

Dickens, Science and the Victorian Literary Imagination

Ben Winyard and Holly Furneaux

Visiting Dickens at his home in Doughty Street in 1839, George Henry Lewes was dismayed to find no major philosophical, literary or scientific texts in the author's library. To Lewes, Dickens appeared mystifyingly indifferent to the latest scientific discoveries and their multiple implications for the writing of fiction, and he was also consistently unhelpful in assisting Lewes's research into the psychology of literary production. Despite a new 'seriousness which [...] became more and more prominent in his conversation and his writings', the author nevertheless 'remained completely outside philosophy, science, and the higher literature'.¹ Lewes's damning verdict quickly became part of the critical consensus and Dickens was long considered ignorant of, unresponsive to, or even antagonistic towards the scientific endeavours, findings and insights of his era. This issue of **19** participates in the lively revision of Lewes's account, with contributors exploring Dickens's myriad engagements with scientific thought of many varieties. As this issue seeks to show, at the heart of Dickens's response to scientific ideas was his cherished ideal that culture should show 'the romantic side of familiar things', illuminating the wonder, even magic, of everyday phenomena for people of all classes, and affectively uniting them by quenching a shared thirst for imaginative succour.² The essays here also collectively demonstrate the value of holding open our definition of Victorian science, so that it can encompass, as it did so capaciously in the nineteenth century, diverse fields including medicine, psychology and other mental sciences, social science, forensics, evolutionary thought, palaeontology, ecology, and contested practices and bodies of knowledge, such as mesmerism.

Science by the Book? Forms of Engagement

In 1955, Gordon S. Haight expressed the representative view that Dickens was 'indifferent or hostile to the scientific developments of his age' and that his novels sadly failed to engage with the 'new theories that revolutionized man's view of himself and his universe in the nineteenth century'.³ However, the many scientific texts found on Dickens's bookshelves at Gad's Hill – including Georges-Louis Leclerc, the Comte de Buffon's *Natural History* (1797–1808), Georges Cuvier's *Animal Kingdom* (1827–33), Charles Darwin's *On the Origin of Species* (1859), George Henry Lewes's *Physiology of Common*

Life (1859) and Charles Lyell's *Geological Evidence of the Antiquity of Man* (1863) – suggest that he was far from scientifically illiterate.⁴ Dickens, whose close friendships with other men profoundly shaped his life and work, was also intimate with a number of leading men of science. John Picker, for example, has demonstrated the impact of Dickens's career-long engagement with the wave theories of his friend Charles Babbage, the pioneer of modern computing whose *Ninth Bridgewater Treatise* (1837) Dickens owned and quoted in *Dombey and Son* (1846–8) and an 1869 speech to the Birmingham and Midland Institute. Furthermore, Gowan Dawson has explored the significance of the connection between Dickens and Richard Owen, an especially good friend, an avid Dickens reader and the century's leading palaeontologist, who ran the Hunterian and Natural History Museums.⁵ In this issue Owen is represented through his likely manifestation in Dickens's taxidermist character in *Our Mutual Friend* (1864–65), Mr Venus, a relationship between life and work discussed by Nicola Bown.

These personal and professional affinities are unaccounted for in K. J. Fielding's account of Dickens and science, in which Fielding endeavours to defend Dickens from earlier charges that he lacked the requisite education and mental sophistication to appreciate scientific thought.⁶ However, his defence relies entirely on a textual measure of scientific engagement, which carefully documents the books that Dickens owned and directly referenced. Fielding's argument proceeds from particular attitudes about hierarchies of knowledge and the dissemination of scientific ideas, which prioritise text as the only medium. Both Fielding's response and the earlier assessments that he counters demonstrate the powerful currency of the kinds of distinction made by Lewes in his attack on Dickens's perceived lack of engagement with intellectual culture. Thus, Dickens and science remains a provocative combination, in which attitudes about the division and relationship between high and low culture, authorised and unofficial epistemologies, and intellectual and popular ways of knowing are still contested. In his article here about the ecological concerns contained within Dickens's work, John Parham explores the contested nature of Dickens's understanding of contemporary scientific thought in more detail, arguing that Dickens combined his 'acquaintance with contemporary science and a socially reconstructive urge' in 'ways that signal suggestive new possibilities' for literary-cultural scholars.

