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Bright Star:

John Keats and Romantic Astronomy

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1. Frontispiece from John Bonnycastle's 1807 edition of *An Introduction to Astronomy* which Keats was awarded as an academic prize. Urania, Greek muse of Astronomy, crowned with a star and gesturing skywards, places a guiding arm around her pupil. He is an Endymion figure, earth-bound (symbolised by the globe in the left hand corner) but entranced by the heavens.

Thesis Contents

Abstract

As the Romantic biographer Richard Holmes has noted, 'the very terms "world" and "universe" began to change their meanings' during John Keats's lifetime. In papers published in the *Philosophical Transactions of the Royal Society* between 1780 and 1814, the astronomer William Herschel identified a vast and unwieldy universe filled with millions of star laboratories – galaxies of nebulous matter and stars existing in various stages of development formed under the universal force of gravity. Stellar material was in flux and stars could no longer act as sublime metaphors for permanence and constancy. The simple yet dangerous idea that the universe, in its entirety, undergoes change, found its way into the intellectual culture of Keats's time. While some writers attempted to resolve this cosmological confusion by emphasising the unity and cohesion of the cosmos, Keats recognised the fertility of this new cosmological model and incorporated it into his poetry. According to Marilyn Gaull, Romantic astronomy 'did not find its voice in art or literature, except in the mythic representations of Blake and Shelley.' It is the purpose of my research to disprove or at least complicate this statement. My thesis will discuss, not only how contemporary scientific debate found its way into Keats's writing, but how he was able to take up his poetic inheritance by acting, like Ovid, Shakespeare and Milton before him, as interpreter or interlocutor, between scientific and popular understandings of contemporary astronomy. By contemplating the intricacies of Herschel's work, especially the nebulosity of his theories on the 'construction of the heavens' and the paradox of eternity that rests at the heart of his cosmology, this thesis contains an in-depth study of the science and scientific discourse, as well as the poetry of the period. Paying particular attention to Keats's cosmological writing – those poems interested in the relation between heavenly and earthly realms, namely 'On First Looking into Chapman's Homer,' 'Bright Star,' *Endymion* and *Hyperion*: *A Fragment* – as well as the representation of contemporary astronomy in Romantic-era print culture, my thesis argues that Keats's poetry contains a sensitive response to the complications posed by science to mythical and biblical ideas of permanence, universalism and eternity.

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I would like to dedicate this thesis to my husband, Dr Timothy Hasted, and to my parents, Antony and Fae Capsopoulos. The deep love and friendship that was shown to me throughout this process allowed me to approach my research – to use a Keatsian metaphor – 'with shoulders fledged.'

Illustrations

Abbreviations

In the following thesis, all references are footnoted except in the case of four frequently cited texts:

1. All references to John Keats's poems are taken from John Keats, ~~*The*~~ *Complete Poems*, ed. Jack Stillinger (Cambridge, MA: Harvard University Press, 1982) [cited as *Poems*].

2. Excerpts from Keats's letters are taken from John Keats, *The Letters of John Keats, 1814-1821*, ed. Hyder Edward Rollins, 2 vols. (Cambridge, MA: Harvard University Press, 1958) [cited as *Letters*].

3. The poetry and prose of Percy Bysshe Shelley, except where otherwise indicated, comes from Percy Bysshe Shelley, *The Major Works*: *Including Poetry*, *Prose*, *and Drama*, ed. Zachary Leader and Michael O'Neill (Oxford: Oxford University Press, 2003) [cited as *Major Works*].

4. Quotations from John Bonnycastle's treatise on astronomy, unless otherwise indicated, refer to John Bonnycastle, *An Introduction to Astronomy*. *In a Series of Letters, from a Preceptor to His Pupil*. *In which the Most Useful and Interesting Parts of the Science are Clearly and Familiarly Explained* (London: J. Johnson, 1807) [cited as *Introduction to Astronomy*].

Oft have you seen a swan superbly frowning,
And with proud breast his own white shadow crowning;
He slants his neck beneath the waters bright
So silently, it seems a beam of light
Come from the Galaxy: anon he sports, –
With outspread wings the Naiad Zephyr courts,
Or ruffles all the surface of the lake
In striving from its crystal face to take
Some diamond water drops, and them to treasure
In milky nest, and sip them off at leisure.
But not a moment can he there insure them,
Nor to such downy rest can he allure them;
For down they rush as though they would be free,
And drop like hours into eternity.
Just like that bird am I in loss of time,
Whene'er I venture on the stream of rhyme;
With shatter'd boat, oar snapt, and canvass rent,
I slowly sail, scarce knowing my intent;
Still scooping up the water with my fingers,
In which a trembling diamond never lingers.

John Keats, 'To Charles Cowden Clarke,' 1816.

Prologue:

Percy Bysshe Shelley's 'Ode to Heaven'

The final verse of Percy Bysshe Shelley's 'Ode to Heaven' (1820) is typical of the poet's treatment of religious subjects – contrary and precocious, beautiful and blasphemous:

> What is Heaven? a globe of dew,
> Filling in the morning new
> Some eyed flower whose young leaves waken
> On an unimagined world.
> Constellated suns unshaken,
> Orbits measureless, are furled
> In that frail and fading sphere,
> With ten millions gathered there,
> To tremble, gleam, and disappear!
>
> (*Major Works* 448)

Heaven, as Shelley imagines it in the final verse of his ode, is anything but an eternal paradise. Millions gather (whether planets, suns, or souls is uncertain) to 'tremble, gleam, and disappear!' Heaven is grand with 'orbits measureless' yet also trivial, 'a globe of dew' or just 'some eyed flower.'[1] It is 'frail and fading' – in decay – yet somehow 'unshaken' and 'filling in the morning new.' The language of the verse (with its globe, world, sphere and orbits) demonstrates the poet's familiarity with astronomical phenomena. But the image of a confused, whirling, gleaming mess of disappearing suns in a fading galaxy attests to the currency of Shelley's scientific education.

At Eton, Shelley was mentored by James Lind MD, FRS (1736-1812), a friend of William Herschel (1738-1822), the leading astronomer of the age. Lind, himself well versed in the theory and practice of astronomy, is the most likely source for Shelley's impressive knowledge of the science and of Herschel's work in particular.[2] From Eton,

[1] These images resonate strongly with Samuel Taylor Coleridge's question: 'Are we struck at beholding the cope of heaven imaged in a dew-drop?' and William Blake's famous lines from 'Auguries of Innocence': 'To see a World in a Grain of Sand,/And a Heaven in a Wild Flower.'

[2] See Christopher Goulding, 'Shelley's Cosmological Sublime: William Herschel, James Lind and "The Multitudinous Orb,"' *Review of English Studies* 57.232 (2006): 783–792; 'A Volcano's Voice at Eton: Percy Shelley, James Lind MD, and Global Climatology,' *Keats-Shelley Review* 17 (2003): 34– 41 and '"An Old, Old Man with Hair of Silver White…": A More Scientific Image of Shelley's Mentor at Eton,' *Keats-Shelley Review* 14 (2000): 52–55.

both Shelley and Lind would have experienced frequent sightings of the astronomer's mammoth 40ft telescope that he had built at Slough, near Windsor, and which was an unescapable feature of the area's land and skyscape.[3] In the shadow of this 'monster'[4] (its unwieldy size rendered it symbolic, rather than exemplary of, Herschel's ground-breaking work with telescopic magnification) Shelley would have learnt about a new universal system introduced by observations of deep space. While the discovery of Uranus in 1781 established Herschel's career, it was his observations of 'the heavens,' the space outside of the solar system, which was truly revolutionary. Though Herschel himself was firmly placed within the establishment (he was private astronomer to George III) his groundbreaking hypotheses became associated with radical politics within Lind's progressive circle.[5]

Shelley's generation, which included John Keats, was the first to be schooled to see the heavens as we do today – as a space of unimaginable size, complexity, and change. Keats also learnt about Herschel's discoveries at his school in Enfield and later would have seen the 40FT telescope on his travels to and from Oxford, Exeter and elsewhere.[6] Herschel's discoveries helped poets like Shelley and Keats imagine an anarchic heaven that was neither an orderly assembly of parts, nor a house of God, nor a pristine firmament of eternal lights. The following chapters of this thesis focus on the ways in which Keats's imagination was alive to the discoveries of contemporary astronomy and how this engagement formed an intellectual or philosophical basis for many of his best-known aesthetic treatments of cosmological themes. Though Keats and Shelley undoubtedly reacted differently to the religious, artistic and ontological implications of Herschel's discoveries, a full appreciation of Keats's response is, I argue, contingent upon a comparison with that of his immediate contemporary. The following discussion of Shelley's poem 'Ode to Heaven,' then, is not an attempt to temporise about Keats's poetry, but to construct a strong contextual platform from which to understand it.

Indeed, paying attention to what Shelley does in his poetry is a useful means of understanding what Keats might have done (but did not, or was unwilling to do) with the astronomical metaphors proffered by Herschel and his colleagues. The scene

[3] For example, Herschel's 40ft telescope, the largest ever built, made it onto the 1803 Ordnance Survey [Michael Hoskin, 'Herschel's 40FT Reflector: Funding and Functions,' *Journal for the History of Astronomy* 34 (2003): 1–32, 1]. Shelley attended Eton from 1804-1810.

[4] Hoskin, 'Herschel's 40FT Reflector,' 1.

[5] Goulding, 'Shelley's Cosmological Sublime,' 792.

[6] My thanks to Professor Nicholas Roe for pointing out this fact.

created in the final verse of Shelley's 'Ode to Heaven,' for example, is more angry, more savage, more deliberately challenging to the status quo, than anything that we encounter in Keats's cosmological writings.

Nonetheless, Shelley's verse closely resembles the conditions of Herschel's nebulous galaxies (cosmic clusters of stars, dust and gas). Shelley's heaven, like Herschel's, consists of 'constellated suns' held together 'unshaken' in a gravitational bind. Herschel's suns, like Shelley's, are on the move, circling an unknown centre in 'orbits measureless' and 'furled' throughout space like the giant arms of the Milky Way. And Herschel's heaven, like Shelley's, is uncustomarily dynamic. Heaven is home to both beginnings and endings: through the telescope a universe can crystallise into being like 'a globe of dew' while it can also reveal suns setting in an ageing galaxy ('that frail and fading sphere') to await their inevitable death.[7]

However, it is important to note that this chaotic universe is only presented at the end of Shelley's ode. It is the third spirit's answer to the question 'What is Heaven?' after the first and second spirits have engaged in their own metaphysical speculations about the universe. The first section of the poem gives voice to many of the beliefs about heaven most deeply ingrained in the western imagination:

Chorus of Spirits
First Spirit

Palace-roof of cloudless nights!
Paradise of golden lights!
  Deep, immeasurable, vast,
Which art now, and which wert then;
  Of the present and the past,
Of the eternal where and when,
  Presence-chamber, temple, home
  Ever-canopying dome
  Of acts and ages yet to come!

Glorious shapes have life in thee,
Earth, and all earth's company;
  Living globes which ever throng
Thy deep chasms and wildernesses;
  And green worlds that glide along;

[7] 'To tremble, gleam, and disappear,' the last line of Shelley's ode, as well as acting as a compelling (if ominous) metaphor for human life, could also be read as a prophetic description of the supernova. This major cosmic event (not discovered until the twentieth century) occurs when a massive star becomes unstable and finally succumbs to gravity. The resulting explosion, whereby most or all of the star's material is released into the cosmic atmosphere, emits tremendous amounts of radiation so that for a brief time, the remains of the star can be more luminous that an entire galaxy. Most stars, including the Sun, will meet a far less spectacular fate as their cores cool and fade over millions of years [David H. Levy, *Skywatching* (San Francisco: Fog Press, 2007), 30–31].

And swift stars with flashing tresses;
  And icy moons most cold and bright,
  And mighty suns beyond the night,
  Atoms of intensest light!

Even thy name is as a God,
Heaven! for thou art the abode
  Of that Power which is the glass
Wherein man his nature sees.
  Generations as they pass
Worship thee with bended knees.
  Their unremaining Gods and they
  Like a river roll away:
  Thou remainest such – alway!

(447)

Heaven is a starry firmament, a 'paradise of golden lights.' It is beyond time 'of the present and the past' and so, importantly, is 'eternal' and unchanging, an 'ever-canopying dome.' According to convention, heaven is also the 'abode' of God.

The second spirit's take on matters appears to follow convention, too. This part of Shelley's poem presents a familiar argument: the human mind is too frail to comprehend the sublime promise of paradise and eternal life:

Second Spirit
Thou art but the mind's first chamber
Round which its young fancies clamber,
  Like weak insects in a cave
Lighted up by stalactites;
  But the portal of the grave,
Where a world of new delights
  Will make thy best glories seem
  But a dim and noonday gleam
  From the shadow of a dream!

(448)

Heaven, here, is the unsuccessful human attempt to understand that which is most alien to it: unmitigated delight. Fallen and besieged by mortality and misfortune, the human mind cannot imagine 'a world of new delights.' So, even the imagination's 'best glories' will seem, when compared to paradise, 'but a dim and noonday gleam/ From the shadow of a dream!' But the tone of reverence that dominates the majority of Shelley's 'Ode to Heaven' comes to an abrupt halt in the fifth verse when the third spirit seeks to silence naïve and self-aggrandising notions of heaven:

Third Spirit
Peace! the abyss is wreathed with scorn
At your presumption, atom-born!
  What is Heaven? And what are ye
Who its brief expanse inherit?
  What are suns and spheres which flee
With the instinct of that spirit
   Of which ye are but a part?
   Drops which Nature's mighty heart
   Drives through thinnest veins. Depart!

(448)

'What is Heaven?,' the third spirit asks with menace. The answer seems to be, not much. This verse, and the one I cite at the beginning of this chapter, take contemporary discoveries in astronomy to radical extremes.

Herschel was able to apply Newtonian physics beyond the earth and the solar system to the movements of the outer heavens, ultimately showing that the entire universe moved under the same physical laws. The third spirit exploits this basic premise to argue that heaven is not an elevated realm. Here, heaven is not perfect, or everlasting, or a respite from mortal experience.

The third spirit's heaven is relegated to 'Nature,' the 'mighty heart' of which 'drives through' or vivifies the celestial, just as it flows through the 'thinnest veins' of earthly creatures. Heaven is humble. Though not mechanical, it is material, and made of the same 'drops' as all life. It is not apart from, but akin to, the mortal and all that is 'atom-born.' If heaven is merely 'Nature' writ large, the third spirit seems to say, and all nature lives and dies, then reaching heaven can no longer be considered a path, a promise, a privilege. 'Suns and spheres' move with the same 'instinct of that spirit' of which we all are a part. The final verses of Shelley's ode articulate the ultimate hubris: heaven is only human.

Given that the entire ode is written with the emphatic rhythm of trochaic tetrameters and that its sections 'work through and set against each other different views of the idea of heaven,'[8] it could be argued that, in the final section of the poem, Shelley uses his extensive knowledge of contemporary astronomy to launch an attack on Judeo-Christian cosmology. It is certainly true that the poem's final vision of heaven is intended to be its most confronting. 'Ode to Heaven' can appear to make an assertive

[8] Zachary Leader and Michael O'Neill, 'Notes,' in Percy Bysshe Shelley, *The Major Works: Including Poetry*, *Prose and Drama,* ed. Zachary Leader and Michael O'Neill (Oxford: Oxford University Press, 2003), 702–836, 774, n. 447.

and deliberate case for realist, progressive understandings of the universe by contrasting these, scathingly, with the comforting delusions of traditional belief. In this view, Shelley uses the first and second spirits' reliance on religious and philosophical speculation to render his final, 'scientific' vision of heaven more logical and compelling.

Headings given to the poem in a draft held with the Bodleian Shelley Manuscripts seem to support this reading. In this document, the title 'first spirit' instead reads 'Chorus of Spirits,' the second spirit's verse is entitled 'A Remoter Voice' and the last two verses, attributed to the third spirit in the printed edition, are ascribed to an even 'Louder and Remoter Voice.'[9] The original headings intended for the poem show that Shelley not only sought to represent different views of heaven, but to indicate something about the appeal of these views. It is not hard to imagine Shelley (who wrote the poem during his self-imposed exile in Italy) casting himself as the lone dissenter, paradoxically the 'louder and remoter voice.' It would not, after all, be the first time Shelley had attempted to convert the thinking of the 'chorus' – the men and women of England he felt were oppressed by outdated beliefs and traditions. Yet the final version of the poem (whatever Shelley may have initially intended) does not have the kind of overtly political tone as the other short poems he was writing at around the same time. These poems, which probably included 'Sonnet: England in 1819' and 'Men of England: A Song,' were intended for what Shelley called a 'little volume of *popular songs* wholly political, and designed to awaken & direct the imagination of the reformers.'[10] Due to the inflammatory nature of these poems (Shelley famously calls George III 'An old, mad, blind, despised, and dying King') the edition could not find a willing publisher. There is no indication that Shelley ever considered 'Ode to Heaven' for such a volume and it is telling that the poem was published shortly after its composition alongside another poetic response to Herschelian astronomy, *Prometheus Unbound* (1820). Both of these poems, though vastly different in form and scale, nevertheless obfuscate their revolutionary themes with varied perspectives, complicated, sometimes abstract, imagery and indirect references to reformist principles. It is significant, I think, that Shelley changed his characterised 'voices' to disembodied 'spirits' in his final version of 'Ode to Heaven.' As a result, all three

[9] Leader and O'Neill, 'Notes,' 775, n. 448.

[10] Leader and O'Neill, 'Notes,' 772, n. 442, 773, n. 446. Shelley wrote all of these poems between late 1819 and early 1820 but there is some question about which poems Shelley intended for this political volume.

imaginings of heaven sit alongside each other in relative equality and the poem avoids the potential for aggressive didacticism.

Indeed, the multivocal structure of the poem means that one spirit's idea of heaven cannot be privileged above another. For example, the third spirit's vision in 'Ode to Heaven,' though it draws heavily on contemporary science, is just as much an imaginary confection as the poem's two previous conceptions. It is a version of heaven that, like most others written in the period, seeks to resolve the ever more confusing information that was emerging about the universe into something straightforward and understandable. In the third spirit's case, this means levelling the heavenly and the human through the overwhelming force of natural change. It is an extreme position, and possibly the position towards which Shelley felt the most sympathetic. However, 'Ode to Heaven' does not simply pit scientific against theological understandings of the universe. And the first and second spirits' notions of heaven do not work merely as rhetorical foils to the third spirit's rebellious vision. Indeed, it is rewarding to consider all three sections of the poem as earnest reflections upon the post-Herschelian question: 'What is Heaven?'

Reading in this direction, the first and second spirits' versions of heaven appear less like idealised counterpoints to the grim scientific vision of the poem's final stanzas. For example, the first spirit's heaven, while keeping some key traditional notions in play (heaven is still an eternal paradise), is also demonstrably Herschelian.[11] It is a place – a 'presence-chamber, temple, home' – though also a *space* filled with planets ('earth's company'), comets ('swift stars with flashing tresses') and unseeable stars ('mighty suns beyond the night'). This heaven is a 'wilderness' – unthinkable within the old Newtonian schema that emphasised order, balance and measurability. The glory of heaven, the first spirit seems to say, continually grows and is continually discovered. Astronomical discovery elevates rather than diminishes heaven's magnificence.

Shelley does not seek to reaffirm traditional notions of heaven in this part of the poem – to contrast a safe assimilation of Herschel's hypotheses with the turbid response of the third spirit. Despite the fact that it pays attention to the less threatening aspects of contemporary astronomy's findings (there are no disappearing galaxies for example), the first section of Shelley's poem is almost as revolutionary as the last.

[11] Leader and O'Neill note that 'the First Spirit describes heaven in terms influenced by eighteenth-century astronomy' ['Notes,' 774, n. 447] though it is unclear whether this means the astronomy of Herschel and others that carried over the turn of the nineteenth century or the work of the Enlightenment scientists who came after Newton and from which the work of Romantic-era astronomers marks a significant departure.

While heaven remains 'glorious' and 'eternal' the details of its splendour undermine rather than support a belief in a superior 'Power.' While it could be argued that the first spirit's view of heaven is influenced by the principles of Deism – given that a central tenant of deistic theology is the existence of a Supreme Being responsible for all creation but not involved, or revealed in, the world itself – such a reading proves unsatisfying. The first spirit's heaven plays host to a rolling series of gods that serve the needs of each generation of worshippers. This imagining seems in direct contrast to the deistic idea of an aloof, disinterested God, who can be rationally discovered. In the Oxford English Dictionary's list of past usages of 'Deism,' only Methodist minister J. W. Fletcher's pejorative definition (1777) aligns with the impression of heaven given in the first part of Shelley's Ode: 'Deism is the error of those, who […] think that man […] needs no Redeemer at all.'[12]

The first spirit presents the idea of heaven as a theological constant (that is, common to many belief systems throughout time),[13] as opposed to a procession of ever-changing gods that appear as convenient, even narcissistic, human inventions (gods are 'the glass/ Wherein man his nature sees'). Here, unlike the final stanzas of Shelley's poem, it is heaven's constancy, rather than its volatility, that is stressed in the wake of a newly discovered dynamic universe:

> Generations as they pass
> Worship thee with bended knees.
> Their unremaining Gods and they
> Like a river roll away:
> Thou remainest such – alway!

In the first spirit's reckoning, Aristotle's crystal spheres, the Cartesian whirlpools, the fixed Newtonian firmament – along with a pantheon of gods – have all been overthrown. But heaven has remained. It is heaven's slipperiness as a signifier – its ability to reference the scientific as well as the sacred, the material and metaphysical – that ensures its continued survival.[14]

If the first and third spirits present two revolutionary versions of heaven – a heaven without gods and a heaven that is human – what is the second spirit's response to the astronomy of Shelley's time? This section of 'Ode to Heaven' uses the

[12] 'Deism,' Oxford English Dictionary Online, 2nd edn, 1989, accessed March 2012.

[13] Of course, as Shelley is well aware, the concept of heaven is not common to all cultures.

unimaginable size and complexity of the universe as a metaphor for the potential of the human mind, and in doing so presents a world in which the idea of heaven becomes an obstacle. The second spirit dissolves heaven's materiality; there are no stars or planets here. The result is a vision of heaven that appears innocuous: an unthreatening reverie on the promise of paradise. Perhaps this is why Mary Shelley's notes on Shelley's metaphysical beliefs resonate so strongly with this verse, and not with the other two sections of the poem. Mary Shelley's notes are included in the posthumous edition of her husband's work that she published in 1839. These volumes attempted to rescue Shelley from his reputation as a dissolute atheist and to give a consistent philosophical framework to his writing. In them, Mary links 'Ode to Heaven' to Shelley's faith in the redemptive qualities of the human imagination:

> The creation, such as it was perceived by his mind – a unit in immensity, was slight and narrow compared with the interminable forms of thought that might exist beyond, to be perceived perhaps hereafter by his own mind; or which are perceptible to other minds that fill the universe, not of space in the material sense, but of infinity in the immaterial one.[15]

The similarities between Mary's observations and the second spirit's ideas of heaven help to make sense of this part of Shelley's poem. Both speak of the 'hereafter,' 'a world of new delights,' a heaven that is not a place but a state of full consciousness. In this heaven (is it heaven?) there are no bodies, planetary or otherwise, only 'interminable forms of thought,' a community of minds that have been liberated from the 'young fancies' of the 'mind's first chamber.' Importantly, both passages move away from material understandings of heaven by sidelining astronomical forms (these are relegated to 'space' in Mary Shelley's notes and ignored entirely in Shelley's stanza). A deliberate move away from scientific language and imagery in this context could appear as a conservative, rather than radical, shift in perspective. This is because heaven's parts – its scientifically knowable physical forms – pose the most obvious threats to traditional beliefs about eternity and the afterlife. But these passages, taken together, fashion yet another rebellious vision of heaven in the wake of Herschel's 'immens[e]' new universe.

Here, humanity's 'best glories' (astronomical knowledge, any knowledge), cannot compete with the full realisation of the mind's latent power. By denying the

[15] Qtd. in Leader and O'Neill, 'Notes,' 774, n. 447.

importance of heaven's materiality, the second spirit takes an extreme position: the universe might be infinitely large, complex, challenging and dynamic but knowledge gained through science and reason is but 'slight and narrow,' a 'dim and noonday gleam,' compared with what is on offer when the mind is free. The implications of this suggestion are unsettling. If the afterlife is liberated from the nuts and bolts of heaven, then eternity is whatever we think it is – or, indeed, whatever we think. The second spirit does not say that heaven is godless, or that heaven is human, but that heaven is inconsequential. Thought reigns supreme. And perhaps this makes the second spirit's idea of heaven the most radical of all.

The sophistication of Shelley's poem comes from its equivocation about how heaven can be imagined. This is a part of what Christopher R. Miller calls 'Shelley's multivalent rhetoric of heaven'[16] present throughout his entire body of work. In other words, the ambiguity of heaven in the poem cannot be resolved by looking to Shelley's use of the word in his other writings. As Miller argues, '"Heaven" was one of Shelley's favourite words, typically capitalised, and the poet used it with a frequency and a range of meaning unequalled by his contemporaries or immediate predecessors.'[17] The ode itself presents 'as a drama of lexical transformation, which can be signally tracked in varying iterations of "heaven."'[18] And, according to Miller, while 'odes traditionally ask how best to praise their subjects; this one is remarkable for its radical uncertainty over what is being praised (or derided) – an uncertainty that reflects Shelley's own.'[19]

Nevertheless, while reading 'Ode to Heaven' it is tempting to speculate as to what Shelley might have thought himself. Plenty has been written about Shelley and religion (much of it by Shelley himself), and yet it remains difficult to understand exactly where the poet stood in regards to an afterlife.[20] This is true despite the fact that Shelley appears to set out his position on heaven in number twenty six of his *Declaration of Rights* (1812) where his argues that 'those who believe that Heaven is

[16] Christopher R. Miller, 'Shelley's Uncertain Heaven,' *ELH* 72.3 (2005): 577–603, 598, 578. Miller's essay also points to the fact that 'Ode to Heaven' is, curiously, a 'seldom-studied poem' [578].

[17] Miller, 'Shelley's Uncertain Heaven,' 557.

[18] Miller, 'Shelley's Uncertain Heaven,' 579.

[19] Miller, 'Shelley's Uncertain Heaven,' 579.

[20] For discussion of Shelley and religion see, for example, Colin Jager, 'Shelley After Atheism,' *Studies in Romanticism* 49.4 (2010): 611–631; Martin Priestman, *Romantic Atheism*: *Poetry and Freethought*, 1780-1830 (Cambridge: Cambridge University Press, 1999); Bryan Shelley, *Shelley and Scripture: the Interpreting Angel* (Oxford: Clarendon, 1994) and Ellsworth Barnard, *Shelley's Religion* (Minneapolis: University of Minnesota Press, 1937).

what earth has been, a monopoly in the hands of a favoured few, would do well to reconsider their opinion: if they find that it come from their priest or their grandmother, they could not do better than to reject it.'[21] Here Shelley argues for what heaven is not, rather than for what it is. Mary Shelley's comments on the poem, which link 'Ode to Heaven' to Shelley's beliefs in a visionary afterlife – a utopia of thought – suggest that Shelley's bias lay in this direction (especially as they clash so strongly with the sentiments expressed in the first and third sections of the poem). But Mary Shelley was writing around seventeen years after her husband's death and, as mentioned above, had reasons for downplaying the revolutionary aspects of Shelley's thought. This may have been why she directed attention away from other stanzas of the poem. Shelley's writings, taken as a whole, seem to refute the idea that he sided with the second spirit's bias towards immaterialism. As Mark Kipperman notes, for all his 'rejection of Godwinian materialism, Shelley never abandoned the hope that an expansion of physical knowledge – combined with a refinement of moral sensibility – was a precondition of progressive civilization.'[22]

And so, after consulting both Shelley's and Mary Shelley's most explicit writings on religion and the afterlife, the questions surrounding Shelley's position in regards to heaven in his ode remain. Did Shelley prefer one spirit's speculation about heaven to that of the others? Was he somehow able to keep three conflicting ideas, and perhaps more, in play all at once? Did he dismiss each spirit's vision out of hand as soon as it was written? It is impossible to know, of course, but one thing is clear. Shelley, like his mentor Lind before him, recognised that astronomical imagery could act as a metaphor for revolution.[23] As a poet and philosopher, Shelley also realised that the ideas and imagery afforded by the new astronomy could be interpreted in vastly different ways and to very different ends.

Each part of 'Ode to Heaven' contains a rebellious vision of a new world in which the old rules have ceased to apply. Each part, I argue, is a call to reject conservative assimilations of William Herschel's ideas. Each part makes a plea: do not waste the

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[21] Percy Bysshe Shelley, *The Prose Works*, ed. E.B. Murray (Oxford: Clarendon, 1993), 1.59.

[22] Mark Kipperman argues that Shelley's position on an afterlife is impossible to determine ['Coleridge, Shelley, Davy, and Science's Millennium,' *Criticism* 40.3 (1998): 409–436, 410)].

[23] As well as Goulding, see Carl Garbo, *A Newton Among Poets*: *Shelley's Use of Science in* '*Prometheus Unbound*' (Chapel Hill: University of North Carolina Press, 1930); Desmond King-Hele, *Shelley*: *His Thought and Work* (London: Macmillan, 1970); Fredrick L. Hildebrand, 'Epipsychidion's Cosmic Collision: A Controlling Metaphor,' *Keats-Shelley Journal* 37 (1988): 75–90; Marilyn Gaull, 'Under Romantic Skies: Astronomy and the Poets,' *Wordsworth Circle* 21 (1990): 34–41.

chance to re-imagine the universe. Each part of the poem forges an original and compelling link between astronomy and reform. Still, it is hard to shake the feeling that Shelley wanted the third spirit's blazing cacophony of a universe to take centre stage and it is easy to see why Shelley would have found this interpretation of Herschel's discoveries the most exciting. The third spirit's vision represents, most strongly, the idea that heaven can no longer stand for the tyranny of the 'natural order' – a system of obedience and oppression modelled on the hierarchy of the Church. If the heavens, through the advancement of human knowledge and understanding, can be liberated from a state of eternal stasis, then surely society can also regenerate itself by casting off the debilitating habits of patriarchy and inherited power. This is the message that Shelley shouts in the final verses of his poem.

It goes without saying that not everyone took the findings of contemporary astronomy to the extremes that Shelley managed to do in his 'Ode to Heaven.' For many, including Herschel himself, new discoveries about the size and complexity of the universe only served to prove the scale and grandeur of God's magnificence.[24] Nonetheless, Herschel's hypotheses and Shelley's 'Ode to Heaven' – different as they are in almost every other way (form, style, scope, intent, reach, influence, and so on) – have this in common: they both form part of a western tradition which can be dated from Copernicus's heliocentric cosmology and which complicates literalist biblical understandings of heaven and earth.

The purpose of this thesis is to examine the ways this tradition manifested at the turn of the nineteenth century. This was the age of the 'second scientific revolution'[25] when ideas about the age and structure of heaven and earth were rewritten and re-imagined within the same cultural conditions that produced literary Romanticism. I have invoked Shelley's 'Ode To Heaven' at the outset of this thesis in order to establish a precedent – to show, from the outset, that the second generation Romantics were indeed influenced and inspired by post-Newtonian ideas of the universe. But the central concern of this thesis, as its title suggests, is to explore John Keats's reckoning of the heavens and assess the extent to which the scientific revolution in astronomy influenced the younger poet's imagination. Shelley exploited astronomical imagery as part of his wider commitment to revolution and reform. His references are often

[24] Herschel believed in a 'great Author' of the universal system ['On the Construction of the Heavens,' *Philosophical Transactions of the Royal Society* 75 (1785): 213–266, 216].

[25] See the 'Introduction' for further discussion of this term.

explicit and much has been written about them. Little attention, however, has been given to Keats and the cosmology of the early nineteenth century. Critics have preferred to use Keats's medical training, his knowledge of anatomy, biology and chemistry, as the point of departure for investigating his relation to science. Perhaps this is because, apart from one direct reference to Herschel's discovery of Uranus in 'On First Looking Into Chapman's Homer,' Keats's allusions to the astronomy of the period are relatively abstract. But close analysis of some of Keats's most famous cosmological poems shows that he was fascinated by the new poetic metaphors of contemporary astronomy and was especially attuned to the challenges that astronomy posed to accepted ideas about the nature of change – a theme that ran through many forms of literature and science in Keats's lifetime.

Introduction

1. Romantic Cosmology

John Keats spent his entire poetic career dedicated to an investigation of the mortal and immortal – the earthly and divine. It is no coincidence, this thesis argues, that this preoccupation with the nature of heaven and earth comes at a time when science (and in particular, British science) was investigating the same subject with more precision than ever before. Advances in astronomy beginning in the 1780s and continuing throughout the early nineteenth century, challenged the way in which poets like Keats and Shelley could imagine the universe. 'The modern astronomy,' as it was often referred to, was responsible for challenging traditional associations with permanence and immutability – themes with which Keats maintains a persistent, even compulsive, interest in his poetry.[1] In order to assess the extent to which the science of the stars influenced Keats, this thesis centres on the work of the astronomer William Herschel (1738-1822). At the forefront of his field, the German-born Herschel was involved in many of the most important scientific breakthroughs of the age. I have chosen Herschel as a linchpin of my argument, not in order to suggest that he is the only important figure in Romantic astronomy. I am conscious that such a claim (ignoring, as it would, the rich and often contentious scientific discourse surrounding this discipline) would lay an erroneous foundation for the research and analysis that is to follow. Rather, I hope to use Herschel as point of comparison – a helpful marker for gauging Keats's own position in relation to the scientific debates the poet was actively taking part in. In other words, Herschel was not the only voice speaking about astronomy in the period, but he was the voice that all others were listening and responding to. This is because Herschel's hypotheses (while undoubtedly building on the work of other, earlier efforts) were the first to gain traction within intellectual communities in terms of the specific complications he introduced to established ideas about the age and structure of the heavens.

[1] For references to the 'modern astronomy' see, for example, Thomas Chalmers D. D., *A Series of Discourses on the Christian Revelation, Viewed in Connection with the Modern Astronomy* (Glasgow: Smith and Son, 1817); *Philoastronomicus*, 'On Modern Astronomy,' *Theatrical Inquisitor and Monthly Mirror* May (1814): 301–302 and 'Sir William Herschel,' *The Morning Chronicle* (London), September 10, 1822, 3c.

Right up until the last decades of the eighteenth century, most poets and scientists could agree that the cosmography of the heavens remained, for the most part, unchangable. Stars had always existed as the supreme poetic metaphors for permanence and immutability, free from natural patterns of birth and decay belonging to the organic life cycle. But investigations into the nature of stars and galaxies carried out by William Herschel and his colleagues cast doubt on these as symbols of constancy. Amongst many other revolutionary findings were Herschel's investigations into why the so-called 'fixed stars' were not really fixed at all. His high-powered telescopes replaced a millennium-old conception of the heavens as a stable, ordered, and pristine firmament encasing the solar system. In its place, Herschel identified a vast and unwieldy universe filled with many galaxies of stars existing in various stages of creation and decay. According to Herschel, Isaac Newton's universal law of gravitation was truly universal, extending outside of the Earth's solar system and responsible for all the observable stages of stellar development. Gravity condensed stars out of nebulous matter, drew twin stars together in a gravitational bind, collected millions of suns together in galaxies that moved about a common centre and, ultimately, caused these galaxies to splinter under its force. Romantic-era astronomy, while charting the sublime changes occurring in the heavens, had shown that the laws at work within the universe remained remarkably constant throughout time and space. What emerged from this cosmology, then, was an important paradox, which rendered the universe at once unfathomable and familiar. It constituted a simultaneous recognition of the sublime scope and changeability of the once immutable heavens, and an acceptance of the universality of natural laws once thought uniquely to privilege the Earth and humankind.

This thesis aims to show that even Keats's most well-known poems (which, apart from 'On First Looking into Chapman's Homer,' have rarely been connected directly to Romantic-era astronomy) can reveal new and exciting meanings when read within the context of contemporary cosmology. But doing so relies on establishing Keats's involvement in a culture flooded with an awareness of its own importance within the history of scientific development.

2. The Second Scientific Revolution

> At the present time, everything in science and art seems to be tending toward unity, when matters that long seemed remote from each other are now recognised to be quite close, and a new more universal vision, encompassing almost all disciplines, is taking shape. An epoch such as our own is surely bound to give birth to a new world.
>
> Friedrich Schelling, *On University Studies*, 1802[2]

German Romantic philosopher Friedrich W. J. Schelling's observation about the emergence of 'a new more universal vision' in the arts and sciences 'bound to give birth to a new world' provides a potent example of the way in which cosmological metaphors could be used to represent the dawning of a new age for European writers and thinkers during John Keats's life time. Schelling's comments also point to a surprising affinity between 'science and art,' one that seems at odds with modern ideas about the irreconcilable differences between these two disciplines. But Schelling's account is supported by a flourishing critical tradition which has emerged in earnest over the past twenty years and which is interested in the ways in which all kinds of writers have, throughout history, been intellectually and artistically engaging in discourses which would now be termed 'scientific.' Within the burgeoning critical field dedicated to the relation between literature and science, studies in Romanticism have been particularly fertile. In fact, so strong have been the connections drawn, or rather recovered, between the two seemingly disparate intellectual cultures, that the science (or 'natural philosophy,' as it was also then known) of the period is now frequently termed 'Romantic.' However, separations of literature and science are so intuitively maintained in our own culture that it took a sustained scholarly effort to create the current critical environment.[3]

Until late into the twentieth century, literary Romanticism had been considered the very antithesis of science. Specifically, Romanticism seemed in direct conflict with the material and mechanical nature of this 'other' culture. More than any other literary

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[2] Friedrich Wilhelm Joseph Schelling, *On University Studies* [1802], trans. E.S. Morgan, ed. Norbert Guterman (Athens, OH: Ohio University Press, 1966), 7.

[3] For some of the most important early attempts to reconcile Romanticism and science see T. H. Levere, *Poetry Realised in Nature*: *Samuel Taylor Coleridge and* Nineteenth-Century *Science* (Cambridge: Cambridge University Press, 1981); H. J. Jackson, '"Turning and Turning": Coleridge on our Knowledge of the External World,' *PMLA* 101.5 (1986): 848–856; J. A. V. Chapple, *Science and Literature in the Nineteenth Century* (Hampshire: Macmillan, 1986); Andrew Cunningham and Nicholas Jardine, eds., *Romanticism and the Sciences* (Cambridge: Cambridge University Press, 1990) and David M. Knight, *Science in the Romantic Era* (Hampshire: Ashgate, 1998).

period taught and researched at schools and universities, Romanticism seemed the hardest to reconcile with a scientific sensibility. In large part, this is because the project of British and German Romanticism – its 'tending towards unity,' as Schelling puts it, and its interest in organic forms – seemed in direct contrast to the phenomenon of 'modern science.' This phenomenon had been ignited in the sixteenth century and, supposedly, had steam-rollered its way through the Enlightenment and into the nineteenth century remarkably unchanged. According to Hans Eichner's 1982 essay, for example, Romantic systems could 'be characterised in a single sentence: they attempted to escape the dilemmas of the mechanical philosophy by replacing all its basic assumptions by the exact opposites.'[4] In this way, Eichner argues, Romanticism is, 'perhaps predominantly, a desperate rearguard action against the spirit and the implications of modern science – a rearguard action that […] liberated the arts from the constraints of a pseudoscientific aesthetics but that was bound to fail in the proper domain of science.'[5] In this view, science at the turn of the nineteenth century was cut off from its own context – merely a continuation of rationalist and mechanical ways of thinking – with little if anything to do with the social, economic, political and intellectual influences of its day.

But Schelling's comments, which come from a lecture he delivered to students at the University of Jena, point to a striking commonality between 'almost all disciplines' and 'everything in science and art' within the period. Twenty-first-century scholars have taken up this idea of a shared purpose and have rewritten the history of science and the history of literary Romanticism in increasingly hospitable terms. Connecting the Romantic poets to the physical sciences (and not only German metaphysics) has been responsible for shifting the relation between Romantic literature and Romantic-era science forever. It is no longer sufficient to argue that the British and German Romantics simply rejected the materialism of modern science. Rather, it seems more plausible that artists and scientists began to address many of the same questions.

While Eichner argues that Romanticism liberated the arts from a 'pseudoscientific aesthetics,' Denise Gigante has more recently recognised that a 'merger of science and aesthetics' occurred at the time.[6] Similarly, Judith Hawley has observed that, 'so great

[4] Hans Eichner, 'The Rise of Modern Science and the Genesis of Romanticism,' *PMLA* 97.1 (1982): 8–30, 14.

[5] Eichner, 'Modern Science and Romanticism,' 8.

[6] Denise Gigante, *Life: Organic Form and Romanticism* (New Haven: Yale University Press, 2009), 5.

have been the changes in both the history of science and in literary studies that it is now more common to argue that both science and literature are aspects of a wider culture.'[7] Alan Richardson argues that 'with the mechanistic scientific paradigm associated with Newton giving way to a biological emphasis typified by [Erasmus] Darwin, science and medicine took on a "Romantic" character, featuring a naturalistic ethos, an attention to "organic form," and developmental and ecological models that show more than superficial resemblance to analogous impulses in the arts.'[8] And in his sweeping biographies of key scientific players in the period, Richard Holmes argues that there is 'Romantic science in the same sense that there is Romantic poetry, and often for the same enduring reasons.' [9] Interestingly, the very characteristics that were once considered to set the Romantic poet in opposition to the Romantic-era scientist are now recognised as the most important touchstones between the two. Holmes recognises, for example, that science in the period 'was driven by a common idea of intense, even reckless, personal commitment to discovery,' and links the feverish pursuit of truth by the Romantic scientist to the imaginative journey of the Romantic poet.[10]

The character of Robert Walton in Mary Shelley's *Frankenstein* embodies the marriage of scientific and poetic sensibilities that emerged in the era. Walton's letter, written on the eve of his departure on a scientific expedition to the Arctic, reveals his Romantic temperament:

I cannot describe to you my sensations on the near prospect of my undertaking. It is impossible to communicate to you a conception of the trembling sensation, half pleasurable, half fearful, with which I am preparing to depart. I am going to unexplored regions, to 'the land of mist and snow,' but I shall kill no albatross; therefore do not be alarmed for my safety[11] or if I should come back to you as worn and woeful as the 'Ancient Mariner.' You will smile at my allusion, but I will disclose a secret. I have often attributed my attachment to, my passionate enthusiasm for, the dangerous mysteries of the ocean to that production of the most imaginative of modern poets.

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[7] Judith Hawley, 'General Introduction,' in *Literature and Science 1660-1834*, vol. 1, *Science as Polite Culture*, eds. Cheryl Kramer, Trea Martyn and Michael Newton (London: Pickering and Chatto, 2003), xi–xvii, xii.

[8] Alan Richardson, 'Keats and Romantic Science: Writing the Body,' in *The Cambridge Companion to Keats*, ed. Susan J. Wolfson (Cambridge: Cambridge University Press, 2001), 230–245, 231.

[9] Richard Holmes, *The Age of Wonder*: *How the Romantic Generation Discovered the Beauty and Terror of Science* (London: Harper, 2008), xvi.

[10] Holmes, *Age of Wonder*, xvi.

[11] The lines following do not appear in the original 1818 edition of Mary Shelley's text.

