

*“With Fry Innumerable Swarm”: reading
Milton as intertext in nineteenth-century
popular science*

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CHAPTER XX

“WITH FRY INNUMERABLE SWARM”: READING MILTON AS INTERTEXT IN NINETEENTH-CENTURY POPULAR SCIENCE

ALISON E. MARTIN

“Forthwith the sound and seas, each creek and bay, / With fry innumerable swarm” quoted Philip Henry Gosse at the opening to a chapter on jellyfish, spiny cockles and sea worms in *The Aquarium: An Unveiling of the Wonders of the Deep Sea* (1854, 210). A ‘popular’ account of the flora and fauna of the seaside, this work abounded with literary references, not just to Milton’s *Paradise Lost* (1667), which brought these texts into dialogue with Gosse’s own reflections on the abundance of deep-sea life and the wonders of creation. Published in London by John van Voorst, who specialised in natural history, *The Aquarium* was an immediate success. The lure of the seaside to the Victorian middle classes as a place of leisure and learning had stimulated an upsurge of interest in marine natural history, amply fed by a range of works aimed at non-specialist adult and child readers alike (Allen 1976, 118ff.). With its high price-ticket of 17 shillings, due to its many coloured and black and white pictures, Gosse’s *Aquarium* was scarcely a pocket money purchase. But as the *Christian Remembrancer* enthused, its illustrations were “of ravishing beauty, quite miracles of tinted lithography,” and complemented well Gosse’s “reverential style” which made this work attractive “to the scientific and popular student” (Anonymous 1854, 260). This work therefore derived its vibrancy as much from the coloured plates and engravings as from Gosse’s flair for scientific description, interwoven with intertextual references from the Bible and the British literary canon. But mixing molluscs and Milton was not a stylistic device typical only of Gosse. Mid-nineteenth-century books on marine biology were particularly rich in allusions to Milton’s works. *Paradise Lost*, which described the emergence of landmasses out of the oceans at the Creation, was an obvious source of reference, as to a lesser degree were the masque *Comus* (1634), in which the water-nymph Sabrina frees the steadfastly virtuous “Lady,” and the pastoral elegy

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Lycidas (1638), written in memory of a learned friend drowned off the Welsh coast.

Gillian Beer observes that “Milton, Wordsworth, and to a surprisingly lesser extent, Shakespeare” were the three British poets and dramatists most frequently quoted in Victorian scientific writing (1996, 211). As the sciences underwent profound changes in the course of the nineteenth century, not least as they grew increasingly professionalised, this “mixed economy of old and new methods, and the uncertainty of public appreciation,” Beer notes, caused writers to have frequent recourse to shared, “safe” forms of language and allusion (2012, 467). These were traditionally found in classical literature, the Bible and works from the British literary canon, notably by Milton. The common language used by nineteenth-century scientists was therefore forged out of past literatures, and drew on those works common to a generation of men schooled in the classical tradition. Their writing, Beer argues, fostered “a benign continuity for scientific enquiries with the imaginative past of human society,” thereby strengthening the link with texts we would now classify as firmly “literary,” and a congruity with poetry, “perceived as the authoritative utterance within common language” (1990, 83). But the new theories that some scientific writers of the Victorian period wished to propose would have appeared to more conservative readers anything other than “benign”. As James A. Secord has noted of the geologist Charles Lyell’s writings on the earth as an ever-changing planet, divisive issues “were introduced in measured prose, with quotations from Horace, Ovid, Pindar, Pliny, Virgil, Thucydides, Dante, Milton, and Shakespeare” to make the conceptually problematic more palatable to a British readership (2014, 162). Scientists therefore referred readers back to familiar texts and to the authoritative language of canonical literature as a way of allaying greater anxieties about new understandings of the universe.

Works such as Gosse’s *Aquarium* drew actively on Britain’s literary heritage as a means of perpetuating cultural memory in strikingly modern works of Victorian science. Literary and cultural historians working on the relationship between literature and science have increasingly turned towards an exploration of what Gowan Dawson has termed “the cultural embeddedness of science,” arguing that science writing has neither been value free nor operated outside of cultural influences, but rather has raised “important questions regarding the production of meaning and the transmission of knowledge” (Dawson 2006, 302-3). Ground-breaking work by George Levine has highlighted how the construction of Darwin’s arguments and the nature of his language—vividly descriptive, brimming with exclamations of wonder and alive to the power of metaphor—were

key to the power of his prose (Levine 1991, 2011; also Beer 2000). The young chemist Michael Faraday, urgently seeking to improve the rhetorical power of his own writing, actively extended his reading to include a number of literary sources, including Milton, Pope and Thomson, to develop his powers of expression and persuasion (Jenkins 2008, 31). In a wider study of Victorian science, Alice Jenkins has also highlighted how scientists were keen to use literature to tie new ideas into an “older matrix of cultural references” (2007, 24-5) as part of what she has more generally termed the “uncontrollable nature of the processes of cultural borrowing, appropriating, half-digesting, and half-comprehending, processes that respect no boundary of disciplinary dignity,” processes which “turn literature into science, science into literature, and all into the fertile culture of a society with widespread literacy and access to publishing” (*ibid.*, 142). It is precisely these processes of borrowing, appropriation and (half-)digestion that characterise the intertextual layering which brought Milton into dialogue with the authors of British marine natural history. Such intertextual references do not always represent moments of great narrative artistry. But their recurring presence in a genre widely read by both adults and children suggests they are an important, if hitherto overlooked, facet of nineteenth-century British readers’ wider engagement with Milton as a cultural and literary icon.

