, as well as the inter-penetration of science and literature, in the general periodical press in nineteenth-century Britain. Employing a highly interdisciplinary approach, the following chapters address not only the reception of scientific ideas in the general press, but also examine the creation of non-specialist forms of scientific discourse within periodical formats, and the ways in which they interacted with the assortment of other kinds of articles found in nineteenth-century periodicals.

The prevalence of science in such periodicals as the *Cornhill Magazine*, the *Illustrated London News*, or *Punch* has far-reaching implications for literary scholars and historians of science alike. In an age in which the natural sciences became increasingly demarcated from other fields of learning, and from a self-consciously 'literary' sphere, periodicals frequently served to reincorporate them in a wider culture. Whether in homiletic form in the sermons of the *Wesleyan-Methodist Magazine* or in political form in leading articles of the *The Times*, the cultural significance of the sciences was widely debated in the periodical press. Moreover, the variety or even *bricolage* of their formats made periodicals unusually open to different subjects and genres being juxtaposed, and most readers were not as fastidious as Maxwell about the analogies thus suggested. Indeed, editors and writers were often fully aware of the opportunities for conceptual and linguistic interchange. Novelists, essayists, politicians, and scientists alike found periodicals a common ground for such borrowings. Moreover, with the bounds of the sciences constantly under re-negotiation, non-specialist periodicals presented an invaluable medium for the exploration of new, heterodox, or disputed sciences.

While books are generally intended to be of lasting, if not timeless, value, periodicals are designedly ephemeral: in Margaret Beetham's phrase, literally 'date-stamped'.² For the historical scholar, it is, paradoxically, the very time-sensitive nature of periodicals that gives them their permanent value. Of course nineteenth-century books were often written in response to other books, but the fine texture of debate was embodied far more completely in the periodicals. Day by day, week by week, month by month, periodicals addressing widely diverging reading audiences contained implicit and explicit dialogues concerning the sciences. Such interchanges, occurring both within and between periodicals, represent a remarkable, almost overwhelming, body of evidence for the cultural history of science in nineteenth-century Britain. Books were also secondary to periodicals in

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other significant ways. It was in periodicals, for instance, that many of the best-known works of the nineteenth century first appeared, ranging from a considerable proportion of the novels to such scientific classics as John Tyndall's *Fragments of Science* (1871). In addition, those works first published as books were often primarily known through their representations in periodicals, whether in reviews, extracts, abstracts, advertisements, correspondence, or passing comments. As James Secord observes, the achievement of stability in the process of 'literary replication' was far from straightforward: the meanings of paragraphs and epigrams extracted in periodicals often differed widely from those intended by the producers of the original books.³

The pervasiveness of science in nineteenth-century periodicals has long been recognized. In 1958, Alvar Ellegård's ground-breaking *Darwin and the General Reader* demonstrated that evolutionary ideas were widely canvassed in the non-scientific press. However, while Ellegård's use of a broad range of periodical sources (he examined 115 titles) remains an achievement not subsequently matched, his approach rested on the assumption that 'periodicals can be taken, by and large, as representative of the ideas and beliefs of their readers, and thus, with some qualifications, of the population at large'.⁴ This approach ignores the variety of ways in which periodicals were produced and read. As Secord has recently shown, for instance, newspapers and magazines sometimes functioned as foils for readers' own developing views: they might read them 'not to agree with them, but to think with them'.⁵ More fundamentally, periodicals themselves embodied forms of debate. Whether in the interplay of different contributions or in letters pages, they presented a space which, however tightly bounded, allowed for a variety of opinions to be expressed. Ellegård's attempt to codify public opinion by a statistical analysis of press reaction, classified according to five possible positions on each of three 'parts' of Darwinism, obscures such debate.⁶ Indeed, by focusing on those articles overtly concerned with evolution, Ellegård inevitably overlooked many apparently non-scientific articles which also engaged with Darwin's theory. Examining the entire contents of a periodical allows the historian to gain a more subtle, nuanced, and often very different picture of how Darwinism emerged, or indeed was submerged, in cultural discourse of the time.

