

Women, Science, and Culture: Science in the Nineteenth-Century Periodical.

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Victorian periodicals: the very name seems to exude ponderousness, like those rows and rows of volumes which moulder away in the basements of university libraries, rarely opened or consulted. Yet in their time, periodicals probably had a far greater impact than books, reaching wider and more diverse audiences. They were, indeed, the primary medium of cultural circulation of the age, with hundreds of titles in print at any given point, catering for all sectors of the community, from high to low-brow, with numerous titles aimed at specific religious or political audiences, and others targeted at a female or child readership, with each copy usually reaching multiple readers. Periodicals are a wonderful historical resource, but part of the reason for their relative under-utilisation in scholarship lies in the sheer difficulty of knowing where to start. Indexes within the periodicals or magazines themselves are few and far between, and there is no adequate modern subject index. That wonderful monument of scholarship, the *Wellesley Index* offers a full title and author listing for 43 periodicals, but it is often difficult to determine content from a title. Only by reading the article itself could one tell, for example, that 'First Beginnings' is actually an article on the first signs of insanity.

The Science in the Nineteenth-Century Periodical project (SciPer), takes seriously the notion that science formed a fundamental and integral part of nineteenth-century culture, and seeks to trace, through periodicals, the ways in which science permeated that culture. By the completion of the first phase of the project in December 2001, we will have created an electronic database which will cover 15,000 articles, within 17 periodicals, chosen to represent a range of genres, including women's and children's magazines, from periods across the entire century. Rather than simply index titles that appear to have scientific relevance, the team have adopted a far more comprehensive approach, reading carefully each issue of a periodical, and noting the ways in which scientific references occur, even in the most unexpected places. [One of the periodicals indexed by the SciPer project, the *Englishwoman's Domestic Magazine*,] might seem to have very little engagement with the world of science. Careful reading, however, reveals how often writers call on recent developments in medical or food science in articles on child rearing or domestic economy. The database will offer descriptive entries on each relevant article, placing them in the context of contemporary debate, and identifying intertextual links.

The complexity of modern technology makes possible a whole range of sophisticated searches, according to subject, author, pseudonym, gender, publishers, and people, texts, and institutions cited. One will be able to search, for example, for women writing under pseudonyms on taxonomy in 1842, or more generally for articles which link gendered concerns with an entire range of scientific fields.

Although the database itself is not specifically focused on issues of gender, its capacity to alter and refine both our understanding of women's role within nineteenth-century publishing, and the whole domain of gendered representation, is potentially enormous. Female fiction, for example, once placed in its original periodical context, can be shown to be engaging in dialogue with contemporary scientific debates to a degree hitherto unexpected. Elizabeth Gaskell is rarely considered as a writer who was engaged with science, but once 'Cousin Phillis' is read in the light of periodical discussions of engineering, technology and nervous disease, a very different, highly intertextual narrative emerges. Scholars, exploring the range of reading of women writers, have often noted the absence of scientific texts *per se*, and concluded, therefore, that these writers were not interested in the domain of science. Once one considers the whole range of scientific debate opened to them by periodicals, however, the whole picture changes. Women writers, like the majority of men, would usually have gained their understanding of evolution, or other major scientific issues, not from primary texts, but discussions in periodicals. These would also range from popularising accounts to articles by scientists themselves: much of Henry Maudsley's psychological work, for example, was first published not in specialist scientific journals, but in the generalist press, before being collected together in book form. The sheer range of scientific ideas and debate available to the nineteenth-century woman reader has generally been wildly underestimated.

The following sections look at some of our initial findings relating to a cross section of periodicals: the comic journal, *Punch*, and the best-selling woman's magazine, *The Englishwoman's Domestic Magazine* of the early 1850s; the new fiction-oriented *Cornhill Magazine* of the 1860s, and W. T. Stead's pioneering *Review of Reviews* in the 1890s.