How exactly did Victorian readers interpret the Miltonic references woven into works as varied as Gosse’s *Aquarium*, the anonymously authored *Wonders of the Sea-Shore* (1847), William Henry Harvey’s *The Sea-Side Book* (1849), David Landsborough’s *Popular History of British Seaweeds* (1851) or Robert Fraser’s *Ebb and Flow: The Curiosities and Marvels of the Sea-Shore; A Book for Young People* (1860)? How did they make sense of this interplay of present and past that was also bound up with the presentation of scientific knowledge as part of a specifically British cultural identity? And who exactly belonged to this imagined community of readers confronted with the complexities of literary quotation, allusion and influence at the same time that they were seeking to identify specimens of the aquatic world? Astrid Erll draws on a useful distinction made by Jeffrey K. Olick that cultural memory operates on two different levels, namely one “that sees culture as a subjective category of meaning contained in people’s minds and one that “sees culture as patterns of publicly available symbols objectified in society” (in Erll 2010, 5). While it is difficult to restore those subjective categories of meaning which were generated by readers as they turned the pages of *The Aquarium*, it is easier to investigate how the embedding of Miltonic references into texts like this can be understood within the context of Milton’s works as

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“publicly available,” canonical cultural objects. As Matthew Bradley and Juliet John have recently reminded us, while capturing the essence of the reading process still remains something of a “problematic empty centre” in scholarly discourses, some of the greatest advances in our understanding of nineteenth-century reading have come from those interested in the material facts of books and their history (2015, 5-6). Viewing cultural memory as a kind of “working memory” (Assmann 2010, 97, 100), constantly being redistilled through reading, quoting and commenting on it, enables the cultural capital of Milton’s writing to be continuously reaffirmed. Understanding cultural memory as a form of social memory *pace* Roland Posner (1991) also enables culture to be investigated as a three-dimensional framework that comprises social aspects (such as people, social relations and institutions), material aspects (the very books themselves) and mental aspects (culturally defined ways of thinking).

In what follows, we shall be looking at how Milton’s work resonated through the writing of early Victorian science, and how these references could have been interpreted by a ‘popular’ readership. While Landsborough’s work on seaweeds was aimed at an adult audience, its reference to six named female algologists and conchologists (1857, v-viii) meant that it actively courted female readers’ interest and its chatty tone and 22 illustrations meant that it was a more broadly engaging work for the general reader. Harvey’s *Sea-Side Book*, priced at just 5 shillings in its second edition, boasted 69 illustrations that similarly aimed to make its subject matter visually vibrant to a wide audience. Published by the Society for the Promotion of Christian Knowledge (SPCK), the *Wonders of the Sea-Shore* also sought imaginative rapport with its readers who accompanied the anonymous author on “our excursions” to the coast, and was reviewed as “conveying to the youthful mind real facts more wonderful than fiction” (1849, 421). Fraser’s *Ebb and Flow* was very explicitly marketed as “profusely illustrated, neatly printed, and cheap,” and “well adapted for a school prize or present to young people” thus presenting it as a work which the young reader could aspire to own (1860, back material). This chapter starts by examining the material presence of Milton’s writing on the book market, analysing how the various editions were tailored to different readerships, and reflecting on how works such as *Paradise Lost* sustained their position in the British cultural memory as classical, canonical texts. It is, however, worth bearing in mind the potential disjuncture between envisioned audiences and actual buyers and readers: works written for children were also read by adults, since the sociability of reading practices meant that what was read aloud to children would also automatically be “consumed” by parents (Fyfe 2000, 286).

Moreover, some children could well have learnt their science from books intended for adults, and working class readers were attracted to children's books by their low price (*ibid.*, xi-xii). In a second section, we analyse nineteenth-century experiences of reading Milton to understand the motivations for tackling a reading of his poetry. We then examine in a third section how the intertextual references to Milton's writing transmuted its form and content to generate new meanings and extend the reach of marine natural history beyond the bounds of purely factual scientific narrative.

