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Another *Poetry of Science*: Tom McLeish (2019) in comparison with Robert Hunt (1848)

In *The Poetry of Science*, first published in 1848, the author, Robert Hunt, begins by asking 'where is the relation between the stern labours of science and the ethereal system which constitutes poetry'? (1850 [1848], 17). Himself one of those impressive Victorian polymaths who was a chemist, a photographer, a folklorist, a novelist, keeper of the mining record office and professor of mechanical science, he seems well placed to pursue such an enquiry. The answer he gives, as well as his categories, show him as a child of his time, and in particular as a post-Romantic (see Tait 2018). Hunt's *Poetry of Science* is primarily an accessible account of contemporary scientific discoveries and achievements, with chapters on physics (gravitation, molecular forces, heat, light, electricity, etc.), chemistry, geology and biology. But Hunt's explicit aim is not merely didactic. Rather, he repeatedly makes the point that science is poetical in that it can evoke a sense of admiration and wonder, it partakes of those categories essential to a Romantic understanding of poetry: the beautiful and the sublime. 'In the aspect of visible nature, with its wonderful diversity of form and its charm of colour,' Hunt writes, 'we find the Beautiful; and in the operations of these principles, which are ever active in producing and maintaining the existing conditions of matter, we discover the Sublime' (1850 [1848], 22). The poetry in science, thus Hunt seems to suggest, lies in scientific results and the insights they provide into creation. In Hunt's view science can inspire awe and wonder and humility in the face of the material world even better than poetry. 'The phenomena of Reality are more startling than the phantoms of the Ideal,' Hunt claims; 'Truth is stranger than fiction' (23). Hunt contrasts this poetical (one might also say Romantic) science to the form he suggests science can also 'too frequently' take: 'a cheerless philosophy which clings to the earth, and reduces the mind to mechanical condition, delighting in the accumulation of facts, regardless of the great laws by which they are regulated, and the harmony of all Telluric combinations secured' (21–22). Science escapes from such cheerless materialism in its grandly poetic visions of unity.

Hunt is writing at a time at which poetry is indisputably granted the highest rank in a cultural hierarchy in which science is a rising upstart, struggling for recognition, and particularly struggling for a place in an educational system privileging the study of (classical) texts (a struggle which broke forth publicly in the debate between T.H. Huxley and Matthew Arnold in the late 1870s). Hunt's emphasis on the poetry of science can thus be read as an attempt to heighten science's cultural capital. But Hunt is also taking up and reacting against a widely common perception at the time that poetry and science are incompatible, even antagonistic. Published some 170 years later, Tom McLeish's similarly titled book *The Poetry and Music of Science* (2019) enters a cultural context in which this apparent divide has been rhetorically charged by a succession of two-culture debates, by the so-called 'science wars' and by continuous endeavours to promote science communication. Like Hunt, McLeish attempts to bridge the 'two cultures', but following a strikingly different rationale. Hunt suggests that the processes of science are prosaic, that the 'fumes of the laboratory, its alkalics and acids, the mechanical appliances of the observatory, its specula and its lenses, do not appear fitted for a

place in the painted bowers of the Muses' (1850, 17). He locates the poetry of science rather in its awe-inspiring results, its illuminating truths. McLeish, in contrast, turns to the process of scientific discovery itself, arguing that the nature of artistic and scientific creativity is not only similar, but in effect identical. If Hunt's book, then, is primarily about science, McLeish's book is primarily concerned with scientists. Essentially, McLeish locates the poetry of science in the humans who develop it. In this, his historical and thematic reach is impressive, calling up better and lesser known figures from over 600 years of historical development as well as drawing from personal experience and conversations with colleagues, all the time weaving together examples from a wide range of scientific fields, including different areas of physics, chemistry, experimental science and mathematics as well as various forms of artistic creation (artworks, music, novels …). Throughout, McLeish's basic argument remains the same: scientific discovery involves acts of creativity which are comparable to those of artistic creation. They engage unconscious as well as conscious thought, cognition as well as emotion, and they often take the form of an epiphany, a revelation or creative spark. It is a clear strength of McLeish's book that it shows openness, respect and understanding for practices and practitioners in all the different fields he touches upon, looking for commonalities without pitching one kind of practice against the other. Such magnanimity and genuine interest is too often missing from contributions to the debate, whose allegiances are, for the most part, clearly cut and frequently vitriolic. Hunt's book, with its comparatively gentle privileging of science itself is an early instance, but more recent examples, like Mary Midgley's *Science and Poetry* (2001) or Richard Dawkins' *Unweaving the Rainbow* (1998) readily spring to mind.