This notion of the interplay of scientific and other subjects in periodical literature is central to Robert Young's well-known thesis, adumbrated in the late 1960s, that for the first eight decades of the nineteenth century British periodical literature reflected a 'common intellectual context' in which the sciences were fully integrated.⁷ A major problem with Young's thesis, however, is that it implies a progressive transition from a unified

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intellectual culture to something resembling C. P. Snow's 'two cultures'. It has little to say concerning the complex changes in notions of the 'literary' and the 'scientific' which occurred over the course of the period, or to the manner in which those changes related to the transformations that took place in the forms of, and audiences for, periodical literature. Indeed, Young focused exclusively on a small number of the highbrow magazines and quarterlies indexed by the *Wellesley Index to Victorian Periodicals*, and, while he attributed the putative break-up of the 'common context' partly to 'the growth of general periodicals of a markedly lower intellectual standard', he otherwise disregarded the continual development over the century of new periodical forms addressed to an increasing range of reading audiences.

While the quarterlies undoubtedly represented the leading medium of discussion and debate among the wealthy middle classes and those in positions of cultural power in the early nineteenth century, there were already signs of strain in this 'common context'. As Richard Yeo has shown, Jürgen Habermas's notion of the bourgeois public sphere is helpful here. Such a sphere developed in eighteenth-century Britain, France, and Germany, as the cultural forum of a newly self-conscious 'public'. While effectively open only to the bourgeoisie and the landed aristocracy, it relied on a notion that men of differing ranks could discourse within it on all subjects on equal terms, through the authenticating token of Enlightenment rationality. The bourgeois public sphere existed, characteristically, in the physical space of the coffee house and in the virtual space of the periodical, where the writer and reader were notionally interchangeable. By the early nineteenth century, however, this notion of a unified public was becoming increasingly tenuous. In particular, the emergence from the 1790s of a self-consciously counter-cultural radical press and the strain placed on synthetic writing by the specialization of knowledge, made it increasingly difficult to maintain the notion of a unitary public sphere. Moreover, as Yeo has shown, science exacerbated these tensions. Divergent and threatening notions of science were prevalent in the radical press and elsewhere, and there was increasing conflict between 'the needs and interests of the lay public and the specialists' in terms of periodical writing on science.⁸

The breakdown of the bourgeois public sphere in early nineteenth-century Britain exposes the inadequacy of Young's exclusive focus on highbrow periodicals. In order to negotiate the increasing diversity of reading audiences for science we need to study the full range of periodical types. As Jon Klancher suggests in his ground-breaking study of early nineteenth-century periodicals, reading audiences are not 'simply distinct sectors of

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the cultural sphere' that can be considered in isolation; rather, they develop and are maintained in relation to each other.⁹ Ultimately, a more extensive familiarity with the periodical press is needed even in order to grasp how the 'intellectual' audience envisaged by Young was redefined during the course of the century. To date, most attention in this regard has been devoted to the rise of the radical press – work which has done much to show that the production of science for fashionable or specialist readers was profoundly informed by the presence of other audiences.¹⁰ However, other important reading audiences remain neglected. Take, for instance, Charles Timperley's calculation that of some 318 periodical titles (other than newspapers) issued in London on 16 December 1837, some fifty-two (16 per cent) were religious, and many of the seventy-one left unclassified (22 per cent) were 'very cheap periodicals, addressed chiefly to children'.¹¹ The large circulation of religious and children's magazines suggest areas particularly worthy of consideration, but many other reading audiences also demand attention.

A renewed interest in the full range of nineteenth-century writing on science has been a hallmark of the recent historiography of science popularization and science in popular culture. In their 1994 re-appraisal of the field, Roger Cooter and Stephen Pumfrey urged that future work should be 'responsive to a greater plurality of the sites for the making and reproduction of scientific knowledge', asserting the need to scrutinize 'popular prose and non-scientific texts for (or as) signs of orthodox and unorthodox scientific authority' and to explore the histories of scientific metaphors in popular writing.¹² In particular, Bernard Lightman and others have pointed up the importance of widely circulated scientific writings produced by professional popularizers who 'offered different ways of speaking about nature' to the emergent scientific professionals of the late century.¹³ Similar perspectives have also emerged from recent work in literary studies. As scholars such as Gillian Beer, George Levine, and Sally Shuttleworth have shown, many literary writers of the nineteenth century actively engaged with scientific themes in essays, fiction, and poetry.¹⁴ Much of this writing first appeared in the non-specialist periodicals which are the focus of the present book.