> There is something at work in my soul which I do not understand. I am practically industrious – painstaking, a workman to execute with perseverance and labour – but besides this, there is a love for the marvellous, a belief in the marvellous, intertwined in all my projects, which hurries me out of the common pathways of men, even to the wild sea and unvisited regions I am about to explore.[12]

While Mary Shelley gently satirises Walton's naivety and his clumsy allusion to Coleridge's *Rime of the Ancient Mariner* (1798), this characteristic portrait of a Romantic scientist can be traced in a number of Walton's real-life counterparts. Walton is driven by his 'sensations' and connects his scientific interest in the ocean to the imaginative exploration of poetry. He recognises a dual aspect to his character: an industrious, methodical workmanship on one side, and on the other, a belief in the marvellous and a stirring in his soul that drives him in search of uncommon discovery. Both sides, importantly, are entwined in his identity as an explorer. Yet Walton's sensibilities are contrasted positively to the dangerous hubris of Victor Frankenstein's monstrous ambitions. While Walton consciously avoids causing harm, he 'shall kill no albatross,' Frankenstein's genius takes a destructive path. Shelley's novel is not anti-science. As Tim Fulford notes, for Shelley, natural philosophy 'is an admirable pursuit when social responsibility tempers the egotistical drive to reveal the unknown – a lesson that Dr Frankenstein, the self-isolated genius, ignores.'[13]

Mary Shelley's portrayal of Walton resonates with that of the eminent chemist Joseph Priestley's representation of Benjamin Franklin's experimental work with lightning. Priestley, as a scientist of the Romantic era responsible for the discovery of oxygen, privileges Franklin's imaginative genius. He explains that while others had been struck with the obvious analogy between lightening and electricity, they went no farther than these arguments *a priori*. It was Dr. Franklin who first proposed a method of verifying this hypothesis, entertaining the bold thought […] of bringing lightening from the heavens, of thinking that pointed iron rods, fixed in the air, when the atmosphere was loaded with lightening, might draw from it the matter of the thunderbolt, and discharge it without noise or danger into the immense body of the earth, where it would remain as it were absorbed.[14]

[12] Mary Shelley, *Frankenstein*, *or the Modern Prometheus* [1831], ed. Maurice Hindle (New York: Penguin, 2003), 21.

[13] Tim Fulford, 'General Introduction,' in *Romanticism and Science, 1773-1833*, 5 vols., ed. Tim Fulford (London: Routledge, 2002), 4.

[14] Joseph Priestley, *The History and Present State of Electricity, with Original Experiments*, 3rd edn., vol. 1 (London: Bathurst and Lowndes, 1775), 205–206.

While some scientists had covered the same ground theoretically, according to Priestley, it was Franklin's experimental daring that delivered his success. Franklin's work was also admirable because it harnessed nature's power for the common good. The invention of large conducting rods saved houses and other buildings from the fire caused by lightning and are still in use today.

Walton's character can also be recognised in the life of Sir Humphry Davy (1778-1829), the charismatic chemist whom Coleridge called (alongside Wordsworth) one of 'the two greatest men of the age.'[15] Davy, who tried his hand at poetry himself, even corrected proofs of Wordsworth and Coleridge's *Lyrical Ballads* of 1800.[16] Davy was a brilliant chemist who made a number of important discoveries about the composition of metals, but he was also a showman who enjoyed attracting attention to himself. The travelling exhibitions of his experiments (which were attended by all levels of society) were designed to dazzle the senses and evoke feelings of wonder and amazement in his audience.[17] Critics have often argued that both of Mary Shelley's scientists, the virtuous Walton, the ego-driven Victor Frankenstein, as well as the chemistry teacher M. Waldman, all took inspiration from Davy.[18] The same fusion of scientific excellence and imaginative vigour can be seen in the figure of William Herschel, the once professional musician, braving freezing conditions as he feverishly worked on welding and polishing his own telescopic lenses while his sister Caroline read to him from *Paradise Lost*, the *Arabian Nights* and *Don Quixote*.[19]

The scholarly approach that accounts for the existence of a 'Romantic' scientist has also given rise to the idea that the Romantic period, the era that produced a revolution in letters, also produced an idiosyncratic revolution in scientific enquiry. This scientific revolution is defined by a character of its own, and is understood as a revolution that, however much indebted to earlier thinkers, has much in common with the other forms of cultural production of its day. The revolution in astronomy as well as in geology,

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[15] Samuel Taylor Coleridge, '# 38 John Barclay's *Argenis*,' in *A Book I Value*: *Selected Marginalia*, ed. H. J. Jackson (Princeton: Princeton University Press, 2003), 36.

[16] Roger Sharrock, 'The Chemist and the Poet: Sir Humphry Davy and the Preface to *Lyrical Ballads*,' *Notes and Records of the Royal Society of London* 17.1 (1962): 57–76 and Trevor H. Levere, 'Coleridge, Chemistry, and the Philosophy of Nature,' *Studies in Romanticism* 16.3 (1977): 349–379.

[17] Jan Golinski, 'Humphry Davy: The Experimental Self,' *Eighteenth-Century Studies* 45.1 (2011): 15–28.

[18] See, for example, Simon Schaffer, 'Genius in Romantic Natural Philosophy,' in *Romanticism and the Sciences*, eds. Andrew Cunningham and Nicholas Jardine (Cambridge: Cambridge University Press, 1990), 82–100, 93 and Tim Fulford, 'General Introduction,' in *Romanticism and Science*, *1773-1833*, 5 vols. (London: Routledge, 2002), 1–50, 3. Davy, like Frankenstein, was also enthralled by the work of the ancient alchemists (Holmes, *Age of Wonder*, 248).

[19] Holmes, *Age of Wonder*, 85–86.

physics, chemistry, and biology, that took place at the turn of the nineteenth century, has been termed the 'second scientific revolution' by historians of science and literary critics, to differentiate it from the 'first' scientific revolution of the sixteenth and seventeenth centuries.[20] The earlier revolution, characterised by the discoveries of Kepler, Galileo, Descartes, Boyle, Locke, and Newton, involved a mathematical approach to natural phenomenon that gave birth to modern science and was responsible for the emergence of the rationalist discourses of the Enlightenment.[21] Holmes defines the second scientific revolution as 'a movement that grew out of eighteenth-century Enlightenment rationalism, but largely transformed it, by bringing a new imaginative intensity and excitement to scientific work.' [22]

Andrew Cunningham and Nicholas Jardine, in line with other historians of science, argue that there was 'a first revolution around the turn of the sixteenth century, in which new mathematically and experimentally oriented branches of natural philosophy were created, and a second revolution around the turn of the eighteenth century, in which was formed the federation of disciplines that we call "science."'[23] Romantic science has been called 'pre-disciplinary'[24] for the reasons that Cunningham and Jardine suggest. This was the period of the formation of disciplines rather than their solidification. This would come later in the nineteenth century. It was during the Romantic era that science began to divide itself into specialisations.[25] If Schelling's comments about the emergence of a new intellectual 'epoch' point to a genuine spirit of harmony between the arts and sciences at the turn of the nineteenth century, they also reveal a certain anxious insistence on cohesion. They belie a changing intellectual

[20] Samuel Taylor Coleridge recognised the advancements in science that were taking place around him as belonging to a 'second scientific revolution' – a phrase he probably dubbed in his *Philosophical Lectures* of 1819 [Holmes, *Age of Wonder*, xvi]. Some scholars argue for not one or two scientific revolutions, but a whole series associated with figures such as Galileo, Newton, Michael Faraday, Charles Darwin, Freud, and Einstein ['Scientific Revolution,' in *A Dictionary of British History*, ed. John Cannon (Oxford: Oxford University Press, 2009)]. This system has much to recommend it as it pays attention to the ways key figures, especially those after the 1830s, changed the face of modern science. But it does not capture the collective and collegial nature of discovery, especially during the Romantic era. It would be impossible, for example, to give an account of Faraday's work without discussing his mentor Humphry Davy, or the work of Benjamin Franklin.

[21] Though, as Lucinda Cole points out, it is wrong to represent this shift as 'a straightforward narrative of displacement [whereby] "occult" knowledges were replaced by the mechanical, mathematical, and empirically grounded models of Nature, culminating in the science of Isaac Newton.' Cole argues further that 'it is essential to recognise that neither Boyle nor Newton, nor any of their followers, claim[ed] that science [wa]s an independent means to truth' ['Scientific "Revolution" II: Newton to Laplace,' in *The Routledge Companion to Literature and Science*, ed. Bruce Clarke with Manuela Rossini (Oxon: Routledge, 2011), 449–461, 449].

[22] Cole,'Newton to Laplace,' 449.

[23] Andrew Cunningham and Nicholas Jardine, 'Introduction: The Age of Reflexion,' *Romanticism and the Sciences* (Cambridge: Cambridge University Press, 1990), 1.

[24] Noah Heringman, 'Romanticism,' in *The Routledge Companion to Literature and Science* (Oxon: Routledge, 2011), 462–473, 463.

[25] Heringman, 'Romanticism,' 463.

climate in which a spirit of universality and unity – not only between arts and science, but also within science itself – was under increasing pressure. Schelling's lecture forms part of a German-led push for students and academics to continue in their pursuit of wide-ranging knowledge. His argument for the necessity of a generalist education came at a time when this opportunity, as well as the great German institution of the university itself, was in danger.[26] In his lectures, Schelling argued that it was only a broad, 'universal' view that took into account the most important ideas in art, philosophy and science that could generate intellectually significant work: 'only the general is the source of ideas, and ideas are the living substance of science.'[27]

In 1817, by contrast, William Hazlitt (1778-1830) was arguing that no man could 'thoroughly master more than one art or science' and that the 'universal' was too disparate to master.[28] Hazlitt likened the cultivation of multiple areas of scientific or artistic interest, which was common among gentlemen of independent means at this time, to the fashionable female custom of accumulating talents (such as singing, painting and playing an instrument) for the purpose of attracting social admiration: 'There is no end of accomplishments, of the prospect of new acquisitions of taste or skill, or of the uneasiness arising from the want of them, if we once indulge in this idle habit of vanity and affectation.'[29] His views on specialisation were in direct contrast to those of Schelling. According to Hazlitt, disciplinarity fostered the best kind of passionate commitment and focus, and was the most productive intellectual approach:

> Pedantry in art, in learning, in every thing, is the setting an extraordinary value on that which we can do, and that which we understand best, and which it is our business to do and understand. Where is the harm of this? To possess or even understand all kinds of excellence equally, is impossible; and to pretend to admire that to which we are indifferent, as much as that which is of the greatest use, and which gives the greatest pleasure to us, is not liberality, but affectation.[30]

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[26] Theodore Ziolkowski, *German Romanticism and Its Institutions* (Princeton: Princeton University Press, 1990). In circumstances remarkably similar to the current trend towards vocational, rather than liberal studies in higher education, Ziolkowski details the tendency towards particularisation in Germany at the turn of the century. The German government sought to suspend its universities 'or transmute them into technical schools' that would be more 'useful' [249].

[27] Schelling, *On University Studies*, 18.

[28] William Hazlitt, *The Round Table*: *A Collection of Essays on Literature, Men*, *and Manners*, vol. 2 (Edinburgh: Archibald Constable and Co., 1817), 40.

[29] Hazlitt, *Round Table*, 40.

[30] Hazlitt, *Round Table*, 40.

The tension between these two views would eventually dissolve. Of course, it was Hazlitt's view, rather than Schelling's, that would go on to dominate educational, publishing and economic paradigms for years to come.

As these passages suggest, Romanticism (which debated and contested ideas about the future of knowledge) played a part in creating the ideological shift needed for 'natural philosophy' (general, amateur and genteel) to evolve into science as we recognise it today (specialised, professional and economically driven). As Fulford, Lee and Kitson have noted, 'science' and 'scientist' were concepts under construction in the period.[31] For this reason, Romanticism is deeply and uniquely related to the rise of science and the scientific discourses that would dominate intellectual enquiry for years to come. Even though the term 'science' only replaced 'natural philosophy' in the 1830s (the date usually given to bookend the period in question), it was during the Romantic period that writers and thinkers who had always identified themselves as fellow 'philosophers' began to see themselves differently. Importantly, it was on Samuel Taylor Coleridge's suggestion that the term 'scientist' (rather than 'philosopher') was adopted to describe the vocation of this new professional man.[32]

The most important shift took place gradually. Within the British scientific establishment, natural philosophy, with its penchant for metaphysical and theoretical speculation, began to be overtaken by the materialism of 'natural history,' empiricism and experimentalism, all of which were to dominate in the nineteenth century and beyond.[33] These changes were overseen by Sir Joseph Banks (1743-1820), who was president of the Royal Society from 1778 until his death. Ironically, Banks was the ultimate 'natural philosopher.' He was independently wealthy and staunchly against the creation of specialised disciplines.[34] But Banks's own prejudice towards empiricist forms of enquiry was, at least in part, responsible for the shift towards specialist research that occurred throughout his reign. Banks's passion for botany began as a schoolboy and only increased during his voyage to the Pacific with Captain James Cook's *Endeavour* expedition (1768-1771). His method of collecting and curating

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[31] Tim Fulford, Debbie Lee, and Peter J. Kitson, *Literature, Science and Exploration in the Romantic Era*: *Bodies of Knowledge* (Cambridge: Cambridge University Press, 2004), 2.

[32] It was William Whewell who introduced the term to the British Association for the Advancement of Science in 1833 [Fulford, *Romanticism and Science*, 1].

[33] Noah Heringman, 'Introduction: The Commerce of Literature and Natural History,' in *Romantic Science*: *The Literary Forms of Natural History* (New York: State University of New York Press, 2003).

[34] Fulford, Lee, Kitson, *Literature, Science and Exploration*, 33–35.

specimens was based on Carl Linnaeus's system of classification – Banks called the Swedish botanist the 'God of [his] adoration'[35] – and he favoured and promoted the physical sciences and material forms of knowledge throughout his career. Banks was so influential that the projects he supported became national projects. As well as controlling the most powerful scientific institution in Britain, he had enormous sway in wider political life. Fulford, Lee and Kitson note that Banks was

> the unseen hand, the shadowy impresario of Britain's colonial expansion in the era before the state had created an administrative machine to run the empire. What academics and institutes did in continental Europe, Banks did for Britain. He sent explorers out of Africa, Australia, China and the North Pole. He prepared their journals for publication. He collected, classified and disseminated data and specimens, turning Kew Gardens and his Soho Square house into centres of a network that spanned the empire. It was a network designed to shape the circulation of both literary and scientific 'knowledge' about remote places and unfamiliar cultures.[36]

This passage places Banks, the 'shadowy impresario,' in a sinister light, casting him as gentleman plunderer and chief orchestrator of colonialism. Not all accounts of Banks fit this description, however. It is important to note that he was capable of great tolerance and cultural sensitivity. While staying at Fort Venus, Cook's base camp in Tahiti, the young Banks repeatedly showed himself to be the most willing participant in the Tahitian way of life, often stepping in to mediate when tensions arose between the two groups.[37] He also developed genuine friendships with island inhabitants, including the Queen Oborea and one of her attending ladies, Otheothea, with whom Banks had a continuing sexual relationship.[38] The Raiatean priest, Tupaia, thought highly enough of Banks to want to accompany him back to England.[39] His relationship with another Oceanian, Mai (who had been brought to London by an explorer in 1774), was also one of genuine trust and goodwill.[40] His friendships with the Oceanians extended far beyond viewing them as exotic specimens.

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[35] Fulford, Lee, Kitson, *Literature, Science and Exploration*, 33.

[36] Fulford, Lee, Kitson, *Literature, Science and Exploration*, 35.

[37] Holmes, *Age of Wonder*, 3–46.

[38] Holmes, *Age of Wonder*, 3–46.

[39] Tragically, both Tupaia and the small son he brought with him died of an illness, contracted in Batavia, that eventually destroyed half of the *Endeavour*'s crew.

[40] Vanessa Smith, 'Banks, Tupaia, and Mai: Cross-Cultural Exchanges and Friendship in the Pacific,' *Parergon* 26.2 (2009): 139–160.

The idea that Banks thought of the Pacific Islanders as specimens was cultivated during his lifetime through satirical verse and cartoons and has been further perpetuated by recent scholarly criticism.[41] But recent studies have shown this charge against Banks to be unfair. Vanessa Smith convincingly argues that Banks's

> relationships with Tupaia and Mai were only interpretable to his contemporaries through the medium of satire. Recent criticism colludes with this resistance to recognising cross-cultural friendship; while exposing the discourses that inform such satire, it implicitly related the incommensurability of the friendship. But a particular version of intercultural intimacy nonetheless emerges from these two friendships […] Banks embraces Tupaia as a mentor from whom he has much to learn, both esoteric and practical, of religion and culture, wit and courage, women and life.[42]

All this being said, it is undoubtedly true that Banks went to great lengths to amass the most comprehensive collection of botanical and anthropological specimens and scientific ephemera yet seen, by means that are unconscionable by current standards. And despite his respect for individuals, Banks was not averse to using this ownership of knowledge to further the interests of the Empire, even when gaining ownership of this knowledge had detrimental effects for indigenous populations.

This latter characteristic – a kind of cold and detached striving for scientific supremacy – is usually stressed when Banks is characterised as a paragon of Enlightenment rationalism.[43] It has been easy, then, to argue that Romanticism formed itself in retaliation against the juggernaut of 'modern science' and a worldview that produced men like Cook and Banks, men who seem in such stark contrast to Banks's contemporaries Wordsworth and Coleridge. But these kinds of oppositions, critics have recognised, are rarely helpful and often inhibitive.

While it is important to see Romantic science and Romantic literature as being of one culture, rather than of two, it is equally important to resist the temptation to simplistically oppose this culture to all that existed during the Enlightenment. Tom Furniss argues that 'what we are beginning to call "Romantic science" can no longer be seen merely as the backdrop or foil to Romantic poetry but as part of a much more extensive Romantic cultural formation' and that this formation 'has more continuities

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[41] Smith, 'Banks, Tupaia, and Mai.' 139–160.

[42] Smith, 'Banks, Tupaia, and Mai,' 159.

[43] See John Gascoigne, *Joseph Banks and the English Enlightenment*: *Useful Knowledge and Polite Culture* (Cambridge: Cambridge University Press, 2003).

with the Enlightenment project than is usually recognized.'[44] Indeed, one legacy of scholarly interest in linkages between literature and science in the Romantic period has been a resulting recognition that the ideas of the Enlightenment (themselves complicated and expanded in recent scholarship), which flow so freely in scientific discourse of the time, run just as steadily in its literature. Porscha Fermanis has persuasively argued that key Romantic writers, and particularly John Keats, had 'a more positive and intellectually informed attitude towards the Enlightenment than that of straightforward hostility or opposition.'[45] Her book strongly opposes the idea that 'Romanticism is an improvement or correction to facile and reductive Enlightenment understandings' of the world.[46] The recent British Association for Romantic Studies (BARS) conference 'Enlightenment, Romanticism & Nation' (Glasgow 2011) provided further proof that the term 'Romantic' (for those, like myself, who persist in using it)[47] had undergone a radical redefinition in recent years to the inclusion, rather than the exclusion, of Enlightenment ideas and approaches.

Interestingly, there is a near consensus in dating this period of Romantic science in the many different books and journal articles that have been published over the past two or three decades. Denise Gigante, for example, looks to poets writing between 1760 and 1830.[48] Richard Holmes dates his 'age of wonder' between two famous voyages of exploration: Cook's expedition on the *Endeavour* which embarked in 1768 and Charles Darwin's expedition to the Galapagos islands which embarked in 1831.[49] Tim Fulford, who has edited the most comprehensive anthology on this topic so far, identifies the appropriate period as being between 1773 and 1833.[50] Fulford, like Holmes, recognises the importance of Cook's voyage as 'the largest scientific expedition Britian had ever mounted,' but uses the publication of John Hawkesworth's account of that landmark event as his starting point, ending with William Whewell's

[44] Tom Furniss, 'A Romantic Geology: James Hutton's 1788 "Theory of the Earth,"' *Romanticism* 16.3 (2010): 305–321, 307.

[45] Porscha Fermanis, *John Keats and the Ideas of the Enlightenment* (Edinburgh: Edinburgh University Press, 2009), 2.

[46] Fermanis, *Keats and the Enlightenment*, 6.

[47] I use this term even while recognising the problems of periodicity outlined by Clifford Siskin among others. Many connections between poets, writers, artists and thinkers working at the turn of the eighteenth century have been claimed (then refuted, then revisited, then negotiated, then repositioned, then condemned, then justified, then mediated) as constitutive of a literary Romanticism. The result is a much richer set of associations with Romanticism now than there was during the heyday of the 'Big Six.' This gives the term a remarkable flexibility and inclusivity even while researchers and teachers exploit its convenience.

[48] Gigante, *Life*, 2.

[49] Holmes, *Age of Wonder*, xvi.

[50] Fulford, *Romanticism and Science*, 1.

coining of the term 'scientist' at a meeting of the newly formed British Association for the Advancement of Science (BAAS). The establishment of the BAAS in 1831 was a significant event, as it marked the beginning of the end of Joseph Banks and the Royal Society's domination of scientific practice. Most critics agree that the 1830s saw an important enough shift in the culture (scientific and otherwise) for it to be seen as significantly different from those that had come before it and for it to mark the beginning of a new era.

Though these dates all work well for establishing a working historical and critical context for this thesis, further limitations need to be placed on the period. Focusing, as I do, on discoveries made in astronomy and on the way in which these discoveries influenced the poetry of John Keats, my thesis takes as its bookends William Herschel's 1781 discovery of Uranus (the first planet to be discovered since ancient times) and Keats's death in February 1821.The Romantic period, straddling two centuries, is a time of bridging or transition: between Enlightenment understanding and Victorian questioning, between pastoralism and industrialism, between the threat of revolution and the establishment of Empire. It is a time of transition between natural philosophy and science. As such, the concept of Romantic 'predisciplinarity,' a wonderful term I've borrowed from Noah Heringman,[51] not only signals the way knowledge would become organised in the future, it also indicates where knowledge (or 'science') had come from. Predisciplinarity refers to the contradictory ideas about the material and the metaphysical that were still in play at the time, and to the issues surrounding specialisation that were being debated. In other words, the concept of predisciplinarity refers to the different, often contradictory, though thoroughly recognisable aspects of Romantic science that define it as time in suspension – a time of crystallisation, rather than solidification. As Heringman notes, the result is a colourful miscellany where 'Davy's philosophical chemistry, [Mary] Shelley's imagined laboratory, the evolution of the encyclopaedia, German *Naturphilosophie,* geological explanations of the sublime, the advent of scientific voyaging, the craze for natural history – all these Romantic-era developments can be fruitfully understood in terms of pre-disciplinarity.'[52] This kind of inclusive, rather than exclusive, view of intellectual life in the period creates a more connected and vibrant tapestry for telling

[51] Heringman, 'Romanticism,' 463.

[52] Heringman, 'Romanticism,' 463.

the story of science and Romanticism. Romantic-era science, just like Romantic-era literature, is full of fruitful and abundant difference, lively debate and contested views. In this way, at least, the two are just the same.

3. Bard and Sage

> But all the meditations of mankind,
> Yea, all the adamantine holds of truth
> By reason built, or passion, which itself
> Is highest reason in a soul sublime;
> The consecrated works of Bard and Sage,
> Sensuous or intellectual, wrought by men.
> Twin labourers and heirs of the same hopes;
> Where would they be?
>
> Wordsworth, *The Prelude*, 1805[53]

The Romantic era was a time when, as 'twin labourers and heirs of the same hopes,' the 'bard' was often the ally of the 'sage.' Both poets and scientists, Wordsworth recognised in *The Prelude*, were in search of answers to the same kinds of questions. Both were troubled by 'kindred hauntings' about the materialism and the transcendence of the mind ('Oh! why hath not the mind/ Some element to stamp her image on/ In nature somewhat nearer to her own'),[54] about the future of humanity and the once 'unconquerable' earth ('And yet we feel, we cannot chuse but feel/ That these must perish')[55] and the existence of a life-force beyond matter ('Should earth by inward throes be wrenched throughout […] Yet would the living Presence still subsist').[56]

This final question about the existence of a universal life force is ubiquitous in the work of Romantic writers and thinkers of all kinds. It is the 'tending toward unity' Schelling refers to in his Jena lecture and, as Denise Gigante has exhaustively shown in her book-length study on the subject, it is a driving force behind Romanticism in both literary and scientific discourses throughout the period. According to Gigante, 'Romantic poets and makers of all sorts – from the philosophical to the fictional, from

[53] William Wordsworth, *The Major Works*, ed. Stephen Gill (Oxford: Oxford University Press, 2000), 435, 5.36–44.

[54] Wordsworth, *The Major Works*, 5.44–46.

[55] Wordsworth, *The Major Works*, 5.20–21.

[56] Wordsworth, *The Major Works*, 5.29–33.

Samuel Taylor Coleridge to Victor Frankenstein – were in quest, literally, of the principle of life.'[57] She writes that:

> European writers across the intellectual and historical field that fell somewhere between God and cellular biology could find no escape from the conundrum of life conceived as power: the unifying principle of organic form. Just as beauty was conceived as 'multëity in Unity' (Coleridge's phrase), life became defined in similar terms as 'unity in multëity' […] Despite decades of historical challenge to the rubric of Romanticism as a shared intellectual project, [many Romantic writers] were all committed to defining and representing the incalculable, uncontrollable – often capricious, always ebullient – power of vitality.[58]

Coleridge's attraction to Humphry Davy's work was the result of his overwhelming desire to locate this universal law, or life force, or '*swarm* of motive Powers' (also Coleridge's phrase) that could unite widely divergent forms.[59]

It was this impulse in the older poet's work that John Keats would respond to in the formulation of his theory of 'Negative Capability.' Coleridge studied anatomy and philosophy at Göttingen University in Germany and was a friend of the radical chemist Thomas Beddoes (1760-1808) while in Bristol. He also had connections to a number of prominent scientific men, including the German natural philosophers Georg Christoph Lichtenberg and Johann Friedrich Blumenbach, who were at Göttingen, the Swedish geologist Jean-André De Luc, the Scottish surgeon John Hunter, physicist John Leslie (whom he met through his patron Thomas Wedgwood), the physician John Brown and Beddoes's hero, Erasmus Darwin.[60] But Coleridge's most significant scientific friendship was probably with Humphry Davy, the brilliant and charismatic pupil of Beddoes. Having previously subscribed to the materialism of the British inventor David Hartley (1705-1757), and the chemist and theologian, Joseph Priestley, Coleridge eventually revised his opinion about 'the social utility of scientific knowledge.'[61] Yet according to Mark Kipperman, Coleridge was still able to see in the arts and sciences 'a unifying revolution of dawning moral progress in which matter and mind rose transcendently in a mutually evolving political, scientific, and religious

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[57] Gigante, *Life*, 1.
[58] Gigante, *Life*, 3.

[59] Samuel Taylor Coleridge, 'Letter from S.T. Coleridge to Thomas Poole,' [6 April 1799], in *Romanticism*: *An Anthology*, ed. Duncan Wu (West Sussex: Blackwell, 2012), 684.

[60] Trevor H. Levere, 'Coleridge and the Sciences,' in *Romanticism and the Sciences*, eds. Andrew Cunningham and Nicholas Jardine (Cambridge: Cambridge University Press, 1990), 296–305, 298 and Linde Katritzky, 'Coleridge's Links with Leading Men of Science,' *Notes and Records of the Royal Society London* 49.2 (1995): 261–276.

[61] Mark Kipperman,'Coleridge, Shelley, Davy and Science's Millennium,'*Criticism* 40.3 (1998): 409–436, 410.

order.'[62] Through his chemical experiments, Davy hoped to demonstrate how apparently irresolvable objects and materials could be related to each other when reduced to essential compounds. Davy believed in an energetic and unifying presence and that

> active powers must be supposed to be bestowed upon some species of matter, and the impulse must be ultimately derived from the same source. In the universe, nothing can be said to be automatic, as nothing can be said to be without design. An imperfect parallel may be found in human inventions; springs may move springs, and wheels, indexes; but the motion and the regulation must be derived from the artist; sounds may be produced by undulations in the air, undulations of the air by vibrations of musical strings; but the impulse and the melody must arise from the master.[63]

Here, Davy identifies an animating spirit at operation in the universe. The spirit is 'master' and director – not the same as the 'desultory breeze' that appears in Coleridge's 'The Eolian Harp' (1795)[64] – but a live, creating force. In his *Defence of Poetry*, Percy Shelley turns Davy's external force into man's inner will:

> Man is an instrument over which a series of external and internal impressions are driven, like the alterations of an ever-changing wind over an Aeolian lyre, which move it, by their motion, to ever-changing melody. But there is a principle within the human being, and perhaps within all sentient beings, which acts otherwise than in the lyre, and produces not melody alone, but harmony […] It is as if the lyre could accommodate its chords to the motions of that which strikes them, in a determined proportion of sound; even as the musician can accommodate his voice to the sound of the lyre. (*Major Works* 675)

For Coleridge, Davy's chemistry came to represent a longed-for marriage between physical science and philosophy, by resisting the drive to reduce existence to material forms:

> Davy supposes that there is only one power in the world of the senses; which in particles acts as chemical attractions, in specific masses as electricity, & on matter in general, as planetary Gravitation…. [W]hen this has been proved, it will then only remain to resolve this into some Law of vital Intellect – and all human Knowledge will be Science and Metaphysics the only Science.[65]

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[62] Kipperman, 'Science's Millennium,' 409–410.

[63] Humphry Davy, *Elements of Chemical Philosophy*, part 1, vol. 1 (Philadelphia: Bradford and Inskeep, 1812), 100.

[64] At the time it was drafted, the poem was entitled 'Effusion XXXV.'

[65] Samuel Taylor Coleridge, quoted in Kipperman, 'Science's Millennium,' 422.

Eventually, however, Coleridge's faith in Davy's work faded as he turned away from what he perceived to be Davy's growing materialism, as well as the chemist's rise in social status. 'Alas!' he wrote to a friend, 'H. Davy is become Sir Humphry Davy & an *Atomist*.'[66] Coleridge was dismayed at the development of Davy's thought which had turned away from a trust in 'one power' at work upon all particles and towards the sublime individuality of the atom.

Of course, Coleridge and Shelley were not the only Romantic poets to be drawn to the possibilities afforded by Romantic-era science, nor were they the only literary men to express an ambivalence on the subject. It was the closeness of figures such as Davy and Coleridge – the overlapping of their intellectual projects – rather than the distance between them, that sometimes led to a parting of ways.

The foundational education of both bard and sage was usually similar. The best public schools shied away from the natural sciences in favour of the classics and even students like Keats, who attended more modest schools and were therefore exposed to a more liberal education (including scientific instruction), were incredibly familiar with Greek and Roman mythology. Thus a steady trade in metaphors took place between literary and scientific texts.[67] This shared pool of informing narratives (drawn upon both consciously and unconsciously by writers of all kinds), as well as the convention of polite, genteel expression in formal writing, meant that treatises across the arts and sciences looked remarkably similar, especially by modern standards. Treatises across a wide variety of topics had an air of familiarity and accessibility and were made available to a shared audience. Indeed literary and scientific essays often vied for the same space in popular journals. The *Edinburgh Review* and the *Quarterly Review*, for example, refused either to segregate or privilege the one subject over the other.[68]

Catherine E. Ross notes that, as well as the pressures of disciplinarity and the move towards empiricism, it was the shared intellectual territory within an increasingly commercial environment that led to the first signs of a schism opening up between the arts and sciences. She argues that 'both poetry and science required an affirming audience, addressed virtually the same polymathic public, and vied for the same jurisdiction […] a rivalry ensued that became the catalyst for both groups to initiate the

[66] Coleridge, quoted in Kipperman, 'Science's Millennium,' 423.
[67] Judith Hawley, 'General Introduction,' xi–xvii, xiii.

[68] William Christie, 'The Modern Athenians: the *Edinburgh Review* in the Knowledge Economy of the Early Nineteenth Century,' *Studies in Scottish Literature* 39 (2013): 115–138.

delineation and emphasis of their differences.'[69] According to Ross, it was the need to achieve professional credibility and satisfy economic markets that eventually led to the alienation of men who had always worked alongside each other. The fact is that, while Romantic literature was often a passionate champion of science, it could also be its strongest critic.

Contradictory opinions could appear within the same literary work, suggesting an ambivalence towards the whole scientific project. William Blake's (1757-1827) attack on natural religion in Chapter III of *Jerusalem* (1808), for example, argues in the strongest possible terms against the harmonious co-existence of true religion and natural philosophy: 'Your Religion O Deists: Deism, is the Worship of the God of this World by the means of what you call Natural Religion and Natural Philosophy […] This was the Religion of the Pharisees who murdered Jesus.'[70] Yet, in the same book, Blake puts forward a completely different suggestion by uniting religion and science and elevating them to liturgical significance:

> Answer this to yourselves & expel from among you those who pretend to despise the labours of Art & Science, which alone are the labours of the Gospel […] Can you think at all & not pronounce heartily! That to Labour in Knowledge, Is to Build up Jerusalem: and to Despise Knowledge, is to Despise Jerusalem & her Builders.[71]

Lord Byron's (1788-1824) view on science appears to be no less ambivalent. In Canto VII of *Don Juan* (1823) he reduces the epistemological pretensions of contemporary science – its search for the source of life – to a 'nothingness' reminiscent of Shelley's humiliation of paradise in the final verse of 'Ode to Heaven':

> Socrates Said, our only knowledge was
> 'To know that nothing could be known;' a pleasant
> Science enough, which levels to an ass
> Each Man of Wisdom, future, past, or present.
> Newton (that Proverb of the Mind) alas!
> Declared, with all his grand discoveries recent,
> That he himself felt only 'like a youth
> 'Picking up shells by the great Ocean – Truth.'

[69] Catherine E. Ross, '"Twin Labourers and Heirs of the Same Hopes": The Professional Rivalry of Humphry Davy and William Wordsworth,' in *Romantic Science*: *The Literary Forms of Natural History*, ed. Noah Heringman (New York: State University of New York Press, 2003), 23–52, 24.

[70] William Blake, *The Complete Poetry and Prose*, ed. David V. Erdman (Berkeley: University of California Press, 1981), 201.

[71] Blake, *Complete Poetry and Prose*, 232.

Ecclesiastes said, that all is vanity –
  Most modern preachers say the same, or show it
By their examples of true Christianity;
  In short, all know, or very soon may know it;
And in this scene of all-confessed inanity,
  By saint, by sage, by preacher, and by poet,
Must I restrain me, through the fear of strife,
From holding up the Nothingness of life?[72]

All attempts to search for truth, Byron argues here – whether by 'saint,' 'sage,' 'preacher,' or 'poet' – are levelled to an 'ass.' Science is not the means of knowing, just another form of human vanity. Conversely, Byron also took a sincere and continued interest in contemporary science throughout his lifetime. He incorporated the work of the geologist Georges Cuvier (1769-1832) frequently in his work (even satirising competing theories of the creation of the earth in *Don Juan*).[73] Byron also visited William Herschel's famous telescope[74] and he struck up friendships with a number of promising young surgeons. Byron, like many of his contemporaries, held conflicting views about the future of scientific inquiry.

Female poets, too, were undecided about science. A fashion for botany, entomology and astronomy as feminine pursuits emerged within the period and women poets both elevated science, by incorporating its metaphors, and raised concerns about its claims.[75] When the dissenter Joseph Priestley's home, laboratory and church were destroyed by a mob of royalists in the Birmingham riots, Anna Laetitia Barbauld (1743-1825) came to his defence – and the defence of science – in verse. Her poem, 'To Dr. Priestley, Dec. 29, 1792,' admonishes the 'hooting' loyalist 'crowds' who 'lay their necks beneath the foot of power' and urges Priestley to remember the superior claims of 'delighted Science,' which she links to Priestley's pursuit of liberty and freedom in his public life.[76] These attacks, according to the poem, are but 'the slander of a passing age' against Priestley, the 'large mind,' whose thought 'grasps future periods.' For Barbauld, as for the younger Coleridge, Wordsworth and Shelley,

[72] Lord Byron, *The Major Works*, ed. Jerome McGann (Oxford: Oxford University Press, 2000), 622, 7.33–48.

[73] Byron, *Major Works*, 687, 9.281–320.

[74] Though he visited the telescope as a man, like Shelley and Keats, Byron probably spied the telescope as a school boy at Harrow on the Hill.

[75] See Ann B. Shteir, *Cultivating Women*, *Cultivating Science*: *Flora's Daughters and Botany in England*, 1760-1860 (Baltimore: Johns Hopkins University Press, 1996).

[76] Anna Laetitia Barbauld, *Selected Poetry & Prose*, eds. William McCarthy and Elizabeth Kraft (Ontario: Broadview, 2002), 135–136.

scientific endeavour represents the striving for a new and just age that will overtake a 'servile' regime that is coming to an end.[77]

But Barbauld was also attuned, as Mary Shelley would show herself to be over four decades later, to the dangers science posed to principles of liberty and freedom. Her poem, 'The Mouse's Petition' (1773), is a comical plea, again directed to Priestley, from the mouth of a rodent. Priestley, as Barbauld witnessed on her many visits to her friend's home, used mice and other animal species to test the effects of mixing air with different types of gases.[78] In her poem, Barbauld has the mouse eloquently beg for its freedom:

> Oh! hear a pensive prisoner's prayer,
> For liberty that sighs;
> And never let thine heart be shut
> Against the wretch's cries.
>
> For here forlorn and sad I sit,
> Within the wiry grate;
> And tremble at th' approaching morn,
> Which brings impending fate.
>
> If e'er thy breast with freedom glowed,
> And spurn'd a tyrant's chain,
> Let not thy strong oppressive force
> A free-born mouse detain.[79]

As Mary Ellen Bellanca argues, by 'invoking liberty and decrying tyranny, "The Mouse's Petition" lends itself to interpretations in which the suppliant mouse, a mouthpiece for liberal reform, stands in for detained and oppressed humans.'[80] Though Barbauld denied that her poem was meant as a stricture against Priestley, her exercise in animal empathy shows that she recognised within science the potential for cruelty and subjugation, as well as social progression.[81]

As Heringman and others have noted, Charlotte Smith (1749-1806) capitalised on 'the economy of nature' – the widespread popularity of botanical science – by incorporating fashionable images of plants and flowers and other natural objects into

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[77] Barbauld, *Selected Poetry & Prose*, 135.
[78] Mary Ellen Bellanca,'Science, Animal Sympathy, and Anna Barbauld's "The Mouse's Petition,"' *Eighteenth-Century Studies* 37.1 (2003): 47–67, 47.

[79] Barbauld, *Selected Poetry & Prose*, 70–71, 1–12.

[80] Bellanca, 'Barbauld's "The Mouse's Petition,'" 48.

[81] Bellanca, 'Barbauld's "The Mouse's Petition,'" 48.

her writing.[82] But like Barbauld and Mary Shelley, Smith also reveals anxieties about the unstoppable advance of natural philosophy. In her poem, 'The Swallow' (1807), Smith refers to a 'baffled science' and longs for the supernatural, mystical, intuitive forms of knowledge that once ruled:

> As fables tell, an Indian Sage,
> The Hindostani woods among,
> Could in his desert hermitage,
> As if 'twere mark'd in written page,
> Translate the wild bird's song.
>
> I wish I did his power possess,
> That I might learn, fleet bird, from thee,
> What our vain systems only guess,
> And know from what wide wilderness
> You came across the sea.[83]

The 'vain systems' of modern science, Smith suggests, have replaced an old and sacred relationship between humanity and nature. The swallow's secrets are mysterious because human kind has lost the ability to connect itself and interpret the natural world.

4. Dr Keats

The place John Keats occupies within this dialogue between literature and science is different from that of the other Romantic-era poets I have discussed above. Keats was the only one to receive a formal and comprehensive scientific education. Also, within the wider critical discussion of Romanticism's intersections with science, Keats's decision to abandon a promising career as a medical professional for the much more uncertain life of a poet seems a potent and symbolic event. If Keats 'gave over' medicine for poetry, then how should we regard his relation to science? Alan Richardson astutely summarises the two main barriers to discussing Keats in this context:

> The misguided (and implicitly condescending) tradition of minimising Keats's education and intellectual breadth is not the only obstacle to understanding the links

[82] Heringman, 'Introduction,' 1–22, 9.

[83] Charlotte Smith, *The Poems of Charlotte Smith*, ed. Stuart Curran (Oxford: Oxford University Press, 1993), 273–274, 16–25.

between his poetics and his knowledge of contemporary science. There is an equally misleading tradition of casting the relation between science and Romanticism as hostile, a view for which, ironically, Keats is partially responsible.[84]

It is true that Keats provided nineteenth and twentieth-century scholars with a number of important anecdotes for arguing Romanticism's antagonistic relation to science. Keats declared his approval of men 'who in their admiration of Poetry' did not 'jumble together Shakespeare and [Erasmus] Darwin' (*Letters* 1:113) and raised his glass and drank to 'Newton's health, and confusion to mathematics!' at Benjamin Haydon's Immortal Dinner of 1817.[85] Here he had agreed with fellow guest, Charles Lamb, that Newton had 'destroyed all the colour of the rainbow, by reducing it to the prismatic colours' and took to heart Wordsworth's thoughts about the poet, rather than the medical man, who is the 'healer of the ills of mankind.'[86]

However, there is so much that is contradictory about the sentiments Keats expresses in his letters and poetry that arguing for his wholesale rejection of science proves inadequate. As recent biographers such as Robert White and Andrew Motion have noted, the fact that Keats did so well during his traineeship at Guy's Hospital in London (he was selected for the coveted position of surgeon's dresser), and the fact that he enrolled to continue his studies after passing the Apothecary exams (and after five years of training), at the very least show that Keats's had great scientific aptitude.[87] There was nothing deficient about Keats's education either at John Clarke's School in Enfield or at Guy's, where he was taught by well respected figures, including the head of the hospital, Sir Astley Cooper. Cooper was one of the most eminent surgeons and medical teachers of the day. He was responsible for important developments in anatomy, pathology and surgery. Guy's itself was an important hub for the exchange of scientific knowledge that flowed in from all around Europe, and was the centre of changes taking place in medical practice and teaching as a result of the British Apothecaries Act (1815), which tightened the regulations surrounding the conferral of medical qualifications and sought to improve the overall standard of

[84] Richardson, 'Keats and Romantic Science,' 230.

[85] Benjamin Robert Haydon, *The Autobiography and Journals*, ed. Malcolm Elwin (London: Macdonald, 1950), 317. See also, Penelope Hughes-Hallet, *The Immortal Dinner*: *A Famous Evening of Genius and Laughter in Literary London* (London: Viking, 2000). Keats is referring to Erasmus Darwin (1731-1802), whose poem *The Botanic Garden* (1791) exemplified a genre of 'didactic' poetry which sought to instruct the reader upon scientific principles. Keats's criticism was a fashionable reaction against Enlightenment poetic ideology but his comments also reveal a genuine feeling he had about how poetry should talk about science.

[86] Robert Gittings, 'John Keats: Physician and Poet,' *Journal of the American Medical Association* 224.1 (1973): 51–55, 54.

[87] Robert S. White, *John Keats*: *A Literary Life* (Hampshire: Palgrave Macmillan, 2010). See especially the chapter entitled 'Aesculapius,' where White seeks to redress an inattention to the importance of Keats's medical career in past biographies of the poet. See also, Andrew Motion, *Keats* (Chicago: The University of Chicago Press, 1999), 80–81.

medical practitioners.[88] Richardson notes that 'Keats found himself at Guy's, an institution that was helping to reshape the profession of medicine with the latest currents in scientific thought,' and that he enjoyed being in such an environment.[89]

Why, then, was there no Dr Keats? As he became more engrossed in the artistic court of Leigh Hunt during 1816, it seems that Keats began to lose interest in his medical studies. We know that Keats had been writing poetry throughout his time as an apprentice apothecary with Thomas Hammond in Edmonton and during his surgical training at Guy's Hospital.[90] By early 1817 he had become frustrated with his fellow medical students and their blithe attempts at literary composition.[91] He longed to be included in the serious circle of letters that surrounded Hunt, who had encouraged his poetic ambitions since they met. To his friend, the son of his former principal, Charles Cowden Clarke (1787-1877), Keats recounted his tendency towards dreaminess and the way it interfered with his study: "'the other day, for instance, during the lecture, there came a sunbeam into the room, and with it a whole troop of creatures floating in the ray; and I was off with them to Oberon and fairyland.'"[92] Keats's description of his mental transportation from scientific lecture to Shakespearean reverie might have been the first hint he gave that he was seriously contemplating leaving medicine for poetry. Robert Gittings argues that it was Keats's exposure to Wordsworth's poems in 1815 that derailed his medical ambitions at Guy's. 'From this moment,' he posits, 'Wordsworth and Astley Cooper were in competition for the direction that Keats's genius would take.'[93] Here I agree with Nicholas Roe's contention that Keats's writing instead 'attempts to resolve the Wordsworthian polarisation of "science" and "poetry,"' assimilating *both* Wordsworth and Cooper in his idea of a poet's calling.[94]

Keats may have had another, less romantic reason for abandoning his surgical tools. Writing after Keats's death, Charles Brown was adamant that his friend had not abandoned his costly and expensive medical education on a whim.