McLeish finds particularly valuable material for his study in those early periods of modern history, in which the divide between the arts and the sciences did not exist in the same way as it does today. Medieval thinkers, like McLeish's showcase Robert Grosseteste, 'did not assume the compartmentalized minds that we are educated to develop today' (2019, 312). McLeish seems to suspect a considerable amount of historical blindness in his readers when he speaks of the 'surprising way in which medieval philosophy and its ubiquitous theological context has proved such an effective conversation-partner to the story of scientific creativity' (302) and when he suggests a similar surprise in face of the sophistication of early scientific thought and reasoning (106). After all, even C.P. Snow's infelicitous coinage of the 'two cultures' points to the fact that the differences between these alleged two cultures are not in any way inevitable or given, but cultural, and thus conventional and historically variable. What McLeish's book attests to, then, is first of all, that the myth of the two cultures has apparently, despite all efforts to the contrary, settled so deeply into our society that is has become naturalized. It has become a modern myth in the sense of Roland Barthes: history has been transformed into nature (1972, 128). McLeish's study becomes insightful, indeed apparently necessary, in face of the myth of an essentialized natural difference that separates the way artists and scientists think.[1] He takes great pains to dispel the myth by proving the contrary; and his many examples, anecdotes and discussions beautifully serve to make his point. He argues that scientists nowadays are discouraged from speaking about their emotional involvement in their work, about the creative process, about inspiration and beauty, thus inadvertently cementing the myth of the two cultures. While he looks back historically to periods in which this was not yet the case (he discusses Humboldt and Goethe as final examples of the intersection between science and poetry just before their increasing

[1] It is regrettable and not worthy of a renowned university press like Oxford that the copy editing of McLeish's book has been so very sloppy. There are mistakes and typos on every other page.

separation and apparent antagonism), McLeish not does not ask why the separation should have happened at all. A brief look at the beginnings of the culture divide in nineteenth-century Britain, with Hunt as a convenient example, may suggest some of the historical processes which contributed to the myth of two cultures.

First of all, it is worth emphasizing that the roots of the idea of the two cultures lie in the much more narrow juxtaposition of science and poetry, rather than artistic culture more generally. There was no conception of an antagonism between science vs. the visual arts or music, for example; and the early novel, with its emphasis on realism, understood itself very much in dialogue with and even in extension to science, rather than in opposition to it (McLeish devotes one of his chapters to this latter relationship, which has been the object of intensive studies by literary scholars over the last few decades).[2] In the early decades of the nineteenth century, a Romantic idealization of poetry was widespread, which attributed to poetry a privileged access to eternal and universal (indeed, divine) truths. The poet was cast as a divinely inspired prophet, who has 'drunk the milk of Paradise', as Samuel Taylor Coleridge famously put it in 'Kubla Khan' (1816), or at least as a man (as a rule) of exceptional sensibility and insight. Thus science and poetry, in this conception, have a common aim. William Wordsworth declares in his programmatic preface to the *Lyrical Ballads* (1992 [1802]) that '[poetry's] object is truth, not individual and local, but general, and operative; not standing upon external testimony, but carried alive into the heart of passion' (79). Meanwhile, this shared object of poetry and science does not become a problem and does not lead to the kind of sometimes vitriolic struggle for supremacy which we see commencing later, as long as the ultimate truth both aim at is considered to be of divine origin. As long as both science and poetry are considered to be primarily mimetic, that is, as long as they are understood to offer different ways of accessing the glory and truth of divine creation, poetry and science simply provide two different but equivalent approaches to an ultimate goal. In this they both remain subservient to religion as the supreme interpreter of God's truth.