Punch

Punch, Or the London Charivari is undoubtedly one of the most celebrated and widely read of all nineteenth-century comic periodicals. By 1850, nine years after its launch, three-pence *Punch* was selling over 33,000 copies per week and enjoying a readership of at least five times this figure, and

throughout the 1860s it sustained weekly sales of 40,000.ⁱ Among the reasons for its success were its ability to maintain a respectable brand of humour and to make its readers laugh at themselves and their society, warts and all. Using a wide range of well-known literary genres—notably spoof news reports and proceedings, droll news commentary, cartoons—it managed to distance itself from its subversive early nineteenth-century ancestors and generate a style that, as Richard Altick has put it, was ‘so respectable a periodical that no lady, however modest, would blush to be seen leafing through it in the corner of her [railway] compartment’.ⁱⁱ *Punch*'s carping criticisms, droll commentaries, and eulogistic appraisals of the scientific theories and practitioners of the nineteenth century, as well as its particular interest in the bearing of science, technology and medicine on daily life and its readers, contain insights missing from more prestigious reviews and magazines of the period.

Most of the articles in the nineteenth-century volumes of *Punch* are anonymous or pseudonymous (although *Punch* artists usually signed their work), and many bear the signature of the fictional character for which the periodical was a mouthpiece—Mr. Punch. Inspection of ledger books in the *Punch* archives reveals that during the periodical's first decades, the contributors comprised a relatively close-knit group of male writers and artists, including William Makepeace Thackeray, Douglas Jerrold, John Leech, and Mark Lemon. It was not until the mid-1860s that *Punch* gained its first regular female contributor—the cartoonist Georgina Bowers.ⁱⁱⁱ

Given Mr. Punch's notoriety as a misogynist and wife-beater, we might expect to find that *Punch*'s representations of women and science are largely negative; a systematic survey reveals, however, a more complex picture. Mid-Victorian *Punch* certainly implicitly challenged the legitimacy and usefulness of women scientific practitioners, inventors or engineers. Yet it also offered explicit support for female medical practitioners, identifying such work as an extension of the 'domestic feminine' role, in line with the position adopted by Florence Nightingale and other contemporary campaigners for an extended sphere of female action.

Although *Punch* rejoiced in Elisabeth Blackwell's and Emily Davies's successful struggles to gain medical qualifications, it carefully highlighted the benefits to men would reap from such developments. Responding to news of Blackwell's attendance of medical lectures in Boston, it observed that she was ‘qualifying herself for that very important duty of a good wife—tending a husband in sickness’, while Emily Davies's receipt of a medical diploma from Paris was greeted with the observation that a wife with the skills of a physician was ‘a treasure indeed’, especially because she

would save the husband ‘the cost of those continual doctors’ who attend his ‘ignorant hypochondriacal wife’ (14 (1848),117; 30 (1856), 133). However, *Punch* also upheld medical training as an emancipating force for women, praising Blackwell and the ‘heroic’ Florence Nightingale as highly instructive examples to ‘young women’ who wasted their time reading novels and knitting (16(1849), 226; 28 (1855), 229).

Punch legitimated the new professional women doctors and nurses in terms of a redefined notion of the domestic feminine. Women doctors were developing their ‘natural’ vocation it argued, and because of their gentler nature and ‘softer voices’, would be able to deal with patients ‘as effectually as men’ (27 (1854), 104). It was not so enthusiastic about women’s role in the ‘harder’ sciences of physics, chemistry, geology, and mathematics. Although it accepted women’s roles as amateur geologists and botanists, it also gave space to some imaginary ‘strong-minded’ women correspondents whose pursuit of science was disrupting their romances and marriages (*Punch's Almanack for 1858*, vii). Women who made bold forays into the hard sciences were, in *Punch*’s opinion, usually out of their depth (*Punch's Almanack for 1844*, ii-iv). In 1856, for example, *Punch* published a spoof letter from a ‘Mary Ann’ who recounted her experiences of a lecture given at the Royal Institution by the *doyen* of experimental physics, Michael Faraday. Having read Miss Ann’s decidedly confused account of Faraday’s demonstrations of the correlation of physical forces, Mr. Punch chastised her as a ‘silly little girl’ who did not understand ‘one single link in DR FARADAY’S argument’ (32 (1857), 109). Elsewhere, *Punch* anticipated that women’s contributions to scientific discourses would only lower such esoteric ways of life to the level of the domestic and frivolous. Responding to news that women attended ‘social science’ discussions at the 1871 meeting of the British Association, it denied that ‘ladies are especially well qualified to deal’ with ‘practical discussions’ of any branch of social science. It added that the only ‘sciences’ suitable for ‘female harangues’ were those which would improve their financial and social standing: for example, the ‘Science of procuring from mysteriously-gifted people all kinds of concert, opera, and flower-show admissions as often as you want them’(61 (1871), 67).