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[88] White, *John Keats*, 18. See also, Donald C. Goellnicht, *The Poet-Physician*: *Keats and Medical Science* (Pittsburgh: University of Pittsburgh Press, 1984).

[89] Richardson, 'Keats and Science,' 230.

[90] Richardson, 'Keats and Science,' 32–33.

[91] Walter Jackson Bate, *John Keats* (London: Oxford University Press, 1967), 48–49.

[92] Charles and Mary Cowden Clarke, *Recollections of Writers* [1878] (Foutwell, Sussex: Centaur, 1969), 132.

[93] Gittings, 'Physician and Poet,' 54.

[94] Nicholas Roe, *John Keats and the Culture of Dissent* (Oxford: Oxford University Press, 1997), 187. Roe's study contains an important discussion of Keats's involvement with radical scientists such as Joseph Priestley (169–181).

He has assured me the muse had no influence over him in his determination, he being compelled, by conscientious motives alone, to quit the profession, upon discovering that he was unfit to perform a surgical operation. He ascribed his inability to an overwrought apprehension of every possible chance of doing evil in the wrong direction of the instrument. 'My last operation,' he told me, 'was the opening of a man's temporal artery. I did it with the utmost nicety; but, reflecting on what passed through my mind at the time, my dexterity seemed a miracle, and I never took up the lancet again.'[95]

In any case, Keats's exposure to science during his medical training went on to influence his poetry and artistic philosophy. In 1818, Keats himself mentioned the possibility of his artistic ambitions and scientific training existing in happy congress. In a letter to J. H. Reynolds, he remarked that if he were to 'study physic or rather medicine again' he did not feel that it would 'make the least difference' to his Poetry. 'I am so convinced of this,' Keats said, 'that I am glad at not having given away my medical Books, which I shall again look over to keep alive the little I know thitherwards' (*Letters* 1:277).

Keats never did go back to practising as a surgeon or apothecary, but his training as a medical professional forms the basis of a number of important readings of his poetry. As Richardson notes, 'it is richly ironic that Keats's medical training, once cited as a sign of his low cultural standing, has been cited in recent scholarship for the precision and intellectual sophistication of Keats's response to the momentous scientific and medical developments of his era.'[96] As early as 1970, Stuart M. Sperry drew attention to the rich rewards of viewing Keats's poetry through a scientific paradigm, arguing that 'for Keats, certain fundamental analogies between the laws of physical change and the processes of the imagination were current and readily available in the chemical theory of his day.'[97] And there has been a long tradition of reading Keats's writing in the context of his medical studies.[98] More recently Richardson has identified contemporary developments in brain science in Keats's poetry and letters, specifically in the Great Odes, and Denise Gigante has discussed

[95] Charles Brown, 'Life of John Keats,' in *The Keats Circle*, vol. 2, ed. Hyder Edward Rollins (Cambridge, MA: Harvard University Press, 1948), 56.

[96] Richardson, 'Keats and Romantic Science,' 230.

[97] Stuart M. Sperry Jr., 'Keats and the Chemistry of Poetic Creation,' *PMLA* 85.2 (1970): 268–277, 272.

[98] See, for example, Charles W. Hagelman Jr., 'Keats's Medical Training and the Last Stanza of the "Ode to Psyche,"' *Keats-Shelley Journal* 11 (1962): 73–82; Hermione De Almeida, *Romantic Medicine and John Keats* (New York: Oxford University Press, 1991); Hillas Smith, *Keats and Medicine* (Isle of Wight: Cross, 1995) and R. S. White, '"Like Esculapius of Old": Keats's Medical Training,' *Keats-Shelley Review* 12 (1998): 15–49.

Keats's imagining of monstrosity by linking *Lamia* to the vitalism debates carried out by figures associated with Guy's Hospital.[99] The study of Keats and science, as these examples suggest, has usually meant a study of Keats in conjunction with the science he had been exposed to throughout his medical training. Knowing what books Keats read, what subjects he studied and whose lectures he attended, establishes connections that have rightly taken priority. But this criticism has paved the way for a new approach to discussions of Keats's engagement with a scientific culture. It is now possible to look further afield, into discourses that extend beyond this direct connection to the medically related disciplines of anatomy, chemistry and biology.

5. Astronomy and Romantic Literature

As any reader of Romantic poetry is aware, the language of the fragment, epic, ode and lyric is awash with cosmological imagery. Wordsworth's Lucy is 'fair as a star, when only one/ Is shining in the sky,' 'no telescopes' turn towards Amelia Opie's 'bright unclouded moon,' Byron's Manfred summons the spirits 'of the unbounded Universe' and Coleridge mentions 'plucking flowers from the Galaxy/ On the pinions of Abstraction' in an invitation to Thomas Poole. With astronomical references so clearly abundant, it comes as no surprise that the relation between Romantic poetry and Romantic-era astronomy has attracted the attention of literary critics.

Two main approaches emerge in explorations of literary responses to astronomy. The first reads the skyscape as it appears in Romantic poetry and prose as an extension of landscape, and consequently applies critical theories of nature poetics – usually figuring the heavens as another location where the poet can express his or her view on the relation between the natural world and the human mind.[100] However, in treating the moon, sun and stars as fixtures of the natural world no different from the mountains, lakes, and fields that so frequently appear in Romantic poetry, such criticism pays attention to cosmological phenomenon visible to the naked eye. But the astronomy of the late eighteenth and early nineteenth centuries is characterised by that which cannot

[99] Alan Richardson, *Romanticism and the Science of the Mind* (Cambridge: Cambridge University Press, 2001); Denise Gigante, 'The Monster in the Rainbow: Keats and the Science of Life,' *PMLA* 177.3 (2002): 433–477.

[100] For examples relating to Romantic literature see Beth Lau, 'Coleridge's Reflective Moonlight,' *Studies in English Literature, 1500-1900* 23 (1983): 533–548 and Maggie Lane, 'Star-Gazing with Fanny Price,' *Persuasions* 28 (2006): 150–165.

be easily observed, by what occurred behind the optical illusion of a fixed and calm starlit dome or firmament encasing the earth.

The second general approach scholars have applied to the subject attempts to understand the proliferation of astronomical imagery in Romantic poetry as either responsive or unresponsive to the scientific breakthroughs of the age. And it is within this latter critical discussion that I have positioned this thesis. On this latter strain of analysis, a small but significant body of scholarship exists. In 1930, Carl Grabo's study of Shelley's use of science in *Prometheus Unbound* (1820) traced the astronomical imagery of the poem to Newton's cosmology, even while acknowledging Shelley's awareness of William Herschel's discoveries.[101] Later, Desmond King-Hele also drew tentative links between the German-born scientist and the poet.[102] The later twentieth century, and early twentieth-first century however, have seen a flourishing body of criticism dedicated to Shelley and Romantic astronomy. For example, Fredrick L. Hildebrand discusses the use of astronomical metaphor in *Epipsychidion* (1821). 'In this poem,' Hildebrand argues, 'Shelley uses the collision of a comet with the earth to depict the cataclysmic events which throw an individual, society, and the universe into a state of chaos and to represent his thoughts about the processes that will result in their restoration.'[103] Locating a strong point of connection between Shelley and Herschel in the personage of James Lind (mentor to Shelley and friend and correspondent to Herschel),[104] allows Christopher Goulding to indentify 'a distinct Herschelian character' in Shelley's writing that 'is particularly apparent in the poet's use of lunar and volcanic imagery.'[105] Sophie Laniel has also charted the influence of astronomy, optics and wave dynamics in *Epipsychidion* and *The Triumph of Life* (1822) arguing that, for Shelley, 'optics and astronomy stand for the limitations of man's point of view and for his inability to apprehend absolute beauty.'[106]

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[101] Carl Grabo, *A Newton Among Poets*: *Shelley's Use of Science in* '*Prometheus Unbound*' (Chapel Hill: University of North Carolina Press, 1930), 87.

[102] Desmond King-Hele, *Shelley*: *His Thought and Work* (London: Macmillan, 1970), 189.

[103] Fredrick L. Hildebrand, '*Epipsychidion*'s Cosmic Collision: A Controlling Metaphor,' *Keats-Shelley Journal* 37 (1988): 75–90, 77.

[104] Christopher Goulding, "'An Old, Old Man with Hair of Silver White…": A More Scientific Image of Shelley's Mentor at Eton,' *Keats-Shelley Review* 14 (2000): 52–55.

[105] Christopher Goulding,'Shelley's Cosmological Sublime: William Herschel, James Lind and the "Multitudinous Orb,"' *Review of English Studies* 57 (2006): 783–792, 784.

[106] Sophie Laniel, 'The Anatomy of Light: Astronomy, Optics and Wave Dynamics in Percy B. Shelley's *Epipsychidion* and *The Triumph of Life*,' *Études Anglaises* 63.1 (2010): 73–87, 73.

Beyond Shelley, however, discussions of the relation between Romantic astronomy and poetry have been relatively muted. Marilyn Gaull's foundational essay on 'Romantic Skies,' published in 1990, created something of a silence in the scholarship that came after it. In this essay, Gaull argued that Romantic astronomy 'did not find its voice in art and literature, except in the mythic representations of Blake and Shelley.'[107] She proposed that 'astronomical allusions in Romantic art and poetry' were normally Newtonian, and referred 'to a universe that was stable, symmetrical, mechanical, bounded in space and time rather than the vast, tumultuous, infinite, volatile one contemporary astronomy was revealing.'[108] Gaull's argument shared a similar thesis with Marjorie Nicolson's 1935 essay on telescopes and the imagination. Here Nicolson argued that while 'Copernicanism' was 'the most epoch-making' change of the early modern age:

> the student of seventeenth century literature who reads thoughtfully those earlier poets who first experienced the strangeness of the 'new astronomy,' and the somewhat later poets who accepted it as a matter of course, becomes aware that there was little stirring of the cosmic imagination even among those who defended Copernicus […] athough the intelligent layman of the seventeenth century was aware of the so-called Copernicus hypothesis, in itself the hypothesis disturbed him little.[109]

The truth that is struck by both of these observations, is that writers and thinkers contemporaneous to Copernicus and Herschel were not able to respond fully to the upending of the universal structure posed by the discoveries of each scientist. In Nicolson's words, there is a time when new discoveries are experienced as strange and a time when they are accepted as a matter of course. A useful analogy can be found in our own culture. While the Higgs Boson has been taught, renamed ('The God Particle'), written and sung about, satirised and summarised for a transnational, scientifically literate audience – it would be difficult to argue that the implications of this discovery have been sufficiently processed within the cultural consciousness. In comparison, for example, the Sun sits comfortably at the centre of the solar system and unnumbered universes operate in deepest space populated, undoubtedly, by super massive black holes from which light cannot escape. But just what the Higgs Boson might be or mean – this remains uncertain. In other words, there is a temporal lag

[107] Marilyn Gaull, 'Under Romantic Skies: Astronomy and the Poets,' *Wordsworth Circle* 21.1 (1990): 34–41, 35.

[108] Gaull, 'Under Romantic Skies,' 35.

[109] Marjorie Nicolson, 'The Telescope and Imagination,' *Modern Philology* 32.3 (1935): 233–260, 233.

between discovery and assimilation, between hypothesis and experiment, between what cannot, and then what eventually can, be understood.

It is within this temporal lag – after Herschel's discovery of universal stellar decay but before his work had been universally accepted – that John Keats wrote his poetry about heaven and earth. However, this fact does not necessarily translate, as it does for Gaull, into a reading of Romantic literature as existing somehow outside of its own scientific context or simply adopting an ahistorical view of the stellar heavens. It is my contention that Keats did not 'ignore' the astronomical climate of his time, but instead engaged with its intrusion upon conventional understandings of the universe.

The far-reaching influence of Marilyn Gaull's essay on astronomy and literature is evidenced in the rehearsal of its readings, within even the most recent scholarship on the subject. In her 2014 monograph, *Astronomy and the Reach of the Mind in Victorian Literature*, Anna Henchman argues that

> Tennyson is unique among his contemporaries, not perhaps in the extent to which he uses stellar imagery, but in the extent to which he requires that imagery to be consistent with astronomical innovation. Because recent astronomical discoveries so easily eluded everyday sensory perception, they were easy for poets to overlook. Marilyn Gaull notes, for instance, that while Wordsworth and Keats knew that the stars were in perpetual motion and gradually dying out, each continued to use the stars as symbols of fixity and permanence.[110]

Writing almost 30 years after Herschel's theories about 'the construction of the heavens' had been made public, Alfred, Lord Tennyson (1809-1892) occupied a different temporal space than John Keats. Later in the nineteenth century, when the dust had settled on the hypotheses and theories put forward by 'the modern astronomy,' Tennyson would figure the discipline in vastly different terms. Henchman's scholarship offers exceptional readings of Tennyson within this context.[111] But I include the following discussion of 'Parnassus' (not discussed by Henchman) to provide my own point of comparison between Tennyson's Victorian perspective and the analysis of Keats's poetry that is to follow.

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[110] Anna Henchman, *The Starry Sky Within*: *Astronomy and the Reach of the Mind in Victorian Literature* (Oxford: Oxford University Press, 2014), 97.

[111] Henchman, *The Starry Sky Within*. See also, "'The Globe we groan in:" Astronomical Distance and Stellar Decay in *In Memoriam*," *Victorian Poetry* 41.1 (2003): 29–45 and 'The Telescope as Prosthesis,' *Victorian Review* 35.2 (2009): 27–32. Henchman's work on personal perspective and the aided eye in observational astronomy is particularly fine.

In ‘Parnassus’ (1889) astronomy and its sister science geology are ominous twin shapes casting shadows over poetry. Tennyson recognises that a new cosmology has dispossessed the old. He begins with the poet seated in a position of privilege at the top of Mount Parnassus, somewhere between heaven and earth and able to communicate with both:

I
What be those crown'd forms high over the sacred fountain?
Bards, that the mighty Muses have raised to the heights of the mountain,
And over the flight of the Ages! O Goddesses, help me up thither!
Lightning may shrivel the laurel of Cæsar, but mine would not wither.
Steep is the mountain, but you, you will help me to overcome it,
And stand with my head in the zenith, and roll my voice from the summit,
Sounding for ever and ever thro' Earth and her listening nations,
And mixt with the great Sphere-music of stars and of constellations.[112]

But then the looming figures of these double and diabolical sciences emerge to cast deep shadows over this poetic ideal:

II
What be those two shapes high over the sacred fountain,
Taller than all the Muses, and huger than all the mountain?
On those two known peaks they stand ever spreading and heightening;
Poet, that evergreen laurel is blasted by more than lightning!
Look, in their deep double shadow the crown'd ones all disappearing!
Sing like a bird and be happy, nor hope for a deathless hearing!
'Sounding for ever and ever?' pass on! the sight confuses---
These are Astronomy and Geology, terrible Muses![113]

Tennyson, characteristically, cannot leave matters in such a state of confusion and hopelessness. Even if poets cannot now ‘hope for a deathless hearing’ they must keep writing, making ‘other songs for other worlds’:

III
If the lips were touch'd with fire from off a pure Pierian altar,
Tho' their music here be mortal need the singer greatly care?
Other songs for other worlds! the fire within him would not falter;
Let the golden Iliad vanish, Homer here is Homer there.[114]

[112] Alfred Tennyson, ‘Parnassus,’ in *The Poems*, ed. Christopher Ricks, 3 vols. (Essex: Longman, 1987), 3.203, 1.1–8.

[113] Tennyson, ‘Parnassus,’ 2.9–16.

[114] Tennyson, ‘Parnassus,’ 3.17–20.

‘Parnassus’ expresses poetic defiance in the face of the inescapable decay and impermanence introduced by Herschelian astronomy and the geology of James Hutton (1726-1797) and Charles Lyell (1797-1875). Mountains may crumble, Tennyson says, and stars may die, and poets and their poetry will likewise vanish. But poetic inspiration, the act of creation, transcends temporality. The poet is great in whichever age he lives: ‘Sing like a bird and be happy’: ‘Homer here is Homer there.’

Tennyson’s poem articulates and seeks resolution for an anxiety about material and metaphysical immortality that appears within Keats’s work. But Keats’s response to the natural history of the universe is necessarily different than Tennyson’s. Keats, unlike Tennyson, is writing well before the different parties within the culture had agreed upon the new astronomical and geological terms. In other words, the new ideas about the age and structure of the universe had not been completely accepted and subsumed into the intellectual culture, let alone the public consciousness. Added to this was the fact that, while Herschel was living, his findings were always presented as a work in progress. Herschel had both changed his mind and courted wildly improbable theories – it was only after his death in 1822 that his ground-breaking findings about the natural history of the universe were crafted into a coherent narrative. As I will go on to discuss in the coming chapters, nebulosity and contradiction formed an integral part of William Herschel’s cosmology and his opinions about the life story of the stars and the structure of galaxies shifted over the course of his career. In this regard, poetic ruminations that highlight the mysteries of the universe, that conflate the ancient with the modern, and which appear fragmentary or contradictory did not ignore the ‘modern astronomy’ but were commensurate with it. It is this environment, an environment where astronomical science is embedded on the uncertainty of its own expression, circulation and reception, that produces a Romantic cosmology.

While Marilyn Gaull argues that writers such as Wordsworth and Keats ‘ignored’ the findings of contemporary astronomy, Henchman notes that these discoveries were ‘easy to overlook,’ and I argue that Romantic cosmology consisted of a discontinuous series of discoveries and revisions, it is certainly not true that Herschel’s work was simply disregarded in his own time. In fact, Herschel’s findings were anything but ignored. Summaries of papers Herschel read to the Royal Society appeared frequently in both newspapers and periodical journals for nigh on forty years; public lectures and demonstrations were often advertised as making Herschel’s hypothesis easier to

understand[115] and the astronomer himself was described as 'celebrated,' until his death in 1822.[116] Indeed, it is hard to find a newspaper or journal that does not make reference to Herschel at least once a month over the course of his long career.

All this being said, Marilyn Gaull's summary of Herschel's work provides an excellent reading of the way the new astronomy demanded synecdoche, rather than 'static' analogy to explain it.[117] While Newton's cosmology aligned with an idea of 'clockwork' efficiency, Herschel's universe was too unpredictable to be understood in these terms. As such, according to Gaull, Herschel needed a more complex metaphor, that of the dynamic, cyclical, botanical garden.[118] This last point is taken up at the end of Anne Janowitz's essay on Enlightenment approaches to the night sky as she notices a turn that took place 'from the 1780s onwards […] as both poetic speakers and the world they lived were found to be organic.'[119] Janowitz remarks that it is 'fascinating to see how astronomers and cosmologists also worked with this newer model, and its new form of sublimity.'[120] A small collection of scholarship exists which examines the connections between Romantic-era poetry and the imaginative demands of this 'new form of sublimity,' and which extends further than Gaull's statement about the popular influence of Herschel's science allows. A. J. Meadows, for example, focuses on the usual suspects Blake and Shelley but also spends fruitful time with Coleridge, Wordsworth, Immanuel Kant and Erasmus Darwin.[121] On Keats, however, Meadows has little to say because the poet 'despite his study of medicine […] referred little to science: such comment as there was seems antagonistic.'[122] Kathleen Lundeen has charted the cultural influence of Herschel's 40-foot telescope, examining the poetry of

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[115] See, for example, *The Morning Chronicle* (London), March 23, 1791, 6799, 1d and *The Morning Chronicle*, April 2, 1819, 15576, 1a.

[116] See, for example, *The Courier and Evening Gazette* (London), March 8, 1799, 2049, 2c; *The Morning Chronicle* (London), November 18, 1817, 15147, 3b and *The Morning Post*, November 19, 1822, 16124.

[117] Gaull, 'Under Romantic Skies,' 35.

[118] Gaull, 'Under Romantic Skies,' 39. See William Herschel, 'Catalogue of a Second Thousand of New Nebulæ and Clusters of Stars, With a Few Introductory Remarks on the Construction of the Heavens,' *Philosophical Transactions of the Royal Society* 79 (1789): 212–255, 226.

[119] Anne Janowitz, "'What a rich fund of Images is treasured up here": Poetic Commonplaces of the Sublime Universe,' *Studies in Romanticism* 44.4 (2005): 469–492, 491.

[120] Janowitz, 'Poetic Commonplaces of the Sublime Universe,' 491. For Janowitz's discussion of Lucretius and eighteenth century responses to the idea of infinite worlds see Anne Janowitz, 'The Sublime Plurality of Worlds: Lucretius in the Eighteenth Century,' *Tate Research Papers* 13 (2010), accessed August 19, 2013, http://www.tate.org.uk/research/publications/tate-papers/sublime-plurality-worlds-lucretius-eighteenth-century.

[121] A. J. Meadows, *The High Firmament*: *A Survey of Astronomy in English Literature* (Leicester: Leicester University Press, 1969), 149–183.

[122] Meadows, *Astronomy in English Literature*, 167.

Wordsworth, Blake and Byron in this context. Lundeen makes mention of the 'watcher of the skies' in Keats's sonnet 'On First Looking into Chapman's Homer' (1816) but goes no further in her exploration of the poet's connection to Romantic-era astronomy.[123] Only Dometa Wiegand's unpublished doctoral thesis on Romantic literature's intersections with astronomy – which contains a chapter on *Lamia* (1820) – delves deeper into Keats's cosmological sensibilities.[124]

In fact, Keats's poetry reveals a familiarity with, not only, 'the modern astronomy,' but with a general feeling of anxiety attached to the implications of the Romantic cosmology within popular culture. In attempting to enter into the discussion, this thesis will address two key questions. First, to what extent was John Keats's poetic vocabulary influenced by contemporary discoveries in astronomy? And second, is it possible to read popular anxieties about Herschel's new and challenging universe in Keats's poetic treatment of astronomical phenomena? In answering these questions this thesis argues that Keats exploits the uncertainty and doubt surrounding the terms 'star,' 'universe' and 'eternity' at the turn of the nineteenth century in order to explore the complexity of myth, poetic legacy and the limitations of human knowledge in his poems. For Keats there is an interesting imaginative possibility in the uncertainties contained in the Herschelian cosmology – they have, for him, negative capability. In the following chapters I will pay attention to a number of what I have identified as Keats's 'cosmological poems,' or those works most interested in the congress between heaven and earth. Considering Keats within the context of contemporary astronomical debate provides fresh insights into some of his most important poetry. Chapter One of this thesis re-examines Keats's tribute to George Chapman's translation of Homer and argues that the influence of John Bonnycastle's *An Introduction to Astronomy* is more pervasive than has been previously acknowledged. Chapter Three, '"Still Steadfast, Still Unchangeable": Cosmic Variability and Keats's "Bright Star"' examines Romantic-era scientific treatises on variable or periodical stars and shows that by the

[123] Kathleen Lundeen, 'On Herschel's Forty-Foot Telescope, 1789,' *BRANCH: Britain, Representation and Nineteenth-Century History*, [no date or issue available], accessed August 12, 2013, http://www.branchcollective.org/?ps_articles=kathleen-lundeen-on-herschels-forty-foot-telescope-1789. See, also, Kathleen Lundeen, 'A Wrinkle in Space: The Romantic Disruption of the English Cosmos,' *Pacific Coast Philology* 43 (2008): 1–19.

[124] Dometa Wiegand, 'On All Sides Infinity' (PhD Dissertation, Washington State University, 2005). See, also, Dometa Wiegand,'Coleridge's "Web of Time": The Herschels, the Darwins, and "Psalm 19,"' *The Coleridge Bulletin* 28 (2006): 91–100, for a discussion of Romantic astronomy's temporal hypotheses and Coleridge's poetics and 'Anna Laetitia Barbauld: "Embryo Systems and Unkindled Suns,"' in *The New Science and Women's Literary Discourse*: *Prefiguring Frankenstein*, ed. Judy A. Hayden (New York: Palgrave MacMillan, 2011), 201–218, for Wiegand's take on a woman's engagement with Herschelian astronomy.

time Keats had composed his famous sonnet, the term 'bright star' had become associated with stellar objects that were changeable in appearance. While he appears to reject this aspect of contemporary astronomy with his insistence on the steadfast and unchanging nature of his 'Bright Star,' I argue that Keats invokes these associations to heighten the sense of hopeless longing in the poem, to complicate the divide between the mortal and the celestial, and to underscore his insecurities about the character of his 'fair love.' In an analysis of *Endymion* in Chapter Four, I notice Keats's resistance to the universalising impulses of a number of writers in the period, both non-canonical and canonical, and argue that his theory of 'Negative Capability' – the ability to exist 'in uncertainties' and be 'content with half knowledge' – is informed by a Romantic cosmology that emphasises nebulosity, instability and mutability in all things. Chapter Five, 'Eternity, History and *Hyperion*' discusses Keats's first iteration of the Saturnian myth and argues that in his rendering of the defeat of the immortal Titans by the Olympians, Keats engages with a Romantic-era paradox in thinking about eternity that reveals a deep connection to his own historical context. As well as these four chapters on Keats's poems, this thesis contains one chapter (Chapter Two) dedicated to the story of William Herschel – his life, his telescopes and his legacy. Indeed, I have focused much of my attention throughout this thesis to the specifics of Romantic-era astronomical science and how these details were discussed and contested in the popular press. I have tried to ensure that my readings of the literary cosmologies that emerged in the period have not strayed too far from the scientific cosmologies that contextualised them. As I will go on to argue in the following chapters, the tendency for literary critics to generalise about Herschel's contribution to the intellectual culture of his time, especially in terms of the stability of his cosmological model, is often based on an imperfect engagement with the science and scientific debates associated with him. The summaries of Herschel's work which appear in some (though certainly not all) discussions of astronomy and Romantic literature then, often contrast crudely with the more tentative arguments of historians of science who recognise the astronomer's equivocation and indecision about phenomena such as nebula. One result of this inattention to the scientific in favour of the literary has, in my opinion, been the relegation of Keats's poetry to the sidelines of this discussion. It is my hope that in paying attention to the intricacies of Herschel's thought, the subtleties of Keats's modern and mythical heaven will be revealed.

Chapter One:

'Like Some Watcher of the Skies': Bonnycastle, Uranus and 'On First Looking into Chapman's Homer'

If any artist […] had merely conceived in his mind the system of the sun and stars and planets, they not existing, and had painted to us in words or upon canvas, the spectacle now afforded by the nightly cope of Heaven and illustrated it by the wisdom of astronomy, how great would be our admiration. (*Major Works* 633)

- Percy Shelley, 'On Life,' 1819

1. George's Star

Writing in 1791, Scottish natural philosopher John Anderson (1726-1796) linked the most influential event of the British Romantic artistic movement to Romantic-era astronomy when he declared: 'I am still of [the] opinion that I have seen the two most wonderful things that have ever been seen in this Planet: the French Revolution and Dr Herschell's telescope.'[1] Anderson was writing to fellow polymath and radical, James Lind, a friend of Herschel, who would go on introduce Shelley to contemporary developments in astronomy. For progressives like Lind and Anderson, the revolution in France represented the beginning of a new social and political world order. A few years before the storming of the Bastille in 1789, William Herschel's reflector telescope had also introduced a new world – quite literally. During a routine night measuring the parallax of stars in 1781, Herschel happened upon a curious star that his skilled and experienced eye at once recognised as irregular:

On Tuesday the 13th of March, between ten and eleven in the evening, while I was examining the small stars in the neighbourhood of H Geminorum, I perceived one that appeared visibly larger than the rest: being struck with its uncommon magnitude, I compared it to H Geminorum and the small star in the quartile between Auriga and Gemini, and finding it so much larger than either of them, suspected it to be a comet.[2]

[1] John Anderson, 'Letter dated 7 October 1791,' University of British Columbia, Woodward Biomedical Library, Ms. WZ260.C668.

[2] William Herschel, 'Account of a Comet,' *Philosophical Transactions of the Royal Society of London*, 71 (1781): 492–501, 492.

The object that Herschel had located increased in size according to the magnification of his eyepieces – something that did not happen to regular stars.[3] He was also able to discern that it had 'proper' movement in relation to the stars that surrounded it.[4] Such movement is called 'proper' to distinguish it from the nightly transit of the stars – these are so far away from earth that they appear to rise and set in the same relative positions over time. These observations proved to the amateur astronomer that his point of light could not, in fact, be a star and must belong to the solar system. Only two celestial bodies could fit this description. Herschel's false star was either a comet or a planet. But the six planets of the solar system had been discovered in ancient times and millennia had passed without change.

Herschel may have genuinely thought that the 'moving star' he had found was a comet, and this is certainly how he presented his discovery to the scientific establishment. But there is reason to believe that Herschel suspected, from early on, that he had discovered a new planet. In his observational notes, Herschel remarked that 'the Comet appeared perfectly sharp upon the edges, and extremely well defined, without the least appearance of any beard or tail.'[5] This description, Herschel must have realised, better suited a planet than a comet. The astronomer was well aware of the unprecedented strength of his mirrors, as well as of his own gifts of observation (he had, he said, undertaken 'many thousand observations' in the lead-up to this discovery and acknowledged the 'temporary advantage' his instruments had given him over other observers).[6] It seems likely that he would, at least, have entertained the hope that he had discovered a seventh planet. When another astronomer, Giuseppe Piazzi of Palermo (1746-1826), found a similar object in 1801, he wrote to the eminent German astronomer Johann Elert Bode (1747-1826) announcing that he had discovered a comet. But to his friend, the Italian Barnaba Oriani (1752-1832), he revealed his hopes that his moving star 'might be something better than a comet.'[7]

Herschel, like Piazzi, recognised the diplomacy required. By 1781, Herschel was also making extraordinary claims about the magnification strength of his telescopic

[3] Herschel, 'Account of a Comet,' 492 –501.

[4] Herschel, 'Account of a Comet,' 499.

[5] Herschel, 'Account of a Comet,' 498.

[6] Herschel, 'Account of a Comet,' 493, 500.

[7] Guiseppe Piazzi, quoted in 'Newton and Newtonianism,' in *The Cambridge Concise History of Astronomy*, ed. Michael Hoskin (Cambridge: Cambridge University Press, 1999), 130–167, 161.

lenses which, he predicted correctly, would lead to accusations of lunacy from fellow astronomers.[8] It would have been hubris for the German-born Bath musician to claim that he, an unknown astronomer, had discovered the first planet in recorded history. Whatever Herschel may have privately believed, it was a new comet that he humbly presented to the scientific establishment for verification in 1781.

The mirror of Herschel's reflecting telescope (which he had designed and welded himself in his own basement) was so far superior to that of any found in the private homes or state observatories throughout Europe that it took some time for others to confirm what, in fact, Herschel had found. English Astronomer Royal Nevil Maskelyne (1732-1811) initially had trouble finding Herschel's object with the less powerful telescopes at the Greenwich observatory through which 'everything in the region looked like an ordinary star.'[9] Eminent French astronomer Charles Messier (1730-1817), who was famous for identifying comets, was also flummoxed by the ability of Herschel's telescope to detect proper motion in so small an object. Messier wrote to tell Herschel about the extreme difficulty he had experienced locating the 'star' and his amazement that Herschel had observed enough to return to the object at all. Messier modestly admitted: 'it literally took this observer several consecutive days to discern that it had any movement at all' (« car absolument il a fallu l'observer plusieurs jours de suîte pour s'apperçevoir qu'elle avoit un mouvement »).[10] Eventually, the professionals on the continent came to a consensus. In the *Philosophical Transactions* of 1783, a formal letter from Herschel to Sir Joseph Banks explained that 'by the observations of the most eminent Astronomers in Europe it appears, that the new star, which I had the honour of pointing out to them in March, 1781, is a Primary Planet of our Solar System.'[11] A new world had been found.

Herschel's influential friends, including Banks and Maskelyne, intent on securing Herschel a living that would free him from his employment as a musician, encouraged him to name the star after King George III. There was good reason to believe that the King would look upon Herschel, and his discovery, favourably. The monarch had a

[8] Simon Schaffer, 'Herschel in Bedlam: Natural History and Stellar Astronomy,' *The British Journal for the History of Science* 13.3 (1980): 211–239, 211.

[9] Michael Hoskin, 'William Herschel and the Construction of the Heavens,' *Proceedings of the American Philosophical Society* 133.3 (1989): 427–433, 429.

[10] Charles Messier, quoted in Herschel, 'Account of a Comet,' 500.

[11] William Herschel, 'A Letter from William Herschel, Esq. F.R.S,' *Philosophical Transactions of the Royal Society of London* 73 (1783): 1–3, 1.

keen interest in astronomy – he had built a private observatory at Kew in 1769 in order to witness the transit of Venus that year.[12] Herschel was also 'a native of the country from whence' the King's 'Illustrious Family was called to the British throne.'[13] Herschel, like King George, was a Hanoverian. In the style of Galileo, who had honoured his patrons from the House of Medici by naming the satellites of Jupiter the Medicean Stars, Herschel named the seventh planet of the solar system the Georgium Sidus, or George's star.[14]

The reciprocal requirements of patronage meant that once Herschel had made such a significant dedication to his name, the King was honour-bound to do something for the astronomer. Banks, who had the King's ear, made sure that this something would enable Herschel to dedicate his full attention to the night sky.[15] There was already a 'Astronomer Royal' and a 'King's Astronomer,' so a new position was created for Herschel and he became 'Private Astronomer to the King' with an annuity of £200. And so, for a few years, the planets of the solar system were Mercury, Venus, Earth, Mars, Jupiter, Saturn and George's Star.[16] But the 'Literati of Europe'[17] did not embrace the name Herschel had selected. It continued to be used in England for some years before the name was universally dropped. Bode, who had calculated the orbit of the new planet, suggested the title Uranus (the god of the Sky) and this name, of course, was eventually adopted.[18]

2. Like Saturn's Ring

Over thirty years after Herschel's historic observation, Keats would imagine the discovery of a new planet in his poem 'On First Looking into Chapman's Homer.' This poem shows that Keats, like John Anderson, connected contemporary astronomy to ideas of renewal and purification:

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[12] Richard Dunn, *The Telescope: A Short History* (Greenwich: National Maritime Museum, 2009), 65.

[13] Herschel, 'Letter from William Herschel,' 2.

[14] Herschel, 'Letter from William Hershel.'

[15] Michael Hoskin, *The Construction of the Heavens*: *William Herschel's Cosmology* (Cambridge: Cambridge University Press, 2012), 12.

[16] Hoskin, *William Herschel's Cosmology*, 2012, 12.

[17] Herschel, 'Letter from William Herschel,' 3.

[18] R.V. Jones, 'Through Music to the Stars: William Herschel, 1738-1822,' *Notes and Records of the Royal Society of London* 33.1 (1978): 37–56, 45–46.

Much have I travell'd in the realms of gold,
  And many goodly states and kingdoms seen;
  Round many western islands I have been
Which bards in fealty to Apollo hold.
Oft of one wide expanse had I been told
  That deep-brow'd Homer ruled as his demesne;
  Yet did I never breathe its pure serene
Till I heard Chapman speak out loud and bold:
Then felt I like some watcher of the skies
  When a new planet swims into his ken;
Or like stout Cortez when with eagle eyes
  He star'd at the Pacific—and all his men
Look'd at each other with a wild surmise—
  Silent, upon a peak in Darien. (*Poems* 34)

Keats's sonnet (itself a symbol of the potential and promise of an author about to embark on a literary career) is widely considered Keats's first truly fine work of poetry. Its tightly structured Petrarchan rhythm appears to speak of a moment of pure discovery: the poet figured as both astronomer and conquistador gazing upon new worlds. The poem's clarity, its technical and lyrical perfection, belies its frenzied composition. 'On First Looking into Chapman's Homer' was probably written in the early hours of an October morning in 1816. Keats had spent the previous evening poring over George Chapman's seventeenth-century translation of Homer's *Iliad* and *The Odyssey* with his friend Charles Cowden Clarke. Clarke was the son of the Headmaster at the Enfield School where Keats had boarded until 1810. Keats had left Enfield to take up his medical apprenticeship but he remained in contact with Clarke, who tutored at the school and who continued to be a literary mentor to the poet.[19] Keats had left Clarke's apartments with his head full of the epic's images of adventure and discovery and he soon transcribed these, as well as his passionate enthusiasm for Chapman's translation, into his sonnet.

It was no accident that Keats drew on an astronomical metaphor to describe the feeling of awe and wonderment he took home with him that night. Robert Gittings's discussion of 'Chapman's Homer' points to the starry skyscape that appears in some of the 'famousest' passages Clarke remembered that he and Keats had read that night.[20] Gittings argues that 'there is no doubt' that Keats's poem 'echoes the beginning of the

[19] Nicholas Roe, *John Keats*: *A New Life* (New Haven and London: Yale University Press, 2012), 108.

[20] Charles and Mary Cowden Clarke, *Recollections of Writers* [1878] (Foutwell, Sussex: Centaur, 1969), 129.

voyage of Ulysses, with its imagery of stars and ocean.'[21] In Chapman's translation of Book Five of *The Odyssey,* Clarke and Keats read that the hero had

> beheld the Pleiades;
> The Bear, surnamed the Wain, that round doth move
> About Orion, and keeps still above
> The billowy ocean.[22]

Constellations appear again in Book Five of *The Iliad*:

> Like rich Autumnus golden lampe, whose brightness men admire,
> Past all the other hosts of starres, when with his chearefull face,
> Fresh washt in loftie Ocean waves, he doth his skies encase.[23]

That night, Clarke and Keats might also have read about 'the martiall planet' that did 'hotly raigne' over the battle for Troy at the end of Book Four of *The Iliad*. It is also possible that Clarke (with the definitive example of the genre before him) had described epic poetry to his protégé, as he had before, in planetary terms. A month before, Keats had written a verse epistle to his mentor in gratitude for his continued guidance. Clarke, in Keats's poetic imagining, becomes a spiritual guide:

> Who found for me the grandeur of the ode,
> Growing, like Atlas, stronger from its load?
> Who let me taste that more than cordial dram,
> The sharp, the rapier-pointed epigram?
> Shew'd me that epic was of all the king,
> Round, vast, and spanning all like Saturn's ring? (*Letters* 1.111)

Being in Clarke's company, a strong reminder of his time at Enfield, had probably brought to mind the other astronomical discoveries he had made at school and the times he had learned about the planets.

> Then felt I like some watcher of the skies
> When a new planet swims into his ken

These two lines of 'Chapman's Homer' are almost always linked to Herschel's discovery of Uranus. Keats learnt about Herschel's momentous achievement as a schoolboy. As Nicholas Roe has shown, Keats received 'lively and memorable'

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[21] Robert Gittings, *John Keats* (London: Heinemann, 1968), 129.

[22] In Gittings, *John Keats*, 129.

[23] In Gittings, *John Keats*, 130.

instruction in astronomy thanks to a 'presiding spirit' at Enfield – John Collett Ryland (1723-1793) – the school's founder.[24] Ryland, like James Lind, Shelley's mentor at Eton, had been friendly with Herschel who had visited the astronomer and looked through his telescopes. Ryland had developed a clever and engaging activity to teach students the workings of the solar system which, there is strong reason to believe, was continued after his death under John Clarke's leadership.[25] It is worthwhile quoting Roe's account of Ryland's methods at length:

> He demonstrated the movements of planets and moons in the solar system by encouraging pupils to create a 'living orrery' (as he termed it) in the school playground. Individual pupils were given a card identifying one of the planets or a moon, and listing some information to be learned. Here are two examples:
>
> Card 18.
> 'I represent the grand Georgium Sidus, discovered by Dr Herschel, March 13, 1781. About 4,000 times as big as the Earth. I move round the Sun in about 83 years, and at the distance of 1,800,000,000 miles. My diameter is 34,000 miles.'
>
> Card 19.
> 'I represent the inner Moon of the Georgium Sidus, whom I have the honour to illuminate.'
>
> With their cards, the pupil-planets and moons took up their stations in an appropriate circle of orbit around the classmate representing 'the greater Sun.' The 'living orrery' was then set in motion which, Ryland explained, gave
>
> each boy a direction to move from west to east; Mercury to move swiftest, and the others in proportion to their distances, and each boy repeating in his turn the contents of his card, concerning his distance, magnitude, period, and hourly motion. Half an hour spent in this play once a week, will, in the compass of a year, fix such clear and sure ideas of the solar system, as they can never forget to the last hour of life; and probably rouse some sparks of genius, which will kindle into a bright and beautiful flame in the manly part of life.[26]

We can see Ryland's prophesized 'sparks of genius' in the stars, moons and planets that burn 'bright and beautiful' in Keats's poetry throughout his career.

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[24] Nicholas Roe, *John Keats and the Culture of Dissent* (Oxford: Oxford University Press, 1997), 30.

[25] Roe argues that 'in John Clarke and his family, in the library and classroom routine of the school itself, Ryland's remarkable presence and achievement lived on;' he quotes W.T. Whitley who wrote that 'all of them in after days kept up the traditions [Ryland] implanted' [quoted in Roe, *Culture of Dissent*, 33].

[26] Roe, *Culture of Dissent*, 36.

3. Of the New Planets

Keats would also have read about Herschel's discovery of a seventh planet in John Bonnycastle's popular treatise *An Introduction to Astronomy*, which ran to eight editions between 1786 and 1822. Keats was awarded the 1807 edition of the book as a prize for scholarship in 1811, the year after he left Enfield, in a gesture that acknowledged his continued relationship with the school.[27] Bonnycastle was a professor at the Royal Military Academy at Woolwich who also wrote introductory texts on arithmetic, algebra and geometry.[28] Bonnycastle's publisher was Joseph Johnson (1738-1809). Johnson was a major player in British literary culture in the period, printing titles as diverse as William Cowper's *The Task* (1785) and Erasmus Darwin's *Zoonomia* (1794). He also published work by William Hazlitt, S.T. Coleridge, Maria Edgeworth, William Wordsworth and Anna Laetitia Barbauld, and he employed William Blake to do over 100 engravings for the imprints of his books.[29] Through Johnson, Bonnycastle came into contact with dissenters such as William Godwin, William Frend (who taught Lady Byron mathematics), and the radical scientist, Joseph Priestley. Bonnycastle, however, was cast in a different mould. Marilyn Gaull describes him as 'an elitist, a gentleman, and an Anglican, one son becoming the first professor of natural philosophy and later mathematics at the University of Virginia, and another son, later Sir Richard Henry Bonnycastle, serving in the Army Corps of Engineers in Canada, both sons publishing at least six books of their own.'[30] Nonetheless, Bonnycastle's friendships extended across political lines. He, along with Priestley and the artist Henry Fuseli, 'made up the small coterie of Johnson's personal friends, three totally divergent personalities and intellects.'[31] Bonnycastle's relationship with Johnson involved him in an extensive 'web' of writers and thinkers, including some of the most famous names in British Romanticism. According to Gaull, despite coming from

[27] For the most current and concise summary of the debate surrounding the date that Keats left school see Roe, *John Keats*, 44.

[28] William Bent, ed., *The Modern London Catalogue of Books with their Sizes*, *Prices*, *and Publishers* (London: William Bent, 1818), 13.

[29] Marilyn Gaull, 'Joseph Johnson: Webmaster,' *Wordsworth Circle* 40.2/3 (2009): 107–110.

[30] Gaull, 'Joseph Johnson', 109.

