

## Competing for Eternity: Tracing the Relation between Poetry and Science in Victorian Discourse

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### Abstract

The opposition between poetry and science is a commonplace of nineteenth-century criticism, which still reverberates today. For the Victorians, this conflict derived its urgency from an understanding of poetry which rooted its essence in truth, and thus brought it into direct competition with science. Meanwhile, various juxtapositions and reconciliations of poetry and science involved frequently contradictory definitions of their central terms and their respective epistemological claims. With science's increasing success in establishing uniform abstract laws, concepts of poetic truth retrenched and shifted ground. A close attention to the terms in which the contrast between science and poetry was framed by the Victorians serves as a caution against easy assumptions about their meanings and unsettles clear distinctions between poetic idealism and scientific positivism.

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In *Aurora Leigh* (1856), Elizabeth Barrett Browning has her eponymous heroine boldly claim that poets are "the only truth-tellers, now left to God,—/ The only speakers of essential truth, / Opposed to relative, comparative, / And temporal truths" (1.859–62). In 1856, in the midst of rapid technological progress and scientific discovery and in the face of the growing authority and self-confidence of science such a claim was provocative. Indeed, Barrett Browning's main plot conflict pitches the new social sciences against the poet's knowledge:

It takes a soul,  
To move a body: . . .  
It takes the ideal, to blow a hair's breadth off  
The dust of the actual. —ah, your Fouriers failed,  
Because not poets enough to understand  
That life develops from within. (2.478–84)

For *Aurora*, truth of poetry is the truth of the soul, a truth that is ideal and essential, and thus superior to the truth offered by science. This amounts to the familiar juxtaposition of poetic idealism and scientific positivism which, as Gowan Dawson and Sally Shuttleworth have already remarked, has been frustratingly enduring even though it is a distortion of the complexity of the broader Victorian discourses (1). *Aurora Leigh* itself does not escape these complexities. After all, *Aurora* argues that what her cousin Romney misses is "a poet's individualism / To work your universal" (2.477–8). If poetry's truths are essential, they are also individual and concretely embodied, as opposed to science's abstract truths from numbers. At the same time, *Aurora Leigh* makes little mention of the natural sciences, whose truth-claims much more closely rival those she establishes for poetry, in claiming to be essential, non-relative, universal and timelessly valid.

Indeed, both poetry and science as used by the Victorians were complex terms with a whole range of different meanings. *Aurora Leigh* does exemplify one of the main points of contention in their relation, though, by granting poetry a privileged access to truth. It is on these grounds, that is, on epistemological questions about the kind of truth claims science and poetry make respectively, that much of the early discussion about their difference, antagonism or reconciliation can be seen to hinge. In this there is an important difference to the well-known debate between T.H. Huxley and Matthew Arnold about science's and literature's (and not specifically poetry's) role in education. Indeed, Arnold's definition of literature in this context is famously broad as "*the best which has been thought and said in the world*" (82; emphasis in original), a definition which explicitly includes works of science. Where this debate was concerned with access to truth, it was primarily with regard to the question of what is the best educational method, pitching (scientific) direct observation against (literary) textual instruction. Meanwhile, the more specific rivalry between science and poetry arose from the elevated epistemological and spiritual status granted to poetry in a Romantic tradition. Indeed, by 1880, when Huxley and Arnold began a two culture debate, poetry's hold on truth had already been significantly weakened. To probe the common juxtaposition between poetry and science, as I will do in what follows, is not only to become aware of its various different manifestations and protean delineations, but also to take seriously the challenge science posed to nineteenth-century ideas of poetry and to indicate the wider implications of this challenge. Science changed poetry, not only because it provided new subject matter or new forms, but because it changed how people thought about poetry's nature, its aims, means and essence. The distance that lies between Shelley's poet as the unacknowledged legislator of the world and an Aestheticist call for art for art's sake can, in part, be accounted for as a reconsideration of poetry's truth-claims in the face of growing scientific authority.

In thinking about the relationship between poetry and science, the Victorians were strongly influenced by William Wordsworth's and Samuel Taylor Coleridge's assertion that the two are antithetical. Coleridge's posthumously published lecture on "The Definition of Poetry" (1836), in which he claims that "Poetry is not the proper antithesis to prose, but to science" (7), appears to have been a particularly popular reference, possibly helped by the fact that it is quoted by both George Moir's entry on poetry in the seventh edition (1842) of the *Encyclopaedia Britannica* (140) – the entry was reprinted in the eighth edition of 1854 – and Theodore Watts' entry on the same topic in the ninth edition of 1885 (261). In his lecture, Coleridge goes on to characterize the antithesis he postulates in the following terms: "The proper and immediate object of science is the acquirement, or communication, of truth; the proper and immediate object of poetry is the communication of immediate pleasure" (7–8). Poetry and science are assigned different aims or effects, truth and pleasure respectively, and are thus conveniently kept apart. On this basis, however, it remains unclear what the antithesis between poetry and science really consists of, since truth and pleasure are by no means self-evident opposites. In fact, Coleridge almost immediately proceeds to blur his own neat distinction when he speaks of poetry as "a more vivid reflection of the truths of nature and of the human heart, united with a constant activity modifying and correcting these truths by that sort of pleasurable emotion, which the exertion of all our faculties gives in a certain degree" (10). Even while he highlights pleasure as poetry's main aim, such pleasure is ultimately rooted in the revelation of truths.

William Wordsworth agrees with Coleridge's juxtaposition, which becomes more urgent in the context of his definition of poetry as truth. In the "Preface" to the *Lyrical Ballads*, he programmatically asserts 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 by passion" (*Criticism* 79). Both poetry and science share their principal aim and Wordsworth is pressed to respond to science's increasingly self-confident claims to a monopoly on truth. His answer is two-pronged. Poetry, at least the variety of poetry to which he commits himself, is concerned with tracing "the primary laws of our nature: chiefly, as far as regards the manner in which we associate ideas in a state of excitement" (*Criticism* 71). Thus, poetry is essentially concerned with what is human, its truths are subjective and psychological. As Wordsworth later added, its business is "to treat of things not as they *are*, but as they *appear*; not as they exist in themselves, but as they *seem* to exist to the *senses* and to the *passions*" (*Criticism* 192; emphasis in original). However, being subjective, these truths are by no means restricted to individual experience. Quite the contrary; it is the man of science whose knowledge is "personal and individual". He "seeks truth as a remote and unknown benefactor; he cherishes and loves it in his solitude". The truth of the poet, in contrast, is general, shared by all human beings. His knowledge is "a necessary part of our existence, our natural and unalienable inheritance" (*Criticism* 80). His truth is not solipsistic, remote and elitist like the scientist's, but communal, social and immediately intuited: "The Poet binds together by passion and knowledge the vast empire of human society, as it is spread over the whole earth, and over all time" (*Criticism* 81). Thus poetry is on the one hand justified as a branch of science, precisely a "science of feelings" as Wordsworth calls it elsewhere (*Criticism* 97). On the other hand, Wordsworth makes for poetry the much more ambitious and embracing claim to be "the first and last of all knowledge – it is as immortal as the heart of man" (*Criticism* 77). Individual man might be mortal, but poetry is concerned with the "essential passions of the heart", with our "elementary feelings", which Wordsworth assumes to be permanent and immutable (*Criticism* 60). Since all knowledge is necessarily human and addressed to humans, poetry, as the knowledge of the essentially human, stands first and last and incorporates scientific knowledge: it knows the observer and the receiver of scientific facts.