There was, however, at least one aspect of Victorian scientific and technological culture to which *Punch* considered women particularly well adapted: the electric telegraph. The 1850s witnessed not only the rapid extension of aerial and underground telegraphs across Britain, but employment for women as clerks in the burgeoning number of telegraph offices. *Punch* maintained that young women

would enjoy this work because they were used to ‘talking as quick as lightning’, as well as spending all day ‘in questioning and answering’ (37 (1857), 100; 27 (1854), 76). Like many Victorian commentators, *Punch* also saw the telegraph as a way of disciplining the mind and body. In 1858, the year the first telegraph was laid across the Atlantic, it used this spectacular engineering accomplishment to turn women's garrulousness from a virtue into a fault: it insisted that economic need to reduce the length of messages transmitted through the Atlantic Telegraph was a ‘great economy in verbal expenditure’ that women should ‘imitate’ (35 (1858), 93). Nonetheless, *Punch*'s enthusiasm for women's role in this technology was tempered by its tacit assumption that invention was not something to be associated with women (see 20 (1851), 161).

In his numerous and vitriolic attacks on the apparently unscientific practices of quacks, astrologers, homeopaths, and spiritualists, Mr. Punch upheld his periodical as the foremost scientific journal of its day, and himself as a leading authority on scientific and medical matters (see 35 (1858), 163-4). Accordingly, ‘Dr. Punch’, as he occasionally styled himself, took it upon himself to expose and treat epidemics that appeared to be threatening the constitution of his good friend, ‘John Bull’. Given his strong interest in the oddities of British customs, it is not surprising that ‘Dr. Punch’ directed his medical gaze at those ‘insane’ fashions to which women appeared to be especially susceptible. He was particularly busy during the 1850s, when he published spoof ‘medical reports’ on the ‘diseases’ of ‘Potichomania’ and ‘Crinolineomania’—highly contagious forms of ‘insanity’ which he believed could be most effectively checked by ‘a course of wholesome ridicule’ (31 (1856), 283). In many ways, this first-person account from Mr. Punch developed scientific, technological, and medical analogies to women's habits and diseases that *Punch* had developed elsewhere in anonymous articles. Thus, in 1851, *Punch* ran a two-part article on ‘The Law of Domestic Storms’ which likened women to ships being agitated by volatile weather patterns, and men to the mariners who tried to steer such vessels away from foul weather. Domestic storms, like the meteorological variety, came ‘round at regular intervals’ and frequently produced showers (of crockery rather than fish), and the best way of saving the vessel was to take her out of her ‘stays’ and cut her ‘rigging’ (21 (1851), 185; 229).

The foregoing examples also illustrate *Punch*'s overwhelming tendency to represent women as passive subjects to be controlled and exploited by men. Men were seen as figures seeking control of feminine subjects, using restraints and ridicule (as we saw earlier), but also such strange new forces as electro-biology and mesmerism (1 (1841), 47; 23 (1852), 43-44). According to *Punch* a

society in which the power relation was reversed had, adopting a phrase used by the explorer David Livingstone to describe primitive African tribes, fallen into “frightful barbarism” (31 (1856), 252). Men were also shown to be controllers of feminised sciences and technology. At the height of the Crimean War, a spoof letter from ‘Chemistry’ identified herself as a ‘young female’ and a ‘science of recent origin’, but who wanted the government to let Faraday use her ‘tremendous powers of destruction’ against the ‘odious and brutal tyrant’, Russia (29 (1855), 44).