Publishing and Reading Milton: "The Text-Book of a Nation's Feeling"

As Herbert Graces has noted, "almost all nineteenth-century histories of English literature will reveal that their hierarchical canons are meant to disseminate moral values and great pride in long-standing national excellence in order to foster national unity and identity" (2010: 314). Milton's inclusion in the British canon was no exception. Throughout the Victorian period, James G. Nelson has noted, Milton was a national figure who aroused strong feeling, "loved by many, hated by some, but ignored by few" (1963, 12). Thomas De Quincey, writing in *Blackwood's Edinburgh Magazine* in 1839, had described *Paradise Lost* as "not a book amongst books, not a poem amongst poems, but a central force amongst forces" (1839, 777), thus lending this work a supranational, classical status. The article "On Poetry in General," also published in 1839, which appeared in *Dearden's Miscellany*, was more concerned to see Milton's achievements in a national light: "in descriptive poets of all ages are contained lovely and melodious passages, which form the text-book of a nation's feeling . . . ; the night scenes in Homer and Milton, the 'mediations, fancy free,' of our beloved Shakspeare [sic]; the deep droppings of music from the lips of our venerated Wordsworth" (Anonymous 1839, 2). Where De Quincey had placed Milton in a category of his own, here Milton was located within a wider corpus of "reusable," re-iterable texts which collectively offered a sense of stability, durability and tangible cultural self-image. Written in English, rather than Latin, *Paradise Lost* had also, by the Victorian period, come to be seen as "poetry fit for empire," as Britain rapidly developed into a colonizer and exporter of culture in her own right (Zwierlein 2011, 671).

Echoing the title of Joseph Wittreich's recent work *Why Milton Matters* (2006), this chapter asks why Milton "mattered" to nineteenth-

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century readers, not only in terms of his prosody, diction and syntax, but also in terms of his imagery, themes and preoccupations. The British book market was already awash with single and multivolume editions of Milton's writing by the start of the nineteenth century. Archdeacon Henry J. Todd, who produced a seven-volume *Poetical Works of John Milton* in 1809, recorded 114 British editions of Milton prior to 1800, and 18 just in the nine years previous to the appearance of his own edition. Milton's *Paradise Lost*, which forms the main body of the intertextual references found in the marine natural history writing explored here, was one of the most commonly re-edited books in the nineteenth century, with thirty-nine British (and almost as many American) editions appearing between 1801 and 1860 (see Stevens 1930: 66-99). The appearance of these different variants was justified by publishers through the inclusion of new engravings, details of Milton's life, the addition of related texts from scripture, explanatory notes, and, in the case of "*Paradise Lost*, a Poem in Twelve Bucs. By Jon Miltun. Lundun," an entire reworking of the text in phonetic spelling (Pitman 1846). This was also the period in which Milton's life as a writer and public persona was being reflected upon more intensely: Todd's own *Life of Milton* appeared in 1801, followed by Charles Symmons' competing edition in 1806 and John Mitford's *Life of John Milton* (1851) and later versions by Douglas Hamilton and by Thomas Keightley in 1859. As the nineteenth century saw a shift from books being enjoyed solely at home to being incorporated into school teaching (Alderson and Immel 2009, 384), so Milton increasingly entered the corpus of texts read in school. Thomas Goodwin, Headmaster of the Greenwich Preparatory School, produced *The Student's Practical Grammar of the English Language* (1855) subtitled "Together with a Commentary on the First Book of Milton's *Paradise Lost*," which offered a grammatical treatment of passages from Milton's work that became an increasingly common way of exposing children to his writing in the mid-Victorian period.

The publisher Longman and his trade associates offer an interesting case study of the dynamics of publishing Milton's writing in early nineteenth-century Britain. Todd's multi-volume *Poetical Works of John Milton* (1801), on sale for the princely sum of two pounds and 14 shillings, "traversed the regions of our English Parnassus with a discriminative eye and a discerning taste," according to an enthusiastic reviewer in the *Monthly Mirror*, to produce a work satisfactory even to the greatest admirers of Milton, for "their favourite never has been introduced to the British nation in so advantageous and satisfactory a manner" (Anonymous 1802, 249). Todd's *Poetical Works* remained popular for the next forty

years, enjoying a reprint of 1000 copies in July 1826, with a fourth edition in July 1842 running to 750 copies, and in November 1851 a fifth edition with a similarly large print run of 750 (Longman Impression Books, MS 1393/1, H11: 124, H14: 243). At the same time that Todd's six-volume work was consolidating its position in the market, so too was the four-volume *Poetical Works of John Milton*, originally by Samuel Johnson, and re-edited and prefaced with an essay by the non-conformist physician John Aikin, which likewise appeared in big print runs of 1500 copies in February 1801 and December 1807 (Longman Impression Books MS 1393/1, H5: 2, H6: 77).

Volumes of Milton's writing which sold in series appear to have been particularly popular with readers, presumably because of the motivating impulse to continue buying the series as it expanded, as well as the aesthetic satisfaction of collecting books bound and presented in a similar fashion. In the "Walker's British Classics" series, Milton's *Poetical Works* had an enormous print run of 5000 when it first appeared as a handily sized duodecimo in June 1818, followed by a further 5000 in October 1822 (Longman Impression Books MS 1393/1, H6: 120, 193). Although Longman and associates clearly had a firm grasp on all things Miltonic appearing on the British book market, the ruthless publisher Henry Bohn was undeterred. Despite entering the market relatively late, he produced *Milton's Works, Both Prose and Poetical* (1847), with an introduction by Robert Fletcher, priced at one pound one shilling, boasting in the back pages of his catalogues, "This is the only complete edition of Milton's Prose Works, at a moderate price". Twenty years later he produced a work purporting to draw on all previous key editions—including James Montgomery's two-volume *Poetical Works of John Milton. With a Memoir, and critical Remarks on his Genius and Writings* (Tilt and Bogue, 1843) that had gone on sale in a cloth binding for 24 shillings and a deluxe Moroccan leather edition for 34 shillings. Bohn, with a good eye for business, brought out what he presented as the most authoritative edition around, comprehensively titled the *Poetical Works of John Milton, with a Memoir and Critical Remarks on his Genius and Writings by James Montgomery, and One Hundred and Twenty Engravings [...] With an Index to Paradise Lost: Todd's Verbal Index to All the Poems; and a Variorum Selection of Explanatory Notes* (1861). Priced at just five shillings per volume, it sharply undercut the competition and made Milton accessible to a mass audience.