Periodical studies have also developed apace. Thanks to John North's monumental *Waterloo Directory*, the vast output of the periodical press – North records some 125,000 newspaper and periodical titles in nineteenth-century England alone – has come under increasing bibliographical control.¹⁵ Other resources, notably Alvin Sullivan's *British Literary Magazines* (1983–4) and J. Don Vann and Rosemary VanArsdel's *Victorian*

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Periodicals and Victorian Society (1994), give helpful overviews of the development of the press. Theoretical approaches have also become more sophisticated, as scholars have reflected on the distinctive qualities of the periodical genre.¹⁶ To date, however, little has been done to combine these new perspectives on periodicals with recent historiography of popular science or with scholarship on literature and science.

Scholars wishing to draw on periodical literature in their historical work on science have been daunted by the size and complexity of the task. This literature can be difficult to penetrate: few periodicals have adequate indexes, and modern indexes, such as the *Wellesley Index* and *Poole's Index to Periodical Literature, 1802–1906*, are keyed to titles which frequently offer little guidance as to the content of articles. The invaluable *Wellesley Index*, moreover, has exerted a distorting effect upon the field: scholars have tended to follow its example, focusing primarily on ‘highbrow’ titles, to the exclusion of periodicals aimed, for example, at women, children, artisans, or religious denominations. The ‘Science in the Nineteenth-Century Periodical’ (SciPer) project addressed these concerns by creating an interpretative electronic index to the scientific content of a range of genres of general periodical, based on inclusive reading of the entire periodical texts.¹⁷ This book is based on this in-depth research.

In this book, we seek to reinterpret the place of science in nineteenth-century British culture by combining insights from the history of popular science, cultural and literary studies, and periodical studies, together with the experience of reading tens of thousands of pages of general periodicals in preparing the SciPer index. The book approaches its subject from two main directions. The chapters in the first section focus on the function of science within the literary economy of various periodical genres. All too frequently, historians have raided periodicals for interesting references to science, paying little attention to the wider frame in which those references existed. Yet periodical articles appeared as elements of larger texts, and they were commonly read (and indeed often written) in relation to the texts that surrounded them. In this book, we consider the place of science in six important periodical genres, reinstating the original contexts in which the constituent articles were initially read, and considering how the formal features of the periodicals shaped the content and meaning.

The chapters in the second section of the book address particular themes across a range of periodicals, recapturing the sense that contemporaries had both of the diversity of approaches to the sciences embodied in different kinds of publication and of the frequent interplay between the several journals. In chapter 8, Sally Shuttleworth shows that many of the key early

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interventions in the creation of the science of infant development were made in mid-century literary magazines and highbrow reviews. Even after the psychological journal *Mind* had broached the subject, the debate continued to range across a number of non-specialist periodicals. Shuttleworth also shows the difficulties encountered by George Henry Lewes, James Sully, and others in attempting to negotiate the different demands of non-specialist and specialist periodicals, and considers the implications of such writing for scientific reputation. Geoffrey Cantor, in chapter 9, explores how periodicals transmitted the narratives of free-standing scientific biographies to far wider audiences, transforming their meaning by immersing them in radically different contexts. One of the peculiarities of periodicals is that they contain within a single work a whole range of generic forms, and Cantor also investigates the manner in which the different genres of biographical writing were handled. In chapter 10, Graeme Gooday explores the changing literary forms in which the new technologies of industrial and domestic electricity were handled in the periodicals of the late nineteenth century. He argues that the development of new journalistic media – notably W. T. Stead's campaigning *Review of Reviews* (1890) – contributed to the emergence of a 'futurist romance' of electricity, which was to displace the 'technical-didactic exegesis' of the older reviews.

In this introduction we set these detailed case studies within two larger perspectives. First, we survey the increasing range of periodicals in the period and consider the significance of their changing forms and audiences for a wider understanding of the place of science in nineteenth-century culture. Secondly, we consider some of the key historiographical questions entailed in using periodicals in this way.

‘CHARTING THE GOLDEN STREAM’: SCIENCE IN THE
NINETEENTH-CENTURY PERIODICAL¹⁸

In his *History of Nineteenth Century Literature* (1896), George Saintsbury reflected that no literary phenomenon was ‘so distinctive and characteristic’ of the era as ‘the development . . . of periodical literature’.¹⁹ Since the late seventeenth century, periodicals had been regarded as a potent device for developing the literary marketplace, providing metropolitan publishers with a conduit through which to advertise other literary wares to provincial booksellers and far-flung readers.²⁰ However, with the increasing commercialization of the book trade in the eighteenth century, and with the emergence of new reading audiences and the mechanization of book manufacture in the early nineteenth century, periodicals took on a new

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significance. In an unpredictable market, periodicals allowed publishers to develop relationships with particular groups of readers while at the same time avoiding the financial risks of capital-intensive book production. Their periodicity allowed producers to respond readily both to readers' comments and to sales figures in order to match commodity and consumer more effectively. The periodical was thus the perfect vehicle for sounding out and consolidating the diverse reading audiences of the growing and increasingly entrepreneurial literary marketplace. As a result, the number of titles trebled in the first three decades of the new century, and the types of periodical also rapidly increased.