The Englishwoman's Domestic Magazine

Like *Punch*, *The Englishwoman's Domestic Magazine* (henceforth *EDM*) was undoubtedly the most successful mid-Victorian representative of its genre—the woman’s magazine. As Margaret Beetham has shown, this cheap (2d) monthly, founded and edited by the enterprising Samuel and Isabella Beeton, enjoyed a circulation (among predominantly middle-class readers) of approximately 50,000 and represents ‘a watershed’ between the ‘exclusive ladies’ magazines’ of the early nineteenth-century and the ‘popular women’s domestic journals’ that flourished during the 1890s.^{iv} Unlike *Punch*, however, some of the articles in the *EDM* were signed and a good proportion of all articles were by women. Among the signed articles with scientific, medical, and technological content were Nathaniel Hawthorne's sensational *Scarlet Letter* (6 (1857-8)) and several short stories by Edgar Allan Poe (including 'Collision with a Comet' which describes the globally catastrophic geological and chemical effects of a comet striking the earth, (7 (1858-9), 230-32).

Analysis of the SciPer index of the *EDM*'s first series (1852–59) complements Beetham’s perceptive study of the periodical, but also presents new insights into the way science features in the often competing forms of femininity promulgated in the periodical’s variety of literary genres. On the one hand, regular columns such as the ‘Sick Room and the Nursery’, 'Management of Household Pets', and ‘Things Worth Knowing’, gave practical advice on a range of domestic problems which was underpinned by a strong notion of domestic femininity as skilled practical work that could be learnt from the printed page. On the other hand, serialised fiction and poetry represented the older and more pervasive notion that domestic femininity meant leisure.

Generally speaking, the most commonly represented sciences in the *EDM* were, unsurprisingly, those in which women were already recognised as legitimate (albeit non-professional) practitioners, and those having the greatest bearing on the periodical's advice columns: botany, natural

history, ornithology, and medicine. With headings such as ‘The Sick Room and the Nursery’, ‘Things Worth Knowing’, and ‘Management of Household Pets’, we might expect these regular features of the *EDM* to be in the business of imparting mere recipes to their female readers. However, a close study of the scientific content of these articles illustrates the Beeton's interest in imparting not only useful advice for the kitchen, sick room, and garden, but the scientific rationale for such advice. Domestic work and its organisation was thus represented as more efficient and edifying when underpinned by sound scientific and medical principles. An 1853 entry in ‘The Sick Room and Nursery’, for example, explained that toothache could be relieved by sandwiching the tooth between pieces of zinc and silver, and then pointed out that the pieces of metal acted as a galvanic battery which produced sufficient current for the therapeutic effect. Similarly an 1856 item in the same column presented ‘Fifteen Rules for the Preservation of Health’ which included explanations of the chemical processes involved in respiration and the physiological basis for cleansing the skin (1 (1852-3), 317; 4 (1855-6), 287). Women reading such columns as ‘The Flower and Fruit Garden’, ‘The Sick Room and the Nursery’, and the ‘Management of Household Pets’ undoubtedly learnt a good deal of detailed practical advice, but they will also have gained a basic scientific knowledge of such topics as the natural histories of flowers, the classification of diseases, and the breeding and dietary habits of pets.

A similar argument can be made for other non-fictional material in the *EDM*, notably the essays. For instance, the long-running series ‘On the Rearing, Management, and Diseases of Children’, justified much of its practical advice and corresponding criticism of nurses’ ‘old wives tales’ with lucid physiological accounts of digestion, respiration, and circulation, and with taxonomic descriptions of diseases. Although Beetham suggests that the *EDM* sought to secularize the lives of domestic women and to offer them ‘domestic happiness rather than salvation’ (59) one can also discern a prominent natural theological thread running through the essays and other non-fictional pieces on botany, natural history, ornithology, and medicine. Here, the natural world, whether viewed with the unaided eye or the microscope, was deemed to afford proofs of ‘God's omniscient design’ (2 (1853), 30).