While adult editions of Milton's writing were clearly becoming ever more affordable, attractive and accessible through the addition of notes and indexes, historical accounts of children's literature have largely

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ignored editions of Milton. Indeed, Harvey Darton's seminal *Children's Books in England: Five Centuries of Social Life* (1958) contains no references to his works at all. Yet as Lee A. Jacobus reminds us, *Comus* could well be thought of as children's literature given that the leading role and two important supporting roles were actually written as children's parts (1973, 67). As Joan F. Gilliland has demonstrated, young people's editions of *Paradise Lost* did in fact proliferate in England in the nineteenth century (1985, 26-7). While by the end of the eighteenth century, attempts were being made to establish separate poetic and dramatic canons for children and the appropriateness of giving adult poetry to children was being queried (Grenby 2011, 118-20), glosses such as the Anglo-Irish educationalist Richard Lovell Edgeworth's *Poetry Explained for the Use of Young People* (1802) were making Milton seem altogether much more accessible for younger readers. In his *Essays on Professional Education* (1809) Edgeworth noted that among "our classical English authors" Milton was "here and every where preeminent: It is unnecessary to name with feeble applause those beautiful parts of *Paradise Lost*, which are impressed on the mind of every reader of taste and feeling" (1809, 93). He was, however, swift to add that "[i]t is by no means advisable to insist upon the young reader's going regularly through the *Paradise Lost*; he would be tired and disgusted, and would probably conclude, that he had no relish for good poetry" (1809, 93).

Sarah Siddons was less cautious in recommending Milton as suitable reading matter for children. In the preface to her abridgement of *Paradise Lost* as *The Story of Our First Parents, Selected from Milton's Paradise Lost: For the Use of Young Persons*, which appeared with the London publisher John Murray in 1822, she stressed the possibility that Milton offered of combining "the sublime and beautiful" as "an approach to virtue" (1822, iii). By cultivating an early admiration of Milton in her young audience, she aimed to make a reading of *Paradise Lost* less a duty than a pleasure, precisely because of the human interest aspect the work had to offer. While her assertion that the 190-page volume was "calculated to offer occupation and amusement for four evenings" seems rather ambitious, she was aware of the difficult nature of her task, given how tiring Milton's complex prose could be on "the young attention of my auditors" (1822, iv). Not all Siddons's reviewers were convinced of this new departure into children's literature. The *Literary Melange* of 1822 admitted that "if our children are to be familiarised with Milton, we consider the present method far better than the common one of short and disconcerted extracts, such as are found in our common school anthologies [sic]," but notwithstanding these achievements it voiced grave "doubts as

to the propriety of the proceeding altogether” (1822, 413). In a playfully vicious mode, *The London Magazine* asked:

Could Mrs. Siddons take poor Milton, and thus “first cut the head off, and then hack the limbs?” Could she thus snip up the sublime and beautiful into what Dr. Kitchener would call thin “slices”? Could she really condescend to become an authoress on the strength of an eighteen-penny copy of *Paradise Lost*, and a pair of scissors? (1823: 216)

Milton, that great national treasure, was clearly not to be trimmed, truncated or generally trifled with.

Reading Milton: “Returning Day after Day to Devour the Contents”

While different editions of Milton’s writings obviously existed that were tailored to different readerships, they were clearly also read with rather different motivations in mind. Milton was certainly present in many homes, whether in the “resplendent bindings on the same shelf with Shakespeare and Milton and *Pilgrim’s Progress* and *Robinson Crusoe* in the bookcase that stood in the dining room” of the middle-class family (Cruse 1962, 17) or in working-class households which, besides the Bible, would have had owned religious classics by Bunyan and Milton but perhaps little else (Vincent 1981, 110). Tangible records of reading *Paradise Lost* that do remain are striking for the readership to which Milton appealed. The Lanarkshire shoemaker’s daughter Janet Hamilton, was clearly yearning in the late 1790s for education as a source of inner fulfilment (Boos 2012, 65) when she took up her copy of Milton’s *Paradise Lost*, which she discovered in a similarly working-class setting:

I do not remember when I became mistress of the alphabet, but I read Bible stories and children’s half-penny books with eager delight before I was five years of age. When about eight, I found to my great joy, on the loom of an intellectual weaver, a copy of Milton’s *Paradise Lost* and a volume of Allan Ramsay’s *Poems*. I carried them off in triumph to the kitchen, returning day after day to devour the contents. I soon became familiar with, and could appreciate the gorgeous sublimity of Milton’s imagery, and the grandeur of his ideal conceptions. (1870, vii)

Milton’s *Paradise Lost* was therefore a text to be savoured and read intensively, and it was its imaginative and rhetorical power that appealed to Hamilton. Likewise Samuel Bamford, the Manchester cotton spinner, read widely, and delighted in the poetry of Milton: “O! John Milton! John

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Milton! of all the poetry ever read or heard recited by me, none has spoke out the whole feelings of my heart as have certain passages of thy divine minstrelsy” (quoted in Cruse 1962, 127). That Milton’s work was deemed valuable reading matter for its religious content is confirmed by Thomas Burt, a miner from the age of nine, who grew up in a pious household with a love of reading and who, having walked nine miles to buy a second-hand copy of the English hymnodist William Cowper’s poems, then progressed to works by Milton and the Unitarian theologian William Ellery Channing (Cruse 1962, 128).

Common to many of the early-nineteenth-century reading experiences of Milton’s *Paradise Lost* is a sense not only that Milton affirmed more contemporary religious teachings, but also that his work elicited a sense of rapture and wonder at the scenes portrayed. Thomas Keightley, Irish writer of books on mythology and folklore, recalls his own “discovery” of the work as follows:

It was just as I was emerging from mere boyhood; the season was summer; the scene a residence amid wood and water, at the foot of mountains, over which I beheld each morning the sun rising, invested with all his glories. (1855, vii)

That Keightley should position his revelatory reading of *Paradise Lost* within a natural setting affirms Milton’s own Baconian conception of the natural world, namely that observation rather than speculation, and experience rather than abstraction were central in gaining an understanding of the world (see Edwards 1999). From this perspective, then, Milton’s works seem not only through their subject matter but also through their mode of viewing the natural world to be well attuned to Victorian marine natural history, which continuously invited its readers to observe, examine and record the flora and fauna they encounter at the coast.

But the existence of Siddons’ much-maligned elementary reader of *Paradise Lost* suggests that not all children found Milton such immediately appetizing fare. The less ambitious shoemaker’s apprentice and later Chartist preacher and schoolmaster Thomas Cooper was much more prosaic about his first encounter with the work. He noted in his autobiography that as a thirteen-year-old he had enjoyed Byron’s *Childe Harold* and *Manfred* but:

I do not remember that poetry really touched any chord in my nature . . . I had read the “Paradise Lost;” but it was above my culture and learning and it did not make me *feel*, though I read it with interest, as a mere story. (1872, 35, Cooper’s emphasis)

This did not deter him from giving lectures later in life on Milton and Shakespeare, geology and history, to Chartist groups. But clearly the inspirational potential of Milton's writing was lost on Cooper. While he may have shared with Hamilton the sense that this was an idealized work, it was one he understood as "a mere story" to which he had difficulty relating (Cruse 1962, 169).

Where Keightley had implied that the countryside offered an optimal setting in which to enjoy Milton's writing to the full, John Naule Allen reflected more specifically on where Milton was, and was not, to be appreciated. His article "Railway Reading. With a Few Hints to Travellers" published in *Ainsworth's Magazine* in 1853 argued most forcefully for readers to appreciate Milton "by their home fireside" (1853, 484) rather than on the move as a form of light, leisured reading:

There are book-stalls at the principal stations all along the different lines. I am very glad of it. Many books are sold at those stalls, I believe. I am very glad of that. But did I for a moment think that these same books were perused whilst the train was on its way, and then 'laid on one side'—by which process many copies of Chaucer, Shakespeare, Milton, &c., are daily consigned to oblivion—I should be very sorry . . . I defy the most constant of all "constant readers" to make either head or tail of even a child's primer while in a travelling railway carriage. (1853, 483)

Naule Allen's article therefore reflects an innate tension between the increased accessibility of Milton's works, facilitated by the likes of publishers such as Longman and Bohn, and more conservative concerns to ensure that canonical literature was read "properly" in "appropriate" spaces that paid the respect due to such cultural greats as Milton. Mrs Siddons, allegedly prepared to slice up her cheap "eighteen-penny" copy of *Paradise Lost* as she dumbed down Milton for child readers, was essentially the target of various anxieties about the rise of a lower-middle-class and working-class nineteenth-century readership, about the appropriateness of women's involvement in publishing "high" literature and whether child readers could expand their own knowledge through private enjoyment rather than primarily through formal instruction.

Milton was therefore an economically and intellectually accessible author by mid-century. Accessible even by the working class, as the testimonies of Hamilton and Bamford demonstrate, Milton's *Paradise Lost* in particular appears to have belonged within the core publications that were owned or perhaps received as Sunday School prizes or for merit in school exams. Given that the vast majority of the British population lived

in relatively close proximity to the sea, and that one-day group outings to the coast, organized by church groups, societies or at the goodwill of larger employers, became increasingly common, “popular” accounts of the seaside aimed at instruction as much as entertainment could afford to assume familiarity with Milton. The dual appeal of his work in conjuring up imaginatively the sublimity of the coast while reinforcing religious doctrine on the Creation would also have enhanced the acceptability of works such as the SPCK’s *Wonders of the Sea-Shore* in the eyes of those interested in children’s intellectual and spiritual education.