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Recognising the limiting prioritisation of textual forms of scientific transmission, and the disproportionate critical emphasis on Darwin's writing, Adelene Buckland has observed the preponderance of work that focuses on Dickens's 1860s, post-*Origin*, work. As a means of extending the enquiry and doing fuller justice to the range of Dickens's scientific engagements beyond evolutionary science, Buckland suggests attention to other connections, of a type undertaken by Picker and Dawson. Her own work, however, focuses on 'the importance of material and visual cultures', another previously neglected area, where she demonstrates that Dickens and his contemporaries not only learnt about science by reading; they also attended, in huge numbers, popular shows – panoramas, dioramas, and exhibitions, as new museums opened through the century – which presented different and competing versions.⁷ When Dickens describes his visit to Vesuvius in *Pictures from Italy* (1846), it is not to academic work on volcanoes that he turns, but to the vivid images of popular shows of catastrophe – 'A Rapid Diorama'. Indeed, much scientific literature was accessible to ordinary readers with little or no specialist knowledge and the most important discoveries and developments were popularised and widely disseminated.⁸ It was this cross-genre, multi-media and, above all, democratic aspect to Dickens's understanding of science, that we felt, together with Professor Sally Ledger who proposed this theme, made it a particularly apt subject for Dickens Day. This issue emerges from papers given, and discussions had, on the largest Dickens Day to date, 'Dickens and Science', Institute of English Studies, London, 10 October 2009.⁹

Ways of Knowing: Dickens, Science and Interdisciplinarity

A productive dialogue about Dickens's relationship to science was partly facilitated by the increasing prominence of cultural studies and historicism in literary studies from the 1960s onwards. New Historicism, in particular, stressed the commensurate relationship between dissimilar texts enmeshed within specific power relations with multiple material and cultural effects. Apparently disparate, unrelated texts, such as scientific treatises and canonical and popular fiction, could be juxtaposed, thus allowing literary scholars to cross the disciplinary boundary between the 'two cultures'. The critical separation of literary from scientific texts has increasingly given way to a range of interdisciplinary explorations of how science and literature represented less two discrete realms of

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knowledge than a series of overlapping and mutually constitutive discourses. Furthermore, Michel Foucault's influential 'archaeology' of the modern self and its governance emphasised the importance of various biological and social sciences within a matrix of discourse, knowledge and power. For Foucault, particular discursive practices operate and can be traced across a range of differing, even ostensibly unrelated, textual sites, while discursive fields such as science conceal their genealogies, and the material practices and power relations they establish between subjects and institutions, behind transhistorical truth claims.¹⁰

This new willingness to consider both Dickens's life and work alongside Victorian science was explored in foundational texts by Ann Wilkinson, Gillian Beer and George Levine. As Beer and Levine noted, there are clear, two-directional affinities between Charles Darwin's work and that of his favourite novelist, Charles Dickens. These are discernable in the structure of *On the Origin of Species*, favourably reviewed, anonymously, by Richard Owen in Dickens's journal *All the Year Round*, 'with its apparently unruly superfluity of material gradually and retrospectively revealing itself as order', and in the authors' shared concerns with connection and change.¹¹ *All the Year Round* featured scientifically erudite articles entitled 'Species' (2 June 1860), 'Natural Selection' (7 July 1860) and the 'Transmutation of Species' (9 March 1861) which, Levine observes, 'demonstrate that Dickens was both aware of what was happening in the world of science and convinced that the new developments had real significance for ordinary life.'¹²

Such work has inspired scholarship that recognises the shared narratives and aesthetics in what we now might classify as literary and scientific writing, demonstrating the limitations of such generic division. In this collection Peter Orford's piece on 'Dickens and Science Fiction', which places *Great Expectations* (1860–61) in a context of automata and robot fiction, makes a particularly graphic case for the fertile interconnections and shared poetics of these supposedly discrete genres. Wilkinson's important early piece was similarly attuned to common languages; she uses 'the language of thermodynamics and field theory, and their laws, to describe the world of' *Bleak House* (1852–53), via the engagement in *Household Words*, Dickens's first multi-authored periodical, with Michael Faraday's lectures.¹³ The *Household Words* pieces followed Dickens's enthusiastic 1850 correspondence with Faraday about his talk on the chemistry of a candle. Wilkinson's

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particular attention to this exchange shows the ways in which the intellectual and cultural becomes personal, as Dickens's enthusiasm for thermodynamics develops into a personal correspondence with one of its leading exponents.

These critical juxtapositions have yielded a broader appreciation of Dickens's multiple engagements with scientific ideas and the greatest beneficiaries of this approach have undoubtedly been *Our Mutual Friend*, which exhibits traces of the work of Lyell, Jean-Baptiste Lamarck, Darwin and Owen, and *Bleak House*, which brims with thermodynamic, paleontological and geological imagery. Peter Ackroyd has also espied the presence of scientific discourses in the content, structure and movement of Dickens's narratives: 'the very form, the expansiveness, the detail, the momentum of Dickens's novels' reflect, while also refracting, the scientific ideas and discoveries that most captured his imagination, including 'the discover of *fields of force*, the understanding of the dynamics of *systems*, the enquiries into *magnetic centres*, the research into *thermodynamics*, [and] the hypothesis of *evolution*'.¹⁴