A survey of the *EDM* also reveals the operation of science, technology, and medicine across a range of literary forms. Medical practices were not only promulgated in the regular advice columns, but discussed and challenged in essays, and given prominent places in the plots of several short stories. Similarly, the dangers and mysteries of alchemy can be found in a short epigram, in the non-fictional introduction and main body of a short story about the Rosicrucians, and in a serialised

version of Hawthorne's *Scarlet Letter* (1 (1852-3), 117; 6 (1857-8), 265-71, 302-8; 2 (1853-4), 229-38). Inter-textual links can be located with the more topical practices of mesmerism, whose alleged powers of perception and therapy are debated in book reviews, essays on dreams and on women's association with occult powers, and in a short story describing the use of clairvoyant powers to locate hidden treasure (3 (1854-5), 275-78; 4 (1855-6), 349-50, 373-4; 5 (1856-7, 345-9; 6 (1857-8), 150-6).

In place of the customary biographies of great scientists to be found throughout the periodicals of this era, the *EDM* offered its own series of biographies of the **mothers** of famous scientific practitioners (including Isaac Newton, Georges Cuvier and Adam Smith), thus ingeniously preserving scientific practice as a male domain, whilst also allotting women a major role in its creation. 'Notes to Correspondents' enable the Beetons to be more directly helpful with readers who seek to cultivate their scientific interests. In 1853, for example, they direct one correspondent with an interest in astronomy to John Herschel's *Outlines of Astronomy* (1843). Science, for the Beeton's, appears a legitimate sphere of female interest, as long as it remains outside the public and professional domain.

The Beetons allowed debate on a number of scientific and medical questions, and none was more revealing than the coverage of medical education for women. In stark contrast to *Punch*, the majority of the articles on this topic firmly condemn the training of women as physicians: medicine is the 'most revolting' profession practised by women, and must be destructive of 'female modesty and reserve'. The very qualifications that render women 'invaluable' as nurses, 'unfit them to be physicians or surgeons' (3 (1854-5), 74-9). Such arguments were directly contradicted, however, a few years later by an article praising medical reforms in America where 'woman may take her position side by side with man' and calling for the establishment of 'A College of Female Physicians' (7 (1858-9), 11-14). Even the writers who were horrified by the idea of female physicians nonetheless joined in the adulation and praise heaped upon Florence Nightingale. As in *Punch*, nursing was seen as a legitimate sphere of female action, building upon woman's tender, caring qualities, but it also figured as the perfect combination of femininity and science: Nightingale is seen to be 'endowed with literary and scientific tastes in a remarkable degree', whilst another article notes that nursing training should consist of 'grafting the principles of science on the natural tenderness of woman' (3 (1854-5), 243-4; 4 (1855-6), 333-5).

Cornhill Magazine

The *Cornhill*, founded in 1860 by the publisher George Smith and under the initial editorship of Thackeray, was primarily a literary-oriented magazine. From the start women writers were well represented, the first volume containing 'Curious if True' by Gaskell, Charlotte Brontë's last fragment of a story, 'Emma' and articles by Harriet Parr, Anne Ritchie, and Eliza Lynn Linton. It was later to publish Eliot's *Romola* (1862-3) and Gaskell's 'Cousin Phillis' (1863-4) and *Wives and Daughters* (1864-6). Perhaps contrary to expectations, there was also a strong overt scientific presence in the early volumes, with G. H. Lewes publishing his *Studies in Animal Life* in the opening numbers. Following Thackeray's resignation in 1862, Lewes took over as the magazine's consulting editor until 1864, ensuring a continued engagement with science, including his own 'Notes on Science' column which he co-authored with John Herschel.

Some of the most fascinating material uncovered by the 'SciPer' index lies in a form of hybrid article, where fiction and scientific analysis intersect. These articles reveal that concerns over the implications of Darwin's recently published theory of evolution by natural selection intersected with fears over female education and the growing power of women in society. In particular, these articles show a concern with women's reading (also evident in Gaskell's *Cousin Phillis*), and medical education. In "A Vision of Animal Existences", written by Edmund Saul Dixon and published in the March 1862 number (vol. 5), the middle-aged male narrator rests in the refreshment-room of the Zoological Gardens, where he notices a thoughtful, middle-aged lady engaged in reading a 'thick volume' (clearly Darwin's *Origin*), and accompanied by a young boy who amuses himself with a box of toy animals, 'knocking them together, to try which was the strongest, and then throwing the fragments away, only keeping such of the wooden effigies as were able to resist the shock' (311). The boy's symbolic activity leads into his reflections on nature, and complaints that , a 'knot of French professors and English imitators', with their visions of a world of 'incessant change' have presumed 'to take the reins out of Nature's hands' (312). At this point the article enters into the domain of fantasy: the lady reveals the 'classical Phrygian cap' of the French revolutionaries beneath her bonnet, and hands the narrator a card "'inscribed with my name and official title [...] NATURAL SELECTION! ORIGINATOR OF SPECIES!'". The boy too introduces himself as "'STRUGGLE-FOR-LIFE, sir, at your service'". (313) In the form of a dialogue the two direct the astonished narrator through the