It is well worth dwelling on Wordsworth's position in this context, because, as Gregory Tate has argued, the nineteenth-century discourse on poetry and science is largely continuous, with no clear shift from Romantic to Victorian ("Poetry and Science" 104). Indeed, Victorian approaches to the problem of the relation between science and poetry generally arrange themselves on a spectrum of possibilities very similar to those implied in the "Preface": by some Victorians, poetry and science are perceived to be related activities, sharing the same aim in their search for universal and eternal truth, but reaching for it by different methods (and, perhaps, with different success). Others see poetry's strength in its psychological acuity. If the natural sciences contribute to the knowledge of natural phenomena, the poet contributes to the knowledge of human nature and mind. Their objects of investigation and therefore their truths are of a different kind. The most pessimistic, but today perhaps the most familiar view sees poetry and science not only as antithesis, but as antagonists. In this view, poetry is not associated with truth, but in the best case with beautiful illusion or art for art's sake, and in the worst case with harmful lies. Just as Romantic thought continued to hold sway and to influence Victorian positions, the three main conceptions of the relationship between poetry and science which I trace coexist as much as they succeed each other. While I do mean to imply some sense of chronology

– from endeavours to uphold poetry's privileged access to all kinds of universal truths, to a focus on its psychological acuity, to finally, a retreat (or liberation) into an Aestheticist doctrine of art for art's sake, which renounces the essentiality of poetry's relationship to truth – such a chronology can at best be one of emerging and receding tendencies.

In tracing these shifting grounds, I turn to a miscellaneous group of texts – contributions to periodicals, poetological treatises, philosophy of science, poetry by largely neglected voices (Edward Robert Bulwer Lytton, who also published under the pseudonym "Owen Meredith", Francis Newman, George Barlow) – ranging across the century. Only by paying attention to a wide range of examples does the multiplicity of meanings and connotations which informs Victorian juxtapositions of science and poetry become apparent. My aim is to show that the three prominent ideas about poetry and science and their relation which I discuss are powerful and pervasive enough to structure discussion across temporal and generic divides, but at the same time cannot avoid running into contradiction, internally or with each other. I also mean to suggest that the specific shapes the contrast between poetry and science took over the course of the century contributed to a fundamental shift in the concept of poetry itself, which helps to understand poetry's eventual striking loss of (or willing abdication from) cultural authority.

To trace the various ways in which the relationship between science and poetry were conceptualized by the Victorians is inevitably to raise more questions than an article of this length can reasonably expect to be able to deal with. In particular, I will not be able to address the role of religion and philosophy as further actors on the intellectual stage with all the complexity due to them in this context. To take the shifting connotations and interrelations of all these four terms across the century into account would be a truly formidable endeavour requiring a much longer study and would have inordinately muddled the more specific picture I aim to draw here.

Over the last couple of decades, important work has been done investigating the intersections between poetry and science in the nineteenth century. Much attention has been paid to the way in which both poets and scientists borrowed from each other's work, concepts and language, to poetry quoted and written by scientists and to the scientific interests of poets (see Tate's "Poetry and Science" for a representative list of references). Such work has provided ample evidence for the rich interchanges between science and poetry, notwithstanding the influential (and persistent) commonplace about their antagonism. Rather than drawing on an individual case study to question a general assumption, however, I want to highlight the fault-lines within these general assumptions themselves. It is not just that the individual or collective practice of poets and scientists contradicts a cultural commonplace which casts science and poetry as irreconcilable antagonists. The contradictions already emerge from within the formulations of this antagonism.

Our historical distance to the Victorians makes it easy to see the contradictions in their arguments, but one only has to catch oneself gliding easily from juxtapositions like science and poetry, to science and literature, to science and the arts, to the infamous two cultures, to realize that our own positions are perhaps no less assailable. Probing the all-too-familiar juxtaposition of science and poetry in its Victorian guises not only serves to caution against easy assumptions about its meaning in its historical context, but also serves as a reminder that science and poetry are by no means monolithic concepts today, and that the terms of their relationship or alleged antagonism are always in need of specification.

### Common End, Different Means: Synthesis vs. Analysis

One common way to distinguish science and poetry among the Victorians was to say that science analyzes and poetry synthesizes, a view unsurprisingly popular among poets themselves: "The Man of Science, the Man of Business, break up the whole into little bits, for analysis, for calculation, for sale; the Poet reconstructs the shattered world, and shows it complete and beautiful" – thus wrote William Allingham in 1867 ("On Poetry" 525). Science is associated in such oppositions with the practice of diligent description and classification characteristic of the naturalist, whose search for facts deafens his (it is inevitably "his" for the Victorians) ears to higher harmonies. This is the fate of Theophilus in Edward Robert Bulwer Lytton's poem "A Man of Science or the Botanist's Grave" (1868). As a young boy he is eager to know nature, "[n]ot, . . . the *act*, which I see, but the *thought*, which I cannot discern: / I stand in the centre, gaze round me, see everywhere action alone, / And find nowhere the source of the thought found in action wherever I turn" (lines 38–40; emphasis in original). But his teacher tells him that nature can only be perceived piecemeal: "The thought may be one, once for all, / All at once; but the action is many and diverse, to unity brought / In the mind by slow aggregates growing alike from the great and the small" (42–4). Thus he turns to botany: "But O what a hopeless confusion doth Order at first sight appear! / Unwearied Theophilus, sitting, and conning the grammar of Nature, / Thro' the whole of the humming hot noon with the cuckoo's note cleaving it clear, / Is it knowledge thou seekest? Then patience, and master, meanwhile, nomenclature" (77–80). Over the dry practice of naming and classifying, in the attempt to find order in nature's chaos and to gain knowledge, Theophilus cannot hear the cry of the cuckoo and does not notice the passing of noon and of the prime of his life. The problem, the poem suggests, is that the knowledge Theophilus longs for lies beyond the reach of science, in the realm of poetry. Buried among his books he sighs:

"Ah, but all this, after all, is not what I pined for! Up there  
The veiled Mystery sits on the solemn mountain peak:  
The cast clouds form and change at her feet: and my heart's despair  
Cries aloud where no answer is heard: for this Silence never will speak.

"Yonder, up there, as of old, when he play'd on my heart's harp-strings,  
The wind, with a surly music, is moaning aloof in the tree:  
Yonder, up there, in the blue and the breezy mid-sky swings  
The lanneret Hawk, as of old, when my heart went higher than he.