In the opening essay, Nicola Bown takes an initially familiar approach, building on the work of Howard Fulweiler, and others, that identifies the Darwinian nature of *Our Mutual Friend*.¹⁵ Bown moves from this perspective, with its pessimistic implications for reading this novel, to examine Owen's competing influence on the text, and to explore Dickens's 'focus on the imaginative implications of the idea of evolution by natural selection, and especially the emotional impact of Darwin's vision of the natural world.' In its emphasis on the potentially redemptive versions of the Hunterian museum that this novel imagines, Bown's essay participates in a wider, fruitful confluence of thinking about Dickens and science and Dickensian things. It is no coincidence that the moment at which Thing theorists and Dickensians alike turn their attention to the fascination with objects that imbues Dickens's creativity, coincides with the moment that Dickens and science has become a key critical concern.¹⁶

This coalescence of concerns in broader work on the nineteenth century is dramatised with particular vividness in Dickens studies, long alert, as Bown notes, to Dickens's staple 'enumeration of assorted and incongruous grotesque objects for the pleasure of the effect.' Such work does justice to Beer's tantalising passing observation that Dickens's preoccupation with materiality – the humans made object and the animated things that abound throughout his journalism and fiction – parallels the 'drive' apparent in

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Darwin's work and in that most iconic Victorian experiment in cataloguing, the Great Exhibition (1851), 'towards confirming experience by appeal to the physical and the material, changing language into physical process.'¹⁷ The articles here go some way to fleshing out the phenomenological parities between understandings and methods of object relations and material science, an account which we feel is ripe for further development.

Illegitimate Science: Error, Conviction and Feeling

Lewes attributed a supposed failure of realism in Dickens's work to an absence of scientific method and psychological insight and a perverse reliance on a melodramatic aesthetics which prioritised fixed character traits, moral simplicity and the bodily articulation of emotion. As John Bowen observes, attempts such as Lewes's to marry literary output with the insights of materialist psychology have 'perhaps done more to damage Dickens's critical reputation than anything else.'¹⁸ In 'Dickens in Relation to Criticism' (1872) Lewes famously described Dickens's psychologically unrealistic characters as 'frogs whose brains have been taken out for physiological purposes'.¹⁹ As Bowen points out, 'For a criticism which identifies moral goodness with moral growth and subjectivity with psychological growth, Dickens's characters seem flat and unconvincing', springing fully formed in moral uprightness and intrinsic benevolence from the mind of their originator.²⁰ However, Greta Perletti's article in this issue provides an alternative to this established view of flat Dickensian figures characterised only by eccentric tics and humorous repetitions. Perletti examines Dickens's work in the context of mid-Victorian mental sciences, exploring his representation of competing views of the value and cost of memory and the significance of the experience of memory in his delineation of character.

Dickens's presumed lack of scientific knowledge was also apparently confirmed by his public interest in, and defence of, pseudo-sciences, such as mesmerism. Steven Connor's article here details Dickens's personal involvement, through his friendship with the discredited John Elliotson and his confidence in his own magnetic powers, in controversies over the legitimacy of mesmerism. As Connor shows, a belief in potentially engulfing universal fluid, through which mesmeric impulses passed, profoundly influenced Dickens's world view and his appreciation of gendered power relations therein. Dickens's public spat with Lewes in 1852 over spontaneous combustion is perhaps the

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most famous example of Dickens's investment in what Connor calls 'magical thinking'. Writing in the *Leader* (11 December 1852), Lewes reproached Dickens for the scientific inaccuracy of Krook's fiery death in the tenth part of *Bleak House*. In the battle for legitimacy and disciplinary clarity fought between various emerging sciences in the mid-nineteenth century, Dickens aligned himself with practices and bodies of knowledge that would soon be relegated to the quack end of the scientific spectrum and, on this occasion, a rather po-faced Lewes accused Dickens of a 'vulgar error'.²¹ Dickens responded by citing texts on the subject in the next number before defending himself more fully in the preface to the volume edition: 'I have no need to observe that I do not wilfully or negligently mislead my readers, and that before I wrote that description I took pains to investigate the subject.'²² As Ackroyd baldly states, 'this was a lie'; Dickens copied the sources from Robert Macnish's *The Anatomy of Drunkenness* (1827) and it is doubtful he actually read them.²³ If Dickens was unacquainted with the standard literature on spontaneous combustion, Kostas Makras demonstrates in this issue that he was certainly familiar with a range of literature pertaining to alcoholism and its increasingly prioritised role as a cause of mental instability.