One should not forget that much science, far into the nineteenth century, understood itself in this broad tradition of natural theology. Thus Hunt's evocation of the poetry of science calls on the limits of our understanding in face of the unknowable divine:

> In these studies of the effects which are continually presenting themselves to the observing eye, and of the phenomena of causes, as far as they are revealed by Science in its search of the physical earth, it will be shown that beneath the beautiful vesture of the external world there exists, like its quickening soul, a pervading power, assuming the most varied aspects, giving the whole its life and loveliness, and linking every portion of this material mass in a common bond with some great universal prin ciple beyond our knowledge. […] But if admitted even to a clear perception of the theoretical Power which we regard as regulating the known forces, we must still see an unknown agency beyond us, which can only be referred to the Creator's will. (24)

While it nods to natural theology, this passage already beautifully illustrates the increasing confidence of science, asserting itself to be on par with, indeed superior too both poetry and religion. Science, as characterized by Hunt, gives access to the beautiful in the observation and description of nature. But science is privileged in being able, by means of 'stern labours', to look beyond the 'beautiful vesture of the external world', to glimpse the sublime of the 'great universal principle' and with it, to have intimations of the divine. Science can thus offer a Wordsworthian 'sense sublime / Of something far

[2]For a concise introduction and overview of some of the work done in this area, see Smith (2013).

more deeply interfused […] A motion and a spirit, that impels / All thinking things, all objects of all thought, / And rolls through all things' (Wordsworth 2008 [1798], ll. 96–103). If the Wordsworthian sublime intimation relies on contemplative idleness, heightened sensibility and the gift of epiphany, however, science offers its glimpses of the sublime to the diligent worker. In Hunt's rhetoric we can thus already see some of the rhetorical groundwork being laid for the suppression of the role of inspiration in science which McLeish wants to overcome.

In the course of the nineteenth century then, science gradually displaced both religion and poetry as prime interpreter of truth which, in an increasingly materialistic culture, became primarily understood in terms of externality, quantifiability and predictability. Meanwhile, poetry became increasingly identified with the subgenre of the lyric and thus became ever more associated with the internal, emotional and the ideal while the doctrine of aestheticism contributed to its apparent withdrawal from the physical world which mattered to science.

Of course reality, as always, is much more complex than such a simplification could adequately depict. A burgeoning field of Literature and Science studies has done much over the course of the last decades to uncover and describe the numerous intersections and mutual influences between Victorian science and poetry, or literature more generally.[3] One of the aspects this research has drawn attention to is precisely the importance of the imagination for nineteenth-century conceptions of science. Thus, there is no need to reach as far back as to the Middle Ages, as McLeish does in his search for more holistic concepts of creativity which acknowledge inspiration and imagination in scientific contexts. Victorian scientists who were instrumental for the professionalization of science acknowledged and even promoted the importance of creativity in science.[4] John Tyndall, for example, argued in an address to the British Association in 1870 that '[b]ounded and conditioned by cooperant Reason, imagination becomes the mightiest instrument of the physical discoverer' (2011 [1871], 152). Thirty years earlier, in his influential *Philosophy of the Inductive Sciences*, William Whewell, who first coined the word 'scientist', makes the point that a close observation of facts does not yet constitute scientific discovery: 'The facts are known, but they are insulated and unconnected, till the discoverer supplies from his own stores a principle of connexion. The pearls are there, but they will not hang together till some one provides the string' (2011 [1840], 23). Whewell's analogy is striking, since the image of the pearl necklace suggest what he does not spell out: that the result of such an act of creation is beauty; it converts 'confusion into order, […] chance into certainty, […] variety into simplicity' (2011 [1840], 23). At the same time, he also argues that, once the creative act has happened, it easily disappears from view: 'The pearls once strung, they seem to form a chain by their nature. Induction has given them a unity which it is so far from costing us an effort to preserve, that it requires an effort to imagine it dissolved' (2011 [1840], 23). Whewell's scientist thus shares with the poet the act of imagination, the creation of beauty, the imposition of formal unity. And although Whewell never explicitly compares the scientist to the poet, he does so implicitly when he speaks of successful induction as 'a thought which, once breathed forth, permeates all men's minds. All fancy they nearly or quite knew it before. It oft was thought, or almost thought, though never till now expressed'