"Could one leap all at once to the end! not doom'd, like a grub, to grope  
About in the blinding earth, looking up never more from one's load!  
Well, never mind! One is laying up knowledge, at least, one must hope;  
And one cannot afford to leap over the knowledge that lies in one's road".  
(133–44)

It is no coincidence that the heart, which is so closely associated with poetry for the Victorians that Kirstie Blair called it "the most vital cliché of nineteenth-century poetics" (*Culture of the Heart* 102), is mentioned three times in these lines, whose language, diction and imagery draw heavily on the poetical register and whose musical cadences contrast distinctly with the harsh sounds and awkward rhythm of the scientific jargon employed in lines like: "a manuscript newly begun // On the

carbonaceous compounds found in botanical tissues, – / Cellulose, glucose, lignine, dextrine, inuline, starch, —” (12–14). The leap Theophilus longs for cannot be made by scientific knowledge, but only by poetic imagination. Failing to realize this, he becomes embroiled in an endless and heated scientific controversy about the particular classification of a hitherto unknown weed and dies as dried and withered as the insignificant plant in whose explication his life has been wasted. The poem’s concluding stanzas drive its point home, when the poem’s narrator, a former student of the dead man, muses inspired by nature:

Well! sitting here on the grave of my master, while under the stone  
The red worm is picking his brains, there’s a notion comes into my mind: –  
(Was it the thistle that sung it, up there where the blackthorn is blown?  
Or here, in the long grass, was it let fall by the whispering wind?

What, if the grey cricket chirrup’d it, chasing yon seed-ball enchanted?  
What, if the wild bee humm’d it, ruffling the rich guelder rose?)  
The world, perchance after all, knows already enough: what is wanted  
Is, not to know more, but know how to *imagine* the much that it knows.  
(229–36; emphasis in original)

Owning its romantic allegiance with an almost verbal quotation from Percy B. Shelley’s “Defence of Poetry” (12) in its last line, the conclusion of the poem pitches the dry, barren truth of observational knowledge against a higher truth of the imagination, in secret communion with nature. Poetry is held up against a kind of science which only knows how to observe, notate and classify natural phenomena, but cannot attend to nature’s deeper mystery and unity.

It is highly relevant, however, that Bulwer Lytton chooses a botanist as the protagonist of this juxtaposition of poetry and science since the work of the botanist embodied a particular kind of descriptive and dissecting scientific practice, which was easily and popularly opposed to poetry, not least due to the influence of Wordsworth’s repeated suggestion of the callousness of the scientist, who “murder[s] to dissect” (“The Tables Turned” line 28, *Poems* 108) and “would peep and botanize / Upon his mother’s grave” (“A Poet’s Epitaph” lines 19–20, *Poems* 150). Indeed, the persistent strength of such a commonplace of the relation between the botanist (as science’s representative) and the poet is indicated by Constance Naden’s sonnet “Poet and Botanist” (1887), which takes up the stereotype only to question it, suggesting that “the mild Poet can be ruthless too” (line 9), because he instrumentalizes nature’s beauty to “tell / His thoughts” (12-13) only. In contrast to the natural supernaturalism evident in Bulwer Lytton’s poem, in which the poetic imagination is granted the potential for transcendent insight, Naden’s sonnet is suggestive of her monistic materialist philosophy in its insistence on the beauty and dignity of the material presence of the flower (and by extension, nature) itself, which both scientist and poet fail to acknowledge (see Thain 155–7).

However, the analytic, descriptive side, typified in botany, is but one aspect of science, as some Victorians were keen to emphasize. In a letter to the editors of the *National Review*, a Mr or Ms B. Brooksbank writes, in 1884:

The ordinary scientific analytic mind is antagonistic to the imaginative and creative mind. No doubt the specialist in science is specially unpoetic – he has little to do with the great laws of science – his mind is involved in the

endless details and facts of his subject – and the relation of his facts to eternal laws are perpetually obscure to him. . . . But this is not the whole side of science. There is synthesis as well as analysis, the building up as well as the breaking up. There is the discoverer, the hypothesis maker, as well as the mere observer of facts. From any amount of ascertained facts, to the statement of a general proposition – from induction, however careful, to hypothesis – is a daring leap in the dark, a leap from the known to the unknown. (864)

As it turns out, the great leap to the end which Theophilus was unable to undertake would not necessarily be a leap into poetry after all, but one into a higher, synthetic science. Thus the difference between an analytical science, which is immersed in details, and synthesizing poetry approaching eternal truths breaks down where science sets out to discover fundamental laws, as it would do with increasing success throughout the century. The importance not only of precise observation, but of the imagination in the process of scientific discovery was highlighted by Victorian scientists and philosophers of science. In 1840, William Whewell insisted in his influential *Philosophy of the Inductive Sciences Founded upon their History* that observation can only provide unconnected facts, but that in order to reach a scientific statement, these needed to be brought into relation by a creative act of interpretation: "The conception which the discoverer applies to them gives them connexion and unity" (18). While Whewell avoids speaking of this process as an act of the imagination – he prefers the more scientific terms "ideal conception" and "theory" (18 and *passim*) – some thirty years later John Tyndall should be much more direct in appropriating this faculty for scientific usage in his lecture "On the Scientific Use of the Imagination" (though he, in turn, is careful to qualify that the imagination needs to be "[b]ounded and conditioned by cooperant Reason") (152). "Newton's passage from a falling apple to a falling moon", Tyndall adds by way of illustration, "was, at the outset, a leap of the imagination" (152). As W. David Shaw has shown, such thought contributed to a change in concepts of science. At the same time, it destabilized carefully delineated territories of science and poetry. From the perspective developed by Whewell and Tyndall, even the evocation of the power of the imagination in the final verse of Bulwer Lytton's poem no longer privileges poetry, but could equally point to the synthetic power of the scientific imagination.

This turns out to be the core of the argument put forward by Robert Hunt in his popularization of scientific advances, *The Poetry of Science* (1848). Hunt was a polymath, active both as scientist and author, who attempted to merge poetry and science not only in *The Poetry of Science* but also in the poetic romance *Panthea, the Spirit of Nature*, published only a year later (see Tait). Confessedly indebted to Romantic thought, Hunt opens *The Poetry of Science* with an allusion to Keats' much-quoted conclusion to the "Ode to a Grecian Urn", in order to emphasize the common ground of scientist and poet: "The True is the Beautiful. . . . To be forever true is the Science of Poetry, – the revelation of truth is the Poetry of Science" (19). Hunt, too, admits that the (analytic) scientific labour of gathering facts may seem inimical to poetry: "The fumes of the laboratory, its alkalies 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" (17). But the grander truths which scientific study aims at, the "elementary principles, and . . . the laws which these obey" which inductive science strives to discover – these are deeply poetical, because they can "lead . . . the reflective intellect to higher and higher exercises", connecting "common phenomena

with exalted ideas" (18). Hunt clearly conceives of poetry not in its more restricted sense as a literary form, but in terms of an idealized spirit, and it is as such that he understands it to be compatible with science. Science is not poetical in its study of dry facts but in its illustration of fundamental natural laws. The poetry of science lies, precisely, in its universal, eternal truths:

One atom is removed from a mass and its character is changed; one force being rendered more active than another, and the body, under its influence, ceases to be the same in condition. The regulation which disposes the arrangements of matter on this earth, must exist through the celestial spaces, and every planet bears the same relation to every other glittering mass in heaven's o'erarching canopy, as one atom bears to another in the pebble, the medusa, the lion, or the man. An indissoluble bond unites them all, and the grain of sand which lies buried in the depth of one of our primary formations holds, chained to it by these all-pervading forces, the uncounted worlds which, like luminous sand, are sprinkled by the hand of the Creator through the universe. Thus we advance to a conception of the oneness of creation. (313)

Of course, Hunt deliberately uses the imagery and vocabulary of poetic diction in such an evocation of the poetry of science. Though Hunt will not admit it, it is the language of such passages as the one above which aligns them with poetry at least as much as the lofty, indeed, religious thought expressed in them. Nonetheless, the exalted subjects do matter in a context in which poetry was commonly defined in terms of its content and imbued with religious significance. George Henry Lewes gives voice to a widely held opinion in 1842, when he calls poetry in one of his review articles "*the beautiful phasis of a religious Idea*" (8; emphasis in original). Indeed, the passage quoted from Hunt can count as a nearly perfect example of poetry if the latter is defined in terms like those used by Reverend Thomas T. Lynch in 1853: "To unite earthly love and celestial . . . ; to reconcile Time and Eternity; . . . to harmonise our instinctive longings for the definite and the infinite in the ideal Perfect; to read creation as a book of the human heart both plain and mystical and divinely written: such is the office fulfilled by the best-loved poets" (19). Unfortunately for such an exalted conception of poetry, science increasingly appeared to be in a much better position to establish universally and eternally valid truths and to communicate the harmony of nature's laws. Hunt even suggests that the "high inferences to which the analysis of the subtle agencies of creation leads us, render science, pursued in the spirit of truth, a great system of religious instruction" (63). In effect, poetry as an aesthetic form is superseded by science, which gives rise to poetic and religious feeling more effectually than a poem ever could: "The vigorous mind of that immortal bard who sang 'of man's first disobedience,' never, in the highest rapture, the holiest trance of poetic conception, dreamed of any natural truths so sublime as those which science has revealed to us" (Hunt 313). Fifteen years later, Tyndall was to conclude his *Heat Considered as a Mode of Motion* (1863) in remarkably similar terms: "presented rightly to the mind, the discoveries and generalizations of modern science constitute a poem more sublime than has ever yet addressed the human imagination. The natural philosopher of to-day may dwell amid conceptions which beggar those of Milton" (qtd. in Gilmour 142). Thus the spirit of poetry is preserved within science, but at the cost of literature. A conception of poetry which focuses on content instead of form, on spirit instead of language and which roots the nature of poetry in timeless

truths, could hardly hold its own in face of scientific advances. Conceptions of poetry had to change. Otherwise, the conclusion to which a contributor to *Chambers's Edinburgh Journal* comes to in 1852, arguing that the age is prosaic, follows with a sense of inevitability. In such an age poets naturally turn into scientists: "the restless mind in which the fervour of poetry has died, plung[es] into science for the occupation that is necessary to its happiness" ("Prosaic spirit of the age", 403).

The abstract natural laws established by science thus usurp poetry's claim to convey deeper, eternal truths. A striking example of the consequences of this loss of authority, in particular with reference to the role of religion, can be found in the poem "Science of Things Outward" (1858), by classical scholar and philosopher Francis William Newman (John Henry's younger brother). Like Hunt, Newman recognizes the religious potential of scientific truths, which lies, precisely in their timeless stability:

The Science of things quantitative gives at once this vast advantage,  
(Peculiarly precious for religion and for practical faith,)  
An absolute confidence of the mind in the certainty of Truth,  
That it is unchangeable, and cannot be tampered with. (23–26)

Newman recognizes science as the new guarantor of eternal, immutable truths, and thus as a most important ally of religion, which depends on a faith in "absolute Law" (line 39). Science also combats pagan superstition, insisting on truth, and confronts the mind with thoughts of infinity, revealing "how measureless is God's world great and small": "And imagination spreads wide to clasp ideas so mighty, / And clothes with new grandeur the Ruler of the Universe" (lines 52; 54–5). Imagination, truth, permanent validity, and close relation to the divine – all aspects which Newman's contemporaries commonly associate with poetry – are here assigned to science. While Hunt argued that it is precisely the poetry in science that renders it such, Newman drives a different point. In contrast to science, Newman aligns poetry with change:

Whereas those whose culture is from Poetry alone and Fine Art,  
And from History and from Oratory and from practical Politics,  
Are prone to believe in the universal virtue of compromise  
And in the absence of fixed laws and in the anarchy of genius,  
And to explode as *Platitudes* all broad moralities.  
And their virtue is too superficial, based on shifting opinion  
Or on partial expediency, all pliant and unrigid.  
(31–7; emphasis in original)

Newman's position is intriguing, because it showcases the conditions under which the common claims for an eternal and transcendent validity of poetry became increasingly questionable and difficult to uphold. Whereas science's latest advancements pointed to the uniformity of natural laws, absolute and unvarying over an ever-extending abyss of deep time, a growing interest in history led to an awareness of historical difference and to increasing moral relativism (Buckley 19–20). Once poetry is associated with change, rather than timelessness, however, its previously close allegiance with religion and the divine weakens. For a while, though, poetry maintained its hold on eternal truth by shifting grounds and suggesting a division of labour.

### Head and Heart: Natural vs. Human Truth

If poetry soon had to concede to science a more rigorous hold on the truth of nature, it managed to maintain much longer its claims to a deeper knowledge of human mind and nature, and in particular human sensibility and emotion. An almost universal commonplace held that poetry "is rooted rather in the heart than the head", in the words used by Oxford poetry professor John Campbell Shairp in 1881 (3). Alfred Ewen Fletcher, journalist and later editor of the *Daily Chronicle*, summarizes this position in an essay on "The Philosophy of Art" (1886). Reiterating the contrast between science and poetry on the basis of the different methods of analysis and synthesis, Fletcher adds a distinction in subject matter and aim:

[B]oth as regards its aim and the method of attaining it, poetry widely differs from science. The latter contemplates the phenomena of matter and mind as effects to be referred to their causes, the former as causes of emotional or imaginative effects. Science is analytic and appeals to the understanding; poetry is synthetic, and appeals to the senses and emotions. (271–2)

In contrast to the lofty generalities which Hunt hailed as the poetry of science, Fletcher identifies embodiment, the senses, emotions and pleasure as central aspects of poetry, which stand in a diametrical, possibly complementary, relation to science. Watts accordingly explains in the *Encyclopaedia Britannica* that the scientist deals in abstractions, while "[w]ith abstractions the poet has nothing to do, save to take them and turn them into concretions" (257). Clearly, Watts is no longer thinking primarily of botanists, with their careful attention to concrete details. Science has conquered the field of abstract and general laws, and poetry is hailed as concretely embodied. But in this embodiment poetry again claims superior authority, since poetic embodiment adds subjective (poetic) to objective (scientific) knowledge, as Leigh Hunt had already proposed in his "Answer to the Question 'What is Poetry?'" published in 1844: "Poetry begins where matter of fact or of science ceases to be merely such, and to exhibit a further truth: that is to say, the connexion it has with the world of emotion, and its power to produce imaginative pleasure" (4). In this conception, emotions do not lead to a distortion of objective reality. By understanding the relation of the object to the emotional state of the human observer a higher truth is recognized, a truth that is more relevant to humans because it centres on the human being and his or her emotional response. In this sense, the Wordsworthian distinction between scientists representing things as they are and poets representing things as they appear privileges poetic truth as the higher and fuller truth. Trying to answer the same question at the end of the nineteenth century, school inspector and educationalist Edmond Holmes goes so far as to propose the following astonishing ontology:

Some feelings announce themselves to us as being higher, purer and nobler than others, and also (the one announcement being implicit in the other) as having been generated by higher realities. For example, the sense of beauty announces itself to us as being a higher sense than the sense of sight; and in and through this announcement it tells us that beauty is a more real property of things than either colour or form. . . . Here, then, we seem to be provided with an inward criterion and standard of reality, a scale of dignity in our

feelings which corresponds with a scale of reality in the things that surrounds us. (14–15)

Such idealism, which attributes to aesthetic perception a higher insight into reality, severely restricts science's reach for truth (which depends essentially on the sense of sight). Aesthetic judgement, instead of being disinterested and independent from truth claims, here turns into the means of deepest knowledge; a knowledge importantly rooted in feelings, not perception or reason.

It would be wrong to assume that an emphasis on emotion and subjective experience necessarily compromised poetry's association with timeless truths. For many Victorians, the universality and permanence of poetic truth was still guaranteed in so far as poetry was assumed to be concerned with what is essential and unchanging in human nature: "the nearer we get to the springs of poetry, the nearer also do we get to those dormant passions and unformulated thoughts which seem to be potentially common to all men, and which constitute a secret bond of sympathy between man and man" (Holmes 12). As Isobel Armstrong notes in *Victorian Scrutinies*, the appeal to common bonds and to sympathy were absolutely central to Victorian conceptions of the effect and value of poetry (9). Sympathy, which depends on the imaginative faculty, was assumed to be the basis of a kind of idealized human community which is all-embracing and timeless, and plays an important role for peaceful human cohabitation. As Armstrong explains, "[i]t was assumed that . . . poetry would appeal to the sympathies and the affections of the reader, to those impulses which are aroused by the essentially 'human' ties and feelings which we can all share" (10). Mill's early and influential essay "What is Poetry?", first published in 1833, and more famous for its definition of poetry as soliloquy, exemplifies this logic of eternal poetic truth ratified by sympathy. "The truth of poetry is to paint the human soul truly", he writes (564). Such truth, however, is entirely dependent on the notion of sympathy: "poetry, which is the delineation of the deeper and more secret workings of the human heart, is interesting only to those to whom it recalls what they have felt, or whose imagination it stirs up to conceive what they could feel, or what they might have been able to feel, had their outward circumstances been different" (564). In this conception, poetry can only speak intelligibly, or at least interestingly, at all if it is true to the bonds of common human nature, presumed to have eternal and universal validity. Testifying to the lasting appeal of this logic, Francis T. Palgrave suggests much later, in 1869, that sympathy and knowledge of the "general laws of human nature" are the basis of what he wants to establish as a "scientific study of poetry":

[H]e who studies [poetry] scientifically, – referring all the elements in a poem to the general laws of the human mind by which it is governed, seeking the cause of every quality and every detail which it presents, and not satisfied till he has put himself in the writer's own place, and, as it were, felt the inspiration of the moment with him; he who does this, and not satisfied yet, but desirous to gain the most he possibly can from his study, – trying the particular work before him by the great laws which mark out and limit human faculty, and then comparing it with other works in the same style, – finally is able to weigh truly the value of it. (171)

The value of poetry thus lies in its truthful rendition of "general laws of the human mind", which are assumedly unchangeable. Moreover, it is precisely knowledge of such general laws which makes a "scientific" study of poetry possible. Only on the

basis of such knowledge can the "true value" of a poem be established scientifically, that is, definitively. Indeed, in a kind of inversion of Robert Hunt's position that the universal laws are the element of poetry in science, a critic in the *London Quarterly Review* issue of June 1854 held that poetry "in its dependence upon principles of human nature, rather than upon rules, – and in its existence antecedent to, not springing from experience, . . . partakes of the nature of a science" (McNicol 440–1).

Clearly, such an ideal of poetry and poetic truth brings it into relation and even competition with psychology. Palgrave never specifies how knowledge of the "general laws of the human mind" is to be gained in the first place. Is it to be intuited from one's own nature, inferred from other poetry, or derived from the insights of science? Palgrave's emphasis on the "scientific" qualities of his approach might suggest the latter, in effect turning the science of mind into the arbiter of poetic value. William Johnson Fox, in an important 1831 review of Alfred Tennyson's *Poems, Chiefly Lyrical*, had already suggested that poetry, too, adheres to "the great law of progression that obtains in human affairs" (71), because poetry is concerned with the mind and mental science offers new insights into its workings. Thus, he claims, that "[t]he poetry of the last forty years already shows symptoms of life in exact proportion as it is imbued with this science" (74–5). However, as both Ekbert Faas (1988) and more recently Gregory Tate (2012) have stressed, Victorian poetry and psychology found their most fruitful exchange not in the assumption of universal laws of the human mind, but in the presentation and analysis of individual (often pathological) case studies. In both Victorian poetry and psychology, essentialist claims about psychological universals and the stability of the self came increasingly into question. Especially in contrast to the success of the natural sciences in reducing natural phenomena to general laws, human nature seemed protean, unpredictable and inexact. The concepts of fragmentation and change, according to Tate, became central to Victorian psychology, which "draw[s] attention to the mutability of the mind and to the way in which the ostensibly unified psyche fragments under the pressure of analysis" (*The Poet's Mind* 7). Such a focus does not necessarily mean that psychologists no longer believed in general laws of human nature. However, such laws were deemed to be inaccessible by self-reflection and introspection (see Faas 35–8). George Henry Lewes points to the limitations of the introspective psychologist in *Problems of Life and Mind* (1879):

An inquiry into the genesis of his sentiments and opinions would assure him that his mind was the product of a history; and with this assurance he must conclude that, since his history has not been precisely that of other men, their minds cannot be precisely like his own. His consciousness, therefore, cannot be the standard; it is only material for science in so far as it is in general agreement with the consciousness of fellow-men. By striking off what is individual in each, we may get at a conception of what is common to all. (96–7)

Lewes' general laws are thus pursued on the basis of scientific abstraction, not poetic concreteness. He aims to "reach the solid data for a general science", which needs a more "objective" basis than mere self-conscious introspection. This threatens to invalidate poetic approaches to universal truths of human nature, which are intuited from individual experience, rather than distilled from a mass of comparative data, and it should not surprise that Lewes had already some decades earlier called for a literary criticism that is aware of historical change. Great poets, according to Lewes, "are *not*

'mirrors of eternal truth', but mirrors of their age". With this realization, "a new torch is placed in our hand whereby we may penetrate into much of the darkness and obscurity of the past, and also penetrate into certain unexplained regions of Art itself" ("The Roman Empire" 33; emphasis in original). In this conception, poetry no longer reveals eternal truths, but provides evidence for historical change.