Tellingly, Dickens concludes his defence of *Bleak House* by observing, 'I have purposely dwelt upon the romantic side of familiar things. I believe I have never had so many readers as in this book. May we meet again!'²⁴ The contested medical curiosity of spontaneous combustion evidently captured (*inflamed*, we might say) his imagination, its 'romantic' appeal surpassing trifling doubts as to its scientific veracity. Dickens's phrasing here recalls his journalistic pieces, 'The Poetry of Science' (1848), the 'Preliminary Word' (1851) to *Household Words*, and his two-part 'Amusements of the People' (1851) which similarly foreground the crucial relationship between imagination, audience and emotional attachment. Like fiction, science, for Dickens, is at its best when it forges ties of sympathy and understanding between potentially dissimilar and unequal members of an audience by appealing to their innate eagerness for imaginative stimulation, rather than offering up an ill-nourishing diet of dry facts and austere realism.

Dickens wrote in an era in which the meanings of 'science' solidified, disciplinary boundaries were more firmly established and both scientific knowledge and practice were broadly professionalised. 'Science' increasingly excluded metaphysical and theological concerns and instead denoted bodies of knowledge and interconnected truths that were

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coherent, empirically proven and demonstrable.²⁵ However, when Dickens began writing fiction, science was, in Diana Postlethwaite's words, 'still a discipline-in-progress, not yet a subject to be studied at Oxford or Cambridge, often an enthusiasm pursued by the independent amateur.'²⁶ Always keen to deflate pomposity and narrowness of vision, Dickens predictably turned his satirical guns on this gentlemanly amateur science. Thus, the mock report which opens *The Pickwick Papers* (1836–37) praises 'the unwearied researches of Samuel Pickwick, Esq.' whose 'Speculations on the Source of the Hampstead Ponds, with Some Observations on the Theory of Tittlebats' has advanced 'the cause of science'.²⁷ Pickwick emerges as an unprofessional natural historian – a man whose 'enormous brain' has 'agitated the scientific world' – launching on his travels with a lofty but disorganised desire to observe and document the 'character and manners' of his contemporaries.²⁸ In *The Archaeology of Knowledge* (1969), Foucault stresses that the increasingly unified discipline of science was constituted by 'heterogeneous and dispersed elements', including an earlier natural history – 'a taxonomic discourse, linked to the theory of signs and to the project of a science of order'.²⁹ Alongside the comedic 'elderly gentleman of scientific attainments' in chapter 38, Pickwick is, like many amateur scientists of the early nineteenth century, concerned with the systematisation and classification of observable natural phenomena.³⁰

For Michael Slater, Pickwick the bumbling gentleman-scientist is 'one of those prosperous, self-satisfied old bachelors, often with a hobby-horse' who figured in popular cultural productions of the 1830s, emerging as a stock humorous type alongside the forlorn lover Tracy Tupman, the poet Augustus Snodgrass and the sportsman Nathaniel Winkle.³¹ Although the humour is gentle and the satire restrained, Pickwick nevertheless embodies some of the self-importance, dryness and myopia of the early Victorians' taxonomic fervour. In this issue, Andrew Mangham explores the relationship between Pickwick's classificatory zeal and an emergent forensic science, brought into focus for Dickens by the inquest into, and detailed newspaper reports of, the suicide of Robert Seymour, *Pickwick's* first illustrator. Exploring the impact of Seymour's death on the design of *Pickwick*, Mangham argues that this text, complete with its sustained satirising of scientific misinterpretation, presents a case study for Dickens's interest in the human failings of science, the 'emotional contamination' observable in 'methods of deduction'.

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‘The Poetry of Science’: Affect, Aesthetics and Politics

Dickens championed a democratically accessible science that resembled fiction in its ability to stir the imagination, produce incredible narratives and bind together a reading public. For George Eliot, however, science could mould fiction by offering it a method posited on the steady accretion of facts and details and the precise and objective representation of reality. Just as the scientist observes, records and expounds the laws of nature, so should the novelist faithfully study and report the inexorable operation of natural laws within human society and the fundamental interconnectedness of social relations. In ‘The Natural History of German Life’ (1856), Eliot argues that although scientific reports of lower-class life may act upon a pre-existing sympathy, only Art is capable of extending experience and engendering empathy, the bedrock of moral feeling:

The greatest benefit we owe to the artist, whether painter, poet, or novelist, is the extension of our sympathies. Appeals founded on generalizations and statistics require a sympathy ready-made, a moral sentiment already in activity; but a picture of human life such as a great artist can give, surprises even the trivial and the selfish into that attention to what is apart from themselves, which may be called the raw material of moral sentiment.³²

Ignoring realism’s ‘sacred’ purpose, Dickens proffers implausible depictions of ‘the People’:

We have one great novelist who is gifted with the utmost power of rendering the external traits of our town population; and if he could give us their psychological character – their conceptions of life, and their emotions – with the same truth as their idiom and manners, his books would be the greatest contribution Art has ever made to the awakening of social sympathies. But while he can copy Mrs Plornish’s colloquial style [...] he scarcely ever passes from the humorous and external to the emotional and tragic, without becoming as transcendent in his unreality as he was a moment before in his artistic truthfulness.³³

Indeed, Dickens’s sentimentalism – ‘his preternaturally virtuous poor children and artisans, his melodramatic boatmen and courtesans’ – represent a form of ‘false psychology’ and dangerously encourage ‘the miserable fallacy that high morality and refined sentiment can grow out of harsh social relations, ignorance, and want; or that the working classes are in a condition to enter at once into a millennial state of *altruism*’.³⁴ Dickens’s melodramatic aesthetics, then, hazardously encourage democratisation without first improving the moral suitability of the disenfranchised masses.