Milton and Intertext: Science, Literature and Memory

“Literature,” Renate Lachmann has persuasively argued, “is culture’s memory” (2010, 301). Intertextuality is the means by which a culture draws on other moments in its history, a commemorative action by which it rewrites and transcribes itself. But intertextual references not only make present what might otherwise be absent: they are also transformatory moments in which the quoted element is “incorporated, absorbed, quoted, distorted, reversed, resemanticised” (*ibid.*, 304). While, as Graham Allen notes, the dialogic aspect to intertextuality might seem at first sight to “threaten the unitary, authoritarian and hierarchical conception of culture” (2011, 29), it is in essence a highly creative enterprise, foreignising/foregrounding in the sense of Jakobson the integrally familiar. Direct quotation is the form of intertextual referencing used by the scientific authors on which this chapter focuses, a form which, as Mary Orr rightly remarks, is both “extraneous ornament” and yet “reference of the most overt and saturated kind,” whether homage, authority, or a complex shorthand that may even parody or question the author who is being quoted (2003, 130). In reflecting on what makes a quotable quote, Orr proposes that three main elements are important: brevity (qualified by a certain pithiness), aptness to the host context and “extraction,” namely the process of cultural transmission and transformation that underpins intertextual referencing, since quotation is never a fixed piece or a free-standing authority (*ibid.*, 134-35). Quotation as meaning-making is central to the analysis here of how Milton was deployed by scientific writers, which modes of integration were used (if any) to incorporate quotations from his works into their texts, whether or not these quotations were marked as such, and what tacit assumptions were made about whether the reader would recognise the provenance of the quoted section.

While few of the intertextual references to Milton could claim brevity, what they do reveal is a crystallization of quotations within marine natural history writing around one particular set of lines from *Paradise Lost*. These span a passage from Book VII with which this chapter opened:

Forthwith the sounds and seas, each creek and bay
With fry enumerable swarm, and shoals
Of fish that with their fins and shining scales
Glide under the green wave, in sculls that oft
Bank the mid-sea: part single or with mate
Graze the seaweed their pasture, and through groves
Of coral stray, or sporting with quick glance
Show to the sun their waved coats dropp'd with gold, (ll. 399-406)

At the heart of Milton's epic lies an account of the creation of the world and all the creatures in it: a section largely modeled on the creation story from Genesis 1 and 2, in which God shows the fallen angels that his glorious kingdom can be extended indefinitely. This passage dwells on the seemingly infinite variety of life in the waters once God has shaped the earth and given it light. This emphasis on 'God the Creator' rather than 'Christ the Redeemer' was typical of the way in which natural knowledge was presented by the SPCK's series in which the *Wonders of the Sea-Shore* appeared, and references to the "bounteous Creator" are legion in this work. Taking the first four lines of this passage to head a chapter on saltwater fish, the anonymous author also drew on the imaginative power of Milton's text, ending with "Glide under the green wave," as a transition into the start of the chapter itself:

Watch the shoal of small fish which has been left in this pool by the tide, and observe the elegance as well as the rapidity of their movements, circling their present confined home so incessantly. As they turn and the underpart is seen for a moment, it looks like a flash of light. (165)

This represented an imaginative entry point into a subject that would become more scientifically complex as the chapter progressed towards discussing Linnaean classifications across the next few pages as various species of fish are introduced—the blenny and the stickleback, the perch and even the fearsome angler-fish. Drawing on the work of Georges Cuvier, John Audubon and the Comte de Buffon, the chapter addresses quite complex questions about sociability in fish and their care of their

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young, as well as their powers of sight and hearing and their ability to sleep. The initial quotation by Milton not only serves to give the opening scene visual appeal. Its associations with the Creation are also echoed throughout the chapter in observations such as this:

Fish have frequently been supposed by naturalists to be of all the larger animal world the least possessed of sensibility, to be incapable of powerful impressions, and to be gifted with very little of that species of intellectual power which is shared by so many of God's creatures. (167-68)

The anonymous author of *The Wonders of the Sea-Shore* therefore merged rational recreation and scientific reflection with what was essentially morally virtuous study, given that the discussions turned upon the myriad life forms generated at the Creation.