[31] Gaull, 'Joseph Johnson', 109. See also David O'Shaughnessy, '*Caleb Williams* and the Philomaths: Recalibrating Political Justice for the Nineteenth Century,' Nineteenth-Century *Literature* 66.4 (2012): 423–444, 430.

so many directions, biases [and] interests, the various Johnson circles had an historic impact on language. Whatever their beliefs or practices, they found with Johnson, or created […] a house style for Johnson, a common language shared by art, theology, science, and political discourse, by radical and conservative, political and religious, by mathematicians and classicists. In this first great age of publishing […] Johnson's circle developed a language really spoken and really used, the simple, plain style of English at a crucial time in intellectual history and the dissemination of knowledge.[32]

If Gaull's hypothesis is correct, then Bonnycastle contributed to a literary style that became the dominant mode of writing during Keats's lifetime. Interestingly, it was Keats's rejection of this 'plain style of English' that was 'really spoken and really used' that exposed his poetry to criticism from the literary establishment. Keats's poetic project required a different kind of language. He recognised the difference between the drive to disseminate knowledge and a will to explore the effects of knowledge on human experience. Some of his most famous lines of poetry and prose came from this career-long interest in the divergence between the the impulse to instruct and the impulse to expolore.

There is every reason to believe that Keats appreciated Bonnycastle's book on astronomy. When he received his prize copy, Keats was only just emerging from a reading frenzy that had overtaken him in his last few years at school. Clarke remembered that Keats, recently orphaned, had worked his way through the entire school library. He had even sat up at the dinner table with his nose buried in a book.[33] It is unlikely that in the year after leaving Enfield as a pupil, while still visiting the school and Charles Cowden Clarke frequently, Keats would have laid aside a special gift given to him by the headmaster. In turn, Keats gifted his copy of *An Introduction to Astronomy* to his brother when George emigrated to America in 1818.[34] This further suggests that Keats valued the book and connected Bonnycastle's text with the themes of voyage and discovery that emerge in 'Chapman's Homer.' [35]

An Introduction to Astronomy, and in particular its account of Herschel's discovery of Uranus, is usually connected with Keats's celestial lines in his sonnet.[36] However,

[32] O'Shaughnessy, '*Caleb Williams* and the Philomaths,' 110.

[33] Walter Jackson Bate, *John Keats* (Cambridge, MA: Harvard University Press, 1963), 26, n. 4.

[34] Denise Gigante, *The Keats Brothers*: *The Life of John and George* (Cambridge MA.: Belknap, Harvard University Press, 2011), 337.

[35] Bate, *John Keats*, 17–22.

[36] The connection between Keats's 'new planet' and Uranus has been reinforced over generations of scholarship. See, for example: Anna Henchman, 'The Telescope as Prosthesis,' *Victorian Review* 35.2 (2009): 27–32, 28; Daniel L. Plung, 'Keats's "On First

Roe has argued that while 'Bonnycastle has frequently been cited as the 'source of Keats's reference to "a new planet" in the sonnet […] it seems unlikely that the desiccated prose of *An Introduction to Astronomy* should have quickened the marvellous vision of sidereal motion in Keats's poem.'[37] Bonnycastle's prose may have been somewhat dry compared to Ryland's playground pedagogy, but it was thorough and accurate. He did not romanticise the story of Uranus's discovery by casting Herschel as a solitary genius, alone with his telescope, a new planet miraculously drifting into his lens:

> of all the discoveries in this science, none will be thought more singular than that which has lately been made by Dr. Herschell, who, as he was pursuing a design which he had formed of observing, with telescopes of his own construction, every part of the heavens, discovered, in the neighbourhood of H Geminorum, a star, which, in magnitude and situation, differed considerably from any that he had before observed, or found described in catalogues.
>
> This induced him to consider it with particular attention, and, by continuing his observations, he found that it could not belong to any class of new or temporary stars which had been seen at particular times by preceding astronomers; for by measuring its motion by a micrometer, he found it to move regularly according to the order of the signs; that its apparent diameter was on the increase, and that it declined but little from the ecliptic; which circumstances at first led him to conclude, that it must be some comet belonging to our system, the remote situation of which had hitherto prevented it from being observed.
>
> As a comet, however, it seemed particularly singular, since no tail, or any hairy or nebulous appearance, could be perceived, by which these bodies are commonly distinguished from the rest of the system; on the contrary, it was found to shine with a faint steady light, something paler and more feeble than that of Jupiter, and appeared about four seconds in diameter. […]
>
> A discovery of this nature soon engaged the attention of the most eminent astronomers of Europe, and many observations were accordingly made at different times and places. (354–355)[38]

While Keats must have been inspired by his galactic trips around the schoolyard, it seems to me equally true that he had absorbed Bonnycastle's chapter on new astronomical discoveries and that this, too, found its way into his poem.

For it is not (only) Herschel's discovery of Uranus that makes its way into those two famous astronomical lines in 'Chapman's Homer.' Recent scholarship has shown that,

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Looking into Chapman's Homer,"' *The Explicator* 62.4 (2004): 196–198, 196; Jamey Hecht, 'Scarcity and Poetic Elation in Two Sonnets by John Keats,' *ELH* 61.1 (1994): 103–120, 106; Warren Beach, 'Keats's Realms of Gold,' *PMLA* 49.1 (1934): 246–257, 253.

[37] Roe, *Culture of Dissent*, 37.

[38] My thanks to the Huntington Library of San Marino for answering enquiries about Keats's own copy of the text.

rather than depicting straight-forward moments of primal discovery,[39] there is a 'a pattern of discovery *and rediscovery* embedded in' Keats's sonnet.'[40] Since Tennyson annotated a copy of the poem (he wrote alongside it: 'history requires here Balboa') scholars have interpreted Keats's lines as a mistake.[41] According to these readings, the poet had confused Balboa (the first European to see the Pacific) with Cortez, who came after him. Indeed two recent Keats biographies have made reference to the poet's supposed mistake.[42] However, as early as the 1940s, scholars began to question whether Keats had intentionally substituted Cortez for Balboa.[43] Building on the work of C.V. Wicker,[44] Charles Rzepka argues for the 'deeper intelligence of Keats's decision' to place Cortez, rather than Balboa, within the landscape of his poem. It has long been suggested that Keats read about both Spanish explorers in a passage from William D. Robertson's *History of America* (1777) which was held in the Enfield school library. Keats's only historical error, according to Rzepka, was linking Cortez and the peaks of Darien – and this was the result of Robertson's somewhat misleading prose.[45] But why would Keats choose a lesser explorer for his poem about primal discovery? Why was the Cortez 'mistake' not picked up by any of Keats's contemporaries, including Clarke, who was well versed in American history, and Leigh Hunt who did not hesitate in suggesting multiple editorial changes before he published the sonnet in *The Examiner*? The answer, according to Rzepka, is that Cortez seemed a perfect fit for Keats poem. In this view, 'Chapman's Homer' is not really about a unique or original encounter but about an anxious revisitation.[46] Once 'we stop reading "Cortez" as a mistake,' according to Rzepka, 'we will see that the Darien tableau in

[39] Daniel Pollack-Pelzner, 'Revisionary Company: Keats, Homer, and Dante in the Chapman Sonnet,' *Keats-Shelley Journal* 56 (2007): 39–49, 39.

[40] My own emphasis. Daniel L. Plung, 'Keats's "On First Looking into Chapman's Homer,"' *The Explicator* 62.4 (2004): 196–198, 196.

[41] Frances Turner Palgrave includes Tennyson's annotation [1861] in *The Golden Treasury of Best Songs and Lyrical Poems in the English Language* (New York: Walter J. Black Inc., 1932), 298. Keats's first female biographer Amy Lowell was the first to 'endorse Tennyson's verdict' according to Charles Rzepka. For a comprehensive summary of Balboa/Cortez debate see Rzepka, '"Cortez – or Balboa, or Somebody Like That": Form, Fact, and Forgetting in Keats's "Chapman's Homer" Sonnet.' *Keats-Shelley Journal* 51 (2002): 35–75 and Thomas Frosch, 'Keats's "On First Looking into Chapman's Homer,"' *The Explicator* 62.3 (2004): 146–150.

[42] Andrew Motion, *Keats*, (Chicago: University of Chicago Press, 1997), 112 and Denise Gigante, *The Keats Brothers,* 243.

[43] See C. C. Walcott, 'Keats's "On First Looking into Chapman's Homer,"' *The Explicator* 5.8 (1947): 56.

[44] C.V. Wicker, 'Cortez – Not Balboa,' *College English* 17 (1956): 383–387. Rzepka calls Wicker's essay 'the single most cogent argument against the Tennysonian reading of "Cortez" as historical error' [38].

[45] Rzepka, 'Form, Fact, and Forgetting in Keats's "Chapman's Homer,"' 39.

[46] Rzepka, 'Form, Fact, and Forgetting in Keats's "Chapman's Homer,"' 44.

which Keats has placed his belated conquistador brilliantly underscores the poignant theme, announced in the very title of his sonnet, of the belatedness of the poet's own sublime ambitions.'[47] In Rzepka's reading, Keats casts himself in Cortez's place staring 'eagle-eyed at the Pacific […] a figure of belatedness and ambition charged with the vexing aura of his famous predecessor.'[48] The poet, too, feels the weight of what has come before him Keats is Cortez, Balboa is Chapman.

Rzepka's seminal essay shifted the critical conversation about 'Chapman's Homer' and generated a series of excellent responses from scholars. In his reply essay, Thomas Frosch agrees with Rzepka's point about the poem's sense of belatedness and Keats's 'eagle-eyed' predatory poetic ambition,[49] but takes issue with Rzepka's interest in 'defending Keats from charges of being a bad historian and of not being in intellectual control of his poem.' He argues that:

> instead of taking Cortez as a considered choice, Darien as a result of misreading, and the details of Balboa's discovery as an unconscious addition, we [can] interpret Cortez as an error of a particular kind, a Freudian parapraxis, and the theme of predatory ambition as itself unconscious […] Poets are not diminished when intriguing latent dimensions appear in their poems, rich poems are products of the whole mind, including its unconscious elements. And in this case, an error is the way in which the poet's deep theme enters his poem.[50]

Frosch defines Freudian parapraxis as occurring when 'a manifest intention conflicts with a latent intention.'[51] Keats did not intend to reveal his own anxiety about his poetic antecedents and his own ambitions, but they emerged nonetheless from the richness of his poetic response. Daniel Pollack-Pelzner does not quibble about Keats's intentions with regards to Cortez but he does see the poet's inclusion of the 'eagle-eyed' metaphor differently from both Rzepka and Frosch. Tracing the providence of the avian reference to Dante's *Inferno*, Pollack-Pelzner convincingly argues that Keats's poem is concerned with confluence rather than competition and that the poet felt himself contributing to a poetic project initiated by Homer and then taken up by Chapman.[52] Daniel L. Plung explores a related idea when he suggests that Keats's

[47] Rzepka, 'Form, Fact, and Forgetting in Keats's "Chapman's Homer,"' 39.

[48] Rzepka, 'Form, Fact, and Forgetting in Keats's "Chapman's Homer,"' 75.

[49] Rzepka, 'Form, Fact, and Forgetting in Keats's "Chapman's Homer,"' 75.

[50] Frosch, 'Keats's "On First Looking into Chapman's Homer," 147–148.

[51] Frosch, 'Keats's "On First Looking into Chapman's Homer," 148.

[52] Pollack-Pelzner, 'Revisionary Company,' 39–49.

poem is just as much about collegial or communal discovery as it is about a personalised experience. He argues that the poet's knowing substitution of 'Cortez for Balboa allowed Keats to communicate the intensity of the experience, without limiting himself to an historically accurate account of the sequence of discovery. Moreover, the substitution is critical to the sub-theme of facilitated re-discovery.'[53] For Plung, the lack of historically accurate detail attached to Cortez and the astronomer in Keats's sonnet acts to universalise the experiences that are described in the poem. The latecomer Cortez and the unidentified 'watcher of the skies' allow Keats to explore the exhilaration of a personal (and not necessarily unique) discovery and the capacity for such an experience to inspire others following in the same path:

> Chapman's contribution is not predicated on his having been the first to discover Homer. In the same manner, Keats's generalising about 'some' sky watcher engaged in an apparently familiar activity rather than in a moment of absolute uniqueness invites us to interpret this second discovery also as a step in an individualised, but recurring experience […] Cortez, like Keats and the sky watcher, also comes late to his discovery.'[54]

'An individualised, but recurring experience': perhaps nothing so well describes the act of astronomical observation. Even Herschel (who was the first to observe Uranus or, at least, the first to notice its irregularity against a blanket of common stars) came 'late to his discovery.' Not long after this new planet had been identified, Johann Elert Bode established that Herschel had not been the first to see it. The astronomer John Flamsteed had recorded the planet's position in 1690 as had Tobias Mayer (1723-1762) in 1756.[55] Indeed, anyone with a telescope might have glanced at it, unsuspectingly, since that instrument's invention in the late sixteenth-century century.

Within this context some might argue that Keats's astronomical lines deliberately resist being connected to Herschel's discovery of Uranus. After all, neither astronomer, nor planet, is identified. The explorer Cortez and the conquered lands of Darien, on the other hand, are made explicit. Perhaps, as Wicker has suggested, the astronomer in 'Chapman's Homer' is actually Keats looking out of the school telescope at Enfield. Perhaps the 'new planet' is Mars or Venus or Jupiter observed by any schoolboy for the first time. Perhaps Keats is not talking about a man and a telescope at all, but a

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[53] Plung, 'Keats's "On First Looking into Chapman's Homer,"' 196.

[54] Plung, 'Keats's "On First Looking into Chapman's Homer,"' 197.

[55] Hoskin, 'Newton and Newtonianism,' 163.

woman walking home at night stopping to gaze at the stars and noticing the bright form of a planet. Of course, Keats's lines invoke these interpretations, and many more, all at once. There is no identity given to the astronomer and so no one image of the sky-watcher can be proposed or refuted absolutely. But it does not follow that these lines are not informed by Bonnycastle's account of Herschel's discovery. In fact, the ambiguity of Keats's description points to the poet's familiarity with that text.

Bonnycastle's contribution to understanding 'Chapman's Homer' is more important than has been previously thought. *An Introduction to Astronomy* does not simply provide the source for Keats's information about Uranus (which, after all, Keats first became aware of at school). Looking to Bonnycastle in this context casts doubt upon a foundational assumption readers have been making about the poem for generations. Because Uranus was the first planet to be discovered in recorded history, scholars have, understandably, taken Keats's reference to a 'new planet' as a given. But a closer look at Bonnycastle suggests an alternative reading.

Bonnycastle's description of the Uranus event emphasises the repeatability of Herschel's experience. After his groundbreaking discovery, many more moments of re-discovery needed to take place in order to authenticate Herschel's claim: 'many observations were accordingly made at different times and places' (355) – the planet needed to be seen and seen again in order to be validated. Because *An Introduction to Astronomy* outlined the complicated process – the repeated observations, the manipulation of technology, and the collegial consultation – that led to the official 'discovery' of Herschel's new planet, it seems likely that Keats was inspired by Bonnycastle's narrative. It is the act of rediscovery, rather than discovery, that is privileged by Keats in his poem. Though scholars have been quick to assign Keats's astronomical lines to Bonnycastle's account of Herschel's achievement, there has been a curious inattention to the chapter from which it comes. Given the 1807 publication date for Keats's edition of the text, it comes as a surprise to see that the chapter in question is titled 'Of the New *Planets*, and Other Discoveries' (349).[56] Bonnycastle explains that the Uranus event had triggered a flurry of activity from Herschel's fellow observers:

[56] Own emphasis.

> Such, indeed, has been the diligence of astronomers […] that since the publication of the last edition of the present work, another new planet, of a small magnitude, has been discovered by M. Piazzi of Palermo, between Mars and Jupiter, of which the principal elements have already been calculated with considerable precision by M. Burckhardt and others: and even the discovery of a third, in the same space between Mars and Jupiter, has been lately announced by Dr. Olbers, of Bremen, but of this the particulars are not yet sufficiently known, to enable us to determine with certainty to what class of bodies it belongs. (357)

Ceres and Pallas, the two planetary bodies referred to in this passage, were eventually identified as asteroids. By the time Keats wrote 'Chapman's Homer,' a new edition of *An Introduction to Astronomy* had been released. The chapter dealing with Herschel had been retitled to reflect these developments. It became: 'Of the New Planet and Other Discoveries.' Given Keats's reading of journals dedicated to both literature and science at this time, we can assume that he knew about the downgraded status of Ceres and Pallas. Nonetheless, Bonnycastle's text of 1807, the text Keats would have read alongside the account of the (repeated) discovery of Uranus, marked Herschel's experience as an impetus for 'many new discoveries in the celestial regions, by which our knowledge of the heavenly bodies, and of the immutable laws which govern the universe, will become more extended' (357). It took Herschel's observation of a new planet in the solar system for astronomers to begin looking more deeply into the workings of the universe.

Herschel may not be Keats's 'watcher of the skies' but he, like Balboa, stands in the background of the poem. And Herschel and Balboa, like Chapman (and indeed like Homer), far from casting a menacing shadow over the path of new discovery, act as figures of potentiality. Their achievement lies not in being the 'first' but in paving the way for those who will come after them – those who will repeat their story, and secure their fame. All new discoveries are dependent on being 'seen and seen again in order to be validated.' For what is a new land that is never sighted again? What is a new planet without astronomers to observe it, to begin a search of their own? What is a poem without readers, a reader to translate it, a reader to be struck with inspired awe by that translation?

Chapter Two

'Luminous Apparitions': Herschel Beyond the Solar System

1. Globes

Friedrich Wilhelm Herschel was born in Hanover on 15 November 1738. He adopted the anglicised William from the time he arrived in England in 1757 and the change was officially recorded as part of his naturalisation in 1793.[1] The story of Friedrich Wilhelm becoming William Herschel KH LL.D. F.R.S is surely one of the most fascinating transformations found in scientific biography.[2]

Herschel was the child of Isaac Herschel, a military bandsman, and Anna Moritzen, the illiterate daughter of a Hanovarian baker.[3] Six of the Herschels' children survived to adulthood. Sophia Elisabeth, the eldest, was born in 1733. She was followed by Heinrich Anton Jacob, Friedrich Wilhelm, Johann Alexander, Caroline Lucretia and Johann Dietrich, who was born in 1755.[4] Isaac Herschel eagerly encouraged the advancement of his children.[5] He supplemented the basic instruction they received at the Garrison school by teaching his sons everything he knew about the art and science of music.[6] It soon became clear that William was gifted both musically and academically. At school, the children were taught general knowledge as well as mathematics[7] and (in the words of Caroline Herschel) 'as much Latin as boys in

[1] Angus Armitage, *William Herschel* (London: Thomas Nelson and Sons Ltd., 1962), 18.

[2] But not, in actual fact, the transformation into Sir William Herschel. A recently published article outlines the series of blunders and well intentioned cover ups that led to William Herschel, his wife and sister, and historians for centuries, believing that the astronomer had claim to the honorific 'Sir.' The story goes that a court official addressed Herschel as 'Sir' in a letter written a few days after the latter was appointed 'knight of the Royal Guelphic Order' by the Prince Regent in 1816. Herschel adopted the appellation. Andrew Hanham and Michael Hoskin point out in their fascinating essay 'The Herschel Knighthoods: Facts and Fiction' [*Journal for the History of Astronomy*, 44 (2013): 149–164] that 'no-one thereafter had the heart to tell the venerable old man, the most famous astronomer in Europe, that in reality he was simply "Dr William Herschel, K.H" and his wife still "Mrs Herschel"' [156]. Later on, this caused problems for John Herschel, who wanted to keep the truth from his mother and aunt, when he was accepted into the Order 1831. Ingeniously, John negotiated a 'real' knighthood for himself to be awarded at the same time so that he could tell a half-truth to his aunt: he was 'Sir John' after receiving the same honour as his father.

[3] Michael Hoskin, *Discoverers of the Universe*: *William and Caroline Herschel* [1979] (Princeton: Princeton University Press, 2011), 6.

[4] Constance A. Lubbock, *The Herschel Chronicle* (Cambridge: Cambridge University Press, 1933), 3.

[5] Hoskin, *Discoverers of the Universe*, 6.

[6] J. B. Sidgwick, *William Herschel*: *Explorer of the Heavens* (London: Faber and Faber, 1953), 19.

[7] Michael Hoskin, 'Caroline Herschel: Assistant Astronomer or Astronomical Assistant,' *History of Science* 40 (2002): 425–444, 426. Caroline also attended the Garrison school but girls were not taught mathematics. Later, Caroline would learn the basics from her brother.

general carry away from preparatory schools.'[8] William's younger sister Caroline recalled that one day, their teacher Mr Antonius had been happy to inform her father that his son 'knew not *all* but *more* than he could teach him.'[9] Around this time, Isaac Herschel engaged extra tuition in French for his eldest sons. William soon outstripped his brother Jacob. Caroline remembered that 'William was master' of the new language 'in less than half the time the elder wanted; but he continued to attend the lessons till his brother was also perfect in order to benefit by the learning of their language-master.' [10] The boys' tutor, according to William, 'did not confine his instructions to language only, but encouraged the taste he found in his pupil for the study of philosophy, especially Logic, Ethics and Metaphysics, which were his own favourite pursuits.'[11] While Jacob 'esteemed music as the only science worth cultivating,' William's mind, according to Caroline, had always been receptive to different kinds of knowledge.[12]

As well as providing as much formal education for his children as he could afford, Isaac also engaged his sons in rigorous debate. Caroline recalled that William:

> and his Father were often arguing with such warmth that my Mother's interference became necessary, when the names of Leibnitz, Newton and Euler sounded rather too loud for the repose of her little ones, who ought to be in school by seven in the morning. But it seems that on the brothers retiring to their room, where they shared the same bed, my brother William had still a great deal to say; and frequently it happened that when he stopped for an assent or reply he found that his hearer had gone to sleep.[13]

If Isaac Herschel's success is to be measured by the achievements of his direct descendants, he was an incredibly effective educator of children.[14] Michael Hoskin, the Herschels' most prolific biographer, has noted the family produced an impressive list of accomplishments despite their humble beginnings:

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[8] Caroline Herschel quoted in Lubbock, *Herschel Chronicle*, 4.

[9] Caroline Herschel quoted in Lubbock, *Herschel Chronicle*, 4.

[10] Caroline Herschel quoted in Lubbock, *Herschel Chronicle*, 4.

[11] Caroline Herschel quoted in Lubbock, *Herschel Chronicle*, 7.

[12] Caroline Herschel quoted in Lubbock, *Herschel Chronicle*, 4.

[13] Caroline Herschel quoted in Lubbock, *Herschel Chronicle*, 5.

[14] Hoskin, *Discoverers of the Universe*, 7.

Jacob, Alexander, and Dietrich would be members of the elector's court orchestra in Hanover; Sophia's five sons would form the core of Queen Charlotte's band at Windsor Castle; while William, and later Caroline, would become salaried astronomers to the Court at Windsor. And William's son John would be awarded the hereditary title of baronet by Queen Victoria for his services to astronomy, and when he died he would be buried in Westminster Abbey, next to Newton.[15]

William Herschel had initiated discussions about Newton from his shared childhood bed in Hanover. He could never have dreamed that his own son would one day share the great Englishman's hallowed resting place.

William, like his brothers, began his professional career as a musician. He could play the oboe, the violin and the organ. He could also sing.[16] Like his father, he had been an oboist in the Foot Guards while the Hanovarian army had been engaged in the Seven Years War (1756-1763).[17] After the army was defeated by invading French forces at the Battle of Hastenback in 1757, Isaac became worried about the future prospects, not to mention the safety, of his two oldest sons.[18] In the confusion surrounding the retreat of the Hanovarian forces, and with his father's help, Herschel abandoned military service and, with his brother Jacob, fled to England.[19]

Jacob and William found some work teaching and performing music in London but regular engagements were difficult to secure. This was especially true for Jacob, who would only perform if he were to be showcased on stage. William, by contrast, would take any work that he could to keep the brothers afloat.[20] Two years after they had arrived in London, and after French forces had begun to withdraw from Hanover, Jacob returned home. William, on the other hand, did not have an official discharge, and who feared he would be made to return to the poor wages and difficult circumstances of military service, decided to remain in England. He resolved to leave London in search of work as a travelling musician for hire however, which left him, for a few years, 'nearly constantly *alone*' and facing the 'anxiety' that came with living a 'vagrant life.'[21] His 'rambling about' resulted in more work but it also exposed him to

[15] Hoskin, *Discoverers of the Universe*, 7.

[16] Michael Hoskin, 'Vocations in Conflict: William Herschel in Bath, 1766-1782,' *History of Science* 41 (2003): 315–333, 315.

[17] Hoskin, *Discoverers of the Universe*, 6.

[18] Hoskin, *Discoverers of the Universe*, 6.

[19] On Herschel's swift exit from the military see Michael Hoskin, 'Was William Herschel a Deserter?' *Journal for the History of Astronomy* 35 (2004): 356–358.

[20] Hoskin, *William Herschel's Cosmology*, 2012, 7.

[21] William Herschel, c. January 1761; 4 February 1761, quoted in Lubbock, *Herschel Chronicle*, 17, 18.

profound feelings of despondency and isolation. The letters Herschel wrote to Jacob at this time reveal a temperament that might easily be termed Romantic: 'I do daily meet with vexations and trouble and live only by hope. Many a restless night have I had; many a sigh and, I will not be ashamed to say it, many a tear, would Disappointments and Sensibility steal from me.'[22] He also reveals an awareness of the kinds of literary atmospherics that were becoming fashionable throughout Europe at the time:

If I found any pleasure in showing myself in a situation calling for pity, I would dilate on my experiences of the past night. However […] I will only say that at 9 o'clock, when I had still about 20 miles to ride, I was caught in an unusually heavy thunderstorm, which continued, accompanied by torrents of rain, with unbroken fury for three hours, and threatened me with sudden death. The distance from an inhabitation, the darkness and loneliness, obliged me nevertheless to ride on. I pursued my way therefore with unshaken sangfroid although I was often obliged to shut my eyes on account of the blinding lightening.

At last the flashes all around me were so terrifying that my horse refused to go on; luckily at this moment I found myself near a house, into which, after much knocking, I was admitted.[23]

It is interesting to chart the similarities between Herschel's description of his brush with 'sudden death' to a passage from Anna Laetitia Aikin (later Barbauld) and John Aikin's (1747-1822) early gothic fragment 'Sir Bertrand' (1773):

Sir Bertrand turned his steed towards the woulds, hoping to cross these dreary moors before the curfew. But ere he had proceeded half his journey, he was bewildered by the different tracks […] night overtook him in this situation […] Hope and native courage a while urged him to push forwards, but at length the increasing darkness and fatigue of body and mind overcame him; he dreaded moving from the ground he stood on, for fear of unknown pits and bogs, and alighting from his horse in despair, he threw himself on the ground. He has not long continued in that posture when the sullen toll of a distant bell struck his ears.[24]

Or to a vignette from Ann Radcliffe's (1764-1823) *The Romance of the Forest* (1791):

They continued thus to travel, till a storm of rain, accompanied by thunder and lightning, drove them to a covert of a thick grove. The man believed this a safe situation, and Adeline was now too careless of life to attempt convincing him of his error. The storm was violent and long, but as soon as it abated, they set off on a full gallop, and having continued to travel for about two hours, they came to the borders of

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[22] Herschel, 'Letters of William Herschel to Jacob Herschel,' quoted in Lubbock, *Herschel Chronicle*, 4 February 1761, 18.

[23] Herschel, 'Letters,' quoted in Lubbock, *Herschel Chronicle*, 10 July 1761, 21–22.

[24] From John and Anna Laetitia Aikin, *Miscellaneous Pieces in Prose* (London: Joseph Johnson, 1773), 127–128.

the forest, and soon after, to a high lonely wall, which Adeline could just distinguish by the moon-light, which now streamed through the parting clouds.[25]

Perhaps the similarities between the three passages should not be surprising. After all, Herschel was German and the lineage of the British Gothic traced back to the writers, such as Schiller and Goethe, of his home.

Outside London, Herschel's reputation as a professional continued to grow and, eventually, he was invited to fill the prestigious position of organist at the newly constructed Octagon Chapel in Bath.[26] This was a coup for the immigrant. Here Herschel pursued his career tirelessly, carving out a successful performance record and securing a wealthy clientele as a teacher.[27] Like Blake, Shelley, and Byron, he was inspired by the charismatic and rebellious villain of Milton's *Paradise Lost* and he wrote a song to accompany Milton's poetry called 'the success of Satan against Man.'[28] He also wrote a concerto for the oboe.

Herschel's first recorded astronomical observations appear in his journal entries of February 1766 – the year he had moved to Bath. Here, Herschel noted that he had observed Venus and an eclipse of the moon.[29] But there are earlier signs of his interest in the heavens. Caroline Herschel later recalled her father's interest in astronomy. Isaac Herschel had gathered his family around a container of water, using the reflection that appeared there, to safely explain an eclipse of the sun.[30] Caroline remembered that her father had been 'a great admirer of astronomy' and had some knowledge of that science:

for I remember his taking me on a clear frosty night into the street, to make me acquainted with several of the beautiful constellations, after we had been gazing at a comet which was then visible. And I well remember with what delight he used to assist my brother William in his philosophical studies, among which was a neatly turned globe, upon which the equator and the ecliptic were engraved by my brother.[31]

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[25] Ann Radcliffe, *The Romance of the Forest*, vol. 2, (London: T. Hookham and J. Carpenter, 1791), 116.

[26] Hoskin, *Discoverers of the Universe*, 20.

[27] Herschel, 'Vocations in Conflict,' 316–321.

[28] Lubbock, *Herschel Chronicle*, 36.

[29] Hoskin, *Discoverers of the Universe*, 18.

[30] Michael Hoskin,'Caroline Herschel: Assistant Astronomer or Astronomical Assistant,' *History of Science* 40 (2002): 425–444, 428.

[31] Caroline Herschel, quoted in Lubbock, *Herschel Chronicle*, 5.

Herschel had been so fond of the celestial globe, that upon his departure for England, he had sent a message to his mother requesting she forward it, along with other personal possessions, to his new home. Unfortunately, the globe never made it to England and it became a toy for Caroline and Dietrich.[32]

Eventually, Herschel's finances were healthy enough for him to be able to do something for his family.[33] William helped his brothers, Jacob, Dietrich and Alexander, who all came to Bath at various times and benefited from their brother's musical connections.[34] William's eldest sister, Sophia, had been early married but there existed an axiom in the Herschel family that Caroline, the youngest daughter, was neither pretty, interesting, or rich enough to secure a husband – at least not in her youth. Anna Herschel prevented Caroline from learning music like her brothers and she disallowed lessons in French. Caroline was unable to acquire the skills needed to become a governess.[35] If the matter had been left to Anna and Jacob (who enjoyed having a sister to make his clothes and keep his house for him) Caroline might have languished, Cinderella-style, in Hanvover.[36] William and Alexander, however, thought of Caroline fondly and, in 1772, after a visit to the Continent, William brought his sister home with him.[37] This might not have been quite the escape Caroline had hoped for – she had been brought to Bath to be trained as a vocalist but also 'to keep house.'[38] Eventually, as William became more and more distracted by his own commitments, Caroline's training dwindled and with it her hopes of attaining an independent living.[39] Her brief success as a concert singer, however, had shown Caroline that her confidence in her own abilities had not been in vain. She was talented and capable and rather than proving to be the 'burden' to her brother that she feared she would become,[40] she would instead be indispensable to his success. As William's musical assistant she was knowledgeable and useful; but as he became increasingly seduced by the instruments

[32] Hoskin, *Discoverers of the Universe*, 2011, 10.

[33] Lubbock, *Herschel Chronicle*, 43–44.

[34] Lubbock, *Herschel Chronicle*, 44–45.

[35] Hoskin, 'Caroline Herschel,' 263.

[36] James Sime, *William Herschel and His Work*, ed. Oliphant Smeaton (Edinburgh: T. & T. Clark, 1900), 5.

[37] Armitage, *William Herschel*, 21.

[38] Armitage, *William Herschel*, 21.

[39] Armitage, *William Herschel*, 21.

[40] Caroline Herschel, quoted in Lubbock, *Herschel Chronicle*, 45.

of celestial observation and away from those of music, Caroline developed into a meticulous, patient and tenacious ally.[41]

2. Barriers to the Heavens

The following tribute to William Herschel appears engraved upon a marble tablet at St Laurence's Church (Upton Church), Slough – the place where Herschel worshipped, was married, and finally buried on the 7th of September 1822, a little more than a year after John Keats's death:

William Herschel, Knight of the Guelphic Order.
Born at Hanover he chose England for his country.
Amongst the most distinguished astronomers of his age
He was deservedly reckoned.
For should his lesser discoveries be passed over
He was the first to discover a planet outside the
orbit of Saturn.
Aided by new contrivances which he had himself both
Invented and constructed he broke through the
barriers of the heavens
And piercing and searching out the remoter depths of space
He had laid open to the eyes and intelligence of astronomers
The vast gyrations of double stars.
To the skill
With which he separated the rays of the sun by prismatic
analysis into heat and light
And to the industry
With which he investigated the nature and the position of nebulae and
of the luminous apparitions beyond the limit of our system, ever with
innate modesty tempering his bolder conjectures, his contemporaries
bear willing witness.
Many things which he taught may yet be acknowledged by
posterity to be true, should astronomy be indebted for support to men
of genius in future ages.
A useful blameless and amiable life distinguished not less for the
successful issue of his labours than for virtue and true goodness was
closed by a death lamented alike by this kindred and by all good men in
the fullness of years on the 25th day of August, the year of our Salvation
1822, and the 84th of his own age. [42]

[41] Hoskin, 'Caroline Herschel,' 433.

[42] Lubbock, *Herschel Chronicle*, 380. I have used Lubbock's translation here.

The epitaph, in Latin, can still be seen at the Church in Slough.[43] The words were formally arranged by Rev. Dr. Joseph Goodall, a distinguished classics scholarand provost at Eton.[44] But it was Herschel's son, John, who provided the basis of the commemoration.[45] By the time of his father's death, John Herschel was, in his own right, one of Europe's most prominent scientists and public figures. He was born in 1792, about four years after William had married his friend, the newly widowed and wealthy Mary Pitt.[46] The Herschels' only child had been born into very different circumstances from his father. William had arrived in Britain a penniless unknown while John 'possessed a surname that had become legendary in scientific circles.'[47] In contrast to his father's piecemeal schooling, 'John had all the advantages of the best formal education including a degree from Cambridge' and William had 'also passed on sufficient wealth for John to be of independent means, free to pursue whatever interested him.'[48] John might have chosen any path but Herschel senior had eagerly promoted his son's interest in the family trade, and John Herschel eventually became 'the most prominent independent astronomer in Britain in the first half of the nineteenth century.'[49]

John appears to have been aware of his debt to the life afforded to him by his father's transformative genius and industry. John's own life was spent in the service of the national interests of his father's adopted home. He, alongside fellow scientific enthusiasts at Cambridge, Charles Babbage and George Peacock, established the Analytical Society which was largely responsible for introducing sophisticated French mathematics into the Cambridge curriculum.[50] Between 1834 and 1838, he endured a difficult posting at the Cape of Good Hope in South Africa, where he mapped the southern hemisphere's skyscape, but also witnessed frontier wars and the disillusioning

[43] The parish website proudly advertises its connection to Herschel: http://www.saint-laurence.com. According to this site the tablet was moved in 1850 from its original position at the north side of the Church arch to the north wall of the tower adjacent to the Herschel family vault.

[44] 'Obituary of Rev. Dr. Goodall, Provost of Eton,' in *The Gentleman's Magazine*, ed. Sylvanus Urban (London: William Pickering, January to June 1840), 545.

[45] C. Pritchard, 'The Herschel Tablet at Upton,' *The Observatory* 4 (1880): 297–298. Also see Lubbock, *Herschel Chronicle*, 363.

[46] Lubbock, *Herschel Chronicle*, 175.

[47] Michael Hoskin, 'John Herschel's Cosmology,' *Journal for the History of Astronomy* 18 (1987): 1–34, 1.

[48] Hoskin, 'John Herschel's Cosmology,' 1.

[49] Elizabeth Green Musselman, 'Swords into Ploughshares: John Herschel's Progressive View of Astronomical and Imperial Governance,' *The British Journal for the History of Science* 31.4 (1998): 419–435, 420.

[50] M. V. Wilkes, 'Herschel, Peacock, Babbage and the Development of the Cambridge Curriculum,' *Notes and Records of the Royal Society of London* 44.2 (1990): 205–219.

social and economic reality caused by slavery's lingering effects.[51] His observations from this time won John far-reaching acclaim and entry to the peerage.[52]

William Herschel is often called the father of stellar astronomy,[53] but as John B. Irwin points out,[54] he was also the father of John Herschel, the professional figure who was one of the most important Victorian commentators on science and who stood at the forefront of astronomy in Britain in the years after William's death.[55] In simple terms, the father was responsible for introducing a series of provocative hypotheses about the behaviour, scale and movement of the universe that had never before entered into the realm of empirical science. The son (and his contemporaries) were responsible for assessing and organising this observational data for a new, and increasingly professional, generation of scientific men (and some women) in order to enable verification, refutation or development. In these terms, it is tempting to figure William as the Romantic visionary and John as the Victorian analyst. This is much too neat, but there is no denying the fact that William's work existed in a kind of 'negative' space – a space of his own creation that allowed for wild conjecture, speculation and experiment and where anything, and everything, it seemed, was possible. John and his contemporaries, on the other hand, were engaged in the more limited business of confirmation and conferral. By 'piercing and searching out the remoter depths of space' Herchel had 'laid open to the eyes and intelligence of astronomers' an infinite universe of stellar objects. It was up to the next generation to come to terms with this sublime contribution.

Written in 1821, John Herschel's official tribute to the public figure of William Herschel presents a useful guide to the most important achievements of the older astronomer's life and the way these accomplishments were perceived at the time of his death. Herschel's one-time recreational interest in astronomy had eventually developed into an obsessive passion that turned him into one of the most influential astronomers

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[51] Wilkes, 'Herschel, Peacock, Babbage,' 435.

[52] Agnes M. Clerke, *The Herschels and Modern Astronomy* (London: Cassell and Co., 1901), 187.

[53] But see Simon Schaffer's critique of this argument in 'Herschel in Bedlam: Natural History and Stellar Astronomy,' *History of Science* 13.3 (1980): 211–239. Here Schaffer proposes that historians have been too willing to assign a 'spurious unity' to Herschel's work and that it is important to acknowledge the 'inherent contradictions' of his cosmology (212). While this is certainly true, Schaffer's resulting contention, that Herschel cannot be linked to the birth of stellar astronomy because he proffered a 'natural history' of the heavens that resisted evolution, is unconvincing.

[54] 'Review of *Herschel at the Cape*: *Diaries and Correspondence of Sir John Herschel*, *1834-1838*, by David S. Evans, et al.,' *Science* 165.3896 (1969): 884–885, p. 884.

[55] David B. Wilson, 'Herschel and Whewell's Version of Newtonianism,' *Journal for the History of Ideas* 35.1 (1974): 79–97, 79.

in history. When Herschel was awarded the Copely medal in 1781 for being 'the first to discover a planet outside the orbit of Saturn' no one could have expected that this achievement would occupy only two out of the 29 lines written in tribute to him at the end of his life. The addition of a new planet to the solar system created a paradigm shift within the field of astronomy that launched a wave of experimentation and exploration for scientists in the Romantic era. William Herschel remained at the vanguard of discovery. The Uranus event had won him royal patronage but in terms of the scientific advances the former musician would go on to make with his famous telescopes, the discovery of a new planet was only the beginning.[56]

Herschel's remarkable telescopes, those 'new contrivances which he had himself both/ Invented and constructed' were responsible for all of his discoveries about 'the remoter depths of space.' These included the 'vast gyrations of double stars' (those twin objects invisible to the telescopes of his predecessors); 'the nature and the position of the nebulae' that existed 'beyond the limit of our system' (those 'luminous apparitions' of dust and gas that are the stuff of galaxies); and his discovery of infrared radiation through his 'prismatic/ analysis' of 'the rays of the sun.' The 'lesser discoveries' that were 'passed over' in his epitaph include his locating two moons of Uranus (named Titania and Oberon by John years later) and two of Saturn; the movement of the solar system through space; the general shape of the Milky Way and the first attempt to chart the links between solar activity and the earth's climate.

Importantly, there is no mention of Herschel's 25 years as a professional musician in his epitaph. The achievements of his life are instead summarised in purely astronomical terms. Yet the artistry of Herschel's science, the sublime reach of his telescopes, and the poetic scale of his imagination are memorialised. 'Caelorum Perrupit Claustra' the tablet reads: 'he broke through the barriers of the Heavens.'

3. Telescopes

Galileo Galilei (1564-1642), despite popular perception, was 'neither the first to build a telescope, nor the first to turn it to the heavens.'[57] As recent scholarship has noted,

[56] Simon Schaffer, 'Uranus and the Establishment of Herschel's Astronomy,' *Journal for the History of Astronomy* 12 (1981), 11–26.

[57] Richard Dunn, *The Telescope: A Short History* (Greenwich: National Maritime Museum, 2009), 22. NASA's website still announces that Galileo was the first to turn the telescope towards the stars above, but see the following for a long established argument against this idea: Antoni Malet, 'Early Conceptualizations of the Telescope as an Optical Instrument,' *Early Science and*

the first designer of the instrument may never be known.[58] While the exact circumstances of the birth remain unclear, the historian Van Helden recognises two key events in the telescope's naissance: Hans Lipperhey's application for a manufacturing patent at The Hague in 1608, and the publication of Galileo's *Sidereus Nuncius* (*Starry Messenger*) in 1610.[59] Galileo's treatise emblematises a watershed moment in the history of science:

> Put simply, Galileo claimed to have discovered that the Moon was not a smooth sphere but had mountains and valleys; that the Milky Way was made of individual stars;[60] that there were more stars in the heavens than the unaided eye could see; and that Jupiter had four moons circling around it. These were radical claims that flew in the face of the established doctrine that the Moon and planets were perfect and unchanging, and held in spheres revolving around the Earth.[61]

At first, Galileo was conservative in his support for the Copernican cosmology, but by the publication of his *Dialogues on the Two Great World Systems* in 1632, Galileo had the observational evidence needed to make his case. While the Catholic Church's draconian response to the new world system is legendary, its reaction only served to galvanise the opponents of religious controls on scientific debate and discovery, especially in Protestant countries like Britain. Galileo had used the telescope to legitimise and promote Copernicus's view of the solar system with its stationary, all-commanding sun.[62] By the time the Church reacted, it was too late. What had been seen through the telescope could not be unseen and Galileo's starry message spread across Europe.

John Milton was born two years before Galileo published his *Starry Messenger*.[63] As a result, Milton, like Keats, grew up during a period of rapid advancement within astronomical science that entailed a major shift in humanity's access to the celestial

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Medicine 10.2 (2005): 237–262; Albert Van Helden, 'The Invention of the Telescope,' *Transactions of the American Philosophical Society* 67.4 (1977): 1–67 and Edward Rosen, 'Galileo and the Telescope,' *The Scientific Monthly* 72.3 (1951): 180–182, 180.

[58] Despite the fact that 'polar sighting tubes' (cylinders without lenses) had been used to aid vision in antiquity and convex lenses for eyeglasses had been invented in the late thirteenth century (Van Helden, 'Invention of the Telescope,' 9–10).

[59] Van Helden, 'Invention of the Telescope,' 20.

[60] William Herschel would go on to investigate the validity of this particular claim in his studies of nebulosity. For detailed discussion see 'Chapter Four: Nebulosity and Negative Capability in *Endymion*,' section 2: 'Nebulous.'

[61] Dunn, *Telescope*: *A Short History*, 26.

[62] Michael Hoskin, 'From Geometry to Physics: Astronomy Transformed,' in *The Cambridge Concise History of Astronomy*, edited by Michael Hoskin (Cambridge: Cambridge University Press, 1999) 94–129, 111.

[63] He died in 1647.

regions. The similarities between Galileo and Herschel and Milton and Keats in this regard, as I will continue to maintain in the following chapters, are substantial. While Milton lived during the unseating of our planet as the centre of the universe, Keats lived through an empirical redefinition of what the universe, as a concept, might actually be. It is difficult to say which revolution was the more unsettling to intuitive understandings of the relation between heaven and earth.[64] In any case, both astronomical revolutions produced poetry that was attuned to an'undecided' world system, or a cosmology that was changing and in flux. Milton's use of new astronomical imagery to illustrate his revolutionary principles[65] speaks to Percy Shelley's post-Herschelian political, scientific and poetic project.[66] However, Milton was also interested, like Keats, in exploring the adverse effects heavenly knowledge might have on the individual and collective imagination. Milton was, for example, attuned to the dark recesses of the telescope's metaphorical potential. In *Paradise Regain'd* (1671), he suggests that the telescope may have been delivered from Hell.