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It is in ‘The Poetry of Science’ – his review of Robert Hunt’s eponymous 1848 book – that Dickens delineates his vision of science’s place in the literary imagination:

To show that the facts of science are at least as full of poetry, as the most poetical fancies ever founded on an imperfect observation and a distant suspicion of them [...]; to show that if the Dryades no longer haunt the woods, there is, in every forest, in every tree, in every leaf, and in every ring on every sturdy trunk, a beautiful and wonderful creation, always changing, always going on, always bearing testimony to the stupendous workings of Almighty Wisdom, and always leading the student’s mind from wonder on to wonder, until he is wrapt and lost in the vast worlds of wonder by which he is surrounded from his cradle to his grave.³⁵

Here, Dickens broadly replicates the argument of Robert Chambers’ ‘remarkable’ *Vestiges*, a forerunner of the *Origin of Species*, with its proto-evolutionary ‘Theory of Development’ which asserted that the ascent of humans was divinely preordained (‘Review’, 787).³⁶ Dickens immediately focuses on the ‘reading public’ made receptive for Hunt’s work by Chambers who has commendably ‘awaken[ed] an interest and a spirit of inquiry in many minds, where these had previously lain dormant’ (‘Review’, 787). Central to Dickens’s appreciation of science is its power to rouse the imagination, tell stories and bind together its audience.³⁷ Nature is a language that science deciphers, inspiring ‘wonder’ and opening up ‘vast worlds’ beyond our own:

To show that Science, truly expounding nature, can, like nature herself, restore in some new form whatever she destroys; that, instead of binding us [...] in stern utilitarian chains, when she has freed us from a harmless superstition, she offers to our contemplation something better and more beautiful, something which, rightly considered, is more elevating to the soul, nobler and more stimulating to the soaring fancy; is a sound, wise, wholesome object (‘Review’, 787).

Although ‘Science has blown to atoms’ mythical explanations for natural phenomena, she has replaced them not with arid facts that imprison the mind but with equally fantastical and imaginatively nourishing narratives:

Science has gone down into the mines and coal-pits, and before the safety-lamp, the Gnomes and Genii of those dark regions have disappeared. But, in their stead, the process by which metals are engendered in the course of ages; the growth of plants which, hundreds of fathoms underground, and in black darkness, have still a sense of the sun’s presence in the sky [...]; the histories of mighty forests and great tracts of land carried down into the sea [...] are made familiar to us. Sirens, mermaids, shining cities glittering at the bottom of the quiet seas, and in deep lakes, exist no longer; but, in their place, Science, their destroyer, shows us whole coasts of coral reef constructed by the labours

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of minute creatures; points to our own chalk cliffs and limestone rocks, as made of the dust of myriads of generations of infinitesimal beings that have passed away ('Review', 787).

Reproducing florid extracts from Hunt's book on electricity, gravity, light, magnetism, the formation and decomposition of matter, molecular structure, and time, Dickens is evidently less concerned with the empirical accretion of fact and detail than with the poetry of invisible forces and barely discernible, millennial changes in the natural world. As Ackroyd observes, this melding of literary and scientific worldviews illustrates 'how mythopoeic the Victorian imagination was; how much fact and discovery were seen in terms of mystery and even magic'.³⁸

Dickens's enthusiasm for scientific narratives which stimulate and foster the human imagination and enable visions of a 'better and more beautiful' future chimes with his 'Preliminary Word' to *Household Words*, in which he defends the right of the poor to entertainment and the exercise of 'fancy':

No mere utilitarian spirit, no iron binding of the mind to grim realities, will give a harsh tone to our Household Words. In the bosoms of the young and old, of the well-to-do and of the poor, we would tenderly cherish that light of Fancy which is inherent in the human breast [...]. To show to all, that in familiar things, even in those which are repellent on the surface, there is Romance enough, if we will find it out: – to teach the hardest workers at this whirling wheel of toil, that theirs is not necessarily a moody, brutal fact, excluded from the sympathies and graces of imagination; to bring the greater and the lesser in degree, together, upon that wide field, and mutually dispose them to a better acquaintance and a kinder understanding – is the one main object of Household Words.³⁹

Utilitarianism once again epitomises the narrow scope of the empirical, taxonomical and social sciences, which stunt imaginative growth and check interpersonal attachments. The best type of science, like the best art, enables ordinary people to escape 'out of the literal world'.⁴⁰