An awareness of the changing nature of the human mind, however, not only undermined poetry's hold on universal and unchanging laws of human nature as on a par with, or even superior to science's laws of nature, but posed even more fundamental challenges to the poets' confidence in their ability to communicate. Quoting from Walter Pater's famous conclusion to *The Renaissance* (1873), Carol Christ explains:

The growing fear of a solipsism in which each mind keeps "as a solitary prisoner its own dream of a world" poses difficult problems for poetry. If man can know nothing but his own experience, if personality composes a barrier between the self and the world, the very self-consciousness which had been for the Romantics the source of poetry's divine truth became for later poets the burden which limited its significance to incommunicable personal impressions. (30–1)

If the self is in perpetual flux, constituted entirely by "the passage and dissolution of impressions, images, sensations, . . . – that continual vanishing away, that strange, perpetual, weaving and unweaving of ourselves" (236) as Pater so famously put it; if the poet can no longer rely on sympathy based on a common essence of human nature, poetry's truths can hardly hope to strive for universal, permanent validity. Instead of serving as a common bond, binding together all human beings, subjectivity is reframed as the hallmark of solipsistic individuality. Poetry's subjective truths can no longer claim superiority to objective truths, because there can be no certainty that its subjective impressions are shared, or even shareable. Thus the poetic genre which so quintessentially represents this development, the dramatic monologue, invites the reader to study, analyze and judge its speaker, but resists (*pace* Robert Langbaum) a sympathetic (in the Victorian sense) identification with them, based on shared, essential human qualities. It thrives on difference, not commonality. The historical and moral relativism which Francis Newman had lamented in "Science of Things Outward" is, as it were, woven into the very fabric of the dramatic monologue.

Poetic truth thus becomes associated with relative truth, subject to context and perspective. This poetic approach finds its perhaps most emblematic expression in the kaleidoscope of voices of Robert Browning's *The Ring and the Book* (1868). Browning's guiding metaphor insists on the pure gold of truth out of which his ring is ultimately fashioned, and he claims confidently enough that he "knew the whole truth / Gathered together, bound up in this book", which is his historical source (1.115–6). Nonetheless, each of the voices he presents makes truth claims of their own and even the verdict of the Pope is merely "the ultimate / Judgment save yours", that is, the reader's (1.1212–13). Art, still, for Browning, "remains the one way possible / Of speaking truth" (though he humbly adds "to mouths like mine at least"), but the truth he speaks is precisely the doubt that truth is something humans can achieve: "This lesson, that our human speech is nought, / Our human testimony false, our fame / And human estimation words and wind" (12.839–40; 834–6). Where poetry is no longer sure of its access to essential and universally valid truths, neither about nature, nor about the human mind (nor soul); where it definitively turns from Aurora's "essential

truths" to those "relative, comparative and temporal truths" which she denigrates, the terms of its relationship to science have shifted. It no longer contests with science for a higher truth, but finds its justification in its own aesthetics and form.

### Modern Scientific Truth vs. Archaic Beautiful Illusion

Of course, the position that poetry is rooted not in truth but in illusion, indeed that it is antithetical to truth, dates back at least as far as Plato. Victorians found an influential formulation of this view in the work of Francis Bacon, who, in contradistinction to Aristotle's principle of mimetic probability, emphasized the creative, and imaginative freedom of poetry, defining it as "feigned history", the domain of the imagination, "which, being not tied to the laws of matter, may at pleasure join that which nature hath severed, and sever that which nature hath joined, and so make unlawful matches and divorces of things" (Book 2, Chapter 4). From this perspective, every attempt to reconcile science and poetry must be futile. As John Henry Newman makes this point in 1858, poetry "is always the antagonist to *science*. As science makes progress in any subject matter, poetry recedes from it" (emphasis in original). Science's mission, so Newman explains, "is to destroy ignorance, doubt, surmise, suspense, illusions, fears, deceits" but poetry resides in the mysterious and unknowable: "It implies that we understand [its objects] to be vast, immeasurable, impenetrable, inscrutable, mysterious; so that at best we are only forming conjectures about them, not conclusions, for the phenomena which they present admit of many explanations, and we cannot know the true one" (72). The essence and aim of poetry is thus not truth and knowledge, but wonder and awe. For Newman, it is precisely this awe that allies poetry once again to religion.

Since science, in the nineteenth century, indubitably made progress in every subject matter, such a view could easily lead poets to despair. "The poetry of earth is fading fast" writes Alaric Alexander Watts in his poem "Egypt Unvisited" (1851), because "Science, with eye of microscopic power, / And disenchanting lamp, from land to land, / With railroad speed continues still to scour, / Till scarce a spot on earth remains unscanned" (lines 5–8). Railway lines replace the lines of poems, scientific scanning of geographical space replaces the scanning of metrical verse. In influential evolutionist philosophies like that of Auguste Comte, poetry, instead of being timeless, was given a date of expiry. Once science had taken over the present and the future, poetry became a thing of the past, unfit to survive in the evolutionary struggle, a victim of modernization. Judith Plotz's study of *Ideas of the Decline of Poetry* amply attests to the long legacy of this kind of logic which the Victorians inherited. Reverence for the ancient poets came into conflict with the ideal and indeed the experiential reality of progress in knowledge and civilization, since few found themselves willing to claim that modern poetry was an improvement upon the poetry of the cultural heroes Homer, Virgil, Shakespeare or Milton. Because, to all those who did not, or no longer share Fox's optimism, poetry seemed to be an exemption from the law of progress, it was granted no place in a progressive age.

In its most drastic manifestation, this position could lead into the anti-progressivism and nostalgic hostility towards science expressed in the poetry of George Barlow, who exclaims in "Poetry and Science" (1884):

Give me the days of faith, and not of Science!  
 Give me the days of faith in unseen things!  
 The days of self-doubt, not of self-reliance:  
 Days when the rainbow flashed from fairy wings.

Knowledge hath little worth, if dreams are going.  
 Let me watch in the stream the Naiad's hair;  
 Or wander forth when balmy winds are blowing  
 Through sunlit groves, and find sweet Daphne there.

To know is well, but not to know is better.  
 'Tis ignorance that makes the child sublime.  
 To learn new facts adds fetter unto fetter  
 For all the already weary sons of time. (37–48)

In Barlow's and John Henry Newman's conception, poetry doesn't strive for truth but for uncertainty, for a Keatsian negative capability that cherishes wonder and mystery. While Newman in his work explicitly rejects "so heartless a view of life" as Comte's philosophy of evolutionary stages and insists on the coexistence of all stages, at least in the all-embracing present of the Catholic Church, Barlow's position is more conventional in associating poetry most closely with the mythical and medieval past and, accordingly, in lamenting its disappearance in an age which was widely understood to be unpoetical. At the beginning of the twentieth century, he concludes:

The twentieth century's doom's exceeding dismal!  
 It has to march, with stern-browed Truth to lead,  
 Towards moonless plains and forest-depths abysmal,  
 Past many a cold, once fairy-haunted, mead.  
 .....  
 Nothing to break the dreary desolation;  
 All secrets probed, all mystery solved at last!  
 In truth ours is a luckless generation:  
 Happier, I think, was almost all the past.  
 ("The Gospel of Science" 101–12)

The long-lasting allegiance of beauty and truth evoked by Keats' ode, is here dissolved. Truth and science have become synonymous, joint antagonists to poetic wonder and beauty.