The Gospel of Matthew describes Satan's final temptation of Jesus after he has fasted for forty days and nights in the wilderness: 'the devil taketh him up into an exceeding high mountain, and sheweth him all the kingdoms of the world, and the glory of them; And saith unto him, All these things will I give thee, if thou wilt fall down and worship me.'[67] The means by which Satan shows Jesus all these mighty cities is left unexplained in all three gospels that include the story.[68] But in Milton's imagining, Satan's mysterious and deadly magic might actually be the result of telescopic magnification:

> He brought our Saviour to the western side
> Of that high mountain, whence he might behold
> Another plain, long but in bredth not wide;
> Wash'd by the Southern Sea, and on the North

[64] See Marjorie Nicolson, 'The Telescope and Imagination,' *Modern Philology* 32.3 (1935): 233–260. Galileo's observation of four moons of Jupiter did not equate to the same kind of upheaval to the universe as Herschel's observation of multiple galaxies.

[65] Patrick Brantinger, 'To See New Worlds: Curiosity in *Paradise Lost*,' *Modern Language Quarterly*. 33 (1972): 355–369; Grant McColley, 'Milton's Dialogue on Astronomy: The Principal Immediate Sources,' *PMLA* 52.3 (1937): 728–762; Arthur O. Lovejoy, 'Milton's Dialogue on Astronomy,' in *Reason and the Imagination*: *Studies in the History of Ideas*, *1600-1800*, ed. Joseph Mazzeo (New York: Columbia University Press, 1962), 129–142; Anthony Low, 'The Astronomy of Paradise Lost,' *English Language Notes* 8 (1971): 263–267; Malabika Sarkar, '"The Visible Diurnal Sphere": Astronomical Images of Space and Time in *Paradise Lost*,' *Milton Quarterly* 18.1 (1987): 46–51.

[66] See discussion and references in 'Prologue,' 'section 1: A Globe of Dew.'

[67] *The King James Bible*, Matthew 4.3-5.

[68] The story appears in the Gospels of Matthew, Luke and Mark but not in the Gospel of John.

To equal length back'd with a ridge of hills
That screen'd the fruits of the earth and seats of men
From cold *Septentrion* blasts, thence in the midst
Divided by a river, of whose banks
On each side an Imperial City stood,
With Towers and Temples proudly elevate
On seven small Hills, with Palaces adorn'd,
Porches and Theatres, Baths, Aqueducts,
Statues and Trophees, and Triumphal Arcs,
Gardens and Groves presented to his eyes,
Above the highth of Mountains interpos'd.
By what strange Parallax or Optic skill
Of vision multiplyed through air, or glass
Of Telescope, were curious to enquire.[69]

Had the Archfiend possessed the 'Telescope,' Milton asks, thousands of years before man? Satan might have used his 'Aerie Microscope'[70] to tempt Jesus with a glorious empire that, through an optical illusion, appeared just within reach. Was the natural philosopher, the astronomer, now looking through the Devil's own instrument and being seduced by the grand visions that had crystallised before him?

Milton appears to have set a pejorative tone for some of the literary treatments of the telescope that were to follow. After the emergence of the telescope into the western cultural consciousness, the invention frequently figured in British literary depictions and cartoons as either a dangerous instrument associated with hubris and sensory deception (as is explicitly the case with Milton), or as the ridiculous toy of the overreaching gentleman. Either way, the telescope seemed to evoke a surprisingly unfriendly response.[71]

In the stage-play, *The Emperor of the Moon* (1687), by Aphra Behn (1640-1689), for example, the telescope is described in devilish terms again. Here, though, Behn's tongue is firmly planted in her cheek. Mopsa, the family servant, warns of his master's dabbling in the dark arts: 'Run, run, Scaramouch; my master's conjuring for you like mad below: he calls up all his little devils with horrid names, his microscope, his

[69] John Milton, *The Major Works*: *Including Paradise Lost*, ed. Stephen Orgel and Jonathan Goldberg (Oxford: Oxford University Press, 2008), 5.25–42.

[70] Milton, *The Major Works*, 4.57. The microscope, also invented in the seventeenth-century, 'was a natural outgrowth of the telescope' according to Albert Van Helden ['The Invention of the Telescope,' *Transactions of the American Philosophical Society* 67.4 (1977): 1–67, 5].

[71] But compare the 'inflated praise' of the Italian Lorenzo Salvi's 1615 poem to the Telescope [quoted in Antoni Malet, 'Early Conceptualizations of the Telescope as an Optical Instrument,' *Early Science and Medicine* 10.2 (2005): 237–262, 240].

horoscope, his telescope, and all his scopes.'[72] Partly a play on uneducated and superstitious beliefs about the natural sciences – the confusion of traditional and modern, mystical and material knowledge systems (highlighted by the punning of astrological horoscopes with the other, scientific, 'scopes') – and partly a play on the fashionable domestic acquisition of scientific instruments, Behn's inclusion of the telescope in her play reveals a certain cynicism towards the instrument. This attitude is taken to vulgar extremes in Alexander Pope's (1688-1744) invocation of the telescope in his ballad 'The Discovery' (1726), which satirised the infamous Mary Toft's rabbit-birthing hoax that had taken place in the same year:[73]

> At *Godliman*, hard by the *Bull*,
> A Woman, long thought barren,
> Bears Rabbits, —Gad! So plentiful,
> You'd take her for a Warren.
>
> […]
>
> But hold! says *Molly*, first let's try,
> Now that her Legs are ope,
> If ought within we may descry
> By Help of Telescope
>
> The Instrument himself did make,
> He rais'd and level'd right,
> But all about was so opake,
> It could not aid his Sight.[74]

Pope's lines involve the telescope in a prominent narrative of scientific failure. As Lisa Cody argues, for contemporaries like Pope, 'this was not a story of male medical heroes discovering truth, but a tale of a clever woman who not only outwitted her doctors, but called into question their very methods for locating and fixing truth.'[75] Placing the telescope within this context undermined the instrument's alleged truth-seeking qualities. Meanwhile, the 'bawdy'[76] tone of Pope's ballad foreshadows that of

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[72] Aphra Behn, *The Rover and Other Plays*, ed. Jane Spencer (Oxford: Oxford University Press, 1995) 381, 1.1.124–126. .

[73] Where a poor woman named Mary Toft, in a bid for notoriety and financial gain, pretended to give birth to a number of rabbits so convincingly as to convince her male-midwife and the Court's Anatomist. Lisa Cody, '"The Doctor's in Labour; or a New Whim Wham from Guildford,"' *Gender and History* 4.2 (1992): 175–196, 184.

[74] Alexander Pope, *The Poems of Alexander Pope: A Reduced Version of the Twickenham Text*, ed. John Butt (Michigan: Sheridan Books, 1963), 478–481, 9–12, 49–56.

[75] Cody, '"The Doctor's In Labour,"' 182.

[76] Cody, '"The Doctor's in Labour,"' 175.

Thomas Rowlandson's (1756-1827) cartoons which appeared almost a century later – decades after Galileo's observational astronomy had been overtaken by that of William Herschel. In these sketches, Rowlandson exposes the elements of telescopic observation most ripe for ridicule: its phallic symbolism, its voyeuristic potential, its clumsy appearance and its ability to 'blind' the observer to what is actually taking place around them.

Literary works of the early nineteenth century also reference domestic usages of the telescope. Writers were sensitive to the fact that this visual gateway to the outer world was frequently positioned within the feminised space of the drawing room. The necessity of cultivating a disconnect between scientific (masculine) and feminised understandings of the world was often played out in literary representations of the telescope within the home. In Sir Walter Scott's *The Heart of Midlothian* (1818), for example, the heroine Jeanie is intimidated by the presence of scientific instruments – which take on a mystical, occult presence – there is no question of her using them herself:

> The well-furnished presses and shelves which surrounded the large and handsome apartment, contained more books than Jeanie imagined existed in the world, being accustomed to consider as an extensive collection two fir shelves, each about three feet long, which contained her father's treasured volumes, the whole pith and marrow, as he used sometimes to boast, of modern divinity. An orrery, globes, a telescope, and some other scientific implements, conveyed to Jeanie an impression of admiration and wonder not unmixed with fear, for, in her ignorant apprehension, they seemed rather adapted for magical purposes than any other.[77]

The Miss Beauforts in Jane Austen's *Sanditon*, on the other hand, use the instrument, to their own feminised ends. In a series of idle maneuvers intended to grab the attention of passers by, they 'look at nothing through a Telescope' and thereby attract 'many an eye upwards' to themselves and make 'many a Gazer gaze again.'[78] The instrument is also put to use in a similar way in Fanny Burney's *Camilla* (1796), when the bumbling Sir Hugh imagines that Camilla and Indiana might one day (and, suggestively, after Indiana's marriage) 'live so near that they may overlook one another from park to park, all day long, by the mode of a telescope.' Indiana's young

[77] Sir Walter Scott, *The Heart of Midlothian*, ed. Tony Inglis (London: Penguin, 2006), 330.

[78] Jane Austen, *Northanger Abbey, Lady Susan, The Watsons and Sanditon*, ed. Claudia L. Johnson, John Davie and James Kingsley (Oxford: Oxford University Press, 2003), 342.

Cartoonist Thomas Rowlandson exposes those elements of telescopic observation most ripe for ridicule: its popularity with the amateur, its clumsy appearance, its phallic symbolism, its voyeuristic potential and its ability to ‘blind’ the observer to what is actually taking place around them.

2. ‘Progress of Gallantry or Stolen Kisses Sweetest,’ 1814.

3. Thomas Rowlandson, ‘Looking at the Comet till You get a Criek in the Neck,’ 1811.

Cartoon depicting a bare breasted courtesan being ‘mounted’ by a naval officer with a telescope in his hand. Around his waist a sash reads: ‘Death or Victory.’

4. Thomas Rowlandson, ‘Accomodation Ladder,’ 1811.

suitor understands Sir Hugh's meaning 'perfectly' and 'blush[es] deeply.'[79] In these texts the telescope becomes a tool for creating a sexualised spectacle and attracting the male gaze, rather than broadening female prospects. Such usage, it seems, neutralises the threat the telescope poses to established boundaries between male and female spheres.

Astronomical imagery appears much more often in Romantic-era poetry and prose than the telescope itself. It is as if, for many of the Romantics, being taken with the sublime vistas afforded to the imagination by Herschel's hypotheses, the instrument itself proved disappointing. William Wordsworth, unlike Shelley, Blake, Keats and Byron for example, becomes stuck on the telescope. Kathleen Lundeen has argued that in his poem 'Star-Gazers' (1806), Wordsworth is not backwards 'in communicating his skepticism of telescopes as astronomical instruments.'[80] It is certainly true that Wordsworth reveals skepticism towards the spectacle of observation:

> What crowd is this? what have we here! we must not pass it by;
> A Telescope upon its frame, and pointed to the sky:
> Long is it as a Barber's Pole, or Mast of little Boat,
> Some little Pleasure-Skiff, that doth on Thames's waters float.
>
> The Show-man chuses well his place, 'tis Leicester's busy Square;
> And he's as happy in his night, for the heavens are blue and fair;
> Calm, though impatient is the Crowd; each is ready with the fee,
> And envies him that's looking—what an insight must it be![81]

The show-man might be trading on the crowd's eagerness to access celestial mysteries, but he is figured by Wordsworth as something of a magician or illusionist who is selling false visions:

> Does, then, a deep and earnest thought the blissful mind employ
> Of him who gazes, or has gazed? a grave and steady joy,
> That doth reject all shew of pride, admits no outward sign,
> Because not of this noisy world, but silent and divine!
>
> Whatever be the cause, 'tis sure that they who pry and pore
> Seem to meet with little gain, seem less happy than before:
> One after One they take their turns, nor have I one espied

[79] Fanny Burney, *Camilla*, ed. Edward A. Bloom, Lillian D. Bloom (Oxford: Oxford University Press, 1999), 20.

[80] Kathleen Lundeen, 'On Herschel's Forty-Foot Telescope, 1789,' *BRANCH: Britain, Representation and Nineteenth-Century History*, [no date or issue available], accessed August 12, 2013, http://www.branchcollective.org/?ps_articles=kathleen-lundeen-on-herschels-forty-foot-telescope-1789.

[81] William Wordsworth, *The Major Works*, ed. Stephen Gill (Oxford: Oxford University Press, 2000), 322, 1-8.

That doth not slackly go away, as if dissatisfied.[82]

For Wordsworth, the telescope does not fulfill its promise of providing both visual and metaphysical insights. Indeed, it is no coincidence that Wordsworth, who mentions the instrument more than most of the Romantic poets, is the most resistant to Herschel's new cosmology. The poet is frustrated by its material confinement of the sublime and the physical limits it places on personal introspection and communion with the natural world. For him, no philosophy can be found in the 'silent' 'divin[ity]' of deep spaces. Stars, moons and planets are inspiring to Wordsworth when they appear as part of the natural landscape of our own world. No one becomes a better man by looking through a telescope.

Perhaps Wordsworth would have felt differently had he, like Lord Byron, actually looked through one of Herschel's famous instruments – the telescopes that had revolutionised astronomical observation in the West and that had inspired the public enthusiasm for star-gazing described in Wordsworth's poem. Byron was one of a series of tourists to make pilgrimage to the mammoth telescope that Herschel had convinced the King to fund in 1785.[83] This telescope had put Herschel on the map, literally. As Hoskin explains:

> The 40ft reflector that the former musician William Herschel built at Slough, near Windsor, in the late 1780s was renowned in its day as one of the wonders of the world, featured on the Ordinance Survey map and compared in the popular press to the Colossus of Rhodes and the Porcelain Tower of Nankin. The scale of the support of King George III for its construction – two grants of £2000 each, £200 a year for running costs and £50 a year for Herschel's assistant, his sister Caroline – is very familiar to historians, as is the monster's disappointing performance.[84]

The telescope's 'disappointing performance' (it was much too cumbersome to maneuver and, despite its size, it did not reap expected improvements in clarity and magnification) did not register with Byron. Instead he was struck by the metaphysical and philosophical questions Herschel's giant telescope symbolised. He wrote that he had found that 'the night' was 'also a religious concern' and that when he 'viewed the Moon and Stars through Herschell's telescope,' he saw that 'they were worlds.'[85]

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[82] Wordsworth, *Major Works*, 323, 25–32.

[83] Michael Hoskin, 'Herschel's 40FT Reflector: Funding and Costs,' *Journal for the History of Astronomy* 34 (2003): 1–32, 7.

[84] Hoskin, 'Herschel's 40FT Reflector,' 1.

[85] Lord Byron, *Letters and Journals*, vol. 9, ed. Leslie A. Marchand (London: John Murray, 1979), 46.

Later, he also reflected that 'the comparative insignificance of ourselves & our world when placed in competition with the mighty whole of which it is an atom' had first led him 'to imagine that our pretentions to eternity might be over-rated.'[86]

Despite Coleridge's, Blake's and Shelley's substantial engagement with Romantic-era astronomy, their references to the telescope are either non-existent or inconsequential. The same is true of Keats. His only mention of a telescope comes in a letter to Jane and Mary Reynolds written about a year after 'On First Looking into Chapman's Homer.' Here he makes a brief and teasing reference to the scrambled 'resemblances' the Reynolds sisters might identify 'between waves and Camels–rocks and dancing Masters – fireshovels and telescopes – Dolphins and Madonas.'[87] Indeed, Keats does not directly reference William Herschel at all. There is no mention of astronomers or astronomy either, apart from the 1816 tribute to Homer and stargazing. But, as discussed at length in chapter one, the identity of Keats's sky-watcher is far from clear. Of course, Keats knew about Herschel's world-famous telescopes through Bonnycastle's *An Introduction to Astronomy*. Here Keats read that Herschel stood 'unrivalled for the excellence of his instruments and his skill in using them' (324) and that his telescopes were 'far superior to any that were ever before executed' (333).

4. Lunacy

From around 1773, Herschel had begun to shift his attention from music to the heavens. He bought books on mathematics and astronomy, including Robert Smith's *Optiks* (1738) and James Ferguson's (1710-1776) popular *Astronomy Explained upon Sir Isaac Newton's Principles* (1756).[88] He later wrote to the mathematician Charles Hutton[89] that when he 'read of the many charming discoveries that had been made by means of the telescope' he had been 'so delighted with the subject' that he 'wished to see the heavens and Planets with [his] own eyes thro' one of those instruments.'[90] It

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[86] Lord Byron, *Letters and Journals*, vol. 3, ed. Leslie A. Marchand (London: John Murray, 1979), 64.

[87] *Letters*, 1.150. 'To Jane and Mariane Reynnolds,' 4 September 1817.

[88] Lubbock, *Herschel Chronicle*, 59.

[89] Note that Holmes indexes 'Dr Hutton' (to whom Herschel's letter is addressed) as James Hutton, geologist. But Professor Hoskin assures me that he is writing to Charles Hutton who was a part of Herschel's circle and a friend of Nevil Maskelyne, the Royal Astronomer.

[90] Lubbock, *The Herschel Chronicle*, 59.

was not long before Herschel, dissatisfied with the telescopes that were available to him through conventional means, set about constructing his own. He knew that to conduct far-reaching investigations into the heavens telescopes 'of wide scope and high magnifying powers would be essential.'[91] Though not commonly available, reflecting telescopes were more suited to this purpose than refractors. The former, which was employed and improved by Isaac Newton, used curved metal mirrors rather than glass lenses to collect light, had the advantage of eliminating chromatic aberration and were easier to manoeuvre.[92]

The Scottish astronomer and geometer James Gregory (1638-1675) was involved in the early development of the reflecting telescope.[93] In *Rob Roy* (1817), Scott's dubious hero meets with one of Gregory's distinguished descendants. As Scott explains in his 'Introduction' to the novel, in Aberdeen

> Rob Roy met a relation of a very different class and character from those whom he was sent to summon to arms. This was Dr James Gregory, (by descent a MacGregor,) the patriarch of a dynasty of professors distinguished for literary and scientific talent, and the grandfather of the late eminent physician and accomplished scholar, Professor Gregory of Edinburgh. This gentleman was at the time Professor of Medicine in King's College, Aberdeen, and son of Dr James Gregory, distinguished in science as the inventor of the reflecting telescope. With such a family it may seem our friend Rob could have had little communion. But civil war is a species of misery which introduces men to strange bedfellows.[94]

Scott, to be sure, asserts the Scottish provenance of the reflecting telescope – the design made famous by Newton and Herschel in England. But Scott's novel also considers the transference of Scottish cultural capital over the course of the eighteenth century. In this way, Scott reaffirms a shift in power in Scotland from the clannish, Jacobite nationalists that Rob Roy calls to arms, to 'a very different class of character' that was 'distinguished for literary and scientific talent.' This was a story fundamental to the continued project of enlightened British nation building in Scott's and Herschel's lifetimes. Here, the reflecting telescope is placed at the centre of attempts to unify Britain in a shared rational and empirical approach to knowledge making. It

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[91] Lubbock, *Herschel Chronicle*, 62.

[92] Dunn, *Telescope*: *A Short History*, 57–59; R. V. Jones, 'Through Music to the Stars: William Herschel, 1738-1822,' *Notes and Records of the Royal Society of London* 33.1 (1978): 37–56, 39.

[93] Jones, 'Music to the Stars,' 56. Though he did not in fact 'invent' it, the first 'claims to have built a working telescope with mirrors' began in the early years of the seventeenth century while Gregory's *Optica Promota* was published in 1663.

[94] Sir Walter Scott, *Rob Roy*, ed. Ian Duncan (Oxford: Oxford University Press, 1998), 26.

would not have been lost on Scott that Herschel's reflectors had earned him the patronage of a Hanoverian King.

In any case, Herschel's turn to the reflector had him following in the footsteps of his fellow British astronomers. And so, to Caroline Herschel's dismay, the family basement was soon turned into a foundry.[95] With the help of their brother Alexander (who was also a talented metal-worker), William was attempting to cast the largest telescopic mirror in the world. Initially, the endeavor was far from successful. On the first attempt, 'the mirror cracked while cooling,' while on the second 'molten metal poured out onto the flagstones which, expanding, began to fly about in all directions.'[96] The brothers fled for their lives and for a time put aside the task of casting their own metals. Eventually, however, the Herschels were successful in casting a mirror for their first reflecting telescope. Soon enough, they were making reflectors of unheard-of size and precision, and eyepieces with unprecedented powers of magnification. Indeed, after William's fame as an astronomer and instrument-maker grew, the Herschel family supplied telescopes to the observatories and royal households of Europe.[97]

All of Herschel's discoveries were the direct result of the magnifying power of his telescopes. He saw with powers that were so much greater than those of his contemporaries that his claims hardly seemed credible.[98] It did not help, of course, that he was a complete unknown. Sir Joseph Banks had only heard of him in passing when William Watson, son of the Royal Society's secretary, Watson senior, happened upon him in the street:

> About the latter end of [December] I happened to be engaged in a series of observations on the lunar mountains, and the moon being in front of my house, late in the evening I brought my seven feet reflector into the street, and directed it to the object of my observations. Whilst I was looking into the telescope, a gentleman coming by the place where I was stationed, stopped to look at the instrument. When I took my eye off the telescope he very politely asked if he might be permitted to look in, and this being immediately conceded, he expressed great satisfaction at the view.[99]

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[95] James Sime, *William Herschel and his Work* (Edinburgh: T. & T. Clark, 1900), 37–39.

[96] Michael Hoskin, 'The Astronomy of the Universe of Stars,' in *The Cambridge Concise History of Astronomy*, ed. Michael Hoskin (Cambridge: Cambridge University Press, 1999), 168-218, 205.

[97] John Tracy Spaight, "'For the Good of Astronomy": The Manufacture, Sale, and Distant Use of William Herschel's Telescopes,' *Journal for the History of Astronomy* 35 (2004): 45–69.

[98] Jones, 'Music to the Stars,' 40.

[99] Lubbock, *Herschel Chronicle*, 73.

After this encounter, Watson became Herschel's champion and the German-born amateur was going to need him. Herschel's first papers published in the *Philosophical Transactions of the Royal Society* appeared in the 1780 volume. Scientific and literary historians do not usually pay attention to these treatises, but I discuss them here for the insight they give into Herschel's earliest instincts as an astronomer, before the Uranus event that changed his fortunes.[100]

In Herschel's very first paper, which was read to the Society in May, he engaged one of the most enigmatic subjects in astronomy: the existence of variable stars, or stars that changed their apparent brightness. What did it mean that a 'fixed' star could fluctuate in magnitude? This was a question that had been first introduced by Tacho Brahe (1546-1601) in November 1572 when a bright point of light suddenly appeared in the constellation of Cassiopeia.[101] This was no ordinary occurrence. As Michael Hoskin explains, during Brahe's lifetime 'new heavenly bodies were unheard of, and there were compelling reasons for thinking such a celestial novelty to be impossible: the received Aristotelian cosmology was founded on the dichotomy between the unchanging heavens of the planets and stars, and the changeable central region of the four elements.'[102] What Brahe was actually seeing was a supernova – the massive explosion accompanying a star death.[103] But despite the fact that this event was 'instrumental in the overthrowing of the Aristotelian conception of celestial incorruptibility,'[104] the mystery surrounding the rare appearance of changeable stars continued into the late eighteenth and early nineteenth centuries. Though more periodical stars had been identified in the 200 years following Tycho Brahe's initial discovery, it was not until after the 1770s and the work of astronomers including Herschel, Edward Pigott (1753-1825) and John Goodricke (1764-1786) in England, and J. G. Westphal (1824-1859) and H. W. M. Olbers (1758-1840) in Germany, that

[100] In this I follow Michael J. Crowe's *The Extraterrestrial Life Debate 1750-1900*: *The Idea of a Plurality of Worlds from Kant to Lowell* (Cambridge: Cambridge University Press, 1986), 62. Here Crowe agrees that 'Herschel's scientific debut should be dated not from his 1781 discovery of Uranus but from May 1780.' These early papers, according to Crowe, 'provide evidence that at that time [Herschel] believed that he was already on the verge of a discovery more revolutionary than his detection of Uranus.' Simon Schaffer, for example, calls 'Account of a Comet,' Herschel's first paper for the Royal Society ['Herschel in Bedlam,' 214].

[101] Hoskin, 'From Geometry to Physics,' 96.

[102] Hoskin, 'From Geometry to Physics,' 96.

[103] E. Zsoldos, 'Three Early Variable Star Catalogues,' *Journal for the History of Astronomy* 25 (1994): 92–98, 92; Michael Hoskin, 'Goodricke, Pigott and the Quest for Variable Stars,' *Journal for the History of Astronomy* 10 (1979): 23–41, 23.

[104] Zsoldos, 'Three Early Variable Star Catalogues,' 92.

variable star astronomy began to flourish.[105] While all of these astronomers contributed to the advancement of knowledge about the changeability of stars, it was the power of Herschel's telescopes, as well as his speculative daring, that would ultimately begin to unravel the story of the stellar universe.

As his 1780 paper on the variable star in Collo Ceti reveals, Herschel announced his interest in the question of a mutable cosmos from the very beginning of his career.[106] This 'remarkable star' had been first observed by David Fabricius (1564-1617) in 1596. Herschel was reengaging the question of stellar change that, for the most part, held no interest for the majority of his contemporaries. As Dunn argues:

> in thinking about the nature of the stars, William was engaging in a different astronomical programme from other astronomers of the time. The observatories of Europe, including the Royal Observatory in Greenwich, were still working to create better star maps and more accurate predictions of the movements of the heavenly bodies. Their aim was to make navigation more reliable and to help confirm the model of the universe that Newton had set out almost a century earlier. What they carried out was positional astronomy – measuring more and more exactly where the celestial bodies were and how they moved – and they were generally satisfied with refracting telescopes for this purpose.[107]

By building his reflectors and entering into the debate on the fraught subject of variable stars, a subject that was unlikely to garner interest or admiration from established astronomers who deliberately ignored it, Herschel established his interest in a new kind of astronomical enquiry, one that privileged bold new hypotheses over the refinement of established ideas.

Herschel was not the first philosopher or astronomer to seek to understand the deeper workings of the universe, but he was the first to have an optical instrument that could keep pace with the human imagination's capacity to travel into deep space. Indeed, the optical precision of Herschel's telescopes issued an immediate challenge to the way stars had been imagined for millennia. In the same paper on the variable star in Collo Ceti, Herschel called the object 'exceedingly fine and quite round' and described its borders as 'well defined, full and very large.'[108] This caused some consternation in

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[105] Zsoldos, 'Three Early Variable Star Catalogues,' 96.

[106] William Herschel, 'Astronomical Observations on the Periodical Star in Collo Ceti,' *Philosophical Transactions of The Royal Society* 70 (1780): 338–344.

[107] Dunn, *Telescope*: *A Short History*, 63.

[108] Herschel, 'Collo Ceti,' 340.

intellectual circles.[109] How could anyone believe – who, indeed, would want to – that the stars did not twinkle? But Herschel was seeing the stars without the defective optics that his contemporaries were using. These early refracting telescopes did not eliminate the wobbling effect produced on light passing through the earth's atmosphere – but Herschel's reflectors did. Seated beside the physicist Henry Cavendish (1731-1810) at a dinner party, Herschel demonstrated his ability calmly to assert his opinion without resorting to defensive tactics. This was a talent that would hold him in good stead throughout a career defined by controversial hypotheses:

> At a dinner given by Mr Aubert in the year 1786, William Herschel was seated next to Mr Cavendish, who was reported to be the most taciturn of men. Some time passed without his uttering a word, then he suddenly turned to his neighbour and said: 'I am told that you see the stars round, Dr Herschel.' 'Round as a button,' was the reply. A long silence ensued till, towards the end of the dinner, Cavendish again opened his lips to say in a doubtful voice 'Round as a button?' 'Exactly, round as a button,' repeated Herschel, and so the conversation ended.[110]

While Herschel's first paper for the Royal Society might have raised eyebrows his second was downright controversial. In this paper, entitled 'Astronomical Observations Relating to the Mountains of the Moon' (1780), the former musician did not waste any time with false modesty. Instead he forthrightly engaged some of the most famous names in astronomical science while announcing the superiority of his own telescopes.[111] Yet the most divisive aspect of Herschel's paper was his argument for the existence of life on the Moon. Herschel's fascination with extra-terrestrial life was no modern flight of fancy. Lunar voyages and inhabitants (sometimes called 'lunarians' or 'moonites') had a long scientific and literary history. From Plutarch to Kepler, natural philosophers had used 'fictional techniques' to explore the scientific and imaginary possibilities of Earth's satellite.[112] Like the Pythagoreans, some believed that animals and plants of exquisite beauty habited the Moon; life occupied

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[109] Stuart Clark, *The Sun Kings*: *The Unexpected Tragedy of Richard Carrington and the Tale of How Modern Astronomy Began* (New Jersey: Princeton University Press, 2007), 25.

[110] Lubbock, *Herschel Chronicle*, 102.

[111] William Herschel, 'Astronomical Observations Relating to the Mountains of the Moon,' *Philosophical Transactions of The Royal Society* 70 (1780): 507–526, 508.

[112] Maurice J. Bennett, 'Edgar Allan Poe and the Literary Tradition of Lunar Speculation,' *Science Fiction Studies* 10.2 (1983): 137–147, 139. See also, Marjorie Nicolson, 'Cosmic Voyages,' *ELH*: *A Journal English Literary History* 7.2 (1940): 83–107 and *Voyages to the Moon* (New York: The Macmillan Company, 1948); Michael Crowe, *Plurality of Worlds*; and Karl S. Guthke 'Nightmare and Utopia: Extraterrestrial Worlds from Galileo to Goethe,' *Early Science and Medicine* 8.3 (2003): 173–195.

this silvery pristine and ethereal world.[113] Others, like Kepler, entertained the possibility of life on the lunar surface but maintained that there was 'no globe nobler' than the Earth.[114] It was Galileo, however, who influenced the dominant scientific view in the seventeenth and eighteenth centuries. He had been the first to see the lunar landscape with telescopic clarity but he remained unconvinced about extra-terrestrial life.[115] While literary treatments of lunar habitation continued through the centuries,[116] in scientific circles, speculation on this issue became deeply unfashionable.

It was in this context that William Herschel attempted to convince the British Astronomer Royal, Nevil Maskelyne of life on the moon. As well as describing the micrometre he had used to measure angles on the Moon's surface, Herschel used a formal letter to Maskelyne to outline his more speculative ideas about the satellite.[117] Here he asked whether it was 'not extremely probable, nay beyond doubt, that there must be inhabitants on the Moon of some kind or other?'[118] He also reflected that the celestial body must be home to wondrous beings, forests, cities and turnpike roads[119] and thought that if asked to 'chuse between the Moon and earth' he would not 'hesitate a moment to fix upon the Moon' for his habitation.[120] While Maskelyne had insisted Herschel remove his most provocative speculations about the animation of the moon before the publication of his paper, the amateur would not concede his point entirely. The following paragraph remained and appeared in the 1780 volume of the *Philosophical Transactions*:

> It may, perhaps, be esteemed to be a mere matter of curiosity to search after the height of the lunar mountains. I grant that there are more necessary and more useful objects of inquiry in the science of astronomy; but when we consider that the knowledge of the construction of the Moon leads us insensibly to several consequences, which might not

[113] Crowe, *Plurality of Worlds*, 11.

[114] Crowe, *Plurality of Worlds*, 11.

[115] Crowe, *Plurality of Worlds*, 11.

[116] See, for example, John Wilkins's *The Discovery of a World on the Moone* (1638); Francis Godwin's *The Man in the Moone*; *or*, *A Discourse of a Voyage thither by Domingo Gonsales* (1638) and Cyrano de Bergerac's *Other Worlds*; *A Comical History of the States and Empires of the Moon and Sun* (1650-57).

[117] Hoskin, *Discoverers of the Universe*, 45–46.

[118] William Herschel, quoted in Crowe, *Plurality of Worlds*, 63.

[119] William Herschel, quoted in Crowe, *Plurality of Worlds*, 66.

[120] William Herschel, quoted in *Discoverers of the Universe*, 37.

appear at first; such as the great probability, not to say almost certainty, of her being inhabited, we shall soon agree, that these researchers are far from being trifling.[121]

Herschel himself recognised that his lunar obsession might lead to accusations of 'lunacy.'[122] However, he did not foresee, that questions about his sanity would be raised in relation to his beloved telescopes. Nonetheless, once the details of the magnifying powers of his telescopes became widely known, Herschel came under attack. In December 1781, Watson wrote to Herschel explaining that his claims, declared openly and innocently enough in a paper read to the Royal Society that year, had garnered him serious opposition: [123]

few are inclined to give you credit for your assertions. What, say your opposers, Opticians think it no small matter, if they sell a telescope [that] will magnify 60 or 100 times, and here comes one who pretends to have made some, which will magnify above 6,000 times – is this credible? So that by what I can learn, the trade as well as astronomers oppose your pretensions.[124]

To Watson, who had seen through Herschel's telescopes, his claims appeared well founded.[125] But for other scientists working in Britain and abroad, and for the professional instrument makers who were constructing telescopes good enough to supply the Royal Observatory, Herschel's claims seemed ludicrous. To them, Herschel appeared to have an overreaching imagination as well as ambition.

As part of his campaign to have his instruments and observations verified, Herschel wrote to astronomers including Maskelyne, Alexander Aubert (1730-1805), Johann Bode (1747-1826) and Christian Mayer (1719-1783). Eventually Herschel won the support of European astronomy. In 1782 Aubert wrote to Herschel advising him not to mind 'a few jealous barking puppies' and reassured him that 'a little time' would 'clear up the matter' of his telescopes. If it lay in his power, he added, Herschel would 'not

[121] Herschel, 'Mountains of the Moon,' 507–08.

[122] William Herschel, quoted in Crowe, *Plurality of Worlds*, 63.

[123] Herschel's measurements of the magnification of his telescopes were published and widely distributed in the following papers: 'On the Parallax of the Fixed Stars,' *Philosophical Transactions of the Royal Society of London*. 72 (1782): 82–111; 'Catalogue of Double Stars,' *Philosophical Transactions of The Royal Society* 72 (1782): 112–162 and in emphatic self-defense in 'A Paper to Obviate some Doubts concerning the Great Magnifying Powers Used,' *Philosophical Transactions of The Royal Society of London* 72 (1782): 173–178.

[124] William Watson, quoted in Spaight, 'For the Good of Astronomy,' 50.

[125] And Watson, apparently at the request of Joseph Banks, did ultimately 'examine and measure the powers' of Herschel's seven foot telescope and confirmed the accuracy of his calculations. See Herschel, 'A Paper to Obviate some Doubts,' 178. In modern times, Herschel's claims have been proven by experiments carried out by W.H. Steavenson who outlines his methodology in 'A Peep into Herschel's Workshop,' *The Transactions of the Optical Society* 4 (1925): 210–220.

be sent to Bedlam alone' for he was 'incline[d] much to be of the party.'[126] As Aubert predicted, time and the lure of his new technology wore down Herschel's critics.

In this way, Herschel was like many of his literary contemporaries. He displayed imaginative risk-taking and independence. He faced resistance to his genius and his vision. He had to create his own audience and inspire his own disciples. Like Wordsworth and Coleridge, contemporaries who had also struck out alone, Herschel was one of those 'great' and 'original' thinkers who, in proportion to his greatness and originality, had 'the task of *creating* the taste' by which he was to be enjoyed.[127]

[126] Alexander Aubert, quoted in Schaffer, 'Herschel in Bedlam,' 211.

[127] William Wordsworth, 'Essay, Supplementary to the *Preface*,' in *Poems*, vol. 1 (London: Longman, Hurst, Rees, Orme and Brown, 1815), 341–375, 368.

Chapter Three:

‘Still Steadfast, Still Unchangeable’: Celestial Variability and Keats’s ‘Bright Star’

1. Bright Lights

By the time John Keats composed his famous sonnet, measuring the brightness of the stars was an important part of establishing stellar irregularity. In scientific papers published between 1775 and 1820, unusually bright stars or stars that fluctuated in their brightness, were identified as comets, meteors, double stars and variables. Indeed, paying closer attention to stellar ‘brightness’ alerted astronomers to the changeability of the heavens. Two hundred years after the Danish astronomer Tycho Brahe had confirmed the variability of the stars, the idea of a transmutable heaven had begun to take shape within the popular consciousness. In newspapers and periodical journals, too, the term ‘bright star’ circulated with surprising frequency. Metaphorically, ‘bright star’ was a title given to attractive or talented public personalities or transformative political events. Neither a direct reference to the North Star or the planet Venus, a ‘bright star’ was any star unique in its luminosity and splendour, and it was recognised that many such stars were strewn throughout the heavens.

When unusual alterations took place within the familiar night sky, it was as if the heavens themselves were directing astronomers towards a new discovery. Edward Gregory, for example, discovered his comet this way in 1793: ‘I saw a star of a hazy appearance, and about the size of a star of the second magnitude, in the space between the flexture of the Dragon and the foot of Hercules, larger and brighter than I had before remarked in that part of the heavens.’[1]

In 1808, William Herschel undertook observations on a comet that had been recently discovered by a colleague. The unusual quality of the object’s brightness caught his attention: ‘the first time I had an opportunity of examining it was the 4th of October, when its brightness to the naked eye gave me great hopes to find it of a different construction from many I have seen before, in which no solid body could be

[1] Edward Gregory, ‘Extracts of Two Letters […] Containing an Account of the Discovery of a Comet, with Observations Thereon,’ *Philosophical Transactions of the Royal Society* 83 (1793): 50–54, 50.

discovered with any of my telescopes.'[2] Comets appeared regularly in British newspapers and periodicals in sections dedicated to the reportage of astronomical phenomena, usually entitled 'celestial observances.' For instance, the public was alerted to the unusual brightness of a comet in 1807: 'it has been frequently seen very distinctly in the vicinity of this metropolis, nearly as bright as a star of the first magnitude.'[3] The comet's course was charted in the London papers until its disappearance later that year. In 1818, readers of the *London Gazette* and the *Weekly Entertainer* were reminded of the comet's traditional symbolism as a harbinger of doom:

> BEHOLD! amidst yon wilderness of stars
> (Angels and bright-eyed deities, that guard
> The inner skies, while the sun sleeps by night)
> Is one unlike the rest, misshapen, red,
> And wandering from its golden course.
>
> […]
>
> Thus Satan once
> Sprang up adventurous from Hell's blazing porch;
> And (like a stream of fire) winged his fierce way
> Ambiguous, undismayed[4]

The comet is 'adventurous,' 'ambiguous,' 'misshapen' – winding its own rebellious way among the 'wilderness' of obedient stars. It is a 'blazing' challenge to the order and stability of the heavens.

Whether comets attracted (more) scientific or superstitious interest, they were frequently reported upon. And these transient objects, flaring in the sky for only a limited time, seemed to capture the public imagination. The same was true of meteors, though these objects were even more fiery and fleeting. The polymath Charles Blagden (1748-1820), observed an irregular object when it

> suddenly burst out into that intensely bright bluish light which is peculiar to such meteors. At this period I saw it, and can compare the colour to nothing I am acquainted with so well, as to the blue lights of India, and some of the largest electrical sparks.

[2] William Herschel, 'Observations of a Comet, Made with a View to Investigate its Magnitude and the Nature of its Illumination. To Which is Added, an Account of a New Irregularity Lately Perceived in Apparent Figure of the Planet Saturn,' *Philosophical Transactions of the Royal Society of London* 98 (1808): 145–163, 145.

[3] 'The Comet,' *The Universal Magazine* 8.48 (November 1807): 410–412, 410–411.

[4] B.,'The Comet,' *The Weekly Entertainer or, The Agreeable and Instructive Repository* 58 (April 13 1818): 300.

The illumination was very great; and on that part of its course where it had been so bright, a dusky red streak or train was left, which remained visible perhaps a minute even with a candle in the room, and was thought by some gradually to change its form […] After moving not less that 10° in this bright state, it became suddenly extinct, without any appearance of bursting or explosion.[5]

Blagden's meteor had burst forth with brilliant brightness but its light was extinguished just as quickly. Meteors were a potent reminder that celestial objects were in flux and could undergo speedy metamorphosis.

Comets and meteors are not really stars at all, of course, although they do appear as similar points of light to the untrained eye. Now called 'Near-Earth Objects,' the changeability of comets and meteors was perhaps unsurprising, given their proximity to the mutable world of humankind. However, Romantic-era astronomy was also interested in the variability of the stellar regions, the space outside the solar system. Herschel proved the existence of double stars that revolved 'in circles or ellipses, round their common centre of gravity' and that were 'intimately held together by the bond of mutual attraction.'[6] These binaries were constantly on the move, though they initially appeared to be 'fixed' individual stars. Again, the brightness of these stars was of interest. The luminosity of the larger star often swallowed that of the smaller, making observation impossible. In January 1803, Herschel had noted that in δ Cygni, he 'could no longer perceive the small star; which must have been at least so near the large one as to be lost in its brightness.'[7] Herschel used a paper published in the *Philosophical Transactions* of 1804 to record the changes he had observed, over twenty-five years, to the 'relative situation of double stars.' These stars, he realised, were not only circling but were adjusting their positions in relation to each other. Of the object Rigel, for example, Herschel noted that the 'bright star' had 'undergone a change of situation with regard to its distance from the small one.'[8]

All these examples show that the brightness of a celestial object was often linked to empirical measurements of its irregularity or movement. Yet the brightness of a

[5] Charles Blagden, 'An Account of Some Late Fiery Meteors; With Observations,' *Philosophical Transactions of the Royal Society of London* 74 (1784): 201–232, 219

[6] William Herschel, 'Account of the Changes That Have Happened, during the last Twenty-Five Years, in the relative Situation of Double-Stars; with an Investigation of the Cause to which they are Owing,' *Philosophical Transactions of the Royal Society of London* 93 (1803): 339–382, 340.

[7] William Herschel, 'Continuation of an Account of the Changes that Have Happened in the Relative Situation of Double Stars,' *Philosophical Transactions of the Royal Society of London* 94 (1804): 353–384, 377.

[8] Herschel, 'Continuation of an Account,' 379.

particular star was of most interest to astronomers who studied the curious appearance (and disappearance) of variable stars.

2. Changeable

Also called 'periodical,' variable stars fluctuated in their apparent magnitude or appeared to release more light in measurable phases. These stars usually made themselves known to astronomers due to sharp changes in their luminosity. For example, when the English astronomer John Goodricke reported the discovery of a new periodical star in 1785, he explained that his attention was drawn to ß Lyræ because he was 'surprised to find this star much less bright than usual, whereupon I suspected that it might be a variable star.'[9] Two years earlier, Goodricke had discovered 'a very singular variation' in the 'bright star' belonging to the constellation Algol or ß Persei.[10] His observational notes, printed in the *Philosophical Transactions of the Royal Society* and reprinted in *The Scots Magazine*, reveal his preoccupation with the star's 'brightness':

January 14, 1783.

At 6h. it was varied from its usual brightness, but rather brighter than ß Arietis.
At 6 ¾ h. equal to ß Arietis, but rather a little less bright, and of between the second and third magnitude.
At 7 ¼ h. third magnitude; not so bright as S Arietis, and equal to ß Trianguli.
At 7 ¾ h. nearly the same as at 7 ½ but thought it was rather less bright than ß Trianguli.
At 8 ¾ h. between the third and fourth magnitude; not quite so bright as ß trianguli, and rather less than ε and ζ Persei, but a little brighter than δ and ρ Persei.[11]

As Goodricke's notes reveal, 'brightness' had become the key empirical measurement for stellar fluctuation. A star's magnitude was established by comparing the intensity of its light to other bright stars that surrounded it. It was judged to be either 'less bright' or 'brighter' than its celestial neighbours during a series of incremental

[9] John Goodricke, 'Observations of a New Varibale Star,' *Philosophical Transactions of The Royal Society of London* 75 (1785): 153–164, 153.