'The Amusements of the People', which also ran in the first number of *Household Words*, similarly champions popular forms of entertainment, such as melodrama, which nurture imagination and fantasy. Although the accumulation of facts and a sound understanding of material realities are commendable and necessary, they fail to engender the affective ties that sustain community:

The Polytechnic Institution in Regent Street, where an infinite variety of ingenious models are exhibited and explained, and where lectures comprising

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a quantity of useful information on many practical subjects are delivered, is a great public benefit and a wonderful place, but we think a people formed *entirely* in their hours of leisure by Polytechnic Institutions would be an uncomfortable community. We would rather not have to appeal to the generous sympathies of a man [...] who had passed all his holidays, when a boy, among cranks and cogwheels. [...] There is a range of imagination in most of us, which no amount of steam-engines will satisfy; and which The-great-exhibition-of-the-works-of-industry-of-all-nations, itself, will probably leave unsatisfied.⁴¹

For Dickens, fundamental emotional and social bonds are formed between different classes and peoples by the engendering of sympathy via the imagination. As Sally Ledger observes, Dickens was keen to ensure that the articles in *Household Words* were not ‘too baldly informative and utilitarian’, but instead appealed to and stimulated readers’ feelings.⁴² Sympathy extends not from dry analyses of observable phenomena, but from imagination, wonderment, amusement and emotional engagement. Just as Dickens championed the theatre as a democratically accessible cultural form, so too he advocated the promulgation of arresting, poetical scientific ideas; hence the two *Household Words* articles extolling Faraday’s insights (‘The Chemistry of a Candle’ and ‘The Mysteries of a Tea-Kettle’, 3 August and 16 November 1851) and demonstrating how scientific wonderment is observable in, and radically transforms, everyday realities.

For Eliot and Lewes, Dickens’s fiction failed in its moral purpose because it did not realistically depict psychological depth and the complexity of human emotions and relations. However, Dickens was arguably more fascinated by scientific narratives of the natural world and the forces which shape it than in explanations for, and accounts of, human character, emotion and psychology. Instead of producing fiction posited on an empirical observation of the inner life, Dickens radically questions, in Juliet John’s words, ‘how we know what we think we know about life beneath or beyond surfaces. The reality of innerness and depths is ultimately never empirically knowable.’⁴³ Feeling ‘never resides “in” people in Dickens; it manifests itself metamorphically through and between people and things.’⁴⁴ Thus, Dickens was less interested in science as a method or a means of observing and empirically ‘knowing’ human feeling, than as a medium through which that feeling could manifest itself. For Dickens, science should excite, rather than reductively explain, the imagination and the bonds its forges between people.

Another of Dickens’s more public statements on science was a speech delivered to the Birmingham and Midland Institute on 27 September 1869. Here, he dismisses the

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‘assumption’ that ‘this age is a material age’ and, unpicking the ‘logical signification’ of the phrase, he waggishly observes that the literal materiality of the world has not increased:

Has electricity become more material in the mind of any sane, or moderately insane [*laughter*] man, woman, or child, because of the discovery that in the good providence of God it was made available for the service and use of man [...]? Do I make a more material journey to the bedside of my dying parents or my dying child, when I travel there at the rate of sixty miles an hour, than when I travel thither at the rate of six? Rather, in the swiftest case, does not my agonised heart become over-fraught with gratitude to that Supreme Beneficence from whom alone could have proceeded the wonderful means of shortening my suspense?⁴⁵

The materiality of substances ‘that we can weigh or measure, imprison or release’ is not determined or amplified by technological advances, but, rather, divinely established ‘from the instant of their creation’ and will remain constant until ‘the day of judgment’:

When did this so-called material age begin? With the invention of the art of printing? Surely it has been a long time about; and which is the more material object, the farthing tallow candle that will not give me light, or that flame of gas which will? [*Laughter and applause*] (‘Birmingham’, p. 404)

Just like Faraday’s *Household Words* articles, Dickens’s reference to ‘the farthing tallow candle’ marries scientific insight with the everyday, humdrum objects of lower-class life. This speech also attempts to accommodate materialist science, technological change and geological, palaeontological and evolutionary narratives within a theistic understanding of the unique place of humanity in the universe and God’s benevolent creativity. Dickens thus deftly sidesteps Biblical criticism by arguing that the ‘diversified wonders’ of his age ‘might have been disclosed by Divine lips nigh upon two thousand years ago, but that the people of that time could not bear them’ (‘Birmingham’, p. 405).