To some contemporaries, periodicals seemed almost to be replacing books. In 1823, Hazlitt famously addressed the complaint that his was 'a Critical age; and that no great works of Genius appear[ed], because so much [was] said and written about them'.²¹ The dominance of periodical literature has also been widely recognized by historians. Lee Erickson, for instance, considers that 'the periodical became the dominant publishing format' during the first half of the nineteenth century, and Mark Parker argues that literary magazines were the 'preeminent literary form of the 1820s and 1830s in Britain'.²² Yet the basic parameters of this new market for periodicals remain largely unexplored. Figures from the *Waterloo Directory* suggest there was a sustained if uneven increase in the number of periodical titles over the course of the century, with the exception of a final decline, which may be a result of the method of sampling (fig. 1.1). The number of periodicals apparently increased at an ever-faster rate as the century progressed, although the greatest proportionate increases occurred in the early part of the century (particularly in the late 1810s/early 1820s and in the early 1830s). Comparing this pattern to figures derived from the *Nineteenth-Century Short-Title Catalogue* seems to confirm that from the 1820s, and more especially from the 1850s, the number of periodical titles grew at a faster rate than the number of book titles (fig. 1.2).

When complete, the *Waterloo Directory* may enable us to generate data about the shifting genres and periodicities of periodical publication, and the changing patterns of periodical prices. To date, however, there is no modern study which, like Walter Graham's *English Literary Periodicals* (1930), seeks to provide a comprehensive assessment of the main phases of periodical publication. Yet the rise and fall of periodical forms clearly impinged heavily on the ways in which the sciences were encountered and discussed in nineteenth-century Britain. In this section we sketch some of the key

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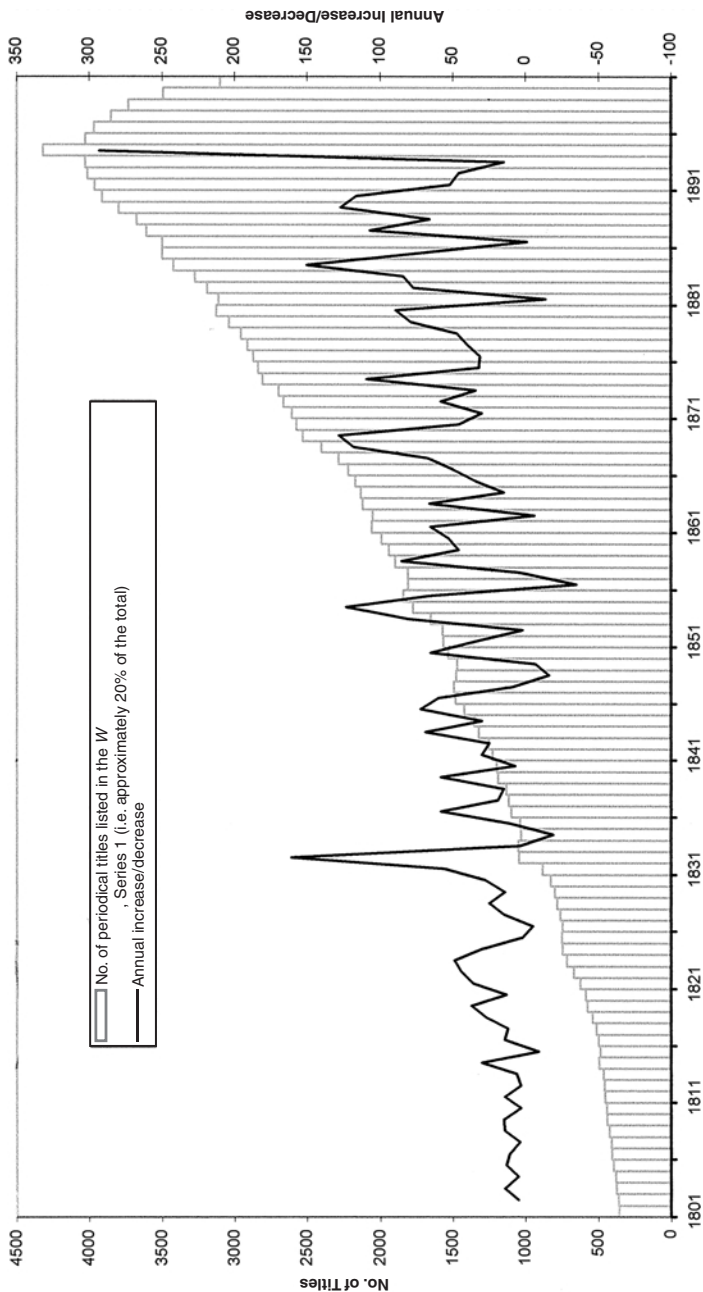