[10] Now called Perseus. John Goodricke, 'A Series of Observations on, and a Discovery of, the Period of the Variation of the Light of the Bright Star in the Head of Medusa, Called Algol,' *Philosophical Transactions of The Royal Society of London* 73 (1783): 474–482, 474.

[11] Goodricke, 'A Series of Observations,' 476. Also see, *The Scots Magazine* 46 (September 1784): 475.

observations. Recording these fluctuations in brightness established the extent of a star's variability.

Because many of the brightest stars in the sky are of a similar magnitude and the weaker stars visible to the naked eye vary little, ancient and medieval astronomers believed that the stars were 'fixed' in brightness as well as position.[12] The Danish astronomer Tycho Brahe (1546-1601) had been the first to discover the changeability of the stars.[13] In November 1572, Brahe observed a bright point of light suddenly appear in the constellation of Cassiopeia.[14] This was no ordinary occurrence. As Michael Hoskin explains, during Brahe's lifetime 'new heavenly bodies were unheard of, and there were compelling reasons for thinking such a celestial novelty to be impossible: the received Aristotelian cosmology was founded on the dichotomy between the unchanging heavens of the planets and stars, and the changeable central region of the four elements.'[15] What Brahe was actually seeing was a supernova – the massive explosion accompanying a star death.[16]

But despite the fact that this event was 'instrumental in the overthrowing of the Aristotelian conception of celestial incorruptibility,'[17] the unusual appearance and disappearance of stars did not hold the attention of astronomers for long. In the century following Brahe's discovery, a number of other variable stars were reported but the subject was dropped soon after. The seventeenth-century astronomer, Ismael Boulliau, had observed the 'wonderful' periodical star in Mira Ceti and had provided an explanation for its changing appearance that seemed to stifle further enquiries into the phenomena.[18] As Hoskin explains, Bouillau's theory was based on the known behaviour of sunspots:

The Sun with its spots rotated, and a rotating star with similar but much larger dark patches would regularly appear of reduced brightness when its rotation brought the

[12] Michael Hoskin, *The Construction of the Heavens: William Herschel's Cosmology* (Cambridge: Cambridge University Press, 2012), 20.

[13] Michael Hoskin, 'From Geometry to Physics: Astronomy Transformed,' in *The Cambridge Concise History of Astronomy*, ed. Michael Hoskin (Cambridge: Cambridge University Press, 1999), 94–129, 96.

[14] Hoskin, 'From Geometry to Physics,' 96.

[15] Hoskin, 'From Geometry to Physics,' 96.

[16] E. Zsoldos, 'Three Early Variable Star Catalogues,' *Journal for the History of Astronomy* 25 (1994): 92–98, 92 and Michael Hoskin, 'Goodricke, Pigott and the Quest for Variable Stars,' *Journal for the History of Astronomy* 10 (1979): 23–41, 23.

[17] Zsoldos, 'Three Early Variable Star Catalogues,' 92.

[18] Hoskin, *Construction of the Heavens*, 2012, 21.

patches to the side facing the observer. But sunspots also varied, and comparable variations in the dark patches could explain any irregular changes in brightness.

This triggered a search for variable stars, one that was – or at least seemed – productive. But alleged discoveries were difficult to challenge, and any variations, cyclic or otherwise, could easily be explained on the 'dark patches' hypothesis. And so it was that in the later years of the seventeenth century such 'discoveries' became commonplace, with the result that eventually the subject fell into disrepute.

And there it remained for most of the eighteenth century.[19]

It was not until after the 1770s and the work of astronomers including Goodricke, Herschel and Edward Pigott in England; and J. G. Westphal and H. W. M. Olbers in Germany, that variable star astronomy began to flourish.[20] Indeed, in a paper published in the 1786 volume of the *Philosophical Transactions*, Pigott remarked that it had been about a century since 'Hevelius, Montanari, Flamsteed, Maraldi, and Cassini, noticed a certain number of stars which they supposed had either disappeared, changed in brightness, or were new ones; and yet to this day we have acquired no further knowledge of them.'[21] One explanation for this, according to Pigott, was that astronomers did not have access to 'exact observations' of the 'relative brightness' of changeable stars.[22] The astronomer then set about accurately recording the positions and fluctuating magnitudes of the known variables – a project that he continued throughout his lifetime. Around ten years later, Pigott reflected upon the importance of measuring 'periodical changes of brightness' in stellar objects for understanding the earth's position within the universe:

Although those far distant suns, the fixed stars, have baffled all investigation with regard to our knowledge of their distance, magnitudes, and attractions; we have, nevertheless, by determining their periodical changes of light, established a strong affinity between them and our sun; and among such an inconceivable number, we may expect to find some with periods of rotation much longer and shorter than those we are already acquainted with, and with changes perhaps even sufficiently rapid to afford a ready means for determining accurately differences of terrestrial longitudes.[23]

This was a project also valued by Pigott's friend, William Herschel, who published six catalogues of the 'comparative Brightness of the Stars' during his career.

[19] Hoskin, *Construction of the Heavens*, 2012, 21.

[20] Zsoldos, 'Variable Star Catalogues,' 96.

[21] Edward Pigott, 'Observations and Remarks on those Stars which the Astronomers of the Last Century Suspected to be Changeable,' *Philosophical Transactions of the Royal Society of London* 76 (1786): 189–219, 189.

[22] Pigott, 'Observations and Remarks,' 189.

[23] Edward Pigott, 'On the periodical Changes of Brightness of Two Fixed Stars,' *Philosophical Transactions of the Royal Society of London* 87 (1797): 133–141, 133.

Extract from my Journal of the Observations on the Variable in *Sobieski's Shield*; made at Bath.

Dates.	Magnit.	
1795. Sept. 25	5	brighter than *k*, and less than *l*; it has lately been increasing.
Oct. between 1 & 8	5	ditto ditto.
26	5	rather less than *k*; much brighter than P.
30	6	much less than *k*, and rather brighter than P.
Novemb. 6 & 7	6	*much* less than *k*, and *rather* brighter than P.
14	5	almost equal to *k*, and much brighter than P.
27	5	I think *rather* less than *k*.
Decemb. 14	5	I could not determine which was brightest, the variable, or *k*.
1796. Feb. 12 & 13	6	considerably less than *k*, and rather brighter than P.
March 4	7	much less than P.
12	6	rather brighter than P; considerably less than *k*.
April 7, 17, 19	5	considerably brighter than P, and *rather* less than *k*.
30	7	less than P; brighter than *r*.
May 4, 10, 12, 13	7.8	much less than P, and rather less than *r*. The observation of the 12th seems to express most decidedly its being less than *r*.
16	7	equal, or *rather* brighter than *r*; much less than P.
19	6	*rather* brighter than P.
24	6.5	brighter than P; much less than *k*.
31	5.6	much brighter than P; rather less than *k*.
June 4	5	not quite so bright as *k*.
9, 10	5	rather brighter than *k*; considerably less than *l*.
14	5	brighter than *k*; *much* less than *l*.
15, 20, 24	5	ditto, ditto, ditto.
25	5	rather brighter than *k*.
29	5	if any difference, brighter than *k*; decreased.
July 7, 8	5	equal to *k*.
16	5	*rather* less than *k*; considerably brighter than P; ☽ near its full.
19	5.6	less than *k*; much brighter than P. ditto.
26, 27	5	*rather* less than *k*; considerably brighter than P.
August 4, 7	5.6	less than *k*; much brighter than P.
12, 15	5.6	ditto ditto; moon near them.
19, 21, 22	5.6	½ between the brightness of *k* and P.
27	5.6	ditto ditto, or less bright.
29	6.5	much less than *k*; rather brighter than P.
Sept. 4, 5	6	considerably less than *k*; rather brighter than P.
7	6	ditto ditto ditto; I think it rather increased.
8	6.5	less than *k*; brighter than P.
16	5	rather less than *k*; considerably brighter than P.

5. Extract from Edward Pigott's observational journal for 1795-1796 showing his attention to the changeable brightness of the variable 'fixed' star in *Sobieski's Shield*. Printed in the *Philosophical Transactions* of 1797.

3. Venus

To be sure, Romantic-era poets were not always prompted by developments in astronomy to revise traditional associations with bright stars. In the poetry of the period, a 'bright star' most often refers to the evening star – the planet Venus. Seemingly the opposite of a variable stellar object, the second planet from the sun was considered a reliable member of the solar system, known since ancient times – its movements mathematically predictable to a high degree of accuracy. Take, for example, the following poem published in the *Lady's Monthly Museum* in 1801:

Sonnet to the Evening Star

BRIGHT Star of Eve, resplendent gem of Night,
Beneath thy lucid orb I love to stray,
Drop Feeling's tear, and mark thy quiv'ring ray;
Till, borne in Fancy's car, with rapid flight,
I mount thy sphere, and tread thy beamy way!

Or if, perchance, I seek the ruin'd tow'r,
To waste alone the contemplative hour,
Wrapt in deep thought, thy secrets I survey:
Methinks my angel Mary's form glides by,
And points to thee, her seat of bliss serene;
Then bids me hope, nor grieve for joys terrene;
Waves her fair hand, and seeks her native sky.

Adieu bright Star,—the airy visions fade,
And leave me pensive in the ruin'd shade.[24]

Here, the 'Bright Star' is actually the planet Venus, the so-called star 'of eve' for its inevitable nightly appearance as a bright and glittering beacon. The poet is taken on 'fancy's car' to mount the planet's sphere and tread its 'beamy way.' Her visionary journey is resolved in an encounter with the divine where a conventional lesson is learnt about the transitory nature of 'joys terrene' compared to the eternal 'bliss serene' of heaven. The separation of earthly and celestial realms could not be more clearly defined.

One of Keats's most influential contemporaries also made frequent apostrophes to a 'bright star.' William Wordsworth's use of the image appears similarly resistant to the

[24] Mrs. Mathews, 'Sonnet to the Evening Star,' *The Lady's Monthly Museum* 5 (November 1800): 416.

descriptions of the variable brightness of the stars that appear in the papers of Herschel, Pigott and Goodricke. In 'Address to My Infant Daughter, Dora, On Being Reminded that She was a Month Old,' the 'bright star' of Wordsworth's poem is the eternal Moon. This body measures the child's incremental survival of mortality, that 'great decay' that is felt throughout 'the wide earth' but which does not enter into the immortal heavens.[25] In August 1802, however, Wordsworth's 'bright star' is Venus. She is in her evening garb, pointing him towards the comfort of England, while he lingers in tumultuous Calais:

> Fair Star of evening, Splendor of the west,
> Star of my Country!—on the horizon's brink
> Thou hangest, stooping, as might seem, to sink
> On England's bosom; yet well pleased to rest,
> Meanwhile, and be to her a glorious crest
> Conspicuous to the Nations. Thou, I think,
> Should'st be my Country's emblem; and should'st wink,
> Bright Star![26]

Similarly, in his poem 'To the Planet Venus,' Wordsworth associates the idea of a 'bright star' with that celestial object's steadiness, its predictable approach to earth and its long-established relationship with 'man's abode':

> What strong allurement draws, what
> spirit guides,
> Thee, Vesper! brightening still, as if the
> nearer
> Thou com'st to man's abode the spot
> grew dearer
> Night after night? True is it Nature hides
> Her treasures less and less. – Man now
> presides
> In power, where once he trembled in
> his weakness;
> Science advances with gigantic strides;
> But are we aught enriched in love and
> meekness?
> Aught dost thou see, bright Star! of
> pure and wise
> More than in humbler times graced

[25] William Wordsworth, 'Address to My Infant Daughter, Dora, On Being Reminded that She was a Month Old,' in *Poems*, *in Two Volumes*, *and Other Poems*, *1800-1807*, ed. Jared Curtis (Ithaca: Cornell University Press, 1983), 602–604.

[26] William Wordsworth, 'Composed by the Sea-side, Near Calais, August 1802,' in *Poems*, *in Two Volumes*, *and Other Poems*, *1800-1807*, ed. Jared Curtis (Ithaca: Cornell University Press, 1983), 155.

human story;
That makes our hearts more apt to
sympathise
With heaven, our souls more fit for
future glory,
When earth shall vanish from our closing
eyes,
Ere we lie down in our last dormitory?[27]

Here, again, the bright star is a familiar and knowable object. There is nothing of the variable in Wordsworth's star, but he does seem to lament the fact that Venus has become less mysterious: 'True is it that Nature hides/ Her treasures less and less.' In this poem, Wordsworth betrays his frustration: 'Science advances with gigantic strides,' but, he questions, 'are we aught enriched in love and meekness?,' are we more 'pure and wise' with our new knowledge? Wordsworth's resistance to using metaphors, language and imagery afforded by the new astronomy is clear. Would contemplating the changeability of the stars improve or damage our relationship with the divine? Would it make 'our hearts more apt to sympathise/ With heaven, our souls more fit for future glory?'

Of course, in aligning Wordsworth's poetry with outdated (or, at least, not updated) astronomy, I am aware that I risk engaging in just the same kind of misreading and misinterpretation that, I argue, has been undertaken on Keats's cosmological poetry. In the following discussion of Keats's 'Bright Star' sonnet, I hope to demonstrate that even a poem that appears utterly contrary – deliberately and stubbornly opposed to advances in modern astronomy – that seems, in fact, to epitomise the features of Aristotelian, Newtonian cosmology, can be read against the grain. If the following discussion is successful it would, perhaps, validate the reexamination of other supposed poetic 'rejections' of Romantic-era astronomy, including the readings of Wordsworth I have just undertaken.

In any case, it is important to note that all of the poems discussed above explicitly link the 'bright star' image to a luminous object in the nearby solar system. In the sonnet quoted above, Mrs Smith addresses the 'Bright Star of evening' because Venus has long been known as the first star of night. Wordsworth likewise calls to the 'fair star of evening' to denote the same planet, while his poem addressing his infant daughter refers to the monthly cycle of the Moon, 'that bright star, / The second glory

[27] William Wordsworth, 'To the Planet Venus,' *Poems*, *in Two Volumes*, *and Other Poems*, *1800-1807*, ed. Jared Curtis (Ithaca: Cornell University Press, 1983), 506.

of the heavens.' The title of his poem, 'To the Planet Venus,' leaves no question about the identity of his bright star. In other words, it is not enough – in these poems, and in many others like them – to invoke the term 'bright star' without including other details that qualify the nature of the celestial object.

4. Stars in the Press

Before I turn my discussion to Keats, one final note must be made regarding the semiotics of the term 'bright star' at the turn of the nineteenth century. Perhaps because Venus is so commonly called a 'bright star' in the poetry of the period, there has been a misconception that the planet and the term were synonymous. This, however, was not so. As the following examples taken from newspapers and periodical journals suggest, usages of the bright star image were surprisingly scientifically informed. There was an awareness (proving the influence of astronomical discourse on general language usage) that multiple bright stars existed in the heavens, that there were usually one or two particularly bright examples belonging to each constellation of 'fixed stars' and that these stars were not planets. Sometimes references to bright stars came in the form of astronomical notices, such as the following:

> Astronomy – On the 12th of October next, at five in the morning, will be seen, the Planet Mercury, Venus and Mercury rise directly East-ward, about the same time, and the obliquity of the Ecliptic to our horizon being at that time favourable in the highest degree, the two Planets will be seen near each other for four or five mornings; that is, on the 10th, 11th, 12th, 13th, and 14th days; we may therefore reasonably hope to have one clear morning out of the five. The bright star Arcturus rises at the same time, but in a direction nearly North East, and therefore need not to be mistaken for Mercury, who will be a little below Venus, full East—The sight will be highly gratifying to young Astronomers in particular.[28]

This passage demonstrates the way that interest in astronomical phenomena had extended beyond the pages of the *Philosophical Transactions* during Keats's lifetime and had entered into the public sphere. Astronomical observation had become a shared cultural practice, not only part of the formal instruction undertaken at schools throughout Britain but a welcome pursuit in domestic spaces. As I discuss in chapter two, it was an activity deemed sufficiently genteel for women, 'young astronomers'

[28] 'Astronomy,' *The True Briton*, September 24, 1798, 7c.

and gentleman enthusiasts alike. Notices such as these, which appeared in widely circulated newspapers as well as in periodical journals, were responsible for the dissemination of astronomical knowledge to the public. In this passage, for example, an important distinction is drawn between the 'bright star' Arcturus and the planets. Neither Venus or Mercury are bright stars, the author of this note advises, but either might be easily mistaken for one. The 'East-ward' trajectory of the planets which appear 'full East' is what sets them apart.

As well as direct references to astronomical events in reports such as the above, references to bright stars appeared metaphorically in a wide variety of contexts. In an article published in 1820, young poets like Keats were issued the following stricture against pinning their hopes on immortality:

> Better ten men of genius should perish in ignorance and die in obscurity, than that one single individual should fancy himself a man of genius at twenty, and find out his mistake at forty. What indeed is at present the highest ambition of a poet? To be received on the footing of a lacquey by a lord. What is his probable fate? To starve in a gaol […] The love of true fame is at best 'all one as we should love a bright particular star and think to wed it.' But in ninety-nine cases out of a hundred, it is trying to catch at a falling star, a meteor raised from the obscure vapours of the brain.[29]

Though a poet might wish to wed his legacy to 'a bright particular star'[30] – a prominent guiding light in the heavens – he should be aware that even the lives of stars can be fleeting. Their bright point of inspiration might be an illusion, 'a falling star, a meteor raised from the obscure vapours of the brain.' Many examples such as these appear in newspapers and periodicals of the era which demonstrate widespread awareness of the multiplicity of 'bright particular' stars in the heavens. For example, one report from 1797 explained that 'there was a material difference between a woman being left alone in this Metropolis, and in Florence.' If the lady in question 'had been moving where there were many others of equal rank and accomplishments, she would still have been, perhaps, a bright Star; but it would be a bright Star in a Firmament where there are many: but placed as she was, alone, she must prove an irresistible object of attraction to a young man.'[31] Florence, apparently, contained not the

[29] *The Examiner*, November 26, 1820, 761.

[30] A 'bright particular star' also appears in Shakespeare's *All's Well That Ends Well* during Helena's speech (1.1.80ff). I was alerted to this connection when reading Robert White's biography of Keats (2010): 216.

[31] *The True Briton*, Wednesday, February 22, 1797, 4a.

firmament of bright beauties observable in London. The brightness of any star, according to this analogy, is relative and shifting. The 'bright star' image was also used as a metaphor for political change. In the passage below taken from an open letter from William Cobbett to Lord Castlereagh it symbolises the Revolution in France:

> that grand revolution, that bright star, which first burst forth in the year 1789, is still sending forth its light over the world. In that year feudal and ecclesiastical tyranny, ignorance, superstition, received the first heavy blow: they have since received others; and, in spite of all that can be now done in their favour, they are destined to perish.[32]

Here a 'bright star' ignites a revolution, it signals a time of auspicious transformation – the reformation of an oppressive and outdated system.

5. Steadfast as Thou Art

All of this presents a very different idea of the meanings attached to a 'bright star' at the turn of the nineteenth century than might be gleaned from a conventional reading of John Keats's famous sonnet. The poet's own 'Bright star' appears bound to a different age – a time when 'fixed stars' were literally fixed and the bright star of the night sky was Venus, wandering her steady way through the unchangeable, steadfast heavens:

> Bright star, would I were stedfast as thou art–
> Not in lone splendor hung aloft the night,
> And watching, with eternal lids apart,
> Like nature's patient, sleepless eremite,
> The moving waters at their priestlike task
> Of pure ablution round earth's human shores,
> Or gazing on the new soft-fallen mask
> Of snow upon the mountains and the moors;
> No—yet still stedfast, still unchangeable,
> Pillow'd upon my fair love's ripening breast,
> To feel for ever its soft swell and fall,
> Awake for ever in a sweet unrest,
> Still, still to hear her tender-taken breath,
> And so live ever—or else swoon to death. (*Poems* 274)

[32] W. Cobbett, 'Letter VIII. To Lord Castlereagh,' *Cobbett's Weekly Political Register* 28.4 (Saturday, July 29, 1815): 97–110, 99.

Scholars have long written about the power of Keats's sonnet. Harold Bloom, for example, has called it a 'poem beyond argument.'[33] John Barnard links the poem's emotional control to its uniqueness among other love poems that Keats probably wrote in the same period (including 'I cry your mercy,' 'What can I do to drive away' and 'To Fanny').[34]

Usually, the singularity of the poem is attributed to Keats's attempts to resolve the irresolvable and to bring the decaying mortality of earth-bound experience into communion with the celestial and eternal. But the most insightful readings of the poem take account of the two distinct formal movements of the sonnet. Andrew Motion, for example, argues that:

> Instead of panting and gasping, filling its lines with irregular rhythms and snatched glances, [the poem] struggles to maintain the discipline of a strict form, a steady antithesis, and an evolving idea. In these respects, it is a poem which at once recognises and masters Fanny's destabilising power – so long as Keats keeps his attention fixed on the heavens, where 'great unerring Nature' is exemplary and conciliatory. In the sestet, though, where Keats switches to Fanny herself, the poem's control begins to loosen. The 'steadfast' and 'unchangeable' attributes of the star can only be maintained in 'lone splendour.'[35]

Harold Bloom, on the other hand, argues that while 'the octet is one of the major expressions of Keats's humanism; the sestet one of the most piercing of his longings after the world of the Beulah land, the breathing garden of repose beyond bounds.'[36] Paradoxically, as is implied in the readings of both Motion and Bloom, the first eight lines of the sonnet assert Keats's 'humanism' despite the fact that the octet's language and imagery are devoted to the 'pure,' the 'eternal,' the 'aloft.' Conversely, the sestet involves a longing for immortality despite the sensuous, bodily images found in last six lines of the poem. The success of Keats's sonnet relies on this inversion, on the strategic placement of the denials: 'not' and 'no.' The positioning of these words creates a space of negative affirmation throughout the poem that infects each part with its own antithesis. In this, Bloom recognises an important aspect of the sonnet that

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[33] Harold Bloom, *The Visionary Company*: *A Reading of English Romantic Poetry* (Ithaca, NY: Cornell University Press, 1971), 435.

[34] John Barnard, *John Keats* (Cambridge: Cambridge University Press, 1987), 127.

[35] Andrew Motion, *Keats*, (Chicago: The University of Chicago Press, 1999), 473–474.

[36] Bloom, *The Visionary Company*, 435.

often goes unremarked: 'Keats wants to be as steadfast as the star, but not in the star's way of steadfastness.'[37]

But what, in fact, is the star's way of steadfastness? What does the poet want to be and what does he believe he is instead? What is the nature of the lover – is she 'changeable,' the 'destabilising power' Motion identifies, or 'stedfast'? In other words, what do the 'not' and 'no' of Keats's sonnet stand against? Might it be true that Keats does long to be steadfast in the star's way of steadfastness? Or rather, that he longs to be steadfast in the bright, variable star's way of steadfastness – which, offcourse, is not steadfast at all?

Marilyn Gaull, suspicious of Herschel's influence on 'the popular, literary, artistic, political, philosophical, religious, and even scientific view of the universe' in his lifetime, hints that there might be something interesting taking place within the subtext of Keats's poem:

> writers, philosophers, artists, even scientists continued to draw on the idea of fixed stars as a sign of permanence, immutability, continuity. Wordsworth, who knew better, compared Milton's soul to such a star in his sonnet, 'London, 1802,' and Keats, who also knew better, in 'Bright Star' rejected the permanence of the star for the sensual pleasures of mortality—or did he? Could that be our reading of both sonnets because we need to believe in fixed stars as well?[38]

Gaull's question is perceptive and compelling. Her critical perspective on Romantic-era responses to the Herschelian cosmology could hardly be clearer; she is adamant that most productions of the era, be they artistic, scientific, educational or governmental, clung to 'Newton's version's of the universe.'[39] Yet Gaull still finds something in Keats's poem that begs a question, that does not add up, that casts doubt upon our own impulses, as modern readers, to take the permanence of the stars for granted.

Nonetheless, the trust critics have placed in the steadfastness of Keats's 'bright star' has been well founded. Passages of writing that resonate strongly with the language and imagery of the poem have been found in Keats's letters; two, in particular, mention

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[37] Bloom, *The Visionary Company*, 436.

[38] Marilyn Gaull, 'Under Romantic Skies: Astronomy and the Poets,' *Wordsworth Circle* 21 (1990): 34–41, 38.

[39] Gaull, 'Under Romantic Skies,' 36.

Venus, and the North Star. Yet it is not at all clear that Keats is talking about either the North Star, or Venus – a fact that is highlighted by critical division upon the issue.[40]

As the two most recent biographies of Keats have noted, it is extremely difficult to pin down the circumstances surrounding the composition of Keats's 'Bright Star' sonnet. Robert White notes that any dating of the poem is 'purely conjectural'[41] while Nicholas Roe observes that this information remains 'unknown and probably unknowable.'[42] Jack Stillinger gives the poem a general date of 1819, which is almost certainly true.[43] Joseph Severn's claim that Keats first wrote the poem aboard the *Maria Crowther* as he travelled to Italy in 1820 has long been refuted.[44] Keats's closest friend, Charles Brown, did recall that the poem was written in 1819 but his memory has sometimes proved unreliable. This fact led Robert Gittings to suggest that 'Bright Star' was written earlier and addressed to Isabella Jones, an attractive acquaintance of John and George Keats.[45]

Yet most critics agree upon the poem's connection to Fanny Brawne, the woman Keats met and fell in love with in 1818. As White notes, 'despite the doubts about the intended recipient and its date, there is something about this beautiful sonnet which makes us *want* it to be addressed to Fanny.'[46] Certainly, since the release of Jane Campion's tribute to John and Fanny's relationship in her film *Bright Star* (2009), the link between the poem and the relationship between these 'star-crossed' lovers has been cemented in the popular imagination. From a scholarly perspective, Cedric Watts has listed Fanny's transcription of the sonnet into a copy of Dante, as well as its association with those other poems presumably addressed to her, as further evidence of the connection.[47] In this chapter I would like to suggest another reason for associating

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[40] In a letter, Keats also mentions the 'unchangeable attribute' of 'the Sun, the Moon, the sea and Men and Women' (1.386–387). I believe this comment has little bearing on my discussion, however, because Keats does not explicitly mention the starry heavens. In any case, he must have recognised the variability of men and women, even as he termed them 'unchangeable.' Keats's point is about the 'poetical character' which must have 'no character,' according to his theory, and must be able to enjoy both 'light and shade.' For obvious reasons, these ideas are often discussed in conjunction with Keats's theory of 'Negative Capability.'

[41] Robert S. White, *John Keats*: *A Literary Life* (Hampshire: Palgrave Macmillan, 2010), 216.

[42] Nicholas Roe, *John Keats*: *A New Life* (New Haven and London: Yale University Press, 2012), 332.

[43] In John Keats, *The Complete Poems*, ed. Jack Stillinger (Cambridge MA: Harvard University Press, 1982), 460.

[44] See Michio Sugano's important study: 'Was "Keats's Last Sonnet" Really Written on Board the *Maria Crowther*,' *Studies in Romanticism* 34.3 (1995): 413–440.

[45] Robert Gittings. *John Keats* (London: Heinemann, 1968), 400.

[46] White, *John Keats*, 216.

[47] Cedric Watts, 'Keats's "Bright Star" and "A Lover's Complaint,"' *Notes and Queries* (2006): 320–322.

Fanny Brawne with Keats's 'Bright Star' sonnet. I argue here that the poem forms a part of a series of Keats's communications with Fanny Brawne that both questions and seeks desperately to confirm her faithfulness to him and to lament his own steadfastness to her.

A letter that the poet wrote in July 1819 strengthens the argument that Keats addressed his sonnet to Fanny. This letter is also the strongest evidence scholars have that it was composed in the middle half of that year. In this passionate epistle, Keats signs off: 'I am distracted with a thousand thoughts. I will imagine you Venus tonight and pray, pray, pray to your star like a Hethen. Your's ever, fair Star, John Keats' (2. 133). Elsewhere in the letter Keats writes of his uncertainty – his belief in the one-sidedness of his affections – and contemplates the possibility of Fanny's infidelity to him. Keats reveals his painful apprehensions with no small amount of manipulative provocation:

> I say you cannot conceive; it is impossible you should look with such eyes upon me as I have upon you: it cannot be […] I have, believe me, not been an age in letting you take possession of me; the very first week I knew you I wrote myself your vassal; but burnt the Letter as the very next time I saw you I thought you manifested some dislike to me. If you should ever feel for Man at the first sight what I did for you, I am lost. Yet I should not quarrel with you, but hate myself if such a thing were to happen – only I should burst if the thing were not as fine as a Man as you are as a Woman. (2.132)

Here Keats, anxious about Fanny's fidelity, must ultimately 'imagine' her a Venus, steady and constant. In this idealistic imagining, she is not a 'bright' but a 'fair' star. Rather than supplying the identity of Keats's star in his poem, this letter to Fanny prompts significant questions about how the sonnet should be read. Why did Keats choose to call Fanny a 'fair star' in his letter but address a 'bright star' in his poem? Why does he leave the star unidentified in his sonnet but so clearly invoke Venus in his letter?

Andrew Motion finds Keats's phrasing in his letter to Fanny 'suggestive but inconclusive.' This is because Motion is confident that 'Keats is talking about the North Star, not Venus the evening star.'[48] Similarly, while John Barnard recognises that Keats's 'Venus' letter to Fanny is a credible means of dating the sonnet, he argues that in the poem Keats is certainly 'thinking of the North Star.'[49] White also believes

[48] Motion, *Keats*, 323.

[49] John Barnard, 'Notes,' in John Keats, *The Complete Poems* [1973], ed. John Barnard (London: Penguin, 2006), 708.

that the poet addresses the North Star,[50] despite the fact that there is no language of navigation, no northern skies or celestial poles, nothing, in fact, in Keats's poem to suggest he is talking about this particular bright star.

Critics have, nonetheless, a strong basis for this hypothesis. In July 1818, while on a walking tour with Brown in the Lakes District, Keats wrote to his brother Tom about the experience of seeing Windermere from Ambleside: 'the two views we have had of it are of the most noble tenderness – they can never fade away – they make one forget the divisions of life; age, youth, poverty and riches; and refine one's vision into a sort of north star which can never cease to be open lidded and stedfast over the wonders of the great Power' (1.299). These lines, as Gittings notes, have more than a coincidental resemblance to those that appear in the sonnet where Keats seemingly declares that he does not want to be 'watching, with eternal lids apart' but eventually decides that he still does want to be 'stedfast.'[51] Gittings uses this evidence to suggest that Keats wrote his poem when reading over his letters to Tom on his return to Hampstead in October 1818. The corresponding lines could not have been written later, he argues, after Keats had forwarded the letters on to his brother George in America. Rather, Gittings believes that they could only have been written while the poet 'had this passage actually before his eyes […] the likeness is so close that there is no question of memory.'[52]

But scholars have taken issue with this logic ever since Walter Jackson Bate noted that 'phrasal anticipations of poems much later than October 1818 appear in these particular letters' and also that 'the recurrence of images and phrases from the letters generally, from 1817 on, is commonplace.'[53] Debunking Gittings's argument in this fashion not only calls the 1818 date of composition into question, but also undermines confidence in the meaning ascribed to the metaphors that Keats salvaged from his letter. According to the same logic, it is not at all certain that Keats uses the same imagery in exactly the same context in his sonnet. As critics have long recognised,

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[50] White, *John Keats*, 216.

[51] Robert Gittings, quoted in Walter Jackson Bate, *John Keats* (London: Oxford University Press, 1967), 359.

[52] Robert Gittings, quoted in Bate, *John Keats*, 359.

[53] Bate, *John Keats*, 359.

Keats often deploys ideas and turns of phrase found in the letters to different ends in his poetry.

Nicholas Roe has recently connected Keats's poem to fresh celestial influences. According to Roe, Keats's correspondence with Fanny 'coincided with quarterly phases of the moon, each letter being written and dispatched at the new moon, its first quarter and the full moon.'[54] Most germane to my discussion, however, is Roe's association of the bright star in Keats's sonnet with a transitory celestial phenomenon. He draws attention to the fact that Keats had written to Fanny, some weeks before he vowed to imagine her a Venus, telling her: 'I have seen your Comet' (2.127). The appearance of the fiery object in 1819 had been significant enough to warrant publication in the press:

New Comet.

The attention of the scientific world is unexpectedly called to the observance of an important phenomenon in the heavens, viz., the appearance of a new comet, (or, possibly, the re-appearance of one that has before visited our system), which is seen to the northward, and not very far above the horizon. Its situation among the stars seems to be near the fore feet of the constellation Lynx, not far from the star called (ß) Beta Ammiga, nearly in a line with it and the very bright star called Capella : this comet is of greater brilliancy and magnitude than any that has appeared for many years; its tail extends considerably more than that of September and October, 1811 […] Probably the present comet has long travelled ethereal space, and is now rapidly making its way towards the sun, its foci, in which case it will become more brilliant in approaching the sun, but appear to sink towards the northern horizon, and very soon become invisible […] If it should have passed its perihelion, and be receding from the sun, it will gradually diminish in splendour, but may remain visible for some considerable time.[55]

The comet 'will gradually diminish in splendour, but may remain visible for some considerable time.' Keats's 'Bright star,' in this reading is impermanent. It is 'ethereal' but also ephemeral, a beacon moving apace. Roe's argument represents a significant break with conventional ideas about the identity of Keats's 'Bright Star' and so is important to quote at length:

Night after night Fanny's comet hung brightly overhead, apparently as stationary and unchanging as the stars yet in reality a transient visitor returned fleetingly from its long traverse of 'ethereal space.' As Keats's solitary yearning for Fanny took on an aspect of 'impossibility and eternity,' contrasting aspects of her comet – brilliantly present, eternally vanishing – may have helped release his divided feelings into a sonnet,

[54] Roe, *John Keats*, 331.

[55] 'The New Comet,' *The Derby Mercury*, July 8, 1819, 2. Other descriptions of the comet appeared in papers throughout the country including in London.

> ‘Bright Star’ […] Steadfast, unchanging, so intimately close as to ‘touch,’ ‘hear,’ ‘feel’ and then ‘swoon on’: the arc of Keats’s feelings across the single sentence of his sonnet mirrors the trajectory of Fanny’s comet, poised aloft yet also careering on towards the sun.[56]

The paradox inherent in the comet recognised by Roe here (it is ‘apparently as stationary and unchanging as the stars yet in reality a transitory visitor’) speaks to the contradiction that emerges in the ‘Bright star’ sonnet between the poet’s longing for permanence and his intoxication with mutability. These ‘divided feelings,’ as Roe terms them, are perfectly emblematised in the symbol of the temporal celestial object. This fugitive of immortality is all the more unsettling because it still must also carry the association with the eternal inscribed into western cultural memory. As a metaphor, the comet has not made a clean escape. I find Roe’s argument about the ‘brilliant’ comet and Keats’s ‘Bright star’ convincing, yet it is important to note – in the observational notes printed in the paper above – the expression ‘bright star’ is not actually ascribed to Fanny’s comet, but to an object outside of the solar system, the ‘very bright star called Capella.’

6. Fixed Star

Given the lack of evidence in the poem itself, it is still unclear whether Keats is referring to either Venus or the North Star, or indeed the comet of 1819 in his poem. It is, however, almost certain that Keats was exposed to the idea that bright stars were often changeable. As well as receiving up-to-date astronomical instruction at Enfield, and becoming a part of a dynamic community at the cutting edge of science while at St. Thomas Hospital, Keats would have absorbed the shifting use of the term in public discourse that had been brought about by the publication of papers on variable stars by Herschel, Pigott and Goodricke in the *Philosophical Transactions*. Interestingly, all of these men continued to use the term ‘fixed star’ to describe celestial objects they knew to be changeable. ‘That several of the fixed stars have a proper motion,’ Herschel notes in an early paper, ‘is now already so well confirmed, that it will admit of no further doubt.’[57] Indeed, Herschel continued to use the term ‘fixed’ to refer to stars, as

[56] Roe, *John Keats*, 331–332.
[57] William Herschel, ‘On the Proper Motion of the Sun and Solar System; with an Account of Several Changes that Have Happened Among the Fixed Stars Since the Time of Mr. Flamstead,’ *Philosophical Transactions of The Royal Society of London* 73 (1783): 247–283, 247.

opposed to the planets, for the rest of his career, even when describing the disintergration of entire star systems.

The observations and theories contained in the papers on stellar variation published in the *Philosophical Transactions* – as well as the continued use of the term 'fixed star' to refer to changeable objects – also found its way into John Bonnycastle's *An Introduction to Astronomy*. Interestingly, in a treatise that is over 400 pages, Bonnycastle mentions the term 'bright star' only three times. First, he describes Samuel Molyneux's (1689-1728) observations of the 'bright star in the head of Draco' in 1725. Here, as is often the case in newspapers and journals of the period, a bright star is any particularly bright star in a constellation (300). Second, Bonnycastle uses the term in connection with the North Star:

> The most remarkable constellation in the northern hemisphere, and that which is more generally known, is the Great Bear; which consists of seven principal stars, four of which form nearly a square and of these, the two hindermost are called the pointers; because, if you imagine a line to be drawn through them and continued upwards, the first large bright star which it nearly passes through, is the polar star. (318)

Rather than being described as *the* bright star, the polar star is one of 'seven principal stars' and 'the first large bright star' in the Great Bear constellation. In the same section, Bonnycastle continues with his guide to the most recognisable objects in the night sky and then turns his discussion to less dependable stellar phenomena, 'the sudden appearance of new stars, and the disappearance of old ones':

> Having thus got the north star, and the seven in the Great Bear, observe what figures they form with some other remarkable star; then by referring to your map, and tracing out there, by your eye, the same figure, you will find the name of this star, which let us suppose to be Arcturus; then again proceed with this and some other in the same manner, and you will soon become familiar with the names of most of the constellations, and the principal stars they contain.
>
> But of all the phænomena of nature, the sudden appearance of new stars, and the disappearance of old ones, is one of the most singular and difficult to account for. A circumstance of this kind first led Hipparchus to compose his catalogue of the stars, in order that posterity might be apprised of the true state of the heavens at that period; and since his time many changes of the same nature have been observed, both by ancient and modern astronomers. Some of the larger stars have not the same precise situations which are attributed to them by the ancients, and others are found to have a periodical increase and decrease of magnitude. The bright stars, Sirius and Arcturus, have been observed to change their places, by moving towards the south, about two or three minutes of a degree in a century; and the stars, Aldebaran and Aquila, have also a like motion but something slower, and less easy to be determined. (318–319).

Some of the 'larger stars' in the sky, Bonnycastle writes, have moved or fluctuated in their brightness. The 'bright stars' Sirius and Arcturus have changed their places, as have, at a slower pace, Aldebaran and Aquilla. In the following pages of Bonnycastle's text, Keats would also have read about the discovery of other brilliant, bright 'new' stars: Tycho Brahe's variable in Cassiopeia, whose 'splendor exceeded that of Jupiter when nearest the earth, and was such that it could be seen in the day-time' (319); another 'new star in the right leg of Serpentarius, which was nearly as brilliant as the former' (320); as well as the pulsating Mira star discovered by David Fabricus in 1596, which

> At the time of its greatest brightness […] appears equal to a star of the third magnitude; and is scarcely ever so small but that it may be seen with a six feet telescope. Hevelius assures us, that it once entirely disappeared for four years; and Cassini, who observed it at the time of its greatest splendor, about the beginning of August 1703, found it to be of the third magnitude, as had before been supposed by Fabricus. In this time it had made about one hundred and seventeen revolutions, which, at a mean, fixes its period at three hundred and thirty-four days; but it has since been found that its changes are very irregular. (320–321)

Through Bonnycastle's treatise, Keats had learnt that a star's 'splendor,' 'brightness' and 'brillian[ce]' was often linked to its changeability and that these changes could be 'very irregular.'

Had Keats ignored contemporary astronomy's findings about stellar displacement and fluctuation, 'Bright Star' might have looked more like a conventional love poem. Instead of containing what White describes as 'a sustained contemplation of Keats's lifelong preoccupation with fusing eternity and the moment' and a reaching 'towards an intersection between the timeless and time,'[58] Keats's poem might have embodied a more straightforward tribute to celestial steadfastness. Just such a poem was written by Keats's contemporary and acquaintance, Barry Cornwall (1787-1874), also known as Brian Procter:

> Perhaps the lady of my love is now
> Looking upon the skies. A single star
> Is rising in the East, and from afar
> Sheds a most tremulous lustre: Silent Night
> Doth wear it like a jewel on her brow:
> But see! it motions, with its lovely light,
> Onwards and onwards, thro' those depths of blue,

[58] White, *John Keats*, 216.

To its appointed course stedfast and true.[59]

Cornwall's star is undoubtedly Venus, rising in the East as she 'sheds a most tremulous lustre.' His lady love looks upon the 'silent' skies of night – the heavens are as deep untroubled waters and the star moves 'onwards and onwards' to its 'appointed course.' The constancy of both the lady and her poet are reflected in the steady course of the star which remains 'stedfast and true.' The final phrase of Cornwall's poem clearly resonates with Keats's own sonnet. But despite the fact that Richard Marggraf Turley argues that the parallels between the two poems could not be coincidental (he asks: 'whose poem has impressed itself on whose?')[60] – the similarities between them might reasonably be explained by the zeitgeist. Of greater interest to my discussion than determining influence between Keats and Cornwall is the way in which two poems with such immediately recognisable touchstones (they both conflate the lovers' image with a brilliant star, they both are interested in its steadfastness) could produce such widely different meditations upon eternity and love. Keats's poem is undoubtedly more heart-wrung and passionate and much less steady. The poet throws his lover's tribute off-kilter through the contrasting, antithetical movements of its octet and sestet. The poet wavers in his desires, qualifies them with his inclusion of 'not and no.' Neither poet, lover, nor indeed star move towards an 'appointed course steadfast and true.' Keats himself wrote to Fanny in August 1819 that he was 'not idle enough for proper downright love-letters' (2.136) and it seems this was true of his love poems as well.

There is good reason to believe that in 1819 Keats had not intended, or indeed was unable, to write an uncomplicated love poem such as Cornwall's. There are two compelling veins of evidence to support this assertion. The first is Keats's troubled, complicated feelings about Fanny Brawne, as expressed in the letters and other poetry he addressed to her in the period. The second is his positioning of the poem when he copied it out on his way to Italy in 1820. The situation of Keats's transcription of the sonnet within the copy of Shakespeare's works (recently gifted by him to Joseph Severn) undermines its reputation as a pristine embodiment of a love of celestial purity. Keats's choice, according to Cedric Watts, was no accident: 'altogether, the book then contained eighteen blank slides. Nevertheless, he has chosen to place his

[59] Barry Cornwall, *Marcian Colonna*: *An Italian Tale*; *with Three Dramatic Scenes*, *and Other Poems* (London: John Warren, 1821), 205–206.