Notwithstanding Barlow's prevailing pessimism, his apparent willingness to eschew any claims to poetic truth and knowledge, his nostalgic turn to the past and his escapist rejection of the poet's role as unacknowledged legislator of the world is not unrelated to late-Victorian attempts to re-empower poetry in a doctrine of art for art's sake. When the "standard of merit" for poetry is declared to be "not the truth, but the poetry" (Garnett xxxiii) – as it was, in this case, by Richard Garnett, in his introduction to his edition of Coleridge's poems, 1898 – poetry claims a self-sufficiency which refuses to be judged according to extraneous measures. This, crucially, is a self-sufficiency which casts off the referential ties and epistemological concerns which had governed conceptions of poetry throughout the century and instead roots itself firmly in an ontology of form. When Dante Gabriel Rossetti famously asserts the sonnet as "A moment's monument" in 1880, it is no longer the content, the respective moment as such, that has eternal validity, but it is the poetic form which eternalizes the moment. Becoming a means and an end in itself, poetry retreats from any direct conflict with science. If the Aestheticist doctrine freed poetry from its heavy moral fetters and opened exciting new aesthetic possibilities, it also

largely surrendered the terrain of material reality, social conditions and the search for knowledge to science and to the novel.

### Conclusion

A short poem published by William Allingham in 1890 polemically lamented "The Age of Poetry is gone / The Age of Suicide sweeps on / Pray Heaven it pass, tornado-wise / and leave behind it clearer skies". The age of poetry's religious and transcendent authority was indeed passing, and some of the aesthetic and early modernist poetic innovations may well have seemed to conservative spirits to sweep poetry tornado-wise into a kind of suicide. From a different perspective, however, poetry's deliberate retreat from knowledge could be understood to be its new strength. It is in this sense that Alain Badiou dates his "age of the poets" "vaguely . . . between 1870 and 1960" ("The Age of the Poets" 3). At this time, so he argues, poetry practised a kind of philosophical thinking that philosophy itself had left vacant because it had turned to scientific positivism. While poetry, for Badiou, "always constitutes a place of thought or, to be more precise, a procedure of truth" ("The Age of the Poets" 4), such poetic truth is one that is antithetical to knowledge: "at the farthest remove from knowledge, the poem is exemplarily a thought that is obtained in the retreat, or the defection, of everything that supports the faculty to know" ("What Does the Poem Think?" 31). In the modernism of Mallarmé, Rimbaud, Trakl and Celan – poets on whose aesthetics Badiou's argument hinges – poetry's ability to resist knowledge gives it a new kind of authority, one that is again antithetical to a scientific pursuit of knowledge. Instead of basing its authority on truth claims which are challenged by science, such poetry may itself challenge scientific confidence in truth by emphasizing relativity, contextual situatedness and, ultimately, unknowability.

I conclude with Badiou here, not to suggest that the modernist resistance to knowledge is a culmination, or a final word. Rather, I want to suggest that the relation between science and poetry, nowadays no less than for the Victorians, depends entirely on the specific conceptions of the terms which are employed. Indeed, what Warren said of early Victorian criticism still seems to apply today: "A critic could use any selection and interpretation [of the various meanings of poetry and science] to prove that science was hostile to poetry, that poetry and science were striving towards the same goal by different means, that poetry was a science, that poetry made the truths of science more impressive; all of these could be proved as well as their contraries" (7–8). I also want to emphasize once more that the relation between science and poetry cannot simply be mapped onto or subsumed into either current or historical debates about the relation of science and literature, or the sciences and the humanities. If the commonplace of the antithesis of poetry and science is a Romantic inheritance, passed on via the Victorians, the grounds on which that antithesis is based have shifted repeatedly and significantly in the course of history. Moreover, beyond the rich evidence of science's presence in Victorian poetry, which valuable work in Literature and Science studies has done much to make available, it is important to understand that with the rise of science and with its increasing rivalry with poetry, the very concept of poetry underwent significant change.

## Works Cited

- "Prosaic Spirit of the Age." *Chambers's Edinburgh Journal*, vol. 443, 26 June 1852, pp. 401–3.
- Allingham, William. "[The Age of Poetry is gone.]" *Blackberries*, Reeves and Turner, 1890, p. 25.
- . "On Poetry." *Fraser's Magazine for Town and Country*, vol. 448, no. 75, Apr. 1867, pp. 523–36.
- Armstrong, Isobel. *Victorian Scrutinies: Reviews of Poetry, 1830–1870*. Athlone P, 1972.
- Arnold, Matthew. "Literature and Science." *Discourses in America*, Macmillan, 1912, 72–137.
- Bacon, Francis. *The Advancement of Learning*. 1605. U of Adelaide ebooks, 2014.
- Badiou, Alain. "The Age of the Poets". *The Age of the Poets*, translated by Bruno Bosteels, Verso, 2014, pp. 3–22.
- . "What does the Poem Think?" *The Age of the Poets*, translated by Bruno Bosteels, Verso, 2014, pp. 23–35.
- Barlow, George. "Poetry and Science." *The Poetical Works*, vol. 7, Glaisher, 1902–1914, pp. 109–11.
- . "The Gospel of Science." *The Poetical Works*, vol. 10, Glaisher, 1902–1914, pp. 171–6.
- Blair, Kirstie. *Victorian Poetry and the Culture of the Heart*. Clarendon, 2006.
- Brooksbank, B. "The Antagonism of Science and Poetry." *The National Review*, vol. 18, no. 3, 1884, pp. 864–65.
- Browning, Elizabeth Barrett. *Aurora Leigh and Other Poems*. Edited by John Robert Glorney Bolton and Julia Bolton Holloway, Penguin, 1995.
- Browning, Robert. *The Ring and the Book*. Introduced by Wylie Sypher, W.W. Norton & Company, 1961.
- Buckley, Jerome Hamilton. *The Triumph of Time: A Study of the Victorian Concepts of Time, History, Progress and Decadence*. Harvard UP, 1966.
- Bulwer Lytton, Edward Robert. "A Man of Science or the Botanist's Grave." *Chronicles and Characters*, vol. 2, Chapman and Hall, 1868, pp. 317–35.
- Coleridge, Samuel Taylor. "Definition of Poetry." *The Literary Remains of Samuel Taylor Coleridge*, edited by Henry Nelson Coleridge, vol. 2, Pickering, 1836, pp. 7–12.
- Cordle, Daniel. *Postmodern Postures. Literature, Science and the Two Cultures Debate*. Ashgate, 1999.
- Christ, Carol T. *Victorian and Modern Poetics*. U of Chicago P, 1984.
- Dawson, Gowan, and Sally Shuttleworth. "Introduction: Science and Victorian Poetry." *Victorian Poetry*, vol. 41, no. 1, Spring 2003, pp. 1–10.
- Dawson, Gowan, and Bernard V. Lightman. "General Introduction." *Negotiating Boundaries*, edited by Piers J. Hale, *Victorian Science and Literature*, edited by Gowan Dawson and Bernard V. Lightman, vol. 1, Pickering & Chatto, 2011, pp. vii–xix.
- Faas, Ekbert. *Retreat into the Mind: Victorian Poetry and the Rise of Psychiatry*. Princeton UP, 1988.
- Fletcher, Alfred Ewen. "The Philosophy of Art." *Time*, vol. 14, no. 15, Mar. 1886, pp. 271–9.