Figure 1.1. Patterns of periodical publication in nineteenth-century Britain.^a
^a The data are derived from *Waterloo Directory of English Newspapers and Periodicals, 1800–1900*, ed. by John North (Waterloo: Ontario North Waterloo Academic Press, 2001) accessed 7 March 2001 <<http://www.victorianperiodicals.com>>. The figures given here are taken from the first of the five planned series of the directory, which, it should be noted, has something of a subject bias. In each series of the directory, all subject areas are covered, but each of the series attempts to provide a comprehensive listing of from seven to ten additional subjects, while including many thousands of titles not on those specialty lists’.

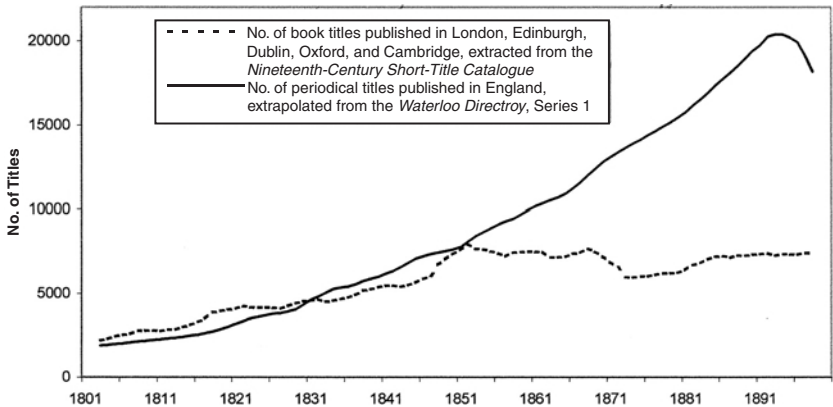


Figure 1.2. Comparative trends of book and periodical publication in nineteenth-century Britain.^a

^a The data (displayed as five-year moving averages) are derived from the *Waterloo Directory* and the *Nineteenth-Century Short-Title Catalogue, Series I & II, 1801–1870 (NSTC)*, CD-ROM (Newcastle-upon-Tyne: Avero Publications, 1996). The *NSTC* is a union-catalogue of the ‘British books’ in a number of leading research libraries, including all books, periodicals, and pamphlets ‘published in Britain, its colonies and the United States of America; all books in English wherever published; and all translations from English’. As a union-catalogue, it does not pretend to be a complete record of publication; while at the same time it contains many foreign publications not germane for our comparison. Thus, we have not only excluded serials from our calculations, but have also followed Simon Eliot in excluding all books not published in London, Oxford, Cambridge, Edinburgh, or Dublin, trusting that these leading publishing centres will give a reasonable reflection of the pattern of British book publishing. See Simon Eliot, *Some Patterns and Trends in British Publishing, 1800–1919* (London: Bibliographical Society, 1994); and Eliot, ‘Patterns and Trends and the NSTC: Some Initial Observations’, *Publishing History* 42 (1997): 79–104, and 43 (1998): 71–112.

phases of this history, considering how the shifting material and cultural forms of periodicals modified not only how the sciences were represented, but also the audiences to which they were addressed.

Science in early nineteenth-century periodicals

The nineteenth century began with the inception of one of the most commanding new periodical genres, namely, the quarterly review journal, initiated by the *Edinburgh Review* (f. 1802). Far more selective in its reviewing, and also far more opinionated and partisan than the monthly reviews of the previous century, the *Edinburgh* ‘plainly set out to break the mould of existing journal culture’.²³ In contrast to the encyclopaedic ambitions and open ethos of the *Monthly Review* (f. 1749) or the *Analytical Review* (f. 1788), the new review prided itself on its discrimination, both in its subject matter