[60] 'Richard Marggraf Turley, *Bright Stars*: *John Keats, Barry Cornwall and Romantic Literary Culture* (Liverpool: Liverpool University Press, 2012), 83.

sonnet "Bright Star" far in, on page 220, so that it is given a starkly ironic counterpoint by "A Lover's Complaint," the story of "a fickle maid," prematurely aged by grief, who has been seduced and abandoned by a charming but wicked young man.'[61] The irony, in Watts's reading, comes from the disparity between the language, tone and outward intention of Keats's sonnet compared to what appears in Shakespeare's poem: 'In contrast to the sonnet's opening imagery of cold serenity,' the woman's state in 'Complaint' is 'one of wild despair':

'[H]eaven's fell rage' opposes the imagery of nature's calmness. Instead of beholding 'moving waters at their priestlike task/ Of pure ablution,' we find that she is 'Storming her world with sorrow's wind and rain.' In contrast to the sonnet's stasis of a youthful embrace, time's ravages are stressed, even if remnants of beauty penetrate the lattice of age. Later, the jilted woman tells how her seducer had offered her, as flattering trophies, 'deep-brain'd sonnets' that enamoured women had sent him. (This cynical detail calls in question the amatory efficacy of a love-sonnet such as 'Bright Star').[62]

Watts goes further to suggest that

Liminal Keats, haunter of thresholds and pursuer of paradox, has complicated and compromised the affirmations of 'Bright Star' by its very positioning […] Keats's placing of the sonnet appears to be deliberate; but, even if it were accidental, powerful ironies would remain. 'Bright Star,' extolling the imagined bliss of being 'for ever' united with a young woman, is modified by its inclusion within the textual space of a lamentation by a time-ravaged woman who has been deflowered and deserted.[63]

Interestingly, Shakespeare (or whoever wrote 'A Lover's Complaint') not only stresses the infidelity of the lover but also describes the jilted woman as 'fickle.' The rogue male has engaged in deception, but the time-ravaged woman has reneged on the sacred vows she took upon becoming a nun. This is a poem about the inherent changeability and unreliability of promises. As such, I agree with Watts that the adjoining of 'Bright Star' with a poem about failed love creates 'powerful ironies' that modify the reading of Keats's sonnet. However, it is possible that these same ironies exist within the poem itself. Scholars know that 'liminal Keats, haunter of thresholds and pursuer of paradox' is interested in occupying uncertainties and that he felt at one time unable 'to endure much longer the agonies and uncertainties which' his love for Fanny was 'so peculiarly made to create' (*Letters* 2.291). What better way to layer his

[61] Cedric Watts, 'Keats's "Bright Star,"' 321.

[62] Watts,'Keats's "Bright Star,"' 321.

[63] Watts,'Keats's "Bright Star,"' 322.

poem with his 'divided feelings' about Fanny (as Nicholas Roe calls them) than to insert a troubled metaphor into the heart of his poem? To speak of the steadfastness of a bright star that may be understood as variable in proportion to its brightness?

7. To Fanny

Keats was 'in deep love' (*Letters* 2.132) with Fanny Brawne, of that there is no question. But this was a troubled, fervent, obsessive love that never achieved a peaceful realisation. I am inclined to agree with Roe who suggests that the poem was composed in July 1819, when we know that Keats was thinking of celestial phenomena and connecting these thoughts with Fanny.[64] I also think that the 'very abstr[a]ct Poem' (2.132) that Keats was composing at the same time – given its mind-twisting inversions of language, imagery and meaning – might have been his 'Bright Star' sonnet. It is not unreasonable to suppose that Keats could have told Fanny that he was 'imagining' her Venus, while composing a sonnet that contained a more complicated celestial metaphor, which imagined her 'bright' like a variable star, rather than 'fair' like the star of morning and evening. Most critics, however, believe that Keats is referring to the composition of *Hyperion* in this letter. Yet whether one takes July, October or November 1819[65] as the date of composition of his 'Bright Star' sonnet, it must be acknowledged that Keats was writing beautiful, anxious, petulant, resentful, adoring and grief-ridden letters to Fanny throughout the last half of that year. This affect found its way into his poetry.

In these communications Keats expressed the ambivalence of his feelings, the pleasure and pain that derived from his devotion to a love that seemed beyond his reach: 'So you intend to hold me to my promise of seeing you in a short time. I shall keep it with as much sorrow as gladness: for I am not one of the Paladins of old who livd upon water grass and smiles for years together—What though would I not give to night for the gratification of my eyes alone' (*Letters* 2.137). Keats had been surprised by the strength of his own feelings and his loss of control over them. He told Fanny that he was 'astonish'd to find' himself 'so careless of all cha[r]ms' but hers, remembering as he did 'the time when even a bit of ribband was a matter of interest' to

[64] See discussion above in 'section 5: Steadfast as Thou Art.'

[65] Based on Fanny Brawne's transcription of the poem into her copy of Cary's *Dante*, a gift from Keats.

him (2.133). He also wrote that he had endured a 'throng of Jealousies' in Fanny's name (2.140–141) and could not understand what she liked in him (2.137). Yet he did not wish to write Fanny an'artificial Passion' (2.141). And so, separated from Fanny by the influence of his well-meaning friends who opposed the match, the apparent poverty that seemed to made marriage an impossibility, and by the decline of his health, Keats wrote to her of his longing to be free of his own passionate steadfastness:

> Knowing well that my life must be passed in fatigue and trouble, I have been endeavouring to wean myself from you: for to myself alone what can be much of a misery? As far as they regard myself I can despise all events: but I cannot cease to love you. This morn[i]ng I scarcely know what I am doing […] I am a Coward, I cannot bear the pain of being happy: [i]t is out of the question: I must admit no thought of it. (2.160)

Keats expressed relief at those times when he was able to put Fanny out of his mind and concentrate on his writing. He thought this made him appear 'unloverlike and ungallant': 'that I should have so unsoften'd so hard a Mind as to forget […] the brightest realities for the dull imaginations of my own Brain' (2.141). Reality with Fanny was dangerously bright in its power and this power derived from his uncertainty. If Keats thought of Fanny, he thought of his own irrational 'greed' for her, the chance that she might not feel as he did, the likelihood that they would remain apart forever. Keats's passion threatened to burn him: 'it seems to me that a few more moments thought of you would uncrystallize and dissolve me—I must not give way to it—but turn to my writing again—if I fail I shall die hard— O my love, your lips are growing sweet again to my fancy—I must forget them' (2.142).

By mid-1820, Keats's 'unreasonable' jealousy of Fanny and his friend Brown had reached fever pitch. Letters from this period describe his 'torments' and 'suspicions' (2.263, 292). Yet his jealousy of Fanny had taken root much earlier, in the latter half of 1819, when Keats was composing 'Bright Star' and other love poetry, such as 'To Fanny.' In this poem Fanny is 'brilliant' and 'bright' and 'changeable':

> Ah! dearest love, sweet home of all my fears
> And hopes and joys and panting miseries,–
> To-night, if I may guess, thy beauty wears
> A smile of such delight,
> As brilliant and as bright,
> As when with ravished, aching, vassal eyes,
> Lost in a soft amaze,
> I gaze, I gaze!

Who now, with greedy looks, eats up my feast?
What stare outfaces now my silver moon!
Ah! keep that hand unravished at the least;
Let, let the amorous burn–
But, prithee, do not turn
The current of your heart from me so soon:
O save, in charity,
The quickest pulse for me.

[…]

Why this, you'll say–my Fanny!–is not true;
Put your soft hand upon your snowy side,
Where the heart beats: confess–'tis nothing new–
Must not a woman be
A feather on the sea,
Swayed to and fro by every wind and tide?
Of as uncertain speed
As blow-ball from the mead? (*Poems* 376–377)

Fanny, when she appeared to Keats to 'roam' (377) from him, to move with 'uncertain speed' to 'turn/ The current' of her heart, might have appeared a 'bright,' wandering star, 'brilliant' and changing. But Keats was bound to his love by tethers that he did not completely understand:

Bright star, would I were stedfast as thou art–
Not in lone splendor hung aloft the night,
And watching, with eternal lids apart,
Like nature's patient, sleepless eremite,
The moving waters at their priestlike task
Of pure ablution round earth's human shores,
Or gazing on the new soft-fallen mask
Of snow upon the mountains and the moors;
No—yet still stedfast, still unchangeable,
Pillow'd upon my fair love's ripening breast,
To feel for ever its soft swell and fall,
Awake for ever in a sweet unrest,
Still, still to hear her tender-taken breath,
And so live ever—or else swoon to death. (*Poems* 274)

If the star – which has always been a symbol of constancy – is now proven to be inconstant, then what does that mean for the lover who is compared to that star? If Keats's 'Bright star' is variable, corruptible under nature's law, the poem contains a different kind of heart-wrung longing than is usually ascribed to it. Read this way, the first part of Keats's sonnet expresses his desire to be like Fanny. He has imagined her

fickle, inconstant, 'a feather on the sea.' The octet speaks to Keats's yearning to be steadfast in the variable star's way of the steadfastness – '*Not*' chained to his lover, to eternity, not patient and sleepless like the stars of old, but able to move, to fluctuate, to be free. 'Bright star,' Keats implores, 'would I were stedfast as thou art': steadfast *as* the bright star which, Keats knows, is not steadfast at all.

Fanny, the 'Bright star,' is a new, a changeable point of light, fluctuating in her brightness. She exists '*Not* in lone splendour hung aloft the night/ And watching, with eternal lids apart/ Like Nature's patient, sleepless eremite.' Fanny in this imagining is not a paragon of Aristotelian purity and constancy but the real, human, changeable lover that emerges from Keats's letters.[66] She, like a variable star – and unlike the stars of old – is infected with mortality. She is '*Not*' set divinely apart in an eternal firmament bound to serenely observe 'earth's human shores' from a distance, to gaze at, but not to enjoy, 'the new soft-fallen mask/ Of snow upon the mountains and the moors.' Instead Fanny breathes. She inhales her 'tender-taken breath.' In the ultimate act of humanity her live, 'ripening breast' moves under 'swell and fall.' It is Keats who, unmoving like the stars of old, is stuck in an eternal fixity. As much as he would like to, he cannot 'forget' Fanny (*Letters* 2.142) nor 'cease to love' her (2.160).

In this reading, the hunger for stellar permanence that emerges in the transition from octet to sestet represents a shift in the poet's feeling towards the 'Bright star' metaphor. Here, Keats admits his own inate steadfastness and longs to invoke a star that represents him, a star that poets and lovers had called upon to symbolise permanence for millennia. This metaphor, he realises, can longer exist, but he longs for a star that is 'yet, *still* steadfast, *still* unchangeable,'[67] that can symbolise for him his own unchangeable longing.[68] Keats longs to be 'awake for ever,' like the old 'sleepless' star that is described in the octet but which the 'Bright star' is defined in opposition against. Keats cannot, '*No*,' not follow the bright star's wandering path.

The transcription of the 'Bright Star' sonnet next to 'A Lover's Complaint,' the characterisation of his relationship with Fanny that appears in Keats's letters, as well as the variable qualities ascribed to bright stars in the popular press throughout Keats's

[66] As unfair a representation as these letters might contain.

[67] The poet's compulsive insistence to be 'still stedfast, still unchangeable' – there appears four 'still's and two 'forever's in a fourteen-line sonnet, in fact, appears to undermine any security we might have about the star being endowed with these qualities.

[68] All italics are my own emphasis.

lifetime, should convince us of the legitimacy of this reading. And yet this is clearly not the only reading that the poem contains. The traditional meaning ascribed to Keats's poem – where Keats wishes, as Harold Bloom eloquently puts it, 'to be steadfast but not in the star's way of steadfastness' and to imbibe the constancy of the eternal star while rejecting its aloofness from sensual pleasure – stands. All turns on the nature of the celestial object. But Keats did not put a name to his star. And so the poem can be read either as a traditional love sonnet or a more troubled and complex expression of a poet's uncertainty about his lover's constancy. Just like the stars of Romantic astronomy that were both 'fixed' in comparison with the planets and endowed with 'proper motion' when compared with the stars of old, the bright star in Keats's poem is either steadfast or changeable, the poet is either steadfast or changeable, the lover is either steadfast or changeable, all according to perspective. Keats exists in two contradictory states of being, each equally convincing and compelling. Indeed, the bright star image was the perfect metaphor for Keats to express his emotional equivocation about his relationship with Fanny.

In allowing for the possibilities afforded by shifting perspective in his poem, Keats further engages with the scientific discourse surrounding 'bright stars' in Romantic astronomy. William Herschel had used his first paper read before the Royal Society of London to discuss the appearance of an irregular star in the constellation Collo Ceti.[69] This object, first discovered by Fabricus in 1596, was a different kind of variable than that observed by Brahe. These stars, called 'Mira' after the first known object of its kind, are pulsating red giants that cycle in brightness less regularly than other variables.[70] In his treatise, eventually published in the *Philosophical Transactions* of 1780, Herschel makes the following observations about its shape, brightness and lustre:

October 6, 1779, 'the periodical star was exceedingly bright this evening' […]
October 19, 1779 […] At 12 o'clock, the periodical star is now about the meridian, and brighter than α Arietis […]
Nov. 2, 1779, the lustre of the periodical star is still increased. The body is very full and round in the telescope […]
Nov. 20, 1779, the periodical star seemed to be as bright as before, but not brighter […]

[69] William Herschel, 'Astronomical Observations on the Periodical Star in Collo Ceti,' *Philosophical Transactions of The Royal Society of London* 70 (1780): 338–344.

[70] In fact there are four kinds of variable stars: Mira stars, eclipsing binaries, cepheids and cataclysmic variables and nova of the kind first observed by Brahe [David H. Levy, *Skywatching* (San Francisco: Fog City Press, 2007), 40–41].

Nov. 30, 1779, o Ceti is considerably decreased […]
December 4, 1779, the lustre of o Ceti is only equal to α[71]

As with many astronomical observations in the period, the star's aesthetic appearance is the means by which Herschel attempts to understand the character of the star, to determine its classification as an irregular celestial object. In other words, he uses his descriptions to speculate on the cause of the star's fluctuating brightness. Was the French astronomer Pierre Louis Maupertius (1698-1759) right in suggesting that these objects might be flat like Saturn's ring and disappear when their fine edge turned towards the earth creating an optical illusion?[72] Or was Newton's student John Keill (1671-1721) correct in his assumption that the stars themselves were corruptible?[73] Herschel finishes his paper with this quote from the latter astronomer:

It is probable, that the greatest part of this star is covered with spots and dark bodies, some part thereof remaining lucid; and while it turns about its axis, sometimes shows its bright part, sometimes it turns its dark side to us; but the very spots themselves in the star are liable to changes, for it does not every year appear with the same lustre. Sometimes it resembles a star of 2d magnitude; in other years in can scarcely be reckoned among stars of order.[74]

According to Maupertius's hypothesis, it is not the stars themselves that are changing but the perspective they offer the observer. In Keill's understanding the stars are capricious, elusive, composed of darkness and light. They sometimes show the best, and sometimes only the worst of themselves. Though he gives Keill the last word in his paper, Herschel himself seems to have aligned with Maupertius's view. While he refers to the variability of the star as 'remarkable,' 'wonderful' and 'surprising,' he admits that these qualities are the result of perception alone, observations as much based on imperfect optical instruments and compromised perspective as an exacting scientific measurements. In his journal entry for October 7, 1779 (printed as part of the same paper), he notes that Mira is 'perfectly round in the telescopes, and its apparent diameter well defined, full, and very large, for a star of that magnitude.' But he also acknowledges the different observational factors that have intruded upon his perception:

[71] Herschel, 'Star in Collo Ceti,' 338–340.

[72] Herschel, 'Star in Collo Ceti,' 340.

[73] Herschel, 'Star in Collo Ceti,' 340.

[74] Herschel, 'Star in Collo Ceti,' 344.

To explain this a little more at large: the body of the sun, for instance, is of a certain dimension, which we call his real diameter, and this remains always the same. His apparent diameter (which I here call real apparent) is changeable, according as we approach to, or recede from him […] but were he removed to the distance of one of the nearest fixed stars, neither his real, nor real apparent diameter, could then be known to us by any method we have hitherto been acquainted with […] and yet I doubt not, but that we should observe some apparent diameter or other of the sun thus removed from us; and this is what I here have called the apparent diameter. This must be owing to some optical deception.[75]

Here it is not the 'deception' or 'duplicity' of the star itself that results in changes to its appearance,[76] but defects inherent in the act of surveillance, the limited vision and perspective offered to an observer. Even if Fanny is a real 'Bright star,' even if she appears to be unsteady, sometimes bright, sometimes dark, it might not be she who is unsteadfast, who has shifted her position, who has changed.

[75] Herschel, 'Star in Collo Ceti,' 339.

[76] Herschel and his contemporaries did not know that 'real' changes within the chemical composition of stars themselves could cause fluctuations in brightness [David H. Levy, *Skywatching* (San Francisco: Fog City Press, 2007), 40–41].

Chapter Four:

Nebulosity and 'Negative Capability' in *Endymion*

1. Heaven and Earth

The argument about *Endymion* and the existence (or not) of allegorical meaning in the poem is one of the long-standing debates that define John Keats scholarship. In 1947, Newell Ford 'sent several bombshells into the ranks of Keatsians by utterly rejecting allegorical interpretation' of the epic and, like his predecessor Amy Lowell, asserting that the poem was more literal than figurative.[1] In arguing that *Endymion* was primarily about physical, erotic pleasure, Ford was setting himself against towering figures such as Sidney Colvin and Ernest De Sélincourt who believed that *Endymion* contained a 'parable of the experiences of the poetic soul in man seeking communion with the spirit of essential Beauty in the world.'[2] In 1953, Jacob D. Wigod sought to temper Ford's position by advocating a 'personal Platonism' in Keats's poem, 'complemented by a definite theory of poetic ascent, which characterises Keats's allegory in *Endymion*,' but which was not the systematic traditional Platonism or neo-Platonism advocated by earlier critics.[3]

By 1965, the majority of scholars believed that the subject of the poem was 'man's (or the poet's) attempt to commune with some ideal, which they have variously identified as beauty, love, truth, original Being, or a neo-Platonic harmony.'[4] This idea, in its many critical forms, basically holds that *Endymion* is about aspiration, a mortal longing for communion with the divine. Jack Stillinger's theory of Keatsian poetics, given at the beginning of his authoritative 1978 edition of the poems, supported this assertion. Here Stillinger stated that there was a 'basic Keatsian structure—a literally spatial conception of two realms in opposition and a mythlike set of actions involving characters shuttling back and forth between them—that appears in a great many of the

[1] Jacob D. Wigod defined Ford's contribution in these terms ['The Meaning of Endymion,' *PMLA* 68.4 (1953): 779–790), 779]. The bombs were dropped in Newell Ford's '*Endymion* – A Neo-Platonic Allegory?' *ELH* 14 (1947): 64–76 and 'The Meaning of "Fellowship with Essence" in *Endymion*,' *PMLA* 62 (1947): 1061–1076.

[2] Sidney Colvin, *John Keats*: *His Life and Poetry, His Friends, Critics and After-Fame* (London: Macmillan, 1917), 205.

[3] Wigod, 'The Meaning of Endymion,' 790.

[4] Bruce E. Miller, 'On the Meaning of Keats's *Endymion*,' *Keats-Shelley Journal* 14 (1965): 33–54, 33.

poems and can usefully serve as a device for relating poems, passages, and situations one to another in a view of what Keats's work as a whole is preponderantly "about."'[5] In his introduction, Stillinger also argued that Keats was not, primarily, a poet of ideas, and that his movement between heaven and earth, actual and ideal, the mutable and the eternal, formed part of an aesthetic rather than political or philosophical impulse. As the notion of Keats as estranged from the ideas and politics of his day eroded under the pressure of New Historicism, Stillinger's insights into the visionary and imaginative voyages of Keats's protagonists seemed less plausible. Could the works (even the early works) of the same author that penned the theory of 'Negative Capability' ever be understood as adhering to a formula or in terms of a neat, unfashionable allegory? Where once critics had argued that *Endymion* (unlike Keats's later poems) promulgated 'fixed and definite' ideas,[6] critics became loath to venture anything so crude as the poem's meaning. Kelvin Everest, for example, argued that *Endymion* was too long to be 'read consistently as allegory' because its materials were 'too profuse, and the narrative too wanderingly protracted.'[7] John Barnard similarly noted that objections to sustained allegorical readings included 'the loose suggestiveness of the poem' which spawned 'too many allegorical readings to allow for coherence.'[8]

Yet the fact remains that Keats's poem is organised according to narrative, and that narrative is an ancient story, a Greek myth – a recognised allegory about the interest taken by the gods in human affairs. The moon goddess Diana (or Luna, or Cynthia or Selene or Celeste) falls in love with the mortal shepherd Endymion. A rich new layer of meaning is created when Keats takes up this particular myth, at his particular moment of history, and infuses it with his own poetic response. In other words, to re-write a mythical story in a new way is to write an allegory. The emblem is the established narrative and the symbolism is what is created through the changes and additions that are made, relevant to the culture that has produced the re-imagining.

There is, as well, the unavoidable appearance of lines such as these in *Endymion*, which seem to announce the poem's implications and make text of subtext:

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[5] Jack Stillinger, 'Introduction,' in *The Complete Poems*, by John Keats, ed. Jack Stillinger (Cambridge, MA: Harvard University Press, 1978), xiii – xxviii, xvi.

[6] Glen O. Allen, 'The Fall of Endymion: A Study in Keats's Intellectual Growth,' *Keats-Shelley Journal* 6 (1957): 37–57, 37.

[7] Kelvin Everest, *John Keats* (Devon, U.K.: British Council, 2002), 43.

[8] John Barnard, 'Notes,' in *Selected Poems*, by John Keats, ed. John Barnard (London: Penguin, 2006), 585.

I have clung
To nothing, lov'd a nothing, nothing seen
Or felt but a great dream! O I have been
Presumptuous against love, against the sky,
Against all elements, against the tie
Of mortals each to each, against the blooms
Of flowers, rush of rivers, and the tombs
Of heroes gone! Against his proper glory
Has my own soul conspired: so my story
Will I to children utter, and repent.
There never liv'd a mortal man, who bent
His appetite beyond his natural sphere,
But starv'd and died. (*Poems* 154)

In this passage, the allegorical readings of Keats-critics-past find solid ground. Endymion, while ostensibly talking about his love of the moon goddess Diana (he has 'bent/ His appetite beyond his natural sphere'), is really speaking of the imaginative ambition of the poet who aims too high for truth and purity and is destroyed by hubris. He has 'clung/ To nothing, lov'd a nothing, nothing seen/ Or felt but a great dream!' and has been 'Presumptuous against […] the tie/ Of mortals each to each.' To use the words of De Sélincourt, he has found a 'reawakened sympathy with humanity.'[9] The poet has witnessed his faults and in so doing, the story of Endymion speaks of 'the development of the poet's soul towards a complete realisation of itself.'[10]

In support of this reading, too, is the fact that Keats himself identified the epic as a trial of his skill, a means for developing his fledgling poetic talents. In the poem's preface, he wrote that his reader 'must soon perceive great inexperience, immaturity, and every error denoting a feverish attempt, rather than a deed accomplished' (*Poems* 64). Both Keats and Endymion sought perfection, beauty and truth. In their failings, they found the path to self-knowledge. As Stuart Sperry has famously noted, 'in working out the destiny of his hero [Keats] was in fact working out his own.'[11]

The search for meaning in *Endymion* has been taken up again by twenty-first century critics. Karen Swann, for example, has developed the self-discovery allegory by arguing that a central thrust of Keats's poem is 'entrepreneurial':

[9] Ernest De Sélincourt, 'Introduction,' in *The Poems of John Keats*, ed. Ernest De Sélincourt (New York: Dodd, Mead & Company, 1905), xix – lxvii, xl.

[10] De Sélincourt, 'Introduction,' xl.

[11] Stuart M. Sperry, *Keats the Poet* (Princeton: Princeton University Press, 1994), 97.

Of all the projects the poet takes up, the most concertedly pursued is arguably one of self-commodification. *Endymion* proliferates images of the poet as a glamorous, arrested youth: these include Endymion himself but also Adonis, Glaucus, Hyacinth, Ganymede, Narcissus, the fevered author of the Preface, halted in a 'space of life between' boyhood and manhood, and his dedicatee Thomas Chatterton – all abstracted dreamers, all piercingly beautiful, all singled out by the gods, all marvelous fated boys, all destined for celebrity.[12]

Jo-Anne Cappeluit, on the other had, finds the poem's concern with youthful thinking and development 'central to understanding the pervasive "subject" of Keats's poetry.'[13] This subject is the imagination's conflict with the intellect and lies as a complicated philosophical allegory in *Endymion*. Cappeluit believes that Keats is keenly aware 'of the built-in failure of his poem […] he cannot make readers recognise Endymion's adolescent intellect as adolescent, much less recognise it as their own failed thinking.'[14]

While all of these readings are convincing, this thesis proposes a related but altogether more obvious reading of *Endymion* than has yet been considered. While Keats's rendering of the myth undoubtedly stands for something, it is also true that it may stand for a number of things. Even the strongest advocates for an allegorical reading of *Endymion*, recognised that Keats did not write in to a rubric. Sydney Colvin, for example, insisted that the poem contained not 'an obvious and deliberately thought-out allegory.'[15]

There is an aspect of Keats's *Endymion* that seems to turn from the self and which embraces the communal and the human. While other readings depend upon heaven acting as a symbol of purity, truth, a kind of poetic nirvana, or place of self-realisation, this chapter will explore what meaning is created if we see heaven in *Endymion* as representing, not the mind or the imagination, but a space presiding over a multitude. In this reading, the youth of Latmos is restored to his mythical identity as both shepherd and astronomer. In Keats's rendering, Endymion has 'been presumptuous […] against the sky,' has extended 'his appetite beyond his natural sphere' and has sought to know too much of heaven.

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[12] Karen Swann, '*Endymion's* Beautiful Dreamers,' in *The Cambridge Companion to Keats*, ed. Susan J. Wolfson (New York: Cambridge University Press, 2001), 20–36, 20.

[13] Jo-Anne Cappeluti, 'The Failed Reader: Keats's "Brain-Sick" Endymion,' *Philosophy and Literature* 36.1 (2012): 96–110, 96.

[14] Cappeluti, 'The Failed Reader,' 96.

[15] Colvin, *John Keats*, 205.

Early visual representations of the Endymion myth where there is no clear boundary drawn between heaven and earth. By the eighteenth century, this aspect of the narrative forms the basis for most artwork on the subject.

Clockwise from left: 6. Fresco depicting Selene and Endymion, Pompeii, 1st Century A.D. 7. Intaglio on Red Jasper, 'Luna with Endymion,' Exact date unknown. 8. Bronze handle with a sleeping youth, probably Endymion, Etruscan civilisation, 4 th – 3rd Century B.C. 9. Silver-gilt drinking vessel decorated with engraved figures of Diana and Endymion among vegetal volutes, circa 1690.

10. Pierre Subleyras, *Diana and Endymion*, c1740.
The realms of heaven and earth are divided equally by the two triangles that make up the rectangle of the picture. The canines ground Endymion to earth while the cherubs act as counterpoints and announce the woman's divinity

11. Richard T. Austin, 'Luna and Endymion,' Wood-engraving, c1802-1818.
Luna enters Endymion's bower. The framing of the two lovers within Endymion's dreamscape suggests that Diana's is not only a physical visitation.

2. Nebulous

I ventured to give notice to my assistant at the clock, 'to prepare, since I expected in a few minutes to come at a stratum of the nebulæ, finding myself already' (as I then, figuratively, expressed it) 'on nebulous ground.'

Herschel, 1784[16]

Keats wrote *Endymion* at a seminal moment in the history of astronomy, at a time that may itself be understood as nebulous. It is not difficult to see the figure of William Herschel, the visionary maverick who attempted to make sense of the universe, in the young sky-watcher of *Endymion* who stands poised at 'heaven's brink' (*Poems* 65). In a series of papers published in the *Philosophical Transactions of the Royal Society* between 1784 and 1814 relating to what William Herschel termed the 'construction of the heavens,' the astronomer theorised about the age and structure of the universe. Herschel's investigations into the heavens led him to the conclusion that stars were the same species as nebulae – that stars could decay under the force of gravity and leave remnants of themselves in the form of gas, dust and other stellar debris. But Herschel's voyages into the heavens, like those of Endymion, raised more questions than they answered.

The unprecedented strength of Herschel's telescopic lenses allowed him to see these mysterious stellar objects with some degree of clarity for the first time in history,[17] and this gave the former amateur astronomer confidence to espouse his theories on nebulous matter freely. Yet Herschel's telescopes – especially the 40ft monster built at Slough (which he thought would lay the heavens bare before him) – never achieved the perfect clarity he had hoped for. Even his immense skill as an observer and his possession of the most powerful optics in the world could not completely dissolve the mystery surrounding nebulous matter. Herschel was never able to speak as 'confidently of the *interior construction* of the heavens, and its various *nebulous and sidereal strata*,' as he had first predicted in 1784.[18] Later, Herschel summarised his predicament:

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[16] William Herschel, 'Account of Some Observations Tending to Investigate the Construction of the Heavens,' *Philosophical Transactions of The Royal Society of London* 74 (1784): 437–451, 449.

[17] Simon Schaffer, 'Herschel in Bedlam: Natural History and Stellar Astronomy,' *History of Science* 13.3 (1980): 211–239, 213.

[18] Herschel, 'Construction of the Heavens,' 437–438.

When I pursued these researches [into stars and nebulae], I was in the situation of a natural philosopher who follows the various species of animals and insects from the height of their perfection down to the lowest ebb of life; when, arriving at the vegetable kingdom, he can scarcely point out to us the precise boundary where the animal ceases and the plant begins; and may even go so far as to suspect them not to be essentially different.[19]

Were the nebulae merely optical illusions ultimately resolvable into individual stars with a powerful enough telescope? Or was there, in fact, 'true nebulosity' – translucent celestial bodies floating in the sky and surrounding stars? These questions pre-dated Herschel by almost a century,[20] but he vacillated between the two positions over his career. There was much at stake, in deciding between the two theories. If 'every visible object, in the extended and distant heavens, was of the starry kind,'[21] then there was no need to hypothesise about the existence of a different order of celestial object or to apply the biologist's trade in classification to the heavens. But if there existed a different kind of celestial matter, then there was a phenomenon in the heavens 'of a nature totally unknown' to astronomy.[22] Important questions had to be asked. Where did this material come from? Were the nebulae related to the stars? And could they change their appearance over time?

Herschel adopted the geological term 'strata' to describe the distribution of nebulae and star clusters through the heavens and thereby added a 'third dimension' to space.[23] In the 1784 paper he explained the necessity for adopting this perspective of the night sky.

Hitherto the sidereal heavens have, not inadequately for the purpose designed, been represented by the concave surface of a sphere, in the center of which the eye of an observer might be supposed to be placed. It is true, the various magnitudes of the fixed stars even then plainly suggested to us, and would have better suited the idea of an expanded firmament of three dimensions; but the observations upon which I am now going to enter still farther illustrate and enforce the necessity of considering the heavens in this point of view. In future, therefore, we shall look upon those regions into which we may now penetrate by means of such large telescopes, as a naturalist

[19] William Herschel, 'On Nebulous Stars, Properly So Called,' *Philosophical Transactions of the Royal Society* 81 (1791): 71–88, 72.

[20] Michael Hoskin, *William Herschel and the Construction of the Heavens* (London: Oldburn, 1963), 60–61.

[21] Herschel, 'On Nebulous Stars,' 1791, 73.

[22] Herschel, 'On Nebulous Stars,' 1791, 83.

[23] Hoskin, *Construction of Heavens*, 1963, 11. However, as Bernard Lovell notes, 'the belief in an infinite universe emerged logically when the heliocentric theory removed the constraints requiring that a sphere of fixed stars surrounded the Earth' ['Herschel's Work on the Structure of the Universe,' *Notes and Records of the Royal Society of London* 33.1 (1978): 57–75, 58].

regards a rich extent of ground or chain of mountains, containing strata variously inclined and directed, as well as consisting of very different materials. A surface of a globe or map, therefore, will but ill delineate the interior parts of the heavens.[24]

From early on, Herschel saw himself as a 'natural historian' of this new 'expanded firmament of three dimensions.' As Bernard Lovell has noted, Herschel's investigations into the history and development of star systems placed him at the coalface of enquiry into this multi-dimensional new vista: 'In three of the major cosmological issues, that is the structure of the Milky Way, the nature of the nebulae and the evolutionary problem[,] the work of William Herschel occupie[d] a central position in the torturous path towards […] new understanding.'[25] In other words, in seeking the truth about nebulous objects, Herschel was seeking the truth about Earth's place within a wider universe and the way this universe had been created, how it lived, and whether or not it could die.

William Herschel's early work on nebulae presented two conflicting points of view. Initially, upon applying his powerful telescopes to known nebulous regions, Herschel found that cloudy matter would often resolve into distinguishable stars. By the early 1780s, he had successfully resolved many of the nebulous objects catalogued by Charles Messier into star systems.[26] This supported the eighteenth-century astronomer Robert Smith's theory that the creamy appearance of nebulae, including the Milky Way, was 'nothing else but a prodigious number of very minute stars, so close to one another that the naked eye can only perceive a whitish mixture of their faint lights. This was *Galileo*'s discovery, who found also that those faint stars, which Astronomers call *Nebulosae*, appeared through his telescope to be small clusters of very minute stars.'[27] But Herschel had also turned to the observational notes of James Ferguson and Edmond Halley to help him answer the question of nebulae. When he compared these astronomers' sketches of the Orion nebula to his own drawings, he found obvious differences. Following on from Ferguson, Herschel reasoned that 'because a vast star system could not possibly alter shape in only a few years, a nebula that had

[24] Herschel, 'Construction of the Heavens,' 1785, 438.

[25] Bernard Lovell, 'Herschel's Work on the Structure of the Universe,' *Notes and Records of the Royal Society of London* 33.1 (1978): 57–75, 57.

[26] Herschel, 'Construction of the Heavens,' 1785, 440.

[27] Robert Smith, quoted in William Hoskin, *The Construction of the Heavens*: *William Herschel's Cosmology* (Cambridge: Cambridge University Press, 2012), 35. For a clear and thorough explanation of Herschel's shifting ideas about nebulosity see Hoskin's summary, which appears in the same work, under three sections on 'The Riddle of the Nebulae.'

demonstrably altered shape *must* be formed of true nebulosity.'[28] This deductive reasoning supported Halley's theory that nebulousity was the result of 'light coming from an extraordinary great Space in the Ether; through which a lucid *Medium* is diffused, that shines *with* its own proper lustre.'[29]

When Herschel published his first cosmological paper he had believed that both phenomena existed in the heavens – both true nebulosity and stars 'disguised' as nebulous matter. The Milky Way belonged to the latter and was an optical illusion created by the solar system's perspective within the strata of stars (or a galaxy). Very soon afterwards, however, Herschel changed his mind about 'true nebulosity.' In his groundbreaking paper of 1785, Herschel proved (through a survey of the boundaries of the galaxy) that 'the stupendous sidereal system we inhabit, this extensive stratum and its secondary branch, consisting of many millions of stars, is, in all probability, *a detached Nebula*.'[30] Herschel had gathered the empirical data necessary to argue that the milky nebulosity of Orion was just like the sprawling translucency of our own galaxy. This meant that he had furthered the theoretical ideas of Immanuel Kant and had proven, empirically, that there was more than one 'island' universe in the heavens.[31] But it also meant (according to Herschel's reasoning and his observations upon the Omega Nebula) that all nebulae must be resolvable, like the stars that make up the Milky Way.[32] The fast-paced changes observed in Orion 'must be illusory.'[33]

Eventually, Herschel's observation of a planetary nebula – so called for the nebula's spherical enveloping of a star – convinced him again of the existence of true nebulosity. He saw that the matter surrounding the star was intimately linked to its life story and thought that he was witnessing the birth of a star out of its own 'atmosphere'.[34] Herschel had found that the '*the nebulosity about the star* [was] *not of a starry nature*'[35] and that stars and nebulae were 'a well connected series of

[28] Hoskin, *William Herschel's Cosmology*, 2012, 36.

[29] Edmond Halley, quoted in Hoskin, *William Herschel's Cosmology*, 2012, 34.

[30] Herschel, 'Construction of the Heavens,' 1785, 244.

[31] Anne Janowitz, "'What a rich fund of Images is treasured up here": Poetic Commonplaces of the Sublime Universe,' *Studies in Romanticism* 44.4 (2005): 469–492, 479, 491–492.

[32] Herschel, 'Construction of the Heavens,' 1785, 218.

[33] Hoskin, *William Herschel's Cosmology*, 2012, 55.

[34] Herschel, 'On Nebulous Stars,' 1791.

[35] Herschel, 'On Nebulous Stars,' 1791, 73.

objects.'[36] He was also impelled to return to the reasoning he had first applied to the nebulae and he finally concluded that the alterations he had 'observed in the great milky nebulosity of Orion, 23 years ago, and which have also been noticed by other astronomers, cannot permit us to look upon this phenomenon as arising from immensely distant regions of fixed stars.'[37]

Herschel's beliefs about nebulae had shifted over his career but along the way he had offered a number of profound insights into the universal system. His most important contributions related to the evolution of individual stars and star systems and his application of Newton's theory of gravity to the remote reaches of the heavens.

> it will frequently happen that a star, being considerably larger than its neighbouring ones, will attract them more than they will be attracted by others that are immediately around them; by which means they will be, in time, as it were, condensed about a centre; or, in other words, form themselves into a cluster of stars of almost a globular figure, more or less regularly so, according to the size and original distance of the surrounding stars. The perturbations of these mutual attractions must undoubtedly be very intricate, as we may easily comprehend by considering what Sir ISSAC NEWTON says in the first book of his Principia[38]

Herschel recognised that the universal system he was describing 'would evidently tend to a general destruction, by the shock of one star's falling upon another.' But Herschel was no nihilist. He theorised, correctly, that cataclysmic events would lead to regeneration. '[W]e ought perhaps to look upon such clusters, and the destruction of now and then a star, in some thousands of ages, as perhaps the very means by which the whole is preserved and renewed. These clusters may be the *Laboratories* of the universe […] wherein the most salutary remedies for the decay of the whole are prepared.'[39]

In his penultimate cosmological paper of 1811, Herschel had shown that, in all probability, nebulous matter was very slowly condensing into 'sidereal appearance' and in his final paper of 1814 he again emphasized the 'intimate connection between the two opposite extremes, one of which is the immensity of the widely diffused and seemingly chaotic nebulous matter; and the other, the highly complicated and most

[36] Herschel, 'On Nebulous Stars,' 1791, 74.

[37] William Herschel, 'Catalogue of 500 New Nebulae, Nebulous Stars, Planetary Nebulae, and Clusters of Stars; With Remarks on the Construction of the Heavens,' *Philosophical Transactions of the Royal Society* 92 (1802): 477–528, 499.

[38] Herschel, 'Construction of the Heavens,' 1785, 214–215.

[39] Herschel, 'Construction of the Heavens,' 1785, 217.

artificially constructed globular clusters of compressed stars.'[40] The astronomer had also realised that the Milky Way was a relatively 'young' galaxy and that the destructive forces of gravity had yet to break apart our own star system, something he thought he had witnessed happening to other galaxies. Yet the effects of gravity on the Milky Way, he thought, could already be perceived. 'Some parts of our system indeed seem already to have sustained greater ravages of time than others, if this way of expressing myself may be allowed; for instance, in the body of the Scorpion is an opening, or hole, which is probably owing to this cause.'[41] At the end of his last paper, Herschel summed up the dramatic implications of his final cosmological hypothesis:

> Now, since the stars of the milky way are permanently exposed to the action of a power whereby they are irresistibly drawn into groups, we may be certain that from mere clustering stars they will be gradually compressed through successive stages of accumulation […] till they come up to what may be called the ripening period of the globular form, and total insulation; from which it is evident that the milky way must be finally broken up, and cease to be a stratum of scattered stars.
>
> We may also draw a very important additional conclusion from the gradual dissolution of the milky way; for the state into which the incessant action of the clustering power has brought it at present, is a kind of chronometer that may be used to measure the time of its past and future existence; and although we do not know the rate of going of this mysterious chronometer, it is nevertheless certain, that since the breaking up of the parts of the milky way affords a proof that it cannot last for ever, it equally bears witness that its past duration cannot be admitted to be infinite.[42]

Herschel realised that in looking out into far distant regions of space he was also looking into the past. The natural history of heaven was finite and measurable. Our own system could not live 'for ever,' nor could its 'past duration' be considered eternal. Heaven was alive, mortal.

Literary scholars exploring William Herschel's influence on the Romantic poets have been quick to point out that the astronomer's discoveries invited sky watchers to replace Newton's mechanical vision of the cosmos with an organic universe. Yet few have acknowledged that Herschel's 'Construction of the Heavens' was itself a narrative under construction. Michael Hoskin's first treatise on Herschel, published in

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[40] William Herschel, 'Astronomical Observations Relating to the Construction of the Heavens, Arranged for the Purpose of a Critical Examination, the Result of which Appears to Throw Some New Light Upon the Organisation of the Celestial Bodies,' *Philosophical Transactions of the Royal Society* 101 (1811): 269–336 and William Herschel, 'Astronomical Observations Relating to the Sidereal Part of the Heavens, and its Connection with the Nebulous Part: Arranged for the Purpose of Critical Examination,' *Philosophical Transactions of the Royal Society* 104 (1814): 248–284, 248.

[41] Herschel, 'On the Construction of the Heavens,' 1785, 256.

[42] Herschel, 'Sidereal Part of the Heavens,' 283–284.

1963, forms the basis for most studies into literary intersections with the astronomer's work. But this early study does not stress those aspects of Herschel's cosmology that Hoskin would later emphasise in his updated analysis, published in 2012. In this recent study, Hoskin explains that after Herschel's paper of 1814, many questions about the composition and behaviour of the stars remained. For example, Herschel did not fully understand what eventually happened to compressed star clusters nor where nebulosity came from. Herschel could account for the birth of stars but not their conception, and while he confidently identified star systems in their prime, he was unable to explain their ultimate demise.[43] Overall, Hoskin is keen to point out a number of important 'problems' with Herschel's cosmology:

> His final papers on the construction of the heavens re-present his two greatest insights, but leave them enveloped in mystery. Nebulae, stars and star clusters are successive stages in the life-cycle of a single species as gravity works its effects, and the stages he sets out for us begin with diffuse nebulosity and end with the perfection of globular clusters; but how the nebulosity arose, and what eventually happens to the globular clusters, we are not told. The Galaxy meanwhile is a stratum of nebulae and stars, and the stratum is of unknown origins and – in two dimensions – of indefinite extent. It is unique, for its one-time rivals (such as the Orion Nebula and the Andromeda Nebula) are visibly finite; indeed, they may be nebulous and not stellar at all.
>
> All this is a far cry from the clockwork universe of Newton and Leibniz, but Herschel left too many questions unanswered, and astronomers were uncomfortable with theories supported by evidence available to one man alone.[44]

Notwithstanding the way Herschel's ideas about the universe might have appeared to himself, by the end of his career, they remained nebulous to those around him.

This last point has been asserted by the historian Simon Schaffer, who argues that

> studies of Herschel have either omitted those aspects of Herschel's work which do not clearly fit into the preconceptions of the historian's astronomy, or alternatively have given his work a spurious unity by locating some principle which claims to pull together the various aspects of his achievement. Neither approach has been able to cope with the contradiction inherent in the intervention made by such figures as Herschel.[45]

[43] Hoskin, *William Herschel's Cosmology*, 2012, 73–74.

[44] Hoskin, *William Herschel's Cosmology*, 2012, 74.

[45] Simon Schaffer, "Herschel in Bedlam: Natural History and Stellar Astronomy," *History of Science* 13.3 (1980): 211–239, 212.

This contradiction, according to Schaffer, exists between the instability of Herschel's universe and the order imposed by applying the laws of attraction universally.[46] They also arise from the inconsistencies and implied contradictions within Herschel's papers. Locating such inconsistencies has become a key focus for Michael Hoskin, who elegantly summarises the incomplete nature of Herschel's speculations in his 2012 analysis. Most frustrating for students of Herschel, Hoskin argues, is the astronomer's unwillingness to offer a sense of resolution and to tie up the separate strands of his theories into a completed sequence of events.

> The limitations of the 1811 and 1814 papers are significant. In them, Herschel deals with the life-stories only of individual astronomical objects – clouds of nebulosity, stars, star clusters – or groups of closely related objects; and while he has a few remarks to make about the Galaxy, he has nothing to say about the cosmos as a whole. Given Herschel's astonishing boldness and inventiveness as a theorist, this is surprising.
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> […] The 1814 paper ends with globular clusters ('a man in his prime'), but as to what then happens to a cluster as it ages and declines past its current perfection he has nothing to say: he makes no attempt to shed light on the celestial counterpart to old age and death. Back in 1785, when he thought all nebulae were star clusters, he had imagined gravity as bringing about the development of a globular cluster into an even more compact planetary nebula, the final stage before gravitational collapse […] In these later writings there is no suggestion that they are eternal, and surely gravitational collapse is the fate that must await them, even if orbital motions postpone the evil day. One might have expected Herschel to argue that the explosion of such gravitational collapses will result in light flung out into space in all directions, to form nebulosity and so begin the cycle over again. If this was his opinion – as seems very possible – he does not say.[47]

Perhaps as a result of the inconclusiveness of Herschel's theories, and the fact that he had changed his mind about the crucial issue of nebulosity, the astronomer's findings were reported as conjecture throughout his career. Though he had shifted his position on star clusters in 1791, it was only after his emphatic paper of 1811 that the popular press began to notify readers of any development. *The Morning Post*, for example, was quick to point out the uncertainty surrounding Herschel's ideas about nebulosity:

> Dr Herschel, in a paper lately read before the Royal Society, has retracted some of his former opinions respecting nebulæ, and that they might be considered as clusters of stars. At present he concludes them to be peculiar condensed matter, supposes that they may constitute or become comets; regrets our inability to form any just notions of their

[46] Schaffer, 'Herschel in Bedlam,' 227.