evidence for 'descent' and 'genealogy'. Asserting that there "'is no purpose'" in nature (316), the lady assures the still bewildered narrator that Nature is a genealogical tree, and that she and the boy are 'the gardeners who train its growth' in accordance with 'relentless and inflexible' laws (317). The narrator's response is instantly to apply these laws from the 'world of brutes' to that of men: the 'milder qualities of humility, forbearance, modesty, [and] self-denial' will be condemned to extinction. 'The future which you promise', he comments, 'is not cheering. Strength is to prevail throughout' (317). At this point, however, the narrator realises that he had fallen asleep and has in fact been 'dreaming' the entire narrative. Upon leaving the refreshment-room he asks the now bonneted lady her opinion of Charles Darwin's book, and she replies that it 'is conscientiously reasoned and has been patiently written. If it be not the truth, I cannot help respecting it as a sincere effort after truth'. (318) The narrative reveals an extraordinarily dense engagement with questions of natural selection, evolution, and gender. The traditional, benign associations between woman and nature take on quite different connotations once nature ceases to be a demonstration of God's order and care, and becomes instead a world where inflexible laws and brute strength prevail. Demure, bonneted middle-aged ladies are revealed to be revolutionary incendiaries in disguise, upholding the necessities of aggression and dominance. Perhaps the most disturbing element of the entire article is the transformation of 'Natural Selection' back into her original non-threatening form, and her sincere praise of Darwin's work for its conscientious questing after truth. Such questing in a woman reader, however, transforms our visions of virtuous motherhood.

A further fictionalised exploration of these themes occurs in Richard Ashe King's 'A Tête-à-Tête Social Science Discussion' in the November 1864 number (vol. 10) which links concerns with Darwinism to the 'surplus woman' question. The narrator, a Mr. Byng, already depressed by the prospect of the 'speedy exhaustion of our coal-pits', returns home to find his wife giving birth to their ninth daughter (569). That night, his depression at having failed to produce even a single son, gives rise to a dream in which he and his statistically-minded friend Mr. Croaker are 'at the bottom of an exhausted coal-pit, both starving with hunger, when suddenly out of the darkness rustled legions of monstrously crinolined women', who throw screaming female babies at the starving men (570). The 'Phrygian cap' has been replaced by the 'monstrous' crinoline, but the effects are even more disturbing. The dream leads on to discussions between Byng and Croaker concerning the 'increase of women' over men, which, in the likely event of 'a general European war', would produce a 'disproportion' that that

would eventually 'grow to two and one-eighth to one' (572–73). While other cultures would simply do away with 'the surplusage of our female infants', the two men agree that, as Christians, they 'must not interfere with the course of nature, however strange and vexatious it may be' (572). Instead, they consider how women could be made less dependent upon marriage by improved female education, especially in medicine. Croaker, however, protests that, in his experience, medical students do not do 'anything but smoke and drink [...] How any man in his senses would put his daughter into such a profession as this, I can't conceive'. He insists that 'talk about women's rights [...] is so degrading to the sex. Most degrading. You are all trying to make her out the missing link between the gorilla and man'. In response to those who argue that an educated woman would be more 'masculine' and hence more 'perfect' he suggests, facetiously, that there is an opportunity 'for giving Mr. Darwin's theory a trial. There comes a great plenty of women, and a great dearth of womanly employment. Press as many as are qualified into male employments, you cry. Then, if natural selection only acts as Mr. Darwin promises, the weak, puling, dependent class of women perish, and the strong-minded, enterprising heroine will have the honour of transmitting to posterity a very much improved type; so that, if all goes well, we shall travel in a circle, and get round to the amazons again'" (578–79).