[3] After groundbreaking early work by Gillian Beer (1985) and George Levine (1988), the field has exploded with too many publications to mention here. The review section of the BSLS (British Society for the Study of Literature and Science) website offers an extensive, though not comprehensive list of relevant titles (https://www.bsls.ac.uk/reviews/).

[4] See David W. Shaw (1987) for an in depth discussion of how the epistemological paradigms of science and poetry intersected and shifted in the course of the century.

(2011 [1840], 23). Whewell's contemporary readers would have easily recognized an allusion to Alexander Pope's famous definition of poetry's 'True Wit' in the *Essay on Criticism* as 'Nature to advantage dress'd / What oft was thought, but ne'er so well express'd' (Pope 2018 [1711], ll. 297–298). As with Hunt's subtle privileging of a scientific sublime based on diligent work over and above a Wordsworthian egotistical sublime, Whewell's substitution of 'never till now' for 'ne'er so well' casts the scientist as the better poet. The scientist creates new truths, the poet merely new expressions.

What can these rather sketchy glimpses of the complex relation between science and poetry[5] in the nineteenth century tell us, if brought into dialogue with McLeish's book? First of all, they serve as a reminder that both science and poetry are dangerous terms with a complex history and changing associations. For the Early Victorians, the rivalry between poetry and science largely derived from their common claim to truth. As poetry ceded its truth claims towards the end of the century, the lines of contention shifted. In the first two-cultures debate between Matthew Arnold and T.H. Huxley, the conflict turned essentially into one about text-based versus experimental education. Still concerned with science's share in education and general knowledge, C.P. Snow then pitched science against literary intellectuals. In the later science wars, the conflict then became one between 'hard' science and the social sciences and humanities. And of course, science is no more a monolithic term in these juxtapositions than its various opposites. All these different aspects then merge in generalizations about the two cultures that have diffused widely into popular discourse. If McLeish's book endeavours to dismantle perceived differences between scientists and artists (in the broadest sense), it also attests to the extent of the naturalization of this supposed difference. Otherwise, an extensive study of the similarity of scientific and artistic processes of creativity, like that McLeish provides would not have been necessary.

But juxtaposing McLeish's *The Poetry and Music of Science* to the Hunt's *Poetry of Science* also highlights the implications of the decisive difference between these books. McLeish's project, as we have seen, put the focus not on the results and insights of science, but on the creative acts which bring them forth. For McLeish, to recognize the poetry of science involves an acknowledgement of the scientist as a human being, to recognize the role of emotions and the unconscious, as well as aims and desires in the development of rational scientific theories. Does this dethrone the depersonalized 'view from nowhere' (Nagel 1986), which has become so central to science's self-understanding? What seems clear, at least, is that while Hunt, relying on the authority of John Keats, starts from the premise that '[t]he True is the Beautiful' (17), thus finding poetry in scientific truths, McLeish throughout the course of his book, finds beauty and poetry, predominately, in the emotions of awe and joy of the individual scientist in face of a new discovery.

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[5]For a more comprehensive and nuanced account of this shifting relationship, see Huber (2019).

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