[47] Hoskin, *William Herschel's Cosmology*, 2012, 70–71.

mode of existence; and presumes that they are much more numerous than we have hitherto been taught to believe.[48]

Herschel's ideas were interesting, compelling and important. But they were also 'opinions,' 'consider[ations],' 'suppos[itions],' and 'presum[ptions].' After all, Herschel himself regretted the 'inability to form any just notions of th[e] mode of [the nebulæ's] existence.' John Bonnycastle, always hesitant to undertake extensive revisions for his new editions of *An Introduction to Astronomy*, kept the following observation about nebulae in his treatise until 1816, despite the fact that it had been 25 years since the greatest living expert on the phaenomena had decided upon the existence of 'true nebulosity': 'Many of these are resolvable by the telescope into clusters of small stars; and telescopes of a still greater power resolve those nebulæ into stars, which, in instruments of less force, appear like white clouds; so that there is great reason to conclude that they all consist of clusters or large masses of stars, at a prodigious distance from our system.'[49] Bonnycastle was in no doubt as to the brilliance of Herschel's intellect, but as to the longevity of his theories he was less certain.

Mr. Herschel is of opinion, that the starry heaven is replete with these nebulæ, and that each of them is a distinct and separate system, independent of the rest. The milky-way he supposes to be that particular nebula in which our sun is placed; and in order to account for the appearance it exhibits, he supposes its figure to be much more extended towards the apparent zone of illumination than in any other direction; which is a supposition that he thinks allowable, from the observations he has made on the figures of other nebulæ of the like kind. These are certainly grand ideas, and, whether true or not, do honour to the mind that conceived them.[50]

Herschel was a genius but even genius could be wrong. The natural history of the universe could not yet be written in stone.[51]

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[48] *The Morning Post*, London, October 28, 1811, 13251, 3c.

[49] John Bonnycastle, *An Introduction to Astronomy. In A Series of Letters from a Preceptor to his Pupil. In which the Most Useful and Interesting Parts of the Science are Clearly and Familiarly Explained* (London: J. Nunn et. al., 1816), 324–325.

[50] Bonnycastle, *Introduction to Astronomy*, 1816, 347–348.

[51] As it happens, Herschel was right on both counts.

3. All Obscurity

At school, Keats was fascinated by Greek legends. Charles Cowden Clarke went so far as to say Keats had an 'uncommon familiarity – almost consanguinity with Greek Mythology.'[52] Keats was conversant with a number of guides including John Lemprière's *Bibliotheca Classica* (1788) and he also held a copy of William Godwin's *The Pantheon* (1806)[53] – a children's guide to Greek and Roman mythology. The latter's entry for *Endymion* reads:

> Diana is said to have fallen in love … though she were the Goddess of Chastity: the object of her flame was Endymion, a shepherd of Caria: she saw him naked on the top of mount Latmos, and thought she had never beheld so a beautiful creature: as she was the most bashful and modest of existing beings, she cast him into a deep sleep, that she might kiss him unseen and undiscovered even by him she loved: every night she visited the beautiful shepherd, whom Jupiter endowed with perpetual youth, and every night she loved him better than the night before: the meaning of the fable is that Endymion was a great astronomer, that he passed whole nights upon mount Latmos contemplating the heavenly bodies … and that he is said first to have explained the phenomenon of Diana, that is, the moon, and to have given a just account of their causes.[54]

These were the basic details Keats challenged himself to turn into an epic poem. He considered *Endymion* a 'test, a trial of my Powers of Imagination and chiefly of my invention […] by which I must make 4000 Lines of one bare circumstance and fill them with Poery […] Besides a long Poem is a test of Invention which I take to be the Polar Star of Poetry, as Fancy is the Sails and Imagination the Rudder. Did our great Poets ever write short Pieces? (*Letters* 1.169–170). From 'one bare circumstace' Keats hoped to create a 'Polar Star of Poetry' – appropriately, ambitiously, he chose a comological subject to test his creativity.

In Goodwin's telling, Endymion is an astronomer and the allegorical 'meaning of the fable' is humankind's increasing knowledge of the heavens. It is little wonder then, that Keats incorporates, rather than ignores, the mysterious discoveries of contemporary stellar astronomy in his updated imagining of the myth. Specifically, Keats animates, complicates and extends the scope of the Endymion myth by infusing

[52] John Barnard,'Notes,' in *Selected Poems*, by John Keats (London: Penguin, 2006), 721.

[53] Published under the pseudonym Edwin Baldwin.

[54] Barnard, 'Notes,' 729.

it with the uncertainties that Herschel's hypotheses had introduced into the cultural atmosphere of his time.

In the figure of Endymion, who struggles and ultimately fails to comprehend the heavenly vistas that have been opened up to him by Diana, Keats reflected contemporary anxieties about what had become known, and what remained unknown about the universe. These uncertainties and anxieties emerge in a variety of printed mediums in the period and reflect the way that classical, historical and contemporary scientific understandings of the universe converged at the turn of the nineteenth century.

The sun rises in the east and sets in the west. This was, probably, the first astronomical observation. For much of western history, the fact that the sun moved from East to West seemed a natural result of the sun orbiting the earth in an anti-clockwise direction. Later, when the earth was discovered to be orbiting the sun, astronomers accepted that the earth must have been turning on its own axis towards the East. Throughout history, and across many cultures, the sun's consistent progress across the sky has been fundamental to our developing understanding of how the sun and earth relate to each other, and about the laws that operate in the universe more generally. It seems incredible, then, that the following passage should be found in John Bonnycastle's popular and respected treatise, published only two hundred years ago, and in an era historians of science consider to be the birth of 'modern' stellar astronomy in the west:[55]

> the ancient Egyptians […] maintained that the sun, in former ages, had risen in the west and set in the east. It was, indeed, a tradition as obscure as their hieroglyphics; and Herodotus, Plato, Diogenes Laerties, and Plutarch, who all mentioned this revolution, must be considered as authors by far too modern to deserve much credit with regard to such antiquities. There are, however, so many remaining witnesses, that this opinion once prevailed; and, from the discoveries of the moderns, some have been induced to believe, that the idea, extravagant as it may seem, was not altogether without foundation. (350)

This passage highlights just how extreme cosmological speculation in Romantic-era Europe could become. Bonnycastle acknowledges that the idea of the sun rising in the

[55] Constance Lubbock and Michael Hoskin, as historians dedicated to William Herschel's career, are clearly eager to place his achievements and the period in which the astronomer worked, within this framework. But see also Sara J. Schechner, *Comets, Popular Culture, and the Birth of Modern Cosmology* (New Jersey: Princeton University Press, 1997); Michael J. Crowe, *Modern Theories of the Universe: From Herschel to Hubble* (New York: Dover Publications, 1994) and James Mullaney, *The Herschel Objects and How to Observe Them* (New York: Springer Science+Business Media, 2007). Simon Schaffer, however, warns against the wholesale acceptance of the idea that Herschel 'founded modern sidereal astronomy' because his work 'both transform[ed] the discipline' but also 'met with incomprehension and misinterpretation from his contemporaries' ['Herschel in Bedlam,' 212].

West and setting in the East is extravagant, but he also points out that the notion has too long a history, has been vetted by too many luminaries, to be entirely dismissed by contemporary astronomers. As Bonnycastle well knew, dismissing the hypotheses and speculations of ancient philosophers could be injudicious. The Pythagoreans Philolaus (470–385 B.C.) and Aristarchus (310–230 B.C.) had proposed a heliocentric model of the universe almost two millennia before the theories of Polish astronomer, Copernicus, gained traction in the Renaissance.[56] Bonnycastle and his fellow classicists could allow themselves to indulge the theories of Ancient Egypt because its philosophers formed an established part of the chronology of western thought. Despite the recent dominance of European science, Bonnycastle and his fellow classicists might have thought, civilization had (like the sun) once moved East to West.[57] Was it possible that the sun had also changed its course?

For many writers informed in science, poetry and history such as the progressive polymath Erasmus Darwin, ancient cultures contained the seeds of modern enlightenment. These insights had been strangled by the religious oppression of the Dark Ages, but the stories of the Egyptians, Greeks and Romans could now stand for the triumph of knowledge both old and new. Darwin defended the use of classical imagery and metaphor in the 'Apology' given in the first pages of his best-selling poem *The Botanical Garden* (1789–1791):

> Many of the important operations of Nature were shadowed or allegorised in the heathen mythology, as the first Cupid springing from the Egg of Night, the marriage of Cupid and Psyche, the Rape of Proserpine, the Congress of Jupiter and Juno, the Death and Resuscitation of Adonis, &c. many of which are ingeniously explained in the works of Bacon [...]. The Egyptians were possessed of many discoveries in philosophy and chemistry, before the invention of letters; these were then expressed in hieroglyphic paintings of men and animals; which, after the discovery of the alphabet, were described and animated by the poets, and become first the deities of Egypt, and afterwards of Greece and Rome. Allusions to those fables were therefore thought proper ornaments to a philosophical poem, and are occasionally introduced either as represented by the poets, or preserved on the numerous gems and medallions of antiquity.[58]

[56] Michael Hoskin, 'Astronomy in Antiquity,' in *The Cambridge Concise History of Astronomy*, ed. Michael Hoskin (Cambridge: Cambridge University of Press, 1999),18–47, 34. See also, for example, Amicus Scientiae, 'Lecture on Astronomy,' *Imperial Magazine* 4.36 (1822): 18–24, 24.

[57] For contemporaneous acknowledgement also see Amicus Scientiae, 'Lecture on Astronomy,' 23–24.

[58] Erasmus Darwin, *The Botanic Garden*, *A Poem*. *In Two Parts* (London: J. Johnson, 1799), xvii.

For writers such as Darwin and Bonnycastle – who were synthesising and interpreting scientific discourse for a literary readership – the use of ancient myth and frequent allusions to classical poetry also reinforced an idea of a shared imaginary between natural philosophers and poets. It also created a sense of continuity and permanence within texts that were engaging hypotheses relating to great, fundamental changes within the natural world and the universe at large. The relation between heaven and the earth, for example, was under sustained scrutiny.

Erasmus Darwin summarised the cosmological confusion circulating throughout this period in a footnote to his poem:

> Has the granite stratum [of the Earth], in very antient times, been produced like the present calcareous and siliceous masses, according to the ingenious theory of Dr. Hutton, who says new continents are now forming at the bottom of the sea, to rise in their turn; and that thus the terraqueous globe has been, and will be, eternal? Or shall we suppose, that this internal heated mass of granite, which forms the nucleus of the earth, was a part of the body of the sun, before it was separated by an explosion? Or was the sun originally a planet, inhabited like ours, and a satellite to some other greater sun, which has long been extinguished by diffusion of its light, and around which the present sun continues to revolve, according to a conjecture of the celebrated Mr. Herschell, and which conveys to the mind a most sublime idea of the progressive and increasing excellence of the works of the Creator of all things?[59]

The answers to these questions were not forthcoming in Darwin's lifetime, and indeed the questions kept on coming. The two scientists Darwin names here, though clearly not the only practitioners in the cosmological sciences of astronomy and geology in the period, were responsible for posing the most significant challenges to established ideas about the age and structure of heaven and earth. The early geologist James Hutton (1726-1797), like William Herschel, believed that the same physical laws were at work throughout the universe. Hutton was a uniformitarian who was the first to hypothesise that geological phenomenon had remained constant, or universal, through time and space.[60] Hutton's *Theory of the Earth* (published in various forms in 1785, 1788 and 1795) argued that unconformities in geological strata proved that the earth was engaged in a process of continual change, erosion and renewal that acted out over ages stretching towards eternity.[61] His ideas famously upset catastrophists and biblical literalists who believed that cataclysmic events, like the Great Flood, had been

[59] Darwin, *The Botanic Garden*, 378, Note XXIV, 'Granite.'

[60] Dennis R. Dean, *James Hutton and the History of Geology* (Ithaca, NY: Cornell University Press, 1992).

[61] Tom Furniss, 'A Romantic Geology: James Hutton's 1788 "Theory of the Earth,"' *Romanticism* 16.3 (2010): 305–321, 307.

responsible for shaping the earth in the near history. However, neither Hutton nor his follower John Playfair (who disseminated Hutton's ideas for a much larger audience), were able successfully to establish that Hutton's version of events was superior to that of the geological catastrophists or Neptunists such as Georges Cuvier (1769-1832), who believed that rock had crystalised from the oceans without the forces of heat and pressure.[62] Herschel's cosmological speculations contained inherent contradictions and significant loose ends that remained unresolved throughout his career.

Until the last decades of the eighteenth century, then, most poets and scientists working in the western tradition could agree that the changelessness of the earth's mountains, cliffs and rocks was matched only in the geography of the heavens. Stars and mountains had always existed as the supreme poetic metaphors for permanence and immutability free from natural patterns of birth and decay. The work of Herschel and Hutton subverted these traditional sites of stability and constancy. Romantic-era astronomy and geology challenged and upset previous beliefs about heaven and earth, but their investigations also raised more questions than they answered. The 'natural history' of heaven and earth that emerged from treatises in both scientific disciplines – extracts of which were widely circulated in the periodical press – produced a Romantic cosmology – a unique way of imagining the universe that was incomplete and fragmentary, fraught with uncertainty, doubt and confusion.

While this thesis exclusively investigates the influence of astronomy and astronomical speculation on the poetry of John Keats, it is important to note that the shifting ideas about the universe (caused by discoveries about variable stars and mysterious nebulous matter in the heavens) were strongly tied to, and amplified by, the questions raised by contemporary geology regarding the age and structure of the earth. In 1820, a year before Keats's death, the Astronomical Society to which Herschel belonged published an 'address explanatory of their views and objects' which stated that:

> Beyond the limits […] of our own system,[63] all at present is obscurity. Some vast and general views of the construction of the heavens, and the laws which may regulate the formation and motions of sidereal systems, have, it is true, been struck out; but like the

[62] Schaffer, 'Herschel in Bedlam,' 212.

[63] That is, the solar system.

theories of the earth which have so long occupied the speculations of geologists, they remain to be supported or refuted by the slow accumulation of a mass of facts.[64]

For astronomers and geologists alike, 'all was obscurity.' This address identifies itself as existing in a time of instability, a time when new, revolutionary views about heaven and earth were being advocated, but before the validity of these hypotheses had been established or disproven or 'supported or refuted by the slow accumulation of a mass of facts.' It is this time of cosmological limbo, I want to argue, that characterises a Romantic cosmology. It was into this environment that Keats wrote *Endymion*, his cosmological romance, his mythical reflection upon the relation between the mortal and divine. While the convergence of Romantic-era astronomy and geology is undoubtedly a subject that deserves further exploration,[65] such an investigation does not fall within the scope of this thesis. While Keats does make references to geological phenomena in his poetry,[66] it is his interest in the space between earth and the heavens, rather than beneath the earth's crust, that has been the focus on my research. In an analysis of *Endymion* I notice Keats's early resistance to the universalising impulses of other writers in the period. In this sense, the allegory of Keats's poem is commensurate with his theory of 'negative capability.' I argue that Keats's poetic preference for exisiting 'in uncertainties' and being 'content with half knowledge' is informed by the nebulosity, instability and mutability of Romantic astronomy.

4. The Abyss Above

In *An Introduction to Astronomy*, Bonnycastle invokes the following lines from Ovid's *Metamorphoses*:

> We, though from heav'n remote, to heav'n will move
> With strength of mind, and tread the abyss above;
> And penetrate, with an interior light,
> Those upper depths, which nature hid from sight.

[64] Royal Astronomical Society, 'Address Explanatory of their Views and Objects,' quoted in Hoskin, *William Herschel's Cosmology*, 2012, 75.

[65] This important connection is hinted at by Marilyn Gaull, 'Under Romantic Skies: Astronomy and the Poets,' *Wordsworth Circle* 21 (1990): 34–41, 40.

[66] See Book 2 of *Endymion* when the mortal travels to the underworld and Keats's address to a geological formation, 'To Ailsa Rock,' written during his last days on the walking tour with Charles Brown in 1818.

Pleas'd we will be to walk along the sphere
Of shining stars, and travel through the year.
To leave the heavy earth, and scale the height
Of Atlas, who supports the heav'nly weight.
To look from upper light, and thence survey
Mistaken mortals wand'ring from the way. (41)

Bonnycastle quotes Ovid when he comes to explain what could be considered the crux of Romantic astronomy – that the solar system, 'with all its superb furniture, is only a small part of the universe; and if it could be wholly annihilated, would be no more missed, by an eye that could take in the whole creation, than a grain of sand from the sea-shore' (45). Thanks to Herschel, after the mid-1780s, informed humanity could no longer consider the Sun and its satellites as the star attractions of the Universe. Galileo had used early telescopes to argue for Copernicus's heliocentric, rather than geocentric structure of the heavens. Now, around 200 years later, the precision and power of Herschel's telescopes had removed the Earth's successor, the Sun, from its honoured position at the centre of the universe. The mutability of the cosmos could no longer be denied. If, as Herschel argued, the whole Milky Way galaxy was in decay, then what of the Sun? The disappearance of the solar system, to use Bonnycastle's analogy, would mean nothing – no more, in fact, than the disappearance of one grain of sand on the sea shore.

Herschel's expanded universe challenged ideas about the existence of a privileged relationship between an Earth-bound humanity and a God who had, in all probability, created thousands of worlds just like our own. A 'Lecture on Astronomy' given in the *Imperial Magazine* of 1822 informed its readers that the belief in a plurality of worlds, sublime in scope, was a matter of logic rather than imagination: 'Nor let the mind stagger at the position, that all these worlds on worlds and systems on systems, are inhabited; the residences of animated, and most likely, of intelligent creatures! As far as analogical reasoning can go, no truth whatever, is more certain.'[67] A review of Robert Woodhouse's *An Elementary Treatise on Astronomy* also emphasized the scale of human insignificance: 'In metaphysics – in literature – in the arts – ignorant as we are, we can assign limits, and supply, in imagination at least, all that may be wanting to perfection; but, in the works of Nature, beyond our power of scrutiny, we see no end to

[67] 'Lecture on Astronomy,' *Imperial Magazine* 4.37 (1822): 115–126, 125.

our inquiries;– we perceive only the littleness of man, and the nothingness and vanity of all his boasted attainments.'[68]

An anxiety about the consequences of humanity 'seeing' and 'knowing' itself into oblivion began to emerge in the period. Bonnycastle, too, joined the fray:

> By contemplating the magnitudes and distances of the fixed stars, all partial considerations of high and low, great and small, vanish from the mind; and we are presented with such an unbounded view of nature, and the immensity of the works of creation, as overpowers all faculties, and makes us exclaim with the Psalmist, 'Lord, what is man, that thou art mindful of him, or the son of man, that thou regardest him?' (42)

The power of Herschel's telescopes meant that astronomers were able to view the heavens with a precision and clarity that had never been seen before. Ironically, this new insight into the true structure and composition of the universe only rendered it more cryptic and illusive. Ovid's 'abyss,' and the imaginative daring needed to penetrate it, had never appeared as a more appropriate metaphor for western astronomy. What Herschel had discovered about stellar distance, star death, multiple galaxies, and the behaviour of light in space, meant that Bonnycastle's readers would have been keenly aware of just how 'remote' from heaven humankind had become. Science may have been comfortable, for example, with particles from the Sun moving through a space of ninety-five millions of miles in eight minutes, but the general population would probably have agreed with Bonnycastle that this was a 'rapidity too great for the imagination to follow, or the mind to comprehend' (274).

Into this void of cosmological confusion stepped writers and thinkers heaven-bent on restoring divine order. In these reactions to the diffuse nature of cosmological speculation can be seen the beginnings of the modern faith in the organising power of a self-correcting universal order and the benevolent interest of 'the universe' in human affairs. To some degree, this was the fault of the scientists. When the universal theory of attraction led Newton and Herschel to the inevitability of universal annihilation, both thinkers resorted to divine intervention to explain away the cosmic collisions suggested to them by reason. 'God preserves and maintains the universe,' Newton wrote in his *Principia Mathematica* (1687), 'lest the systems of the fixed Stars should, by their gravity, fall on each other mutually, he hath placed those systems at immense

[68] 'Review of Robert Woodhouse's *An Elementary Treatise on Astronomy*,' *Edinburgh Review* 31.62 (1819): 375–394, 376.

distances one from another.'[69] Herschel knew that stars were not exempt from the forces of gravity. When he saw that his universal system, if actually in operation, would lead to the eventual 'dissolution' of whole galaxies, he argued that there was 'no doubt but that the great Author of [the universe] has amply provided for the preservation of the whole, though it should not appear to us in what manner this is effected.'[70] It was this consoling, if not entirely convincing, aspect of Newton's and Herschel's revolutionary hypotheses that many writers gravitated towards.

In 1818, the same year that Keats published *Endymion*, the Scottish solicitor Frances Maximus Macnab published an ambitious volume entitled *A Theory of the Moral and Physical System of the Universe*.[71] His 474 page guide to the Universe contained over 1170 separate points (each a paragraph long) explaining the ways a seemingly complicated universe could be understood in terms of its universalism. Macnab was at great pains to show that his unifying idea was anything but contrived. He believed that amid the apparent chaos of the universe, a Christian 'Truth' was beckoning to be discovered which would explain the whole:

> Now the reader will observe […] the *accumulated* force of the evidence, resulting from the *congruity of all its parts*, and the light which they mutually reflect upon each other, and upon the universality to which they belong. He will compare what is stated, with the legends of Ancient Idolatry, the History of the Human Race, and the discoveries of Modern Science; but above all, he will compare it with the Word of God, not only in the letter of the Scriptures, but also in the *Analogy of Faith* deduced from the entire scope and genius of the Sacred Writings.[72]

Unsurprisingly, Christian faith becomes the amalgamating force for differing, even contradictory, ideas about the universe. As this passage suggests, Macnab did not want to turn his back on different types of knowledge or exotic cosmological traditions, but rather to join and reconcile them.

Macnab observes that in accepting that the world was created in six days:

> we are met by an objection, that '*if the world really was created in six days, we should find some evidences of it in the aspect of nature. Instead of this, we find, in the*

[69] Isaac Newton, *Principia Mathematica (Mathematical Principles of Natural Philosophy and History) Volume II: The System of the World* [1687], trans. Andrew Mott, ed. Florian Cajori (Berkeley: University of California Press, 1933).

[70] Herschel, 'Construction of the Heavens,' 1785, 216.

[71] Francis Maximus Macnab, *A Theory of the Moral and Physical System of the Universe, Demonstrated by Analogy; in which the Elements of General Science are Explained Upon a Principle Entirely New* (London: Ogles, Duncan, and Cochrane, 1818).

[72] Macnab, *A Theory*, 3.

geognostic structure of the earth, the infallible proofs of its having existed for millions of ages, and undergone many prodigious revolutions, long before the most ancient nations existed.' Let us therefore pause to examine this; for the geological facts are exactly as the objection states, and therefore the fallacy must lurk in the vulgar notion entertained regarding the duration of the 'six days.'[73]

He further argues, that 'time eternal, and space infinite, are swallowed up in Him; and all our ideas of time and space are merely *relative*'.[74] It is interesting that Macnab accepts the controversial hypotheses of the emerging discipline of geology and seeks to incorporate them into his Christian schema.

Perhaps Macnab's ideas would have been more well received and widely accepted in intellectual circles had he not depended so heavily on (as a reviewer noted) 'the mystery and charm of the number seven.'[75] Ultimately, the 'universe,' especially at this point in history, proved too hard a subject for Macnab to synthesize without some overarching principle. As it happened, he found one exactly to the purpose – a unifying principle at once mysterious and mathematical. And so Macnab argued that 'the word *seven*, in its radical meaning, imports *sufficiency fulness*, *plenitude*; and it also signifies an *oath*, or *swearing.*'[76] And also that

On opening the Bible, the first thing that occurs, is the six days of creation, [with the seventh day of rest] and the constant reference to the *septenary numbers* throughout the Scriptures, and in ancient tradition. In the *seven colours* of the rainbow, and the *seven sounds* of the octave, we observe, as it were, a confirmation of the analogy written in the book of nature. We see that it must allude to something *universal*, being applied to space and time, to the history of nature, and history of mankind.[77]

It can only be imagined what Macnab's excitement might have been when the seventh planet Uranus was discovered by Herschel in 1781.

It comes as no surprise that Macnab's treatise, though clearly his life's work, was summarily and scathingly dismissed by reviewers. The author's reliance on the number seven became an easy target. The *New Monthly Magazine* found cause for ridicule, not only from the work's 'absurd' content but, more crucially, from the conceit of its scope:

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[73] Macnab, *A Theory*, 8.

[74] Macnab, *A Theory*, 9.

[75] 'Review of Francis Maximus Macnab's *Theory of the Moral and Physical System of the Universe*,' *The British Critic* 10 (1818): 87–90, 88.

[76] Macnab, *A Theory*, 4.

[77] Macnab, *A Theory*, 4.

We have already had theories of astronomy, theories of politics, theories of morals, sufficiently numerous and sufficiently bold; but the most hardy adventurer is still behind—Mr. *Maximus Macnab*. Other gentlemen have been contented with a department only, Mr. Macnab boldly grasps the whole, and presents us, in one compact octavo, with what he modestly terms, 'A Theory of the Moral and Physical System of the Universe.'[78]

Blackwood's Edinburgh Magazine was equally scathing in its satire: 'This is one of the best systems of universal knowledge that have lately fallen in to our hands; and, when rightly understood, will go a long way towards rendering useless most books that have been published in modern times.'[79] Indeed, Macnab's theory of the universe became a kind of standing joke in 'Maga' during 1819. The Scottish author's 'puritanical exercise' was on more than one occasion compared to unrelated publications in order to ridicule grandiose claims and illogical method.

Less scathing were the reviews of James Wills's *The Universe: A Poem* which was published in 1821 under the name of C. R. Maturin, the author of *Melmoth The Wanderer* (1820).[80] Wills's blank verse is far more compact and comprehensible than Macnab's prose treatise and there are some exquisite descriptions of cosmological phenomenon throughout the poem. He mentions 'hosts of suns' that 'Throng Ether with fixed rays,' 'launched' in 'awful cycles round the throne of Heav'n/ With their attendant spheres'[81] – lines reminiscent of the dread vision of menacing suns created in the final verses of Percy Shelley's 'Ode to Heaven.' But, as with Macnab, there is the same attempt to force astronomical phenomena into a safe and soothing unifying system. In the following passage Wills captures the doubt and confusion that can attend the contemplation of a universe he describes as appearing with 'thick mysteries':

> Fixed to earth
> We strain our eyes vainly upon the dread
> Inscrutable firmament of eternity,
> Still sinking as we gaze; and though it be
> To soar to loftier skies, yet shadows lie

[78] 'Review of Macnab,' 87.

[79] Tres Juncti in Uno, 'Macnab on the Universe,' *Blackwood's Edinburgh Magazine* 5 (1819): 337–340, 337.

[80] James Wills as Reverend C. R. Maturin, *The Universe*: *A Poem* (London: Colburn, 1821). The explanation for Wills's decision to publish under the name of Maturin, remains unclear.

[81] Wills, *The Universe*: *A Poem*, 13–14 .

> Over the prospect.—Are there then who dare
> To whisper to the spirit awful fears?
> To point and call that shadow endless night;
> To shake the sceptic head, and darkly claim
> A chance-born parentage from earth; itself
> An uncreated monster of the deep?[82]

While Wills admits the modern universe's potential to overwhelm and overburden the human imagination, he is restless in his attempts to resolve the fraying effects of such a 'sinking' and 'shadowy' encounter with heaven. These obscurities, Wills argues, are only fleeting, the result of a fallen understanding – an understanding dependent on bits and pieces, atoms, fragments, parts of the whole, but not on the whole itself:

> On Earth below, or at the farthest sphere,
> Where the sun's noon is starlight!—still, are seen
> The features of some thought-surpassing plan
> Of wide perfection! often vainly sought
> In atoms of the universal scheme
> Viewed in minute detail: They all, alike,
> Fulfil their several functions,—heat and cold,
> And fruit and barrenness, and the circling tides
> Of birth, and consummation, and decay,
> Bound by unerring law, and mingling all,
> Grandly, into the system[83]

While contemporary critics acknowledged Wills's poetic skill, misgivings about the impossibilities of presenting a subject like 'the universe' as a united, coherent whole emerged. In its review of the poem, the *New Monthly Magazine* argued that the subject was 'too vast and vague to be a happy one.' 'The Universe! What a trackless theme for the imagination; absorbing the mind at once in ideas of infinity and abstraction; prescribing no visible boundaries, either of beginning or end, to the poet's course; and leaving his planless and fortuitous progress without the power of curiosity or anticipation.'[84] Similarly, *The Examiner* recognised in the poem a 'fine vein of meditative imagination' and versification that was 'beautifully flowing and harmonious.'[85] But 'the Universe as a single idea,' the review argued, was 'too vast and shadowy to form the exclusive subject of a poem of this class.' The universe was a

[82] Wills, *The Universe*: *A Poem*, 42; 58.

[83] Wills, *The Universe*: *A Poem*, 43.

[84] 'Review of *The Universe*: *A Poem* by Rev. C. R. Maturin,' *The New Monthly Magazine and Literary Journal* 1 (1821): 708–712, 708.

[85] 'Review of *The Universe*: *A Poem* by Rev. C. Maturin,' *The Examiner* 702 (1821): 381.

subject that 'could only be seized generally' and this 'generality' was 'vague and elusive.'[86] All was obscurity, as the astronomers had said.

By reverting to the 'calm stability of Providence'[87] in his description of the universe, Wills proved himself incapable of doing what John Keats had thought every great man of literature should be able to do. He was not 'content with half-knowledge' and he sought to erase, rather than explore, the 'vague and shadowy' nature of his subject. It is telling that Wills dedicated the poem to Samuel Taylor Coleridge who found the erratic nature of contemporary astronomy 'revolting from its want of analogy.'[88] It seems that, like Wills, Coleridge had reacted to the unwieldy nature of Romantic-era cosmology, which seemed to rebel against the kind of spiritual order that underpinned his ideal of 'multëity in unity.'[89] Keats, in turn, responded to what he perceived to be an impulse towards amalgamation in Coleridge and writers and thinkers like Macnab and Wills, by emphasising the literary and philosophical fecundity of leaving the mysteries of the universe unresolved. Indeed Keats invokes Coleridge to make his central point about negative capability.

In an 1817 letter to his brothers George and Tom, Keats uses just one paragraph to outline his most famous and influential literary theory:

> I had not a dispute but a disquisition with Dilke, on various subjects; several things dovetailed in my mind, & at once it struck me, what quality went to form a Man of Achievement especially in Literature & which Shakespeare posessed so enormously – I mean *Negative Capability*, that is when man is capable of being in uncertainties, Mysteries, doubts, without any irritable reaching after fact & reason – Coleridge, for instance, would let go by a fine isolated verisimilitude caught from the Penetralium of mystery, from being incapable of remaining content with half knowledge. This pursued through Volumes would perhaps take us no further than this, that with a great poet the sense of Beauty overcomes every other consideration, or rather obliterates all consideration. (1.193–194)

Negative Capability, defined by Keats, is the capacity to exist in 'uncertainties, Mysteries, doubts,' to remain suspended in a state of conflict or confusion and to explore the richness of this experience 'without any irritable reaching after fact &

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[86] 'Review of *The Universe*,' *The Examiner*, 381.

[87] Wills, *The Universe*: *A Poem*, 2.

[88] Samuel Taylor Coleridge, quoted in Gaull, 'Under Romantic Skies,' 36.

[89] Samuel Taylor Coleridge, *The Collected Works of Samuel Taylor* Coleridge, vol. 2., ed. Barbara E. Rooke (Princeton: Princeton University Press,1969), 369–71. For further discussion see Denise Gigante, *Life: Organic Form and Romanticism* (New Haven: Yale UP, 2009), ff. 23 and Daniel Brown, 'William Rowan Hamilton and William Wordsworth: The Poetry of Science,' *Studies in Romanticism* 51.4 (2012): 475–501, 484–487.

reason.' The poet, according to Keats, must remain content with 'half knowledge.' In a related passage, written in a letter to Richard Woodhouse, the younger poet also rejected the 'egotistical sublime' of William Wordsworth, advocating, instead, the erasure of the poetic self in favour of becoming 'everything and nothing' (1.387). Here he also argued that the poet could do 'no harm from its relish of the dark side of things any more than from its taste for the bright one; because they both end in speculation' (1.387). Keats relished the 'speculative state' and was willing to occupy both dark and light spaces. This was not true of Wordsworth, who sought to write poetry that was the fullest expression of his moral sense and who recognised a universal drive towards goodness. According to Stephen Gill, Wordsworth's idea of the universe is post-Newtonian, not 'mechanical and dead, but alive and vitally connected with the human mind.' For Wordsworth, Gill argues, 'awakened consciousness leads to an awakened moral sense, love of nature leads to love of Man and awareness of God.'[90] Indeed, Wordsworth's universe in Book 1 of *The Prelude* is divine, 'purifying' and 'everlasting' in its unity.

> Wisdom and Spirit of the universe!
> Thou Soul that art the Eternity of Thought
> That giv'st to forms and images a breath
> And everlasting motion! not in vain
> By day or star-light thus from my first dawn
> Of Childhood didst Thou intertwine for me
> The passions that build up our human Soul,
> Not with the mean and vulgar works of Man,
> But with high objects, with enduring things–
> With life and nature, purifying thus
> The elements of feeling and of thought[91]

The universe, in these lines, is made manifest in the human mind, 'the elements of feeling and of thought,' and thus, according to Wordsworth, all the natural world can become intimately connected to individual experience.

> There is an active principle alive in all things;
> In all things, in all natures, in the flowers
> And in the trees, in every pebbly stone
> That paves the brooks, the stationary rocks,
> The moving waters, and the invisible air.

[90] Stephen Gill, 'Introduction,' in *The Major Works*, by William Wordsworth, ed. Stephen Gill (Oxford: Oxford University Press, 2000), xiii–xxv, xviii.

[91] William Wordsworth, *The Major Works*, ed. Stephen Gill (Oxford: Oxford University Press, 2000), 1.428–438.

> All beings have their properties which spread
> Beyond themselves, a power by which they make
> Some other being conscious of their life,
> Spirit that knows no insulated spot,
> No chasm, no solitude, from link to link
> It circulates the soul of all the worlds.
> This is the freedom of the universe,
> Unfolded still the more, more visible,
> The more we know, and yet is reverenced least
> And least respected in the human mind,
> Its most apparent home.[92]

Wordsworth's spirit is 'the soul of all the worlds,' the unifying principle that draws together the seemingly disparate elements of the material universe and which resides most correctly in the 'human mind,' 'its most apparent home.'

Keats viewed the 'freedom' offered by the universal metaphor differently. His poetry instead advocated a continued 'unfold[ing]' or questioning of the natural world. A belief in a benevolent and uniting universal force (which can also be found in the poetry of Blake, Coleridge and Shelley) is absent from his writing. This is true even of *Endymion*, Keats's first full-length reflection upon the 'universal' theme. In this regard, Keats's poem evidences his early commitment to the sentiment of Negative Capability before the theory had become formulated in his letters of 1817.

Perhaps because Keats wrote these letters only after he had experienced the vicious and vitriolic 'Cockney School' reviews of *Endymion* in the periodical press,[93] scholars have often disssociated *Endymion* with Keats's theory of Negative Capability. Recently, Karen Swann has observed that *Endymion* has always been seen as a pre-theoretical text, belonging to a time before the young poet's formulation of his ideas about the displaced and displacing poetic self:

> Until recently, Romanticism and other friends of Keats have viewed *Endymion* and its reviews as a moment in a life-story that takes a swerve from this point: after, and as a result of his work on *Endymion*, Keats finds his poetic voice, leaves his 'Cockney' origins behind, and becomes canonical Keats, the poet of 'Negative Capability,' the 'poetical Character' who 'has no character.'[94]

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[92] William Wordsworth, 'Dove Cottage MS 16, (a),' in *The Major Works*, by William Wordsworth, ed. Stephen Gill (Oxford: Oxford University Press, 2000), 676, 1–16.

[93] See Z., 'On the Cockney School of Poetry. No. 1,' *Blackwood's Edinburgh Magazine* 2.7 (1817): 38–41 and Z., 'Cockney School of Poetry. No IV.,' *Blackwood's Edinburgh Magazine* 3.17 (1818): 518–525.

[94] Karen Swann, '*Endymion's* Beautiful Dreamers,' 21.

According to Swann, however, 'Cockney' and 'canonical' Keats are 'less discontinuous' than has been assumed. Li Ou's outstanding inquiry into the provenance of Keats's theory has successfully updated Walter Jackson Bate's 1930s interpretation of the poet's 'intuitive approach' by connecting the idea of 'Negative Capability' to its literary antecedents (specifically, the work of Shakespeare and Hazlitt), and by charting the emergence of the concept within Keats's poetry and beyond.[95] To a certain degree, Li Ou maintains the critical status quo by arguing that Keats's theory was something that grew out of, but was not developed in, *Endymion*. 'The poem itself […] for all the ideas fermenting within it, only remains "a trail of …Imagination."'[96] But Li Ou, like Swann, also recognises that Negative Capability exists within the very fabric of Keats's poem:

> Pan's all-pervasive 'immensity' epitomises the fusion of immortality and humanity by its embrace of diversity, ever leading to universal truth yet ever promising more mystery, ultimately an 'unknown' infinity. The hymn to Pan is thus a celebration of a vast, negatively capable mind, which is being approached by the poet himself while composing it.[97]

For Li Ou, the heavens in Keats's poem require Endymion, the poet, and the reader to exist in 'uncertainties' together: 'if Pan is the god embodying negative capability, then Endymion can be likened to the poet himself in search of it.'[98]

5. Things Mysterious, Immortal, Starry

In a letter to his sister, Fanny Keats, written in 1817, Keats described Endymion as philosophical and 'contemplative':

> Many Years ago there was a young handsome Shepherd who fed his flocks on a Mountain's Side called Latmus – he was a very contemplative sort of Person and lived solitary among the trees and Plains little thinking – that such a beautiful Creature as the Moon was growing mad in Love with him – However so it was; and when he was asleep on the Grass, she used to come down from heaven and admire him excessively

[95] Li Ou. *Keats and Negative Capability* (London: Continuum, 2009). Li Ou's work is the first monograph dedicated to 'Negative Capability' since Walter Jackson Bate's *Negative Capability: The Intuitive Approach in Keats* (Cambridge, MA: Harvard University Press, 1939). Bate's study contains no mention of *Endymion*.

[96] Li Ou, *Keats and Negative Capability*, 117.

[97] Li Ou, *Keats and Negative Capability*, 114.

[98] Li Ou, *Keats and Negative Capability*, 114.

[for] a long time; and at last could not refrain from carrying him away in her arms to the top of that high Mountain Latmus while he was dreaming. (1.154)

'Mountain Latmus' in Keats's final version of *Endymion*[99] reaches up into the heavens, beyond the reach of the Moon and even the solar system, and into the lively stellar regions of space. The effect that experiencing these new vistas has on the shepherd-astronomer drives the narrative of the poem over its four books, although Keats's most important reflections upon Endymion's experience of heavenly spaces occur in Book One of the poem. Indeed, the first part of the epic contains a sustained inquiry into the idea of 'enlightenment,' and into whether or not universal knowledge is something to be desired.

Endymion's famous 'Hymn to Pan' is sung by the pagan priest and his woodland followers. Pan, the god of shepherds is the interlocutor between the inhabitants of Caria and divinity. The hymn addresses this 'satyr king' who is the 'Dread opener of the mysterious doors/ Leading to universal knowledge' (*Poems* 71). Endymion is in attendance but he is wan, sick, troubled by his visions of transcending his earthly sphere and entering, with Cynthia, the heavenly spaces above. The Carians, oblivious to Endymion's plight, sing out a plea to Pan to keep the 'mysterious doors' or 'universal knowledge' firmly closed.

> "Be still the unimaginable lodge
> For solitary thinkings; such as dodge
> Conception to the very bourne of heaven.
> Then leave the naked brain: be still the leaven,
> That spreading in this dull and clodded earth
> Gives it a touch ethereal—a new birth:
> Be still a symbol of immensity;
> A firmament reflected in a sea;
> An element filling the space between:
> An unknown—but no more: we humbly screen
> With uplift hands our foreheads, lowly bending,
> And giving out a shout most heaven rending,
> Conjure thee to receive our humble pæan,
> Upon thy Mount Lycean!" (73)

For the Carians, bliss is ignorance. Divinity should remain an 'unimaginable lodge,' 'an unknown.' The three 'stills' of the poem – a foreshadowing of the same repetitious language Keats would use in 'Bright Star' – undermine the certainty placed in Pan as a

[99] He had used the myth as the basis for the shorter and less complex poem, 'I Stood Tip Toe' (1817).

symbol of an unknowable 'immensity.' Instead, this passage seems to highlight an anxiety within the congregation about a weakening in the boundary between heaven and earth.

This idea is furthered by a debate that occurs between the wise men of Caria about the nature of heaven and comfort they derive from imagining eternity. Earlier in the poem, Keats had acknowledged that human kind has sought refuge in immortality as a way to weave 'A flowery band to bind us to the earth' (65) and as an impulse to move 'away the pall/ From our dark spirits.'

> And such too is the grandeur of the dooms
> We have imagined for the mighty dead;
> All lovely tales that we have heard or read:
> An endless fountain of immortal drink,
> Pouring unto to us from heaven's brink. (65)

What Endymion finds on his traverse into the heavens is that this 'endless fountain' of 'lovely tales' has been 'imagined.' Yet he sits and listens to the 'goodly company' of philosophers on Mt Latmus compare their ideas of heaven.

> Who thus were ripe for high contemplating
> Might turn their steps towards the sober ring
> Where sat Endymion and the aged priest
> 'Mong shepherds gone in eld, whose looks increas'd
> The silvery setting of their mortal star.
> There they discours'd upon the fragile bar
> That keeps us from our homes ethereal;
> […]
> Anon they wander'd, by divine converse,
> Into Elysium; vieing to rehearse
> Each one his own anticipated bliss. (73)

For the Carians, heaven is 'a fragile bar that keeps us from our homes ethereal.' They hold a post-Aristotelian but pre-Herschelian understanding of the heavens that was 'in favour of an infinite universe beyond the sphere of the fixed stars—an infinite space containing no matter but serving as the abode of God and the angels.'[100] Yet each philosopher has his own 'anticipated bliss.' What proceeds, in Keats's poem, is a series of interpretative imaginings of an afterlife that somewhat resembles Percy Bysshe Shelley's 'Ode to Heaven.' One man, 'gone in eld,' feels 'heart-certain' of being greeted by his 'quick gone love, among the fair blossom'd boughs' (73–74). Another

[100] Bernard Lovell, 'Herschel's Work on the Structure of the Universe,' *Notes and Records of the Royal Society of London* 33.1 (1978): 57–75, 58.

wishes to meet his 'rosy child' sweeping by on 'feathery sails' through 'almond vales' (74). Others – hard-worn travellers – are 'athirst in soul to see again/ Their fellow huntsman' (74). These 'fond imaginations,' however, collide dangerously with Endymion's new heavenly knowledge.

> Thus all out-told
> Their fond imaginations,—saving him