As these articles show, concerns with gender were *definitely* part of the general fears engendered by Darwinism. Such fears were often expressed in extremely imaginative ways, in forms of articles that have usually been neglected by historians looking only at strictly non-fictional pieces. By giving an index for the entire magazine, 'SciPer' also allows cultural historians interested in gender to contextualise fictional representations of gender with more explicitly scientific writing that was being published in the same journal. For example, representations of female insanity in Thackeray's *Denis Duval* (vol. 9) (where the Countess de Saverne falls into a post-natal madness resembling that of Thackeray's own wife) can be set alongside the discussion of female insanity in "A Visit to a Convict Lunatic Asylum" (vol. 10) by William Gilbert, in which John Lush, the principal of Fisherton House Asylum, draws attention to the peculiar fact that while there are many 'flowers and shrubs in the airing-ground of the dangerous male convicts', the 'women destroy every one the moment it shows its head above the ground'. He attributes the women's behaviour 'possibly to that reversion of feeling and natural tastes that insanity so frequently causes' (457), creating yet another, destabilising model of women's relations to the natural world.

Within the space of the magazine, non-fictional representations of women are often contested implicitly in fiction and poetry, genres which provide a space for women writers, but which are often considered by literary critics in isolation and not in relation to the material that was originally published alongside them. For example, George Eliot's novel *Romola*, with its portrait of its large-souled, highly intelligent heroine was being serialised at the same time as G. H. Lewes and Herschel's "Notes on Science" (vol. 7) which explores recent findings concerning the larger size of the male brain. The article discusses in an even-handed way the accumulation of scientific evidence concerning the larger male brain, but refuses, finally, to concede that such evidence confirms female intellectual inferiority. Evidence is still wanting to show that size and intellect are causally related (278). The authors acknowledge that, although we must 'grant that in the purely intellectual activities woman is, as history seems to prove her to be, on the average inferior to man, though often individually superior', when looking at the brains of the two sexes 'the mere estimate of size is too general for any particular conclusions' to be drawn. Eliot's exploration of female intellectual aspiration takes place in a cultural context where science is pressing increasingly to confirm traditional views of female inferiority. Lewes and Herschel's article, in its turn, with its distinctive refusal to accept a correlation between brain size and intellect, is clearly in dialogue with Eliot's text. The Sciper database, with its foregrounding of the intertextual connections between different genres within the periodical frame, will add greater cultural depth to our understanding of both the fiction and the gendered scientific debates of the nineteenth century.

Review of Reviews

Edited by the crusading journalist W T Stead, the *Review of Reviews* was an organ which was very supportive of female suffrage in the 1890s. 'SciPer' provides the only index of this extremely important late-century periodical, and shows how its pro-women coverage interacted with its treatment of science. In 1892 (vol. 6), for instance, it reports that the decision of the University of St Andrews to admit women to 'everything ... has had some curious results'. Sir James Crichton Browne, the lunacy specialist, had been prompted to deliver a lecture on the physiological inferiority of women which is treated in fine sardonic fashion. According to the 'exquisite phrase' of Crichton Browne, "that which has been settled millions of years ago by the prehistoric protozoa, from whom we

are supposed to be descended, cannot be reversed by Acts of Parliament or the resolutions of Women's Righters".

the *Review* makes great play with 'this doctrine of the infallibility of the remote protozoa', suggesting that although women are 'not able to do everything [...] equally with the protozoa of the pre-historic ages they have a right to decide and to influence, so far as they can, the shape of their brain convolutions. The process is slow, but every little counts, and a full-grown woman has at least as much right to decide the shape of her own brain as those of interesting protozoa who are elevated to the rank of scientific substitute for God Almighty' (74). The *Review's* proto-feminist stance gives it a highly unusual scepticism towards the pretensions of science. Whilst not challenging science itself, it exposes the vested male interests which lie behind so many of its claims. In similar vein, the 1893 volume (vol. 8) relates how the 'Royal Geographical Society made itself ridiculous last month by deciding that women should not be admitted to be Fellows on the same footing as men' (125).