- Fox, William Johnson. "Tennyson Poems, Chiefly Lyrical, 1830." *Victorian Scrutinies: Reviews of Poetry 1830–1870*, edited by Isobel Armstrong, Athlone P, 1972.
- Garnett, Richard. "Introduction." *The Poems of Samuel Taylor Coleridge*, edited by Richard Garnett, Lawrence & Bullen, 1898, pp. xiii–lii.
- Gilmour, Robin. *The Victorian Period: The Intellectual and Cultural Context, 1830–90*. Longman, 1993.
- Holmes, Edmond. *What is Poetry?* John Lane, 1900.
- Hunt, Leigh. "An Answer to the Question 'What is Poetry?'" *Imagination and Fancy*, 1844. Smith, Elder, & Co., 1891, pp. 1–61.
- Hunt, Robert. *The Poetry of Science: or the Studies of the Physical Phenomena of Nature*. Gould, Kendall, and Lincoln, 1850.
- Langbaum, Robert. *The Poetry of Experience: The Dramatic Monologue in Modern Literary Criticism*. Chatto and Windus, 1957.
- Lewes, George Henry. "Article I." *The British and Foreign Review*, vol. 13, no. 25, Jan. 1842, pp. 1–49.
- . "The Roman Empire and its Poets." *Westminster Review*, vol. 38, 1842, pp. 33–58.
- . *Problems of Life and Mind*. Houghton, Osgood and Company, 1879.
- Lynch, Thomas Toke. *Essays on Some of the Forms of Literature*. Longmans, 1853.
- Marston, J. Westland. *Poetry as an Universal Nature: A lecture delivered 8th June, 1838, at the Town Hall, Grimsby, for the Mechanics' Institution of that place, to which is added, The Poet, an Ode*. W. Strange, 1838.
- McNicoll, Thomas. "ART. V. The Poetical Works of James Russell Lowell." *London Quarterly Review*, vol. 2, no. 4, June 1854, pp. 440–59.
- Mill, John Stuart. "What is Poetry?" *The Broadview Anthology of Victorian Poetry and Poetic Theory*, edited by Thomas J. Collins and Vivienne Rundle, Broadview P, 2005, pp. 562–70.
- Moir, George. "Poetry." *Encyclopaedia Britannica: Seventh Edition*, vol. 18, 1842, pp. 140–73.
- Moon, Washington G. *What is Poetry? A Paper read before the Royal Society of Literature*. Hatchards, 1879.
- Naden, Constance. "Poet and Botanist." *The Complete Poetical Works of Constance Naden*, Bickers & Son, 1894, p. 332.
- Newman, Francis William. "Science of Things Outward." *Theism. Doctrinal and Practical*, John Chapman, 1858, pp. 19–21.
- Newman, John Henry. "The Mission of the Benedictine Order." *Negotiating Boundaries*, edited by Piers J. Hale, *Victorian Science and Literature*, edited by Gowan Dawson and Bernard V. Lightman, vol. 1, Pickering & Chatto, 2011, pp. 69–77.
- Palgrave, Francis T. "On the Scientific Study of Poetry." *Fortnightly Review*, vol. 6, no. 32, Aug. 1869, pp. 163–78.
- Pater, Walter. *The Renaissance: Studies in Art and Poetry*. 6<sup>th</sup> ed., Macmillan, 1902.
- Plotz, Judith A. *Ideas of the Decline of Poetry: A Study in English Criticism from 1700 to 1830*. Garland Publishing, 1987.
- Rossetti, Dante Gabriel. "[Sonnet on the Sonnet.]" *Collected Poetry and Prose*, edited by Jerome McGann, Yale UP, 2003, p. 127.
- Shairp, John Campbell. *Aspects of Poetry: Being Lectures Delivered at Oxford*. Clarendon P, 1881.

- Shaw, W. David. "Poetic Truth in a Scientific Age: The Victorian Perspective." *Centre and Labyrinth: Essays in Honour of Northrop Frye*, edited by Eleanor Cook et al., U of Toronto P. 1983.
- Shelley, Percy B. "A Defense of Poetry." *Essays, Letters from Abroad*, edited by Mary Shelley, Edward Moxon, 1845, pp. 1–14.
- Tait, Adrian. "The 'True Philosophy' of Robert Hunt: Forms of Understanding in Panthea and The Poetry of Science." *EJES*, vol. 22, no. 3, 2018, pp. 273–286.
- Tate, Gregory. "Poetry and Science." *The Routledge Research Companion to Nineteenth-century British Literature and Science*, edited by John Holmes and Sharon Ruston, Routledge, 2017, pp. 101–14.
- . *The Poet's Mind: The Psychology of Victorian Poetry 1830–1870*. Oxford UP, 2012.
- Thain, Marion. "'Scientific Wooing': Constance Naden's Marriage of Science and Poetry." *Victorian Poetry*, vol. 41, no. 1, Spring 2003, pp. 151–69.
- Tyndall, John. "On the Scientific Use of the Imagination." *Negotiating Boundaries*, edited by Piers J. Hale, *Victorian Science and Literature*, edited by Gowan Dawson and Bernard V. Lightman, vol. 1, Pickering & Chatto, 2011, pp. 149–65.
- Warren, Alba H. *English Poetic Theory 1825–1865*. Frank Cass & Co. LTD, 1966.
- Watts, Alaric Alexander. "Egypt Unvisited. Suggested by Mr. David Roberts's Egyptian Sketches." *Lyrics of the Heart*, Longman, 1851, pp. 269–70.
- Watts, Theodore. "Poetry." *Encyclopaedia Britannica: Ninth Edition*, vol. 19, 1885, pp. 256–272.
- Wheelwright, E.G. "A Claim for the Art of Fiction." *Westminster Review*, vol. 146, no. 1, July 1896, pp. 205–12.
- Whewell, William. "Philosophy of the Inductive Sciences Founded upon their History." *Negotiating Boundaries*, edited by Piers J. Hale, *Victorian Science and Literature*, edited by Gowan Dawson and Bernard V. Lightman, vol. 1, Pickering & Chatto, 2011, pp. 15–28.
- Wordsworth, William. *Wordsworth's Literary Criticism*. Edited by W. J. B. Owen and Paul Kegan, Routledge, 1974.
- . *Selected Poems*. Edited by Damian Walford Davies, Everyman, 1994.