Gosse's *Aquarium*, as we saw at the beginning, likewise used this reference from Milton's *Paradise Lost*. He too placed it at the opening of a chapter to enhance the process of scene-setting that would then slip, as had occurred in the *Wonders of the Sea-Shore*, into a more factual, scientific appraisal of different species of fish, their collection and use in the aquarium:

The summer was over, but I still lingered at Weymouth. Spring-tides came and went with tantalising regularity . . . but fierce autumnal gales blew with characteristic violence and tenacity . . . In a brief interval of gentleness, however, I found an animal which had long been an object of desire to me, a normal form of the genus *Lucernaria*. (210)

It is unsurprising that Philip Henry Gosse should have been one of the most avid users of literary references in his own scientific writing, given his own recognition that the work of the field-observer was “the careful and conscientious accumulation and record of facts bearing on the life-history of the creatures,” whereas the poet's approach corresponded to the aesthetic aspect which dealt with “the emotions of the human mind,—surprise, wonder, terror, revulsion, admiration, love, desire, and so forth,—which are made energetic by the contemplation of the creatures around him” (Gosse 1860, v). Gosse, an evangelical and leading populariser of natural history by the mid-1850s, therefore adopted a poetics of description for the natural world that would combine the approach of the scientist with that of the poet (2012: 481). And for Gosse, a believer in the literal truth of the accounts of the creation of the world, Milton's *Paradise Lost* still remained a key literary work that asserted the presence of God in creation (2012, 482). Gosse, the “Puritan Naturalist” (as the *London*

Quarterly Review described him from his son Edmund Gosse's unforgiving biography), in fact put the seventeenth-century Puritan Milton's text to good use in demonstrating its imaginative possibilities for thinking about and depicting the natural world (Anonymous, 189, 15).

While some authors used this passage as a descriptive non-scientific opening to contrast with the body of the chapter itself, others, such as the Irish marine botanist William Henry Harvey, took it to close a section and provide a transition to the next. In his *Sea-Side Book* (1849, 3rd edition 1855), one chapter on marine animals that inhabited the rocky sea-shore—limpets and sponges, polyps and sea-weeds—ended with that same quotation from Book VII of *Paradise Lost*, albeit extended to include the next 10 lines following that passage:

The transparent shrimp, now resting on its oars, midway in the water, watching your motions with its peering eyes, and attentive to the slightest disturbance, now darting through the pool, and hiding himself among sea-weeds; the basking Sea Anemone displaying his starry flowers; the Purple Rock Urchin studding the bottom of the pool with spiny globes; and the quiet Molluscs leisurely pursuing their way, feeding as they go: these, mingled with the varied contour and colour of delicate sea-plants, form a picture which has its prototype nowhere but in fairyland.

“The sounds and seas, each creek and bay, [...] Or, in their pearly shells at ease, attend Moist nutriment; or under rocks their food In jointed armour watch: on smooth the seal And bended dolphins play: part huge of bulk, Wallowing unwieldy, enormous in their gait, Tempest the ocean: there leviathan, Hugest of living creatures, on the deep, Stretched like a promontory, sleeps or swims, And seems like a moving land; and at his gills Draws in, and at his trunk spouts out, a sea.”

MILTON (146-47)

The transition from the line “nowhere but in fairyland” to the quote from Milton suggests a different set of associations from those found in Gosse or the anonymous SPCK publication. The religious element is downplayed by Harvey as he instead emphasizes the almost unimaginable beauty of these seaweeds that seem almost to come from an enchanted place: that these might reflect the artistry of a divine creator is not explicitly mentioned. Certainly terms like “Creator” or “God” are to be found in the *Sea-Side Book*, albeit with only half the frequency than in *The Wonders of*

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the Sea-Shore (where indeed the closing word of the book is “God” (1847: 264)). Harvey therefore appears to have drawn on Milton less to give his work an overt religiosity than for its imaginative appeal. The additional lines included from *Paradise Lost* refer to the Leviathan image of an epic large sea creature, which in Harvey’s context was the whale. Here mythology and science engage in a rather jarring encounter, not least because Milton speaks of “gills” and presumes whales to breathe like fish, whereas by the mid-nineteenth-century, scientists were well aware that whales were mammals and breathed air into their lungs through blowholes.

One final example of how this same extract from Milton’s *Paradise Lost* was woven, arguably with little artistry, into scientific writing on the coast, was in the Church of Scotland minister Robert William Fraser’s *Ebb and Flow: The Curiosities and Marvels of the Sea-Shore. A Book for Young People* (1860). Here it is placed at the end of a rather eclectic, associative chapter on “Algae or Sea-Weeds” which focuses on species native to Britain but also expands to include foreign seaweeds that grow in much larger banks on which animals feed. It follows a few lines quoted from Sir George Grey’s Australian travelogue *Journals of two Expeditions of Discovery in North West and Western Australia, during the years 1837, 38, and 39* (1841) which, as Fraser noted, described “animals of whose habits and means of existence we have, from the nature of the element they inhabit, but little acquaintance” (82). Quoting Grey first in this passage, Fraser then went on to include the same passage from *Paradise Lost* used elsewhere:

. . . . No portion of the globe is more thickly inhabited, or affords, in proportion to its size, a greater amount of animal enjoyment than did this wave-tossed isle. On it were innumerable barnacles, several species of teredo; one of which, having its head shaped like a screw divided into two equal portions, I believe to have been quite new. Many varieties of crabs and minute insects, shaped like a slug, fed on the sea-weed growing on the log.” A description which reminds one forcibly of that given by Milton, in his account of the Creation, where he says:

“Forthwith the sounds and seas, each creek and bay, (83)

Here the transition lacks the stylistic elegance and thematic coherence of the previous authors as it lurches from the ugly factuality of slug-shaped insects feeding on a log into Milton’s rich poetic description of the abundance of sea life: it seems that the inclusion of this quotation by Milton had now become a formulaic iteration, a stock reference and a standardised nod both to the Creator and to Milton. While it has been argued elsewhere in this chapter that intertextual referencing has the

potential to be creative or innovative, here its failure to be well seamed into *Ebb and Flow* generates a jarring multivocality rather than a smooth and meaningful dialogue between sources.