The *Review of Reviews* gives a high profile to female scientific practitioners and writers who are often neglected in other sources, noting the achievements of the geologist Maria M Ogilvie Gordon (8), the Harvard astronomers Williamina P Fleming and Antonia C de P P Maury (5), the mathematician Sonya Kovalevsky (3), and Mérie M Dowie, the 'granddaughter of Robert Chambers', who in 1890 delivered a paper on her explorations in the 'out-of-the-way' Carpathian mountains to the Geographical Section of the British Association, which, far from being considered 'unwomanly', was received enthusiastically, it reports, by 'the Parliament of Science' (2). The *Review* also gives a biographical account of the Fawcett family which begins by noting that for many people 'the event of the month has been the placing of Miss Phillipa Garrett Fawcett, in the great contest of the mathematical year at Cambridge, "above the Senior Wrangler"', and details the education of 'the Lady Senior Wrangler' by her mother Millicent Fawcett, who has brought to the patriarchal world of politics 'a mind which may be called mathematical' and 'meets the Home Ruler with statistics of the cattle trade' (2).

A particularly remarkable article showing the relations between gender and science is 'Vaccination Against Asiatic Cholera. By a Lady Who Has Been Vaccinated' by the pseudonymous A. T. G., 'an American lady who has shown her faith in Pasteurism', which appeared in 1893 (vol. 7). The female author recounts how she put herself forward to be treated with the experimental

inoculation because although 'a number of men had been inoculated successfully with cholera, there was necessarily a doubt about the effect it would have upon women'. She then describes her visit to the Institut Pasteur, and the curiosities revealed in the laboratories there, before offering a diary of her symptoms following injection, with 'discreet little pains' growing 'until getting up and sitting down become matters of serious reflection, especially when your family and friends have no idea that you have been trying to do the heroic'. Such an intrusion into the masculine sphere of medicine is to be kept hidden, it seems, from friends and family. The article concludes, however, with a request to the public to lend similar assistance to the experimental research of Dr Haffkine, so that 'cholera may be stamped out within the next few years'. Women, then, were able to write on the very latest scientific and medical issues in the *Review of Reviews* in the 1890s. Although this writer is still a subject of science, rather than its creator, she casts herself, significantly, in the role of active agent, seeking out the laboratory, and then creating the necessary levels of public support. By exploring the entire range of intersections between gender and science within the *Review*, and other 1890s magazines, the SciPer index will transform our understanding of gender issues in this era.

Overall, we hope that the SciPer index (and linked publications) will offer a complete remapping of our understanding of the role of science in nineteenth-century literary and cultural life. In the domain of gender, it will offer further insight into the explicit debates around women and science, and into the more subtle ways in which gendered imagery is employed within scientific discourse. It will also explore the ways in which women writers engaged with contemporary scientific debates, and show, through detailed readings of entire runs of periodicals, the range of intertextual debate and exchange supported by the periodical format. With its sophisticated search capacity, the database should enable researchers across the entire field of nineteenth-century gender studies to find new material relevant to their particular needs. Science, understood in its broadest sense, permeated nineteenth-century culture, and nowhere is this more true than in the domain of gender. To maintain that nineteenth-century women, whether as writers or readers, lived largely in cultural isolation from the world of science, is to perpetuate one of the most misleading myths of the Victorian age.

The SciPer project is run jointly by the Department of English Literature, University of Sheffield and the Division of the History and Philosophy of Science, University of Leeds. For further details consult our website, www.sciper.leeds.ac.uk, or contact:

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ⁱ Circulation figures are taken from Richard Altick, *Punch: The Lively Youth of a British Institution 1841-1851* (Ohio: Ohio State University Press, 1998), 38, and Alvar Ellegård, *Darwin and the General Reader: The Reception of Darwin's Theory of Evolution in the British Periodical Press, 1859-1872* (Chicago: Chicago University Press, 1990), 380.

ii. Altick, *Punch*, op. cit. (i), 41.

iii. M. H . Spielmann, *The History of "Punch"*(London: Cassell & Co., 1895), 529.

iv. Margaret Beetham, *A Magazine of One's Own: Domesticity and Desire in the Woman's Magazine, 1800-1914*, (London: Routledge, 1996), 59.