Dickens also tellingly deploys melodramatic and sentimental images – the ‘dying parents’ and the ‘dying child’ – recalling figures from his own fiction such as Clara Copperfield and Little Nell, among many others. As in ‘The Poetry of Science’, Dickens filters science’s most awe-inspiring and imaginatively sustaining narratives and observations through his melodramatic aesthetics and radical politics, seeing in the immensity of the universe a metaphor for ties between individuals and communities:

As astronomers tell us that it is probable that there are in the universe innumerable solar systems besides ours, to each of which myriads of utterly unknown and unseen stars belong, so it is certain that every man, however

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obscure, however far removed from the general recognition, is one of a group of men impressible for good and impressible for evil, and that it is in the eternal nature of things that he cannot really improve himself without in some degree improving other men [*Hear, hear.*] ('Birmingham', p. 400)

Dickens readily accepts scientific ideas potentially discomfiting to his theistic worldview, but he is repeatedly drawn to examine them in terms of human relations and the bonds between people which sustain individuals and communities. For Dickens, the power and wonder of science lay in its ability to forge narratives, to tell stories, about the natural world and, as evidenced by his library at Gad's Hill, he was captivated by accounts of the Earth's geological structure and formation, natural forms, and invisible dynamics and forces. Dickens was less stimulated by science's hypothetical ability to explain human emotions and relationships than in its poetic ability to stimulate and sustain them. For Dickens, the best science offered metaphors for describing human life and society and acted as a medium for the values that he believed united and bound disparate peoples.⁴⁶

Postscript

It was a mournful honour to dedicate the one-day conference, 'Dickens and Science', to the memory of Sally Ledger. Sally, whose loss we feel so profoundly in both personal and professional terms, had long been an organiser of the annual Dickens Day and had been working recently on this topic: she presented a paper entitled 'Dickens, Natural History and *Our Mutual Friend*' on a 'Dickens and Science' panel at the 2008 MLA conference in San Francisco.⁴⁷ Given the polyphonic and democratic potential in approaches to Dickens and science and the topic's imbrication in debates about the value of forms of cultural and intellectual capital, it is easy to see why this theme appealed to Sally after completing her groundbreaking book *Dickens and the Popular Radical Imagination* (Cambridge: Cambridge University Press, 2007), which placed Dickens in a radical culture of dissent, examining him in a context of thinkers including William Hone, William Cobbett, and Ernest Jones. It is to Sally that many of us owe a richer understanding of Dickens and a profound sense of the myriad pleasures – intellectual and emotional – to be gained from his work. We dedicate this issue to her with the hope that we will always endeavour to replicate her generous spirit, keen intellect, wicked sense of humour and radical imagination.

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- ¹ [George Henry Lewes], 'Dickens in Relation to Criticism', *Fortnightly Review*, n.s. no. 62 (1 February 1872), 141–54 (p. 152).
- ² Charles Dickens, 'Preface to 1853 edition of *Bleak House*', in *Bleak House* [1852–53], ed. by Nicola Bradbury (London: Penguin, 2003), p. 7.
- ³ Gordon S. Haight, 'Dickens and Lewes on Spontaneous Combustion', *Nineteenth-Century Fiction*, 10 (1955), 53–63 (p. 63).
- ⁴ K. J. Fielding, 'Dickens and Science?', *Dickens Quarterly*, 13 (1996), 200–16 (pp. 204–05); J. H. Stonehouse (ed.), *Catalogue of the Library of Charles Dickens from Gadshill* (London: Piccadilly Fountain Press, 1935).
- ⁵ John Picker, *Victorian Soundscapes* (Oxford: Oxford University Press, 2003); Gowan Dawson, 'Richard Owen, Comparative Anatomy and the Reading of Dickens's Serial Fiction', paper given at the 'Dickens and Science' Dickens Day conference, Institute of English Studies, London, 10 October 2009.
- ⁶ K. J. Fielding, 'Dickens and Science?', *Dickens Quarterly*, 13 (1996), 200–16 (pp. 204–05).
- ⁷ Adelene Buckland, "'The Poetry of Science": Charles Dickens, Geology and Visual and Material Culture in Victorian London', *Victorian Literature and Culture*, 35 (2007), 679–94 (p. 680).
- ⁸ Diana Postlethwaite, 'George Eliot and Science', in *The Cambridge Companion to George Eliot* (Cambridge: Cambridge University Press, 2001), pp. 98–118 (p. 99).
- ⁹ This annual event is now organised jointly by Birkbeck, The University of Leicester and The Dickens Fellowship. We would like to thank Michael Slater and Tony Williams for their support with the organisation of the day, and Jon Millington of the IES for his unflappable administration. We are grateful to all participants for a really invigorating day of discussion.
- ¹⁰ Michel Foucault, *The Archaeology of Knowledge* [1969], trans. by A. M. Sheridan Smith (Abingdon: Routledge, 2002), p. 198.
- ¹¹ Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (London: Routledge and Kegan Paul, 1983), p. 8; George Levine, *Darwin and the Novelists: Patterns of Science in Victorian Fiction* (Cambridge, MA: Harvard University Press, 1988), p. 120.
- ¹² George Levine, 'Dickens and Darwin, Science and Narrative Form', *Texas Studies in Literature and Language*, 28 (1986), 250–81 (p. 256).
- ¹³ Ann Y. Wilkinson, 'Bleak House: From Faraday to Judgement Day', *ELH*, 34 (1967), 225–47 (p. 229).
- ¹⁴ Peter Ackroyd, *Dickens* [1990] (London: Vintage, 1999), p. 698 (original emphases).
- ¹⁵ Howard Fulweiler, "'A Dismal Swamp": Darwin, Design and Evolution in *Our Mutual Friend*', *Nineteenth-Century Literature*, 49 (1994), 50–74.
- ¹⁶ See, for example, Michael Hollington, 'The Voice of Objects in The Old Curiosity Shop', *Australasian Journal of Victorian Studies*, 14 (2009), 1–8; Catherine Waters, *Commodity Culture in Dickens's Household Words: The Social Life of Objects* (Aldershot: Ashgate, 2008); Elaine Freedgood, *The Ideas in Things: Fugitive Meaning in the Victorian Novel* (Chicago: University of Chicago Press, 2006), and Elaine Freedgood, 'Commodity Criticism and Victorian Thing Culture: The Case of Dickens', in *Contemporary*