Not all those writing on marine natural history drew on this particular passage from Milton's *Paradise Lost* for their inspiration. To head the fifth chapter on the fructification of seaweeds in his *Popular History of British Seaweeds* (1857), the Scottish clergyman and naturalist David Landsborough took lines 694-97 and 702-4 from Book III of *Paradise Lost*, in which Milton lauds those who seek after knowledge:

Thy desire which tends to know
The works of God, thereby to glorify
The great Work-master, leads to no excess
That reaches blame, but rather merits praise,
The more it seems excess;
.....
For wonderful, indeed, are all his works,
Pleasant to know, and worthiest to be all
Had in remembrance always with delight. (31) Landsborough?

To recognize the complexities of Creation is therefore to come closer to recognizing the achievements of its Creator. Landsborough successfully links this quotation with assertions at the start of this chapter that twenty years previously little had been known about the fructification of the *Fuci* genus but since then “very great progress has been made in this department” (31). Distinguished algologists, “aided by vastly improved microscopes” were therefore working in the same spirit of intellectual curiosity that Milton had encouraged some three hundred years previously. What is doubly interesting about this quotation, seen in combination with a Latin quotation from a classical source “Raius” that preceded it, is that this dual reference from Raius and Milton had appeared in exactly the same form at the opening to George Johnston's *A History of British Sponges and Lithophytes* (1842). By incorporating this quotation into his text, Landsborough was therefore not only referencing Milton, but also paying indirect homage to “my excellent friend Dr. Johnston” (ix), with whom he shared an energetic interest in furthering scientific knowledge.

Landsborough was one of few writers on marine natural history to borrow from other works by Milton to enhance the imaginative appeal of his account. At the end of a description of the *Wrangelia* genus, and specifically the finely fronded red seaweed *Wrangelia multifida* found off the Atlantic coasts of Europe (particularly Ireland and the southernmost tip of England), Landsborough drew on Milton's *Comus*:

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Once or twice during the summer it may be found by us, floating, but the specimens are always exceedingly fine, though not the fourth part of the size of the Irish specimens, some of which would cover a quarto page.

“By the rushy-fringed bank,
Where grows the willow and the osier dank,
My sliding chariot stays;
Thick-set with agate, and the azure sheen
Of turkis blue, and emerald green,
That in the channel strays;
Whilst from off the waters fleet,
Thus I set my printless feet,
O’er the cowslip’s velvet head
That bends not as I tread;
Gentle swain, at thy request
I am here.” *Milton’s Comus*. (191)

While the figure of the water-nymph Sabrina, who sings these lines, is an intriguing figure for her ability to free the virtuous woman from her torment by the debauched Comus, the gendered aspect inherent in this quotation is played down here. Rather, Landsborough appears to be drawing on it as a reminder of the magical beauty of her underwater palace, the brilliance of the colours of marine life and the fascination that the underwater world holds for him.

Conclusions

While the countless series and volumes of Milton’s work that were in circulation in Britain in the first half of the nineteenth century suggest that his writings were widely known amongst readers not just from the (upper-)middle classes, the majority of intertextual references taken up by writers of Victorian marine natural history were surprisingly narrow. A particularly concentrated image of his writing is thus presented that crystallises it into those scenes thematically most useful to those working on texts pertaining to marine life. What appears to have made Milton’s work most valuable, and, in a capitalist market system, consumable, were those passages which appealed to the reader’s imagination by inspiring in them a sense of awe and wonder at the power of nature. Certainly, some of these works were also written with a particular set of religious teachings in mind, and the morally virtuous study of the Creation, encouraged through these works of “popular” science, intimately linked them to the theology of nature. In others, though, a more rationalist approach to reading the

book of Nature prevailed. Precisely how well such passages were “extracted” for inclusion in natural historical writing is debatable: certainly Milton’s writing belonged among that body of “resuable” texts from the British literary canon with which all authors expected their readers to be familiar, even if the original authorship of the quoted sections from *Paradise Lost* or *Comus* was almost always made explicit. But an analysis of later works of popular marine natural history seems to suggest that inclusion of his work had started to become formulaic, a “standard” voice in all discussions about marine life, regardless of how apt and appropriate the intertextual reference really was. Nevertheless, the inclusion of Milton’s work in all the works of Victorian marine natural history explored here demonstrates the importance of intertextual referencing in strengthening the cultural connectivity between science and literature by reflecting back across three centuries of human observation and reflection on how to conceive of and describe the natural world.

Note

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