

# Introduction

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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 its upstart, 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.<sup>1</sup>

In this suggestive analogy, the new scientific theories which were to threaten the divinely authored, orderly sequence of Christian theology are aligned with that increasingly popular publishing format, the magazine. While we must take issue with Clerk Maxwell’s notion of rigid discontinuity within the covers of a magazine, his association is telling. For the majority of the Victorian reading public, periodicals probably played a far greater role than books in shaping their understanding of the new discoveries and theories in science, technology and medicine. Such understanding would be formed not merely by serious articles, but also by glancing asides in political reports, fictional representations, or the humorous attacks in comic magazines. Science, in many, often surprising, guises, permeated the content of the nineteenth-century periodical press.

The pervasiveness of science in nineteenth-century periodicals has long been recognized. As far back as 1958, Alvar Ellegård’s ground-breaking *Darwin and the General Reader* demonstrated that evolutionary ideas were widely canvassed in the non-scientific press, ranging from the *Methodist Recorder* to *Punch* and from the *Popular Science Review* to *Reynolds’s Newspaper*. While Ellegård’s use of a wide range of periodical sources (he examined 115 titles) remains an achievement not subsequently matched, his approach rested on a simplistic view of how periodicals functioned. His 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’ pays scant regard to the variety of ways in which historical readers actually used periodicals.<sup>2</sup> As James 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’.<sup>3</sup> More fundamentally, periodicals generally themselves embodied debate. Whether in the interplay of different contributions or in letters pages, they presented a space which, however tightly bounded, allowed

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<sup>1</sup> ‘Are there Real Analogies in Nature?’, in Lewis Campbell, *The Life of James Clerk Maxwell, with a Selection From his Correspondence and Occasional Writings and a Sketch of his Contributions to Science* (London: Macmillan and Co., 1882), pp. 235–44 (243).

<sup>2</sup> Alvar Ellegård, *Darwin and the General Reader: The Reception of Darwin’s Theory of Evolution in the British Periodical Press, 1859–1872*, 2d ed. (Chicago: University of Chicago Press, 1990), p. 21.

<sup>3</sup> Secord, p. 351.

for a variety of opinions to be expressed. Ellegård's attempt to codify public opinion by a statistical analysis of press reaction, classifying according to five possible positions on each of three 'parts' of Darwinism, tends to obscure the traces of such debate.<sup>4</sup> Indeed, by focusing on those articles which appeared to be overtly concerned with evolution, Ellegård inevitably missed the juxtaposition of scientific and other articles which contemporary readers encountered. To read the entire contents of a periodical is to gain a more subtle, nuanced, and often very different picture of the ways in which Darwinian thought emerged, or indeed was submerged, in cultural discourse of the time.

This notion of the interplay of the scientific and the non-scientific in periodical literature is central to Robert Young's well-known thesis, adumbrated in the late 1960s, that for the first seventy or so years of the nineteenth century, the high-brow monthlies and quarterlies indexed by the *Wellesley Index to Victorian Periodicals* reflected a 'common intellectual context' in which the sciences were fully integrated. Arguing that a wide-ranging study of the sort pursued by Ellegård ran the danger of resulting merely in 'an impressively annotated bibliography', Young restricted his focus to a smaller number of essays and reviews of each of a larger range of primary works.<sup>5</sup> Such an approach, however, fails to do justice to the fundamentally cross-referential nature of the nineteenth-century periodical press. Issued at regular intervals, periodicals were ideally suited to respond to passing events, including to the publication of other periodicals. Moreover, as Jon Klancher has shown, it was in their mutual representations that periodicals came to produce their audiences as distinctive and self-conscious.<sup>6</sup>

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.<sup>7</sup> In particular, studies by such scholars as Bernard Lightman 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.<sup>8</sup> Similar perspectives have also emerged from recent work in literary studies [any thoughts, Gowan...?].

Periodical studies have also developed apace. Thanks to John North's monumental *Waterloo Directory*, the vast output of the periodical press—North estimates some 125,000 newspaper and periodical titles in England alone—has come under increasing bibliographical control. Other resources, notably Alvin Sullivan's *British Literary Magazines* (4 vols, 1983–84) and J. Don Vann and Rosemary VanArsdel's *Victorian Periodicals and Victorian Society*, give helpful overviews of the development of the press. Theoretical approaches have also become more sophisticated, as scholars have reflected on the distinctive

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<sup>4</sup> Ellegård, p. 341.

<sup>5</sup> Young, p. 131.

<sup>6</sup> Klancher, p. 12.

<sup>7</sup> Cooter and Pumfrey, 255.

<sup>8</sup> Lightman, p. 191.

qualities of the periodical genre.<sup>9</sup> To date, however, little has been done to combine these new perspectives on periodicals with recent historiography of popular science.

One reason for this has undoubtedly been that scholars wishing to draw on periodical literature in their historical work on science are often daunted by the size and complexity of the task. This literature can be difficult to penetrate: few periodicals have adequate indexes, and modern finding aids, 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 diverse content of articles. The invaluable *Wellesley Index* has also exerted a distorting effect upon the field: scholars have tended to follow its example, focusing primarily on 'high-brow' titles, to the exclusion of periodicals aimed, for example, at women, children, or religious denominations. The 'Science in the Nineteenth-Century Periodical' (SciPer) project was commenced with the intention of obviating these problems by creating an interpretative electronic index to the scientific content of a range of different genres of general periodical, based on inclusive reading of the entire periodical texts. It is this in-depth research on which the present study is based.

The object of this book is to help to redraw our understanding of the cultural dissemination of science in the nineteenth century by combining insights from the history of popular science, cultural and literary studies, and periodical studies with the experience of reading more than 50,000 pages of periodicals in preparing the SciPer Index. The book approaches the question from two main perspectives. The first focuses on the manner in which science functioned within the literary economy of the several 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 were made. Yet, as James Clerk Maxwell recognized, periodical texts appeared as elements of a larger text, and—while Maxwell may have resisted the practice—they were commonly read (and indeed often written) in relation to the text that surrounded them. In this study, we consider the place of science in six periodical genres, reinstating the original context in which the constituent articles were initially read, and considering the manner in which the formal features of the periodicals shaped the content and meaning of the scientific references. The second approach focuses on the interplay between periodicals of different types in approaching scientific subjects. Thus, we examine the differential treatment of 'baby science', biography, and electricity across a range of periodical forms [...].

In this introduction our intention is two-fold. First, we consider some of the key historiographical questions in using nineteenth-century periodicals [...]. Secondly, 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 [...].

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<sup>9</sup> Beetham, Pykett, Brake, &c.

## ‘Charting the golden stream’: Rethinking Nineteenth-Century Periodicals

The period at which an evident and essential improvement and elevation of our periodical publications took place, may be traced back to the first French revolutionary war [...] The stirring up of the mind which took place during the French Revolution [...] gave rise to the demand for more numerous and various publications, as well as for a superior quality in their character and contents [...] Many more thought and read than formerly; and their thoughts were of a more original cast and bearing.

*Blackwood’s Edinburgh Magazine* (1824)<sup>10</sup>

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 in it of periodical literature’.<sup>11</sup> Since the late seventeenth century periodicals had been regarded as a potent means of developing the literary marketplace, providing Metropolitan publishers with a conduit through which to advertise their other literary wares to provincial booksellers and far-flung readers.<sup>12</sup> However, with the increasing commercialization of the book trade in the late eighteenth century, and with the emergence of new reading audiences in the early nineteenth century, periodicals took on greater significance. In a high-priced and 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. Moreover, their periodicity allowed their producers to respond both to readers’ comments and to sales figures, in order to match commodity and consumer. The periodical was the perfect vehicle for sounding out and consolidating the diverse reading audiences of the expanding and increasingly entrepreneurial literary marketplace. As a result, the number of titles trebled in the first three decades of the new century, and the number of periodical genres also rapidly expanded.

This expansion was not lost on contemporaries. To some, periodicals—first the reviews, then the magazines—seemed almost to be replacing books. In 1823, Hazlitt famously felt it incumbent upon him to answer the complaint ‘that this is a Critical age; and that no great works of Genius appear, because so much is said and written about them’.<sup>13</sup> The dominance of the periodical literature has also been widely recognized by historical scholars. 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’.<sup>14</sup> Yet the basic parameters of this new market for periodicals (quite apart from their contents) remain

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<sup>10</sup> [William Stevenson], ‘On the Reciprocal Influence of the Periodical Publications and the Intellectual Progress of this Country. No. 1’, *Blackwood’s Edinburgh Magazine*, 16 (1824): 518–28 (521, 523).

<sup>11</sup> George Saintsbury, *A History of Nineteenth Century Literature, 1780–1895* (New York and London, 1896), p. 166????.

<sup>12</sup> Michael Harris, ‘Periodicals and the Book Trade’, in *Development of the English Book Trade, 1700–1899*, ed. by Robin Myers and Michael Harris (Oxford: Oxford Polytechnic Press, 1981), 66–94; and John Feather, *A History of British Publishing* (London and New York: Routledge, 1988), 106–15.

<sup>13</sup> [William Hazlitt], ‘The Periodical Press’, *Edinburgh Review* 38 (1823): 349–78 (350).

<sup>14</sup> Erickson, 7; Mark Parker, *Literary Magazines and British Romanticism* (Cambridge: Cambridge University Press, 2000), 1.

largely unexplored. In his 1969 study of *The Romantic Reviewers*, John Hayden suggested that, in addition to the *Edinburgh* and *Quarterly*, ‘at least sixty other periodicals carried reviews between 1802 and 1824’. Casting his net more widely, Jon Klancher estimated that there were in excess of 4000 periodical titles published between 1790 and 1832—roughly the number listed in W. S. Ward’s *Index and Finding List of Serials Published in the British Isles, 1789-1832*. Figures extrapolated from the published portion of John North’s monumental *Waterloo Directory of English Newspapers and Periodicals, 1800–1900*, however, now suggest some 12,000 titles for this period alone.<sup>15</sup>

Attempting to provide a comprehensive listing of nineteenth-century periodicals, and presenting its data in electronic form, the *Waterloo Directory* makes it possible to estimate numerically the growth of the periodical market-place in nineteenth-century England. As Fig. 1 shows, there was a sustained if uneven increase in the number of periodical titles over the course of the century, with the exception of the final decline, which seems likely to result from a skew in the sampling.<sup>16</sup> The number of periodicals apparently increased at an ever-faster rate as the century progressed, although it was in the early part of the century (particularly in the late 1810s/early 1820s and in the early 1830s) that the greatest *proportionate* increases occurred. Comparing this pattern to that derived from the *Nineteenth-Century Short-Title Catalogue (NSTC)* 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. 2).<sup>17</sup>

Despite a generation of work on the history of nineteenth-century periodicals, however, we still have only a limited overview of its main phases. In time, the *Waterloo Directory* might enable us to generate data about the shifting genres and periodicities of periodical publication or 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

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<sup>15</sup> John O. Hayden, *The Romantic Reviewers, 1802–1824* (Chicago: University of Chicago Press, 1968), 39; Klancher, ix; William S. Ward, *Index and Finding List of Serials Published in the British Isles, 1789-1832* (Lexington: University of Kentucky Press, [1953]); John North ed., *Waterloo Directory of English Newspapers and Periodicals, 1800–1900* <<http://www.victorianperiodicals.com>>.

<sup>16</sup> *Waterloo Directory of English Newspapers and Periodicals, 1800–1900*, ed. by John North, 2001, North Waterloo Academic Press, accessed 07 March 2001 <<http://www.victorianperiodicals.com>>. The figures given here are extrapolated from the first of the five planned series of the directory (the only one published to date), 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’. The subjects dealt with most completely in Series 1 are: Art and Architecture (800 titles), Children (800), Feminism (83), Music (350), Theatre (650), Wit and Humour (625), and Women (515).

<sup>17</sup> 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, I have not only excluded serials from my calculations, but have also followed Simon Eliot in excluding all books not published in London, Oxford, Cambridge, Edinburgh, or Dublin (LOCED), trusting that these leading publishing centres will give a reasonable reflection of the *pattern* of British book publishing. Simon Eliot, *Some Patterns and trends in British Publishing, 1800–1919* (London: Bibliographical Society, 1994); and idem., ‘Patterns and Trends and the *NSTC*: Some Initial Observations’, *Publishing History* 42 (1997): 79–104, and 43 (1998): 71–112; *Nineteenth-Century Short-Title Catalogue, Series I & II, 1801–1870*, CD-ROM (Newcastle-upon-Tyne: Averro Publications, 1996).

phases of periodical publication. Yet the larger history of 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. From the emergence of the highly partisan quarterlies (*Edinburgh, Quarterly, and Westminster Reviews*) in the early years of the century to the rise of the campaigning new journalism of the late century in such journals as the *Review of Reviews*, the material and cultural forms of periodicals modified not only the ways in which, but also the audiences to which, the sciences were represented.

In attempting to rethink the importance of periodicals for the history of science, this book takes as one of its central concerns the question of audience, which Jon Klancher a few years ago called ‘the most unexamined assumption in the armory [*sic*] of cultural history and criticism’.<sup>18</sup> As we have seen, periodicals fulfilled a pivotal role in the literary market-place, allowing publishers, editors, and writers to attempt to shape the interpretative frameworks and self-awareness of individual readers in order to carve out new audiences. It is this which makes periodicals, in Klancher phrase, ‘probably the clearest framework for distinguishing the emerging publics of the nineteenth century’.<sup>19</sup> Klancher’s own analysis, in his important *Making of English Reading Audiences*, is based on a close reading of a number of periodical texts. Drawing on the work of Mikhail Bakhtin, he identifies the mutual creation of audiences in the dialogic form of periodical writing; it is in the representation of other social languages, he argues, that readers become aware of themselves as members of particular audiences. However, such linguistic analysis must also be supplemented by historical evidence about the strategies employed in periodicals to consolidate groups of consumers as self-conscious audiences, and about the manner in which they were actually distributed and used.

The notion of ‘audience’ is thus complex, and involves exploring not only the intended or ideal readers but also the much more elusive actual readership. We know all too little about those who read the *Edinburgh Review, Punch, or the Academy*. Although the steady rise of literacy throughout the eighteenth and nineteenth centuries is highly relevant, we need to attend to the different literacy rates between the social classes. While reading had already been accepted as a natural accomplishment of the social elite, a wider middle-class market was created during the eighteenth century, not only for Bibles but also increasingly for leisure activities including the reading of novels.<sup>20</sup> Literacy among the working classes became a highly political issue especially during the closing years of the century when many regarded the existence of an increasingly literate working class as encouraging the distribution of seditious literature and thus fomenting revolution. The runaway sales of Thomas Paine’s *Rights of Man* (1791-92) and other militant publications helped create an audience of radical artisans.<sup>21</sup>

The audience for books, periodicals and newspapers was also constrained by their cost. New forms of production—such as stereotype, the steam press, and mechanical means of paper-making—helped bring down the price of books and periodical and thus enabled the printed word to become available to an increasingly large market and

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<sup>18</sup> Jon P. Klancher, *The Making of English Reading Audiences, 1790-1832* (Madison Wisconsin: University of Wisconsin Press, 1987), p.8.

<sup>19</sup> Klancher, p. 4.

<sup>20</sup> J.H. Plumb,

<sup>21</sup> Kathryn Sutherland, “‘Events ... have made us a world of readers’: reader relations 1780-1830”, in David B. Pirie, ed., *Penguin History of Literature. Volume 5: The Romantic Period* (London: Penguin, 1994), 1-48.

no longer remain the prerogative of the affluent few. Circulating libraries, reading groups among working men and the many attempts by innovative publishers and organisations to produce cheap literature helped spread reading matter. Yet the heavy tax on paper (alleviated in 1836) and the stamp duty on newspapers (repealed in 1855) retarded this process.

Yet the picture is more complex than might initially appear since although we can identify different groups in terms of, say, the gender, politics and religion of their members, no such group necessarily constitutes an audience. Klancher argues that after about 1790 writers could no longer presuppose the existence and constitution of a like-minded audience for their work.<sup>22</sup> Instead, they had to work at creating their audience, in the sense that every publication had to attract a self-aware readership that, in turn, identified with the published work. This more dynamic notion of audience possesses a number of important implications for the study of nineteenth-century periodicals. In particular, it challenges the notion that audiences possess an independent existence and that audiences and periodical can simply be mapped one onto the other.

Taking periodical audiences seriously demands that attention be paid to the literary market-place in which they existed. However various in other respects, the vast majority of nineteenth-century periodicals were commodities. Indeed, as material constructs of paper and print, manufactured, marketed and distributed to customers in a similar manner to other merchandise, they were collectively big business. In 1827, for instance, a writer in the *London Magazine* reported that the gross annual income of *The Times* newspaper was £45,000, and that the *Morning Chronicle* had recently been purchased for £40,000.<sup>23</sup> Yet the commercial significance of periodicals is not merely a point of relevance to economic or publishing historians. The form and content of periodicals, the creation of their reading audiences, and their relations with other kinds of text were critically shaped by the exigencies of the book trade in which they were manufactured, marketed and distributed.

The role of the book trade is perhaps most obvious in the case of those countless publishers who were responsible for initiating new periodicals—whether edited by others, as with Henry Colburn's *New Monthly Magazine* [?], or by the publisher himself, as was ultimately the case with the eponymous *Blackwood's Edinburgh Magazine*. Here, the role of the publisher in shaping the policy and content of the periodical could be most complete. Indeed, it was when the editors of his *Edinburgh Monthly Magazine* failed to deliver a product suitable to his requirements that William Blackwood elected not only to dispense with their services, but to become his own editor. The number of cases in which publishers were the initiators of periodicals indeed testifies to the commercial importance which such publications could have. To begin with, a periodical, if successful, could generate a regular and reliable income, and importantly involved much less risk than book publication, where the print-run was difficult to determine in advance. In addition, a periodical provided an important means of marketing other printed matter, whether through puffing reviews of the sort for which Colburn was notorious, or more mundanely through advertisements on the wrappers or advertising leaves. Often, too, a periodical allowed a publisher to cultivate a coterie of authors, providing them with regular

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<sup>22</sup> Jon P. Klancher, *The Making of English Reading Audiences, 1790-1832* (Madison Wisconsin: University of Wisconsin Press, 1987).

<sup>23</sup> 'London Newspapers', *Mirror of Literature*, 10 (1827): 322–23 (322). According to the *DNB*, William Innell Clement paid £42,000 for the *Morning Chronicle* in 1821.

income while they wrote (or amassed) more substantive work. *Blackwood's*, for instance, while it drew upon its editor-publisher's pre-existing literary coterie, clearly served to strengthen that coterie, even giving it fictionalised representation in 'Noctes Ambrosianae'. Moreover, a successful periodical and its associated coterie often served to establish the reputation of a publishing house, bringing authors and customers alike.

While publishers might be motivated by any of these commercial imperatives to found and fashion periodicals, many were also motivated by what might broadly be termed ideological imperatives. Indeed, some of the most active publishers of periodicals were explicitly ideological and non-commercial in their approach. Yet, while such bodies were not motivated primarily by profit, they ignored the 'bottom line' at their peril, as the Society for the Diffusion of Useful Knowledge notoriously discovered. Moreover, finding that their periodicals could yield a profit, many avowedly charitable organizations, such as the Religious Tract Society and the Wesleyan Methodist Connexion, soon came to rely on that profit to fund their non-publishing activities.<sup>24</sup>

For both ideological and financial reasons, periodicals also often attracted proprietors who were neither editors nor publishers, but who nevertheless often exerted considerable authority over their property. Faced with the overt power of publishers and other proprietors, suitably capitalized editors might elect to take proprietorial control themselves. Even editor-proprietors, however, could never extricate their texts from the literary marketplace. Publishers who took periodicals on a commission basis continued to benefit greatly from the regularity of the work, the opportunities it gave for advertising, and the reputation it might give to their house. At the same time, however, their role generally required them to exert considerable control over many aspects of the manufacture, marketing, and distribution of periodicals.

One of the critical areas of expertise exercised by publishers was in the exploitation of manufacturing technologies. It was in the production of periodicals that many of the new technologies of the nineteenth-century book-trade were first used, most notably the introduction of steam presses and stereotyping. Used judiciously, such innovations could have major implications for the profitability of a periodical. They could also be used to produce a cheaper product, which could be marketed to a far wider audience, as Charles Knight famously showed with the Penny Magazine. More generally, the expertise of publishers in handling the material form of the periodical significantly contributed to the meaning it had for readers. Whether it was the small type and triple columns of the quarto *Chambers' Edinburgh Magazine* or the good paper and wide margins of the octavo *Quarterly Review*, physical features which publishers oversaw had a semiotics of their own. Publishers were also usually responsible for handling the technologies of marketing and distribution. Marketing was a major issue. Advertisements were expensive, but without them a new periodical could not hope to make much progress, and an established one could not hope to expand its readership. Judicious placement of advertisements was thus essential, to maximize returns. Sometimes, publishers were forced to other expedients, such as the use of posting and hand bills, to advertise their periodicals. Distribution was equally critical, and here the book trade could conspire to thwart certain kinds of periodical. The new cheap periodicals of the 1820s and 1830s, for instance, found that the wholesaling houses of London would not send out

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<sup>24</sup> Fyfe, Cumbers.

their weekly numbers, carrying only the monthly parts. In such a situation, alternative distribution networks had to be developed ...

It has become a commonplace of recent scholarship on nineteenth-century print culture that the specificities of periodical production problematise traditional notions of authorship in ways similar to the Post-Structuralist theories of Michel Foucault and Roland Barthes.<sup>25</sup> The authorship of periodicals, which are made up of articles by many different writers on a wide variety of subjects, is by necessity collective rather than individual. Even the individual articles in each number, though, are never the work of a single author. Rather, they are the outcome of a process of mediation between the many figures (writer, editor, proprietor, printer, illustrator, bookseller, reader) involved in the material and commercial apparatus of periodical production. It was in the nineteenth century, according to many commentators, that the role of the editor increasingly became the dominant one in this complex process. In the wake of Francis Jeffrey's trailblazing editorship of the *Edinburgh Review* (1803–29), as Walter Bagehot famously observed, the editor of a periodical was transformed from a mere 'bookseller's drudge' into a 'distinguished functionary'.<sup>26</sup> Indeed, by the 1870s monthly review editors like John Morley had become prominent members of the liberal establishment with close ties to the highest echelons of government, while in the next decade William Thomas Stead, campaigning editor of the *Pall Mall Gazette*, proclaimed the coming of a new era of 'Government by Journalism' in which the 'editor's mandate is renewed day by day, and his electors register their vote by voluntary payment of the daily pence'.<sup>27</sup> In an epoch of steam printing and the industrialisation of publishing, editors were necessary mediators of rapidly proliferating information for the expanding reading public(s), and in an age increasingly obsessed with commodity culture and celebrity, famous editors like Anthony Trollope at *St Paul's Magazine* (provisionally titled the *Trollope Magazine*) ensured large circulation and acted as signifiers for the nature of the journal's content. The role of the periodical editor has only recently begun to attract sustained scholarly investigation,<sup>28</sup> but it was nevertheless an integral component of the nineteenth-century experience of print culture.

At the same time, however, there was no consensus as to the precise responsibilities and functions of editing in the nineteenth century. As Henry Labouchère, editor of *Truth*, remarked towards the end of the century: 'I have now been connected with newspapers over thirty years and I have never yet discovered what an editor is'.<sup>29</sup> Editorship was never a stable identity, with many widely different established styles available to later practitioners, from Henry Reeve's incessant rewriting of other's contributions at the *Edinburgh Review* (known as

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<sup>25</sup> Foucault, 'What is an Author?' [1969], in *Textual Strategies: Perspectives in Post-Structuralist Criticism*, ed. and trans. by Josué V. Harari, (London: Methuen, 1980), 141–60; and Barthes, 'The Death of the Author' [1968], in *Image-Music-Text*, ed. & trans. by Stephen Heath, (London: Fontana Press, 1977), 142–148. See Mark W. Turner, 'Toward a Cultural Critique of Victorian Periodicals', *Studies in Newspaper and Periodical History Annual*, 3 (1995), 111–25 (115); and Laurel Brake, 'Writing, Cultural Production, and the Periodical Press in the Nineteenth Century', in *Writing and Victorianism*, ed. by J. B. Bullen, (London: Longman, 1997), 54–72 (55), for recent scholarship that draws a parallel between periodicals and Post-Structuralist theories of authorship.

<sup>26</sup> [Walter Bagehot], 'The First Edinburgh Reviewers', *National Review*, 1 (1855), 253–84 (??).

<sup>27</sup> W. T. Stead, 'Government by Journalism', *Contemporary Review*, 49 (1886), 653–74 (655).

<sup>28</sup> See Joel H. Wiener, ed., *Innovators and Preachers: The Role of the Editor in Victorian England*, (London: Greenwood, 1985), xiii.

<sup>29</sup> Quoted in *ibid.*, xii.

‘sinning reevishly’)<sup>30</sup> to James Knowles’ deferential cultivation of highly-paid ‘star’ contributors at the *Nineteenth Century*; and from Mark Lemon’s jovial homosocial bonhomie at *Punch* to Mary Elizabeth Braddon’s cross-dressing pseudonymity at the fiction-based *Belgravia* (she edited under the Thackerayan nom de plume ‘Captain Shandon’). Styles of editing of course changed markedly across the century, and were also intimately connected with the constantly shifting material and commercial aspects of journalism.

In the conditions of anonymous publication which characterised most periodical writing until after the 1860s, for instance, each journal upheld a sectarian editorial position through a series of unsigned essays by diverse hands, presenting the façade of a single author of the entire periodical — the amiable fiction that everything that appeared in *Punch* was in fact the personal opinion of the irascible Mr. Punch is a case in point. In this ‘anonymous system’, John Morley reflected in the wake of its apparent overthrow, ‘the editor is answerable for every word’.<sup>31</sup> When journals such as *Macmillan’s Magazine* and the *Fortnightly Review* began to disavow the previously ‘sacred principle of the Anonymous’, instead enforcing a strict policy of signature, the editor, according to Morley, became something like a ‘conductor’ with ‘his bâton’, who freely allows the talented orchestra of named contributors to take ‘their several parts in his performance’. However, while Morley insisted that the ‘childish imposture of the editorial We’ was now ‘thoroughly exploded’,<sup>32</sup> anonymous publication in fact continued as the norm in many different genres of journalism long after its self-proclaimed nemesis had exchanged Grub Street for Parliament (and it still persists in the editorial comment columns of most twenty-first-century newspapers). The Whiggish narrative of the gradual emergence of Morley’s strict principles of liberal editing, predicated above all, of course, upon the demise of anonymity, is consistently undermined by the sheer diversity of editorial practice across the nineteenth century.

In the burgeoning ‘new journalism’ of the 1890s, for example, editors like Stead, who had begun his career as Morley’s deputy at the *Pall Mall Gazette* and was now at the helm of the predominantly anonymous *Review of Reviews* (the only name mentioned in most issues was that of the eminent editor), emerged as new demagogues of the era of mass democracy, appealing directly to readers — who were encouraged, among other things, to send in details of their experiences with ghostly apparitions and to purchase the wares of homeopathic doctors — above the heads of even expert contributors such as Grant Allen who now and then wrote for the journal.<sup>33</sup> While Morley had proclaimed that an editor should be an ‘impresario of men of letters, the entrepreneur of the spiritual power’, Stead rode rough shod over his mostly nameless contributors, claiming in contradistinction to his erstwhile boss that ‘the editorial we is among many millions the only authoritative utterance’, and instead priding himself on having a relationship with the roughly two hundred thousand readers of the *Review of Reviews* that was ‘so much closer than those which exist

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<sup>30</sup> See Joanne Shattock, ‘Showman, Lion-Hunter, or Hack: The Quarterly Editor at Mid-century’, *Victorian Periodicals Review*, 16 (1983), 89–103 (96).

<sup>31</sup> Editor [John Morley], ‘Memorials of a Man of Letters’, *Fortnightly Review*, 23 n.s. (1878), 596–610 (602).

<sup>32</sup> Editor [John Morley], ‘Valedictory’, *Fortnightly Review*, 32 n.s. (1882), 511–21 (513 and 516).

<sup>33</sup> On Stead’s bickering with Grant Allen about scientific specialisation, see Allen, ‘Our Scientific Causerie. The New Theory of Heredity’, *Review of Reviews*, 1 (1890), 537–38. On appeals made to readers over the heads of expert contributors, see ‘Wanted, a Census of Ghosts! An Appeal to our Readers for Statistics of Hallucinations’, *Review of Reviews*, 4 (1891), 257–58; and ‘Count Mattei, the Cancer Curer. Lady Paget’s Testimony’, *Review of Reviews*, 1 (1890), 393.

between the editors and readers of most periodicals'.<sup>34</sup> The stark contrast between Morley's liberal and Stead's democratic ideals of editorship shows how perilous it is to make generalisations about the role of the editor in any given period in the nineteenth century.

In all cases, moreover, there were very real commercial and material constraints on the actual extent of the editor's control and authority. In the nineteenth century, as Joanne Shattock notes, 'the whole business of editing was a ...haphazard and chaotic affair ...the existence of a periodical was often a precarious one, and the emergence of each new issue an event quite literally brought about more by good luck than by good management'.<sup>35</sup> Even the most prominent and seemingly powerful editors were continually subject to the contingencies of publisher's finances and the unwelcome meddling of heavy-handed proprietors. During his ill-starred internship at the ostensibly clerical *Contemporary Review*, for example, the increasingly latitudinarian editorial style of Knowles provoked a long-running feud with the review's Presbyterian proprietor Alexander Strahan, and, after Strahan's publishing business had collapsed, finally led the *Contemporary's* new board of owners to terminate his contract. Most crucially, though, editors were generally required to turn a profit in what by mid-century was an increasingly saturated and competitive periodical marketplace, and in most cases what counted as a successful style of editorship was, above all, one that met with a favourable—and thus remunerative—response from the periodical buying or borrowing public.

In 1862 the *Cornhill* ran an article entitled 'Journalism' which outlined the hierarchical division of writers pertaining within the newspaper world:

Our leading journalists are barristers waiting for business, or resigned to the want of it; clergymen unattached, who regret their choice of profession which their conscience or inclination forbids them to practise, and which the law forbids them to resign; Government officials, whose duties are not connected with party politics, and do not occupy the whole of their time; and in a few cases men of independent means, who have a fancy for writing, and who wish to increase their incomes.

Such figures, who usually produced technically accomplished, but limited, articles were to be firmly differentiated from the category of men who were 'journalists pure and simple, men who have no other occupation or position in life than that which they derive from newspapers' and 'without much other education than the newspaper itself supplies'. These men were responsible for the 'ceaseless stream' of nonsense which poured from the press: acquainted only with the outside of London clubs, or the House of Commons, they yet claimed intimate knowledge of the nation's literary or political life.

In the mid-nineteenth-century, as now, the terms 'journalist' or 'journalism' frequently carried negative connotations, suggesting lack of depth or scholarship. Men of education, the article suggests, could write for the newspapers without loss of caste, as long as they were not defined by that activity. The anonymous writer of this piece, whose identity would, as he notes in the article, be known to all his peers, was James Fitzjames Stephen, aspiring barrister and future judge. Educated at Eton and

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<sup>34</sup> [Morley], 'Memorials', 596; Stead, 'Government', 667; [Stead], 'Some Pages of a Busy Life', *Review of Reviews*, 19 (1899), 537–43 (537).

<sup>35</sup> Joanne Shattock, 'Editorial Policy and the Quarterlies: The Case of *The North British Review*', *Victorian Periodicals Newsletter*, 10 (1977), 130–39 (130).

Cambridge, and called to the bar in 1854, he also pursued a vigorous parallel career in journalism, thus epitomising his first category of leading journalists. Despite this note of ironic self-consciousness, the article stops short of extending its observations to magazine or periodical writers: by implication the writers for Cornhill, who were not constrained by rules of coverage and format which governed newspaper 'leaders', were free to produce a higher form of art.

Fitzjames Stephen's article exposes the internal politics of a rapidly growing media world where writers, and periodicals themselves, were struggling to establish or maintain their position. Although such writers as G. H. Lewes, James Sully, Grant Allen, Robert Louis Stevenson, and Richard Proctor all made the majority of their money, at least initially, from journalism, none would wish to have identified himself as a 'journalist', a label which would have cut across their higher ambitions. Their difficulties would have been compounded by an engagement with science,<sup>36</sup> a loosely defined domain which was itself undergoing highly politicised struggles to establish itself as a range of academic disciplines and professions. As T. H. Huxley's early attack on G. H. Lewes suggests (p. ), those seeking the label of professional scientist, were quick to disparage mere writers. Yet these divisions were far from secure. Huxley himself made his reputation as much from his speeches and articles in periodicals as from his performance in laboratories. Under the system of anonymous publication which largely pertained until the 1870s, it was also impossible for general readers to ascertain what form of authority lay behind an article.<sup>37</sup> Writers on science in the periodical covered the whole range of professional backgrounds outlined by Fitzjames Stephens, with the addition of practising medical men and leading scientists. For readers, however, before the developing practice of signed articles produced a form of 'star' system into journalism, there were no external indicators of scientific competence; the words of Huxley, or W. B. Carpenter for example, stood on a par with those of their fellow writers within the covers of each periodical number.

The educational and social elitism so forcibly expressed by Fitzjames Stephens had a powerful effect on many of the writers considered in this section. Lewes had no degree and had to make his entire living initially from journalism; Sully had taken a degree, but at a Baptist College, and was forced to eke out his meagre living from various teaching jobs by creating a prolific output for a wide range of journals. Allen had obtained a degree from Oxford, and Proctor from Cambridge, but both had to turn to journalism for their primary means of support. Proctor used his marginal social and scientific status aggressively, creating his own journal, *Knowledge*, to challenge the hierarchical structure of both professional science, and the periodical market.

It would be difficult to find a figure within nineteenth-century publishing who could be identified purely as a science journalist. Grant Allen, who perhaps comes closest to this definition, was eager to be recognised as a scientist in his own right, and latterly turned to fiction as the most lucrative way of securing an income. Lewes, by contrast, started life as novelist and critic, before moving through science journalism and high-profile editing, to achieve his final status of scientific author and philosopher. Proctor, who confined his writing most exclusively to the spheres of

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<sup>36</sup> Robert Louis Stevenson falls into a different category here since, unlike the others, he did not write overtly scientific articles, and was not seeking to make a name for himself in science.

<sup>37</sup> *Macmillan's Magazine* had introduced signed articles in 1859, but the general shift towards signed authorship was instituted by the new *Fortnightly Review*, edited by G. H. Lewes, in 1865, which carried a strong manifesto for signed authorship. Many periodicals, including the *Cornhill*, chose, however, to resist such pressures.

science (and whist), united the roles of journalist and editor, and grounded his popular journalism on his own original research into the movements of stars. Other figures in the history of popular science writing such as the now largely forgotten James Hinton or Francis Anstie who wrote for the *Cornhill*, were practising medical men, turning to journalism to enhance both their cultural status and their income.

Although writers frequently belonged to a 'stable' attached to particular journals, such associations were neither binding nor restrictive. Each of the writers considered here customarily wrote for a range of journals, targeted at different forms of audience. It is possible to trace the ways in which material was moulded for specific audiences - overt religious or political statements excluded for the *Cornhill*, or a more lofty tone adopted for the *Fortnightly*, for example - but the relationship between writer, material and periodical was often more flexible, or even haphazard, than such a controlled model might suggest. The diversity of science content in the periodicals, ranging across fiction, social reporting, and original research, is matched by the publishing profiles of the writers involved.

Scholars have long recognised the historical value of studying controversies in the sciences. These dramatic episodes force scientific practitioners to articulate and fight over the tacit aspects of scientific practices—aspects that are fundamental to the construction of natural knowledge but which are usually excluded from formal scientific reports. Historical and sociological studies show that during scientific controversies, appeals to observational and experimental evidence are insufficient to resolve matters, and conflicts over a claimed 'result' necessarily involve disputes over the expertise, resources, and notions of evidence underpinning the result. These studies also show that the resolution of controversies involves appeals to non-empirical factors such as metaphysics and the background of the experimenter, but also frequently occur in informal settings far from the laboratories, observatories and other recognised sites of scientific inquiry.

In 1979 the sociologists of science Harry Collins and Trevor Pinch persuasively argued that one such setting was the non-specialist periodical. Analysing late-twentieth century controversies over parapsychology, they drew an important distinction between the 'constitutive' and the 'contingent' forums of scientific debate. The 'constitutive' forum refers to the specialist periodicals, formal conferences, and other settings where actions are believed to be based on 'universalisable non-contingent premises' and which are constitutive of scientific knowledge. In contrast, the 'contingent' forum refers to the popular journals, after-dinner speeches, private gossip and any other setting where actions are not supposed to affect scientific knowledge. Collins and Pinch examined controversies conducted in range of different periodicals from the putatively constitutive *Nature* to the contingent *Scientific American*, and concluded that there is 'no epistemological distinction between the forums' (Collins and Pinch 1979, 241). This analysis supports the argument that debates conducted within semi-popular scientific journals and generalist periodicals can no longer be dismissed as 'marginal' or 'irrelevant' to the making of natural knowledge, and must be seen as constituting an important part of this latter process.

There is now a growing literature demonstrating the insights into scientific controversies that can be gained by mining the rich and relatively unexploited material in specialist and non-specialist periodicals (see, for example, Ellegård 1990, Desmond 1989, Corsi 1988, Yeo 1993). Valuable as these studies are, they implicitly treat periodicals as straightforward sources for mapping the complex reception of scientific claims. The active roles of periodical producers and the function of the periodical format per se is not taken seriously as a factor in the origin, development,

and termination of scientific controversies. Studies by Secord, however, are spectacular exceptions to this trend, and constitute a powerful model of how periodicals might be approached in the future (Secord 1989, Secord 2000). James Secord's analyses of the rocky reception accorded Andrew Crosse's electrical production of insects and of the sensation caused by the *Vestiges of the Natural History of Creation* (1844) demonstrate the considerable power of nineteenth-century mass-circulation newspapers and magazines in dictating the terms of scientific controversies. He shows that with the rapid rise of steam technologies and expansion of reading audiences, tensions developed between the local cultures within which experimental claims were produced and the public arena where the meaning of such claims was transformed. What began as a claim in a private laboratory was dramatised and 'replicated', with a range of literary and graphical techniques, into a 'fact', chimera, a 'discovery', or non-discovery in periodicals. Journalists, editors, publishers and others involved in periodical production had the power to control the meaning of an experiment, and to force scientific practitioners to join the fray—whether by redirecting their laboratory projects or by writing to daily newspapers—and promulgate their own views on what was fact and fancy. Secord's analysis, like that in several chapters in this section, illustrates how generalist periodicals fulfilled the role of their specialist counterparts. They not only carried abstruse material that we might find in technical journals but sought to police the behaviour of participants in scientific controversies—for example, by respecting the wish of the *Vestiges* author to remain anonymous—and thereby promulgate images of how the sciences should be conducted. Secord's studies clearly suggest that the relationship between periodicals and scientific controversies is much more complex than we might expect and is crying out for further research. We need more studies of the way general periodicals sparked and facilitated scientific controversies, how periodicals defined the possible positions it was legitimate to hold in disputes, and how their avoidance of controverted topics was informed by their ideals of the unified scientific enterprise.

While Secord's analysis suggests that we need to know much more about the activities of journalists, editors, and other, hitherto marginalized, agents involved in shaping controversies, recent work by literary scholars suggests that we need to explore the ways in which controversies are facilitated by the very nature of the periodical itself. Margaret Beetham, for example, has suggested that all periodicals 'can be located on a spectrum between those which emphasise its open, serial qualities and those in which each number is more self-defined'. Owing to the fact that a serial is, by definition, published over time, and contains a multiplicity of authors, positions, and genres, it permits a variety of interpretations of the text. However, the periodical also feature self-contained texts that are 'end-stopped or marked by closure' and contained suggestions that only certain interpretations of the text are permitted. (Beetham 1990, 29) While different periodicals will contain different proportions of open and closed qualities, it is arguably the combination of these qualities that enables the periodical to become an especially powerful weapon for initiating, fuelling, and terminating disputes. It remains for historians and literary scholars to explore the validity of this argument, and to detail links between the rapid nineteenth century developments in periodical format and changes in the way scientific controversies were conducted.

## Science in the Nineteenth-Century Periodical

For many years, the standard approach to nineteenth-century periodicals in relation to science has been framed by Robert Young's notion that there was a common intellectual context in early nineteenth-century Britain reflected in the periodical literature, and that this 'came to pieces in the 1870s and 1880s' as reflected in 'the development of specialist societies and periodicals, increasing professionalization, and the growth of general periodicals of markedly lower intellectual standard'. Yet, as Richard Yeo has argued, while the quarterlies were undoubtedly 'the dominant forum for cultural debate amongst the educated upper middle classes and the governing elite' in the early nineteenth century, there were already symptoms of strain in this 'medium of Young's common intellectual context'.<sup>38</sup>

Yeo links his critique of Young's account with Habermas's notion of the structural transformation of the bourgeois public sphere in the early nineteenth century. According to Habermas, such a sphere emerged in the eighteenth century in Britain, France, and Germany, in which the ascendant bourgeoisie could scrutinize the activities and principles of the absolutist state. While effectively open only to the bourgeoisie and the landed aristocracy, the sphere operated according to a fiction that men of differing ranks could discourse within it on all subjects on equal terms, through the authenticating token of Enlightenment rationality. It existed, classically, in the physical space of the coffee house and in the virtual space of the periodical, where the writer and reader were, by definition, interchangeable. Yet, while early nineteenth-century periodicals were, according to Yeo, 'one of the last bastions of the public sphere', they betrayed signs of strain in the political partisanship of the leading reviews, the emergence of 'an alternative medium of debate' as in the radical press, and the strain placed on synthetic writing by the specialization of knowledge. Moreover, he argues, science exacerbated these tensions: it was 'not immune to the political cleavages that the periodicals now expressed', 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.<sup>39</sup>

Yeo's critique clearly suggests the importance, despite Young's remonstrations, of approaching the increasing diversity of reading audiences for science in the nineteenth century through the study of the full range of periodicals in the period. To date, most attention has been devoted to the relevance of 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.<sup>40</sup> By contrast, 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%) were religious, and many of the seventy-one left unclassified (22%) were 'very cheap

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<sup>38</sup> Robert M. Young, 'Natural Theology, Victorian Periodicals, and the Fragmentation of a Common Context', in *Darwin's Metaphor: Nature's Place in Victorian Culture* (Cambridge: Cambridge University Press, 1985), 126–63 (128); Richard Yeo, *Defining Science: William Whewell, Natural Knowledge and Public Debate in Early Victorian Britain* (Cambridge: Cambridge University Press, 1993), 42, 43.

<sup>39</sup> Yeo, 42, 45–47. See also Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*, Trans. by Thomas Burger (Cambridge MA: MIT Press, 1991); and Terry Eagleton, *The Function of Criticism: From The Spectator to Post-Structuralism* (London and New York: Verso, 1984).

<sup>40</sup> Desmond

periodicals, addressed chiefly to children'.<sup>41</sup> The large circulation of religious and children's magazines suggest areas particularly worthy of consideration, but many other reading audiences also demand attention.

Of course, the quarterlies themselves represented the first new periodical genre of the nineteenth century, a genre pioneered by the Whig *Edinburgh Review* (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'.<sup>42</sup> In contrast to the encyclopaedic ambitions of the *Monthly Review* or the *Analytical Review*, the new journal prided itself on its discrimination. It was founded by an ambitious group of young men influenced by the academic specialisms of the Scottish universities, and these featured prominently in the review. Several of the editorial coterie having been former members of the Academy of Physics—a student scientific society—they gave particular emphasis to the natural sciences, as well as moral philosophy and political economy.<sup>43</sup> By contrast, traditional theological and classical lore, together with the mechanical arts and antiquities beloved of the new middle-classes, were notable by their absence. In addition, the *Edinburgh* viewed medical subjects as generally suitable only for the specialist writers and readers of the medical journals.<sup>44</sup>

As Butler observes, such selectivity and the journal's superior tone ran counter to the ethos of a bourgeois public sphere given expression in the earlier reviews. As Terry Eagleton points out, the new journalism manipulated more than it represented public opinion.<sup>45</sup> While at the peak of its importance in the 1810s the *Edinburgh* sold as many as 13,000 copies, and was reportedly read by five times that number, only a small portion of the readers could have had the sense that the roles of reader and writer were interchangeable. The point was well encapsulated by the *Gentleman's Magazine*, reflecting on the role of literature in the wake of the Peterloo massacre:

since the establishment of the great Quarterly Journals, every subject of any moment to the Publick is sure to be most elaborately discussed, in a proper scientific technical form, by men of rank in life, and high acquisitions, who are above dependence on their professional situations; and the result is, that they abhor and check rash and foolish innovations, while they place real and safe improvements in a luminous view, and warmly recommend them. Things of this very high character can only be executed by persons resident in large cities, and who can have access, upon particular subjects, to documents, not of a general kind<sup>46</sup>

Reassessing the periodical press in 1824, James Mill sardonically identified the *Edinburgh* with the Tory *Quarterly Review* (1809), arguing that both journals ultimately addressed the same aristocratic interest. Yet Mill's journal, the

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<sup>41</sup> Charles H. Timperley, *Encyclopaedia of Literary and Typographical Anecdote*, 2 vols (London: H. G. Bohn), 952.

<sup>42</sup> Butler, 'Culture's Medium: The Role of the Review', in *The Cambridge Companion to Romanticism*, ed. by Stuart Curran (Cambridge: Cambridge University Press, 1993), p. 131.

<sup>43</sup> Cooke, Clive.

<sup>44</sup> Roy Porter, 'Lay Medical Knowledge in the Eighteenth Century: The Evidence of the *Gentleman's Magazine*', *Medical History* 29 (1985), 138–68 (142).

<sup>45</sup> Eagleton, p. 39.

<sup>46</sup> *Gentleman's Magazine* 1820.

*Westminster Review* (1824), itself aped the discriminating form and tone of its competitors.<sup>47</sup>

Socially and politically divisive, the new quarterlies also belie Young's notion of a common intellectual context in the extent to which the natural sciences began by the 1820s to prove problematical to the quarterly reviewers. The early *Quarterly* was not so strenuously scientific as the early *Edinburgh*. Moreover, the quarterlies began to reflect an 'ordered *separation* between literature, especially poetry, and independent or reformist or scientific thinking' that was 'in train by the 1820s'.<sup>48</sup> By the 1830s, according to Yeo, 'it was clear that there was no longer a single educated readership', and writers in the quarterlies had to contend with the 'problem of speaking to both experts and general readers' on scientific subjects. It was also difficult to identify suitable books for review on scientific subjects or to find reviewers who could write in a suitable manner for a non-scientific audience.<sup>49</sup> Nevertheless, in the 1830s around one tenth of articles in the *Edinburgh* and *Quarterly* were devoted to scientific subjects (somewhat less than half that number in the *Westminster*), and other articles often broached scientific themes.<sup>50</sup> Moreover, gentlemen of science like David Brewster and William Whewell who wrote at length in the reviews clearly viewed them as important platforms for addressing a non-specialist public of opinion formers. Such literary performances were of a piece with the conversational interventions gentlemen of science were expected to make in London's fashionable salons, and fulfilled important functions in making the claims of science heard amongst the ruling elite.<sup>51</sup>

The breakdown of the ideal of a bourgeois public sphere and the separation of the literary from the scientific was, if anything, more evident in the monthly magazines. Conceived as storehouses ('magazines') of learning and information, the eighteenth-century miscellanies of the sort typified by the *Gentleman's Magazine* had welcomed contributions from readers on subjects ranging from natural history to the practical arts, and from meteorology to agriculture.<sup>52</sup> The Enlightenment project of amassing observations and experiments flourished in such magazines, as Roy Porter has illustrated in relation to medical subjects.<sup>53</sup> Regular sections also reported the proceedings of scientific societies at home and abroad, together with notable scientific discoveries or inventions. Advertising a reprint of its half-century run in 1782, the magazine claimed: 'There has scarce a new Subject been started, a new Invention introduced, or a Discovery of any Kind, either by Land or Sea, of which a satisfactory

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<sup>47</sup> Parker, p. 8; Butler, p. 137.

<sup>48</sup> Butler, pp. 139, 143

<sup>49</sup> Yeo, pp. 43, 44, 80, 84; Joanne Shattock, *Politics and Reviewers: The Edinburgh and the Quarterly in the Early Victorian Age* (London: Leicester University Press, 1989), 90.

<sup>50</sup> Yeo, 82.

<sup>51</sup> Secord.

<sup>52</sup> See, for instance, David A. Kronick, *A History of Scientific and Technical Periodicals: The Origins and Development of the Scientific and Technical Press, 1665–1790*, 2nd edn, Metuchen, N.J.: Scarecrow Press, 1976, pp. 244–58; Peter Delehar, 'Illustrations of Scientific Instruments in the *Gentleman's Magazine*, 1746–1796', in *Making Instruments Count: Essays on Historical Scientific Instruments Presented to Gerard L'Estrange Turner*, ed. by R. G. W. Anderson, J. A. Bennett, and W. F. Ryan (Variorum, 1993), 383–94; and Arthur Sherbo, 'The English Weather, the *Gentleman's Magazine*, and the Brothers White', *Archives of Natural History* 12 (1985), 23–29.

<sup>53</sup> Porter, 'Lay Medical Knowledge'; Roy Porter, 'Laymen, Doctors and Medical Knowledge in the Eighteenth Century: The Evidence of the *Gentleman's Magazine*', in *Patients and Practitioners: Lay Perceptions of Medicine in Pre-Industrial Society*, ed. by Roy Porter (Cambridge: Cambridge University Press, 1985), 283–314.

Account is not to be found in the GENTLEMAN'S MAGAZINE'.<sup>54</sup> In the years following the Napoleonic wars, however, this situation rapidly changed, as the older style of miscellany was replaced by self-consciously literary magazines and a growing body of commercial science periodicals appeared.<sup>55</sup>

The first of the new magazines was *Blackwood's Edinburgh Magazine* (1817). Founded as the *Edinburgh Monthly Magazine*, its publisher William Blackwood intended it to be a Tory riposte to his Edinburgh rival, Archibald Constable's *Edinburgh Review*. For the first six months it was produced in a strictly traditional form by editors James Pringle and Thomas Cleghorn, including separate sections devoted to 'Original Communications', 'Select Extracts', 'Literary and Scientific Intelligence', and a 'Monthly Register' of news, commercial and agricultural reports, and births deaths, and marriages. Stepping in at the start of the second volume, Alexander Blackwood radically revised the format, removing the traditional sections (with the exception of the 'Monthly Register', which continued—increasingly intermittently—until 1831) and paying handsomely for contributions that were self-consciously original literary creations. The first number under the new title contained a spoof 'Translation from an Ancient Chaldee Manuscript' attacking in quasi-Scriptural language Edinburgh's Whig writers and publishers. Although subsequently withdrawn, the article established the outrageously particularized and personal character of the new magazine. Moreover, it signalled a growing self-consciousness of professional 'literary' men, and representations of such writers permeated the magazines of the 1820s.

This newly literary approach to the monthly magazine was soon adopted by other publishers. In January 1820, the London publishers Baldwin, Cradock, and Joy began the *London Magazine* in deliberate imitation of *Blackwood's*, eschewing the traditional departments of the monthly miscellany in favour of a mix of poetry, fiction, and criticism. The following year the *New Monthly Magazine* (1814), Henry Colburn's Tory riposte to Richard Phillips's reformist *Monthly Magazine* (1796), took on a markedly more literary form under the editorship of Thomas Campbell, the 'Historical Register' now being separately paginated from the 'Original Papers'. Other existing titles, including the *Monthly Magazine* (which had been one of the most scientific of the monthlies) and the *European Magazine*, soon followed suit.

The *Gentleman's Magazine* maintained its traditional format, seeming increasingly outmoded, yet the extent to which it operated as a forum for the exchange of original observations on the sciences declined markedly. Roy Porter has noted that from the 1810s in particular, 'there was a dramatic decline in the exchange of medical advice, inquiries, remedies', and that it 'ceased to play any important role in instructing the laity in medical self-help or as a medical talking-shop'; instead, the magazine carried 'reports on what the medical profession was doing, viewed as an organized profession'.<sup>56</sup> In 1817, reports of scientific discoveries and technical innovations began to appear as brief paragraphs in a separate section, often in extracts from other publications. The implication was that readers were consumers of scientific news more than active participants in scientific discovery. An 1820 preface was more explicit, arguing that it was the role of journals like the *Gentleman's Magazine*, especially in such turbulent times, to suppress erroneous ideas brought forward by partly-educated men who believed that 'one man ha[d] an equal right with another to attention'. The magazines were to act 'as Clerks of the Market, to prevent

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<sup>54</sup> *Gentleman's Magazine* 52 (1782), ii.

<sup>55</sup> Hayden, xx.

<sup>56</sup> Porter, p. 164.

the Literary Public Stomach from being seriously injured by eating unwholesome food.<sup>57</sup>

The transformation of the monthly magazine into a primarily literary genre did not occur in isolation. While a number of commercial scientific, medical and technical magazines had been in existence since the later part of the eighteenth century, the period following the Napoleonic wars witnessed a rapid increase in the number and range of such magazines. Whereas in 1815 there had been eight or so such magazines, by 1830 the number exceeded thirty; moreover, in the same time period the number of society publications had only risen from seven to ten. The existing commercial journals, like the *Botanical Magazine* (1787), the *Repertory of Arts* (1794), the *Philosophical Magazine* (1798), and the *Medical and Physical Journal* (1799) were supplemented by a number of competitors, like the *Botanical Cabinet* (1817), the *London Journal of Arts* (1820), the *Edinburgh Philosophical Journal* (1819), and the *Medico-Chirurgical Review* (1820). In addition, however, a wider range of specialized subject journals appeared, ranging from the *Phrenological Journal* (1820) to the *Gardener's Magazine* (1826), and the *Veterinarian* (1828) to the *Magazine of Natural History* (1829). Such magazines opened their pages to original observations from readers in much the way that the Enlightenment miscellanies had; however, their audiences were now clearly fractured along subject-interest lines. Furthermore, a number of the new genres of scientific, technical, and medical periodical originated at this period emphasized socio-cultural divisions—perhaps most strikingly those which, like the *Lancet* and the *Mechanics' Magazine*, emulated the new cheap weekly miscellanies of the 1820s.

The demise of the traditional Enlightenment miscellany and the development of the new specialized genres of the scientific and literary magazine requires much more detailed analysis than can be given here. However, it is not our intention simply to replace Young's 'fragmentation of the common context' in the 1870s with an alternative fragmentation in the 1820s. The generic innovations of British periodicals in the years following the Napoleonic wars certainly contributed to the disintegration of an Enlightenment ideal of the bourgeois public sphere. Historians have long recognized that this period witnessed the development of specialized scientific disciplines with increasingly technical vocabularies and a developing emphasis on trained experts, but the emergence of self-consciously scientific and literary magazines has previously gone largely unnoticed. Yet not only the quarterlies, but also the new literary monthlies, and other forms of periodical intended for those who were not scientific specialists, manifestly continued to engage with the sciences in a range of important ways, as this book will illustrate. Moreover, there is no clearly linear pattern to the changing representations of the sciences in the periodical press during the course of the century. While the new literary magazines of the 1820s and 1830s contained relatively few dedicated articles on the sciences, for instance, a number of the later shilling monthlies, including *Macmillan's* (1859) and the *Cornhill* (1882), consciously included such articles. In assessing the ebb and flow in the representation of the sciences in the periodicals of nineteenth-century Britain, close attention must be paid both to the rapidly changing reading audiences and to the constantly shifting genres of periodical publication.<sup>58</sup>

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<sup>57</sup> *Gentleman's Magazine* 1820.

<sup>58</sup> Put in somewhere that Terry Eagleton argues that the Victorian man of letters who emerged as a cultural critic addressing posterity rather than any of the real fractured audiences, sought to 'assess each strain of fresh specialist knowledge by the touchstone of a general humanism', although the enterprise ultimately could not withstand the proliferating division of intellectual labour. p. 55.

The development of the new literary magazines in the post-war period, for instance, was doubtless influenced by the emergence of another new periodical genre: the weekly literary journal of *belles-lettres*. The genre became familiar with the success of Henry Colborn's *Literary Gazette* (1817), although aspects of it were developed in such earlier titles as Leigh Hunt's largely political *Examiner* (1808). A sixteen-page quarto, issued on Saturdays at a shilling, the *Gazette* promised 'original essays on polite literature, the arts and sciences, a review of new publications, poetry; criticisms of fine arts, the drama, etc.; biography, correspondence of distinguished persons, anecdotes, *jeu d'esprit*, proceedings of literary societies, and literary intelligence'. Like the selective reviewing of the quarterlies, the *Gazette's* formula was in part a response to the vast output of the press. Issued weekly, the *Gazette* was able to review a wider range of new publications, but it also had the advantage of being able to provide readers with literary and other news on a more immediate basis than the monthlies. Although Walter Graham observes that 'scientific matters were very minor elements in the content of the journal', the new genre offered new possibilities for the reporting and discussion of science which were increasingly exploited in succeeding decades. The weekly appearance of the journal, and the occasional use of wood engravings, meant that scientific subjects sometimes appeared as items of news. On William Edward Parry's return from his first Arctic voyage in 1820, the *Gazette's* editor, William Jerdan, boarded the ships as they came up the Thames, penning an account which boosted the sale of the journal by five hundred copies.<sup>59</sup> Later, following the founding of the British Association for the Advancement of Science in 1830, Jerdan used to travel in person to the annual meetings to report on the sessions. Nevertheless, the primary emphasis was literary, and, as Susan Holland and Stephen Miller have noted, science in the early *Athenaeum* was typically reported at second hand, as 'Popular Science'.<sup>60</sup>

The *Literary Gazette* was the first periodical after the *Times* to be printed using steam presses. The effects of the industrialization of book manufacture were felt increasingly in the years following the peace, as stereotype, machine-made paper, and case-binding were all adopted. However, the advent of the first cheap periodicals owed more to the recognition of a growing market for cheap print which the runaway success of William Cobbett's *Political Register* prompted.

...the political press...the cheap weeklies...the penny weeklies...

The specialization of periodical literature in which the scientific and literary monthlies partook was part of a larger development: the emergence of what the Victorians called 'class journalism', directed to the ever-increasing range of specialized reading audiences. In the growing middle-class leisure market of the eighteenth century, a number of monthly magazines had been directed to ladies, but the new century saw the market expand further. As Shteir has shown...

Massive expansion of religious and childrens' periodicals.

Comic annuals.

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<sup>59</sup> Jerdan, p. 187.

<sup>60</sup> Holland and Miller.

The middle decades of the nineteenth century was a period of enormous growth and development in the British periodical press and saw the establishment of several of the most celebrated serials of the century including *Punch*, *British Medical Journal*, *Illustrated London News*, *Daily Telegraph*, *Cornhill Magazine* and *Nature*.<sup>61</sup> Simon Eliot's bibliometric researches have analysed this boom and show that the total number of newspapers published between 1851 and 1870 trebled from 551 to 1,390, while the number of new periodical titles published per year rose from 80 in 1840 to 235 in 1870, although many of these titles enjoyed only brief lives.<sup>62</sup>

This expansion had manifold causes. First, this period saw a rise in demand from increasingly literate and leisured reading audiences for what Patricia Anderson calls 'new and varied sources of knowledge and amusement'.<sup>63</sup> Second, technological developments offered ways of catering to this growing and diversifying taste with periodicals. By the end of the 1830s powerful technologies such as the rotary steam press and multiple-cylinder stereotyping had industrialised publishing and making it possible for such entrepreneurs as Charles Knight to produce cheap periodicals faster and on an enormous scale. By the early 1860s, further technological developments such as electrotyping and the powerful Hoe rotatory printing machine — permitting some 20,000 impressions per hour — were transforming the rate and quality of periodical production.<sup>64</sup> Steam-power transformed the production *and* distribution of periodicals and other printed matter. Britain's rapidly expanding railway network furnished cheaper means of transporting heavy bundles of periodicals, and allowed publishers to reach more readers much faster.

The third, but not least significant, cause was legislative. After forcing the government, in 1836, to reduce the stamp duty on newspapers, campaigners against 'taxes on knowledge' scored further victories with the repeal of advertisement and stamp duties on newspapers in 1853 and 1855 respectively. These resulted in marked falls in the prices and production costs of newspapers and fostered a sharp growth in the number of new newspaper titles launched.<sup>65</sup> The legislation made newspapers more accessible to increasingly literate working- and middle-class readerships and fostered the growth of cheap newspapers in London and more significant, in the provinces where few newspapers were produced locally. Of course, only newspapers were affected by the Acts of 1853 and '55, but the abolition of taxes on paper and rags in 1860 and 1861 lowered the cost of the materials from which periodicals were made and thus made the production of *all* types of periodical much cheaper and fostered a further expansion of the periodical press.

The early and mid-Victorian boom in periodicals was characterised by an explosion in the number of titles in existing periodical genres, the diversification in

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<sup>61</sup> This discussion draws heavily on Richard D. Altick, *The English Common Reader. A Social History of the Mass Reading Public 1800–1900* (Chicago: Chicago University Press, 1957), 318–364; W. H. Brock, 'The Development of Commercial Science Journals in Victorian Britain', in A. J. Meadows (ed.), *Development of Science Publishing in Europe* (Amsterdam: Elsevier Science Publications, 1980), 95–122; John Feather, *A History of British Publishing* (London: Routledge, 1988), 129–179.

<sup>62</sup> Simon Eliot, *Some Patterns and Trends in British Publishing 1800–1919* (London: The Bibliographical Society, 1994), 82 and 148–49.

<sup>63</sup> Patricia Anderson, *The Printed Page and the Transformation of Popular Culture 1790–1860* (Oxford: Clarendon Press, 1991), 3.

<sup>64</sup> T. K. Derry and Trevor I. Williams, *A Short History of Technology From the Earliest Times to A.D. 1900* (Oxford: Oxford University Press, 1960), 647.

<sup>65</sup> The fall in prices is succinctly illustrated in Alvar Ellegård, 'The Readership of the Periodical Press in Mid-Victorian Britain', *Göteborgs Universitets Årsskrift* **63** (1857), 1–41, 17–22.

the scope of periodicals catering to, and cultivating, specialist interests, and the creation of a plethora of new periodical genres. Alvar Ellegård's analysis of the mid-Victorian press, though extremely limited in its sample size, highlights the astonishing increase in new titles in the established periodical genres of morning and evening newspapers, weekly newspapers and reviews, fiction-based weekly journals, monthly magazines, and comic journals.<sup>66</sup> New titles were launched in a breathtaking number of fields including regional interest, the sciences, medicine, engineering, agriculture, religious denominations, secularism, trade, law, society, temperance, architecture, sport, and music. Among the most long-lived, but not necessarily representative, of these newcomers were *Nature* (ff. 1869), *British Medical Journal* (ff. 1842), *Engineer* (ff. 1856), *Agricultural Gazette* (ff. 1844), [regional], the High Church *Christian Remembrancer* (ff. 1845), the *Nonconformist* (ff. 1841), the secularist *Reasoner* (ff. 1846), the *Economist* (ff. 1843), the *Law Times and Journal of Property* (ff. 1843), the society-focused *Vanity Fair* (ff. 1868), the *British Temperance Advocate* (ff. 1850), the *Builder* (ff. 1842/3), the sporting *Field* (ff. 1853), and the *Musical Times* (ff. 1844). The economics and literate audiences that made these developments possible also enabled shadier early-Victorian entrepreneurs to launch a welter of cheap illustrated serials of highly sensational, lurid and pornographic content that would earn the epithet 'penny dreadfuls' from high-minded Victorians seeking to lure readers away from such 'trash' with more wholesome serials.

Studies by Bill Brock, Susan Sheets-Pyenson and Ruth Barton emphasise that *Nature* was only the latest in a large crop of new commercial popular and semi-popular science journals appearing in the period 1840–70, some of which built on the examples of cheap weekly mechanics' magazines (for example, the *English Mechanic* (ff. 1865)), some flowed from trade weeklies (for example, the *Chemical News* (ff. 1859)), some developed from the more expensive genre of the monthly natural history magazine (for instance, the *Zoologist* (ff. 1843)), and others experimented with the example of periodical genres traditionally associated with general topics (for instance, the *Popular Science Review* (ff. 1862) and the *Reader* (ff. 1863)).<sup>67</sup> These journals catered to, and helped define, specialist scientific readerships. They gave scientific practitioners many more alternatives to the existing general media where scientific debate had traditionally taken place and thus widened the gulf between general readers and scientific experts. Nonetheless, as Barton shows, popular science journals occupied a crucial nexus between trained scientists and the increasing number of readers with scientific interests because they functioned as sources of education and recreation and, increasingly during the 1860s, platforms from which the new breed of scientific professionals could promote their rival versions of why the sciences mattered to culture.<sup>68</sup>

One of the reasons why scientific professionals used popular science journals as pedagogical tools was to correct public misapprehensions about the meaning and uses of science, a problem spectacularly brought home to many scientific experts during the controversy over the publication of the *Vestiges of the History of Natural of Creation* (1844). The Victorian reading public were not simply picking up claims made in the name of science in specialist journals and other established periodical

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<sup>66</sup> Ellegård, 'Readership'.

<sup>67</sup> Brock, 'Development'; Susan Sheets-Pyenson, 'Popular Science Periodicals in Paris and London: the Emergence of a Low Scientific Culture, 1820–1875', *Annals of Science* 42 (1985), 549–572; Ruth Barton, 'Just before *Nature*: The Purposes of Science and the Purposes of Popularisation in some English Popular Science Journals of the 1860s', *Annals of Science* 55 (1998), 1–33.

<sup>68</sup> Barton, 'Just Before *Nature*'.

genres but in the welter of new serial forms that emerged in the period 1840–1870. We shall concentrate on the most significant: illustrated journals, comic periodicals, serials for women and children, shilling monthlies, fiction-based weekly magazines and reviews, and fortnightly and monthly reviews.

In many ways, the most important difference between periodicals of the 1840s and older serials is the increase in the quantity and quality of illustration, whether wood engravings or the less common etchings, steel engravings, coloured lithographs, and photographs. This period saw the emergence of a distinct ‘illustrated’ periodical genre as well as periodicals of all genres boasting more illustrations. Exemplified by the *Illustrated London News*, *Reynolds’s Miscellany* (ff. 1849), and *Vanity Fair*, illustrated periodicals greatly expanded and unified the Victorian reading public’s visual experience and played a central role in creating a mass culture.<sup>69</sup> The essays in this volume agree with much recent scholarship arguing that the pictorial representations of scientific events, notably spectacular exhibitions of new technology, shows of exotic specimens, and meetings scientific savants, constituted an important part of the kaleidoscope of images on periodical’s pages.<sup>70</sup>

Illustrations were, of course, a key component of the myriad comic journals that imitated and sought to enjoy the success of *Punch* launched in 1841. *Punch* and such rivals as *Fun* (ff. 1861) built on earlier traditions in ‘high’ and ‘low’ comic journalism, from the waspish visual caricatures of William Hone and George Cruikshank, the grubby political satire of *Figaro in London* to the genteel literary humour of *Fraser’s Magazine*, Hood’s *Comic Annual*, and *Bentley’s Miscellany*. What distinguished *Punch* and many other new comic journals from their ancestors — and what constituted major ingredients of their success among their predominantly bourgeois readers — was their development of comic formulas that combined respectability of tone, topicality, variety, and political conscience. As Noakes’s chapter shows for *Punch*, scientific material played a much bigger part in this formula than hitherto believed. Major scientific spectacles lent themselves to visual caricature in comic journals as much as sober depiction in the *Illustrated London News*, while the abstruse claims of astronomers, the immoral conduct of doctors, and the ingenious schemes of inventors provided exactly the right material for comic journalists to continue their humorous, and frequently vitriolic, commentaries on the rights and wrongs of Victorian culture.

Illustrations also explain the success of other newcomers to the early and mid-Victorian marketplace for periodicals: fiction-based weeklies, and new serials for women and children. One of the most outstanding features of mid-Victorian periodical publishing is the enormous circulation achieved by a string of cheap (1d) fiction-based weeklies catering to a relatively uncultivated and in some cases, semi-literate audience. By the 1850s, titles such as the *Family Herald* (ff. 1842), the *London Journal* (ff. 1845) and *Cassell’s Family Paper* (ff. 1853) were being read by several hundred thousand people each week.<sup>71</sup> Building on earlier traditions of cheap miscellanies, they offered large quantities of medium to low quality fiction, as well as useful information and serious articles, much of which was unoriginal and presented

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<sup>69</sup> For the development of illustrated periodicals see Celina Fox, *Graphic Journalism in England During the 1830s and 1840s* (New York: Garland Publishing, 1988) and Anderson, *Printed Image*.

<sup>70</sup> Anderson, *Printed Image*; James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of the Vestiges of the Natural History of Creation* (Chicago: Chicago University Press, 2000), 437–470.

<sup>71</sup> Altick, *English Common Reader*, 394.

in a patronising way. Of much higher literary and intellectual quality, though more expensive and lacking illustrations, were the two fiction-based weeklies ‘conducted’ by Charles Dickens: *Household Words* (ff. 1850) and *All-the-Year-Round* (ff. 1859). Dickens’s name guaranteed large sales for his serials which featured fiction by such established writers as Dickens himself, Wilkie Collins and Elisabeth Gaskell, articles frequently engaged with the same scientific, medical and technological issues raised in the intellectually astute essays appearing elsewhere in the periodicals.<sup>72</sup> These serials did not sustain the huge readerships enjoyed by the *Family Herald* and other downmarket rivals, they demonstrated to middle- and upper-class Victorians that it was possible to have a cheap periodical that combined high-quality stories and intellectual astute essays.<sup>73</sup>

The middle-class readership that Dickens targeted with his serials included the educated though not necessarily affluent women who other early and mid-Victorian publishers believed would clamour for cheap periodicals tailored to their specialist needs. The most successful attempt to exploit this market was Samuel Beeton’s *Englishwoman’s Domestic Magazine* (hereafter *EDM*) launched in 1852. As Margaret Beetham points out, the *EDM* ‘marked a watershed between the exclusive ladies’ magazines and the popular women’s domestic journals’ that dominated women’s periodicals from the 1890s.<sup>74</sup> In the decades before the *EDM*, most women’s magazines had been expensive (1s) monthlies for upper class ladies that were either focussed largely on fashion and beauty or were more sober affairs promoting the morality and spirituality of Christian motherhood.<sup>75</sup> The *EDM* offered something very different and was much imitated. Its low price guaranteed it enormous sales among middle-class women for whom there was no comparable publication. Indeed these readers had to be content with such fiction-based weeklies as the *Family Herald* and the *London Journal*. Like these serials, the *EDM* carried a large amount of medium quality fiction, articles on history and biography, and answers to correspondents, but it trail-blazed with its systematic coverage of aspects of domestic management such as gardening, hygiene, and cookery. These articles best represent Beeton’s aim to improve readers’ intellect, morality, and domestic abilities, and they furnished ample opportunities for introducing useful scientific and medical information. The *EDM*, Beeton’s *Queen* (ff. 1861) and most other women’s periodicals typically reinforced mid-Victorian ideals of womanhood as piety and domesticity and for this reason were sceptical of the campaigns for women’s rights promoted in the more overtly political *Female’s Friend* (ff. 1846) and *Lady’s Review* (1869).

Samuel Beeton also played a pivotal role in the mid-Victorian transformation of children’s magazines. Until the mid-1850s the middle- and upper-class children’s experiences of periodicals were usually either from family journals or juvenile serials published by religious presses which were strongly didactic in tone, evangelical in content, and dreary in presentation. Scientific topics, especially natural history, were common ingredients of their dry pedagogical format. A few children’s periodicals of

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<sup>72</sup> Louise Henson, ‘“In the Natural Course of Physical Things’: Ghosts and Science in Charles Dickens’s *All the Year Round*’ in Louise Henson et al, *Culture and Science in the Nineteenth-Century Media* (Andover: Ashgate, forthcoming 2003), ???–???

<sup>73</sup> Altick, *English Common Reader*, 347.

<sup>74</sup> Margaret Beetham, *A Magazine of Her Own? Domesticity and Desire in the Woman’s Magazine, 1800–1914* (London: Routledge, 1996), 59.

<sup>75</sup> Beetham, *Magazine*; Cynthia White, *Women’s Magazines 1693–1968* (London: Michael Joseph, 1970), 39–50.

the 1830s, however, broke this pattern by distinguishing the gender of readers, and by carrying larger quantities of secular material including discussions of scientific topics.<sup>76</sup> Juvenile periodicals launched from the 1850s, however, developed this trend much further, differentiating between juvenile readers of different ages and gender, and offering much more secular material. Exemplary here was Beeton's *Boy's Own Magazine* (ff. 1855) which, like the same publisher's *EDM*, was a cheap (2d) monthly aimed at older middle-class boys. It fully exploited falling periodical costs, growing literacy among the more affluent children, and the rising mid-Victorian bourgeois taste for what Kirsten Drotner calls 'moral entertainment where an extrovert, imperial manliness mattered more than introspective piety or dry memorising'.<sup>77</sup> It entertained with exciting adventure stories, puzzles, and a welter of (often coloured) illustrations, and instructed with hagiographies and detailed recipes for nature study, scientific experiments, and workshop projects, many of which were written by recognised experts in the subjects such as J. G. Wood.<sup>78</sup> The runaway success of the *Boy's Own Magazine* inspired a series of other monthly magazines for boys, girls, and general juveniles, including *Every Boy's Magazine* (ff. 1862), and *Aunt Judy's Magazine* (ff. 1866) aimed principally at girls. The latter examples were among the more successful of the new juvenile periodicals, but many of their rivals failed to sustain children's, and in particular boys', interest with their balance of entertainment and instruction. What many boys wanted was more entertainment and less instruction and this was provided by a flurry of immensely successful cheap boys' weeklies published from the late 1860s by Edwin J. Brett and his rivals. Like publishers of the more reputable juvenile periodicals, Brett emphasised that his serials were designed to give less affluent boys wholesome alternatives to the 'penny dreadfuls' that had flourished in 1840s like many other serials. Titles such as Brett's *Boys of England* (ff. 1866) sacrificed pedagogy for entertainment and sensation and were accordingly scorned by many parents. However, the *Boy's Own Magazine* and the *Boys of England* represented different ways of interpreting wholesome entertainment and instruction that shaped the late-Victorian era in juvenile periodicals.

Beeton was one of many mid-Victorian entrepreneurial publishers who identified gaps in the market for periodicals and sought to exploit them. The publishers of the 'shilling monthlies', such as Alexander Macmillan of *Macmillan's Magazine* (ff. 1859) and George Smith of the phenomenally successful *Cornhill Magazine* (ff. 1860), were no exceptions. Shilling monthlies catered to a new sector of the mid-Victorian reading public — educated but not traditionally affluent readers — who were attracted to neither the grubby cheap 'family' journals or the expensive (2s) monthly literary magazines. The shilling monthlies were cheaper than monthly magazines, and wanted to attract a wider audience than that enjoyed by such rivals. They succeeded by offering more fiction, a generous helping of woodcuts and lithographs, and a plethora of serious articles on a wide range of serious articles on history, art, and the sciences. Part of the appeal of this material was that it was put together by cultural figures respected by middle-class audiences, whether it was William Makepeace Thackeray, Anthony Trollope, and Sheridan Le Fanu for their high-quality fiction, or T. H. Huxley, William Thomson and Richard Proctor for their lucid scientific articles. But as Dawson's chapter argues, scientific material in

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<sup>76</sup> Kirsten Drotner, *English Children and their Magazines, 1751–1945* (New Haven: Yale University Press, 1988), 64–66.

<sup>77</sup> Drotner, *English Children*, 67.

<sup>78</sup> Diana Dixon, 'Children's Magazines and Science in the Nineteenth Century', *Victorian Periodicals Review* 34 (2001), 228–238.

dedicated articles and elsewhere in the shilling monthlies fulfilled the same function as scientific discussion in the new comic journals: it was a key element in periodicals' overall strategy of meeting the middle-class taste for topical, learned, and entertaining discourse.

The founders of the new fortnightly and monthly reviews of the 1860s worked much harder to make periodicals extensions of intellectual debates taking place in societies, clubs, and conversazioni. Again, they identified gaps in the periodical marketplace and this was a gap for more open intellectual forum, free from the party lines that tainted the older, and increasingly unpopular quarterly reviews. The most radical was Chapman and Hall's *Fortnightly Review* (ff. 1865) which was not only a good deal cheaper (2s) than the 6s quarterlies but carried signed articles to demonstrate that the periodical was a platform for personal opinion on topics of the day.<sup>79</sup> This policy of openness on questions of religion, politics, philosophy, literature, and the sciences certainly appealed to the scientific practitioners who contributed to its pages, including its first editor G. H. Lewes, John Tyndall, ???, and it was their contributions that prompted criticisms that the periodical was more liberal than politically neutral, and more rationalist than theologically unbiased. Shocked as some Victorians were by the *Fortnightly* abandonment of anonymity, it was quickly adopted by a string of other intellectually highbrow serials, notably the mid-priced (2s6d) monthly *Contemporary Review* (ff. 1866) and the *Nineteenth Century* (ff. 1877). Edited by Alexander Strahan, a publisher of a string of religious magazines, the *Contemporary* focused more strongly on theological and philosophical issues than the *Fortnightly*, especially those that had been raised in the Metaphysical Society informal debating society of statesman, scientists, theologians and philosophers, most of whom contributed to the *Contemporary* itself. Despite its Established Church leanings, the *Contemporary* differed strongly from most religious serials of the period in the wide range of theological, philosophical and scientific positions that it presented. Indeed, the *Contemporary* that featured some of the most ferocious arguments by Huxley, Tyndall and other scientific professionalisers for the authority of trained scientific experts on social, intellectual, and cultural questions that had traditionally been the province of clergymen.

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<sup>79</sup> ???, 'The Fortnightly Review', in the Walter Houghton (ed.), *The Wellesley Index to Victorian Periodicals* (Toronto: University of Toronto Press, ???),

**Fig. 1. Periodical Titles in Waterloo Index to English Periodicals, Series 1**

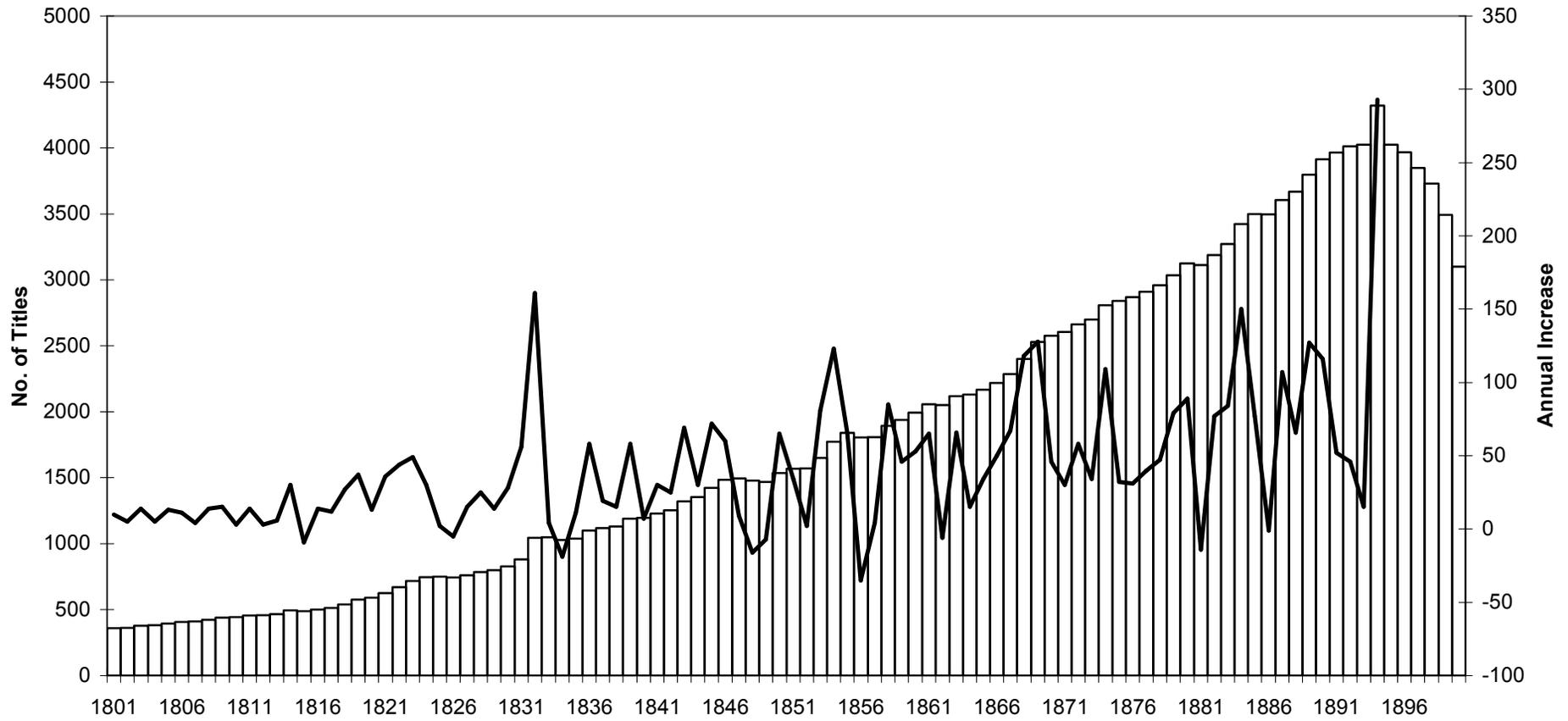


Fig. 2. Comparative trends of Book and Periodical Production (5-year Moving Averages)