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Dickens, ed. by Deidre David and Eileen Gillooly (Columbus: Ohio State University Press, 2008), pp. 152–68.

¹⁷ Beer, pp. 46–7.

¹⁸ John Bowen, *Other Dickens: Pickwick to Chuzzlewit* (Oxford: Oxford University Press, 2000), p. 16.

¹⁹ Lewes, p. 148.

²⁰ Bowen, p. 19.

²¹ Michael Slater, *Charles Dickens* (New Haven and London: Yale University Press, 2009), p. 349.

²² Dickens, 'Preface', p. 6.

²³ Ackroyd, p. 697.

²⁴ Dickens, 'Preface', p. 7.

²⁵ Foucault, p. 197.

²⁶ Postlethwaite, p. 99.

²⁷ Charles Dickens, *The Posthumous Papers of the Pickwick Club* [1836–37], ed. by Mark Wormald (London: Penguin, 1999), p. 15.

²⁸ Dickens, *The Posthumous Papers of the Pickwick Club*, p. 16.

²⁹ Foucault, pp. 198, 199.

³⁰ Postlethwaite, pp. 99–100, 101.

³¹ Slater, p. 65.

³² George Eliot, 'The Natural History of German Life' [1856], in *George Eliot: Selected Critical Writings*, ed. by Rosemary Ashton (Oxford: Oxford University Press, 2000), pp. 260–95 (pp. 263–64).

³³ Eliot, p. 264.

³⁴ Eliot, p. 265 (original emphasis).

³⁵ [Charles Dickens], 'Review of Robert Hunt's *The Poetry of Science, or Studies of the Physical Phenomena of Nature*', *Examiner*, 9 December 1848, 787–88 (p. 787). Subsequent references occur in the text as 'Review'.

³⁶ Slater, p. 277.

³⁷ Slater, p. 277.

³⁸ Ackroyd, p. 699.

³⁹ [Charles Dickens], 'A Preliminary Word', *Household Words*, 1 (30 March 1850), 1–2 (p. 2).

⁴⁰ Juliet John, *Dickens's Villains: Melodrama, Character, Popular Culture* (Oxford: Oxford University Press, 2001), p. 5. The phrase is from 'The Amusement of the People', Dickens's classic statement on the important role of the theatre in the lives of the lower classes.

⁴¹ Charles Dickens, 'The Amusements of the People [I]', *Household Words*, 1 (13 April 1850), in Michael Slater (ed.), *Dickens's Journalism, vol. 2: 'The Amusements of the People' and Other Papers, Reports, Essays and Reviews, 1834–51* (London: J. M. Dent, 1996), pp. 179–85 (pp. 180–81, original emphasis).

⁴² Sally Ledger, *Dickens and the Popular Radical Imagination* (Cambridge: Cambridge University Press, 2007), p. 173.

⁴³ John, p. 121.

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⁴⁴ John, p. 121.

⁴⁵ Charles Dickens, 'Birmingham and Midland Institute: Annual Inaugural Meeting, 27 September 1869' in *The Speeches of Charles Dickens*, ed. by K. J. Fielding (Oxford: Clarendon, 1960), pp. 397–408 (pp. 403, 404). Subsequent references occur in the text as 'Birmingham'.

⁴⁶ Bowen, p. 20.

⁴⁷ A version of this paper, together with contributions from other panel participants Regenia Gagnier and Leona Toker, is forthcoming in *Partial Answers: A Journal of Literature and the History of Ideas* (in press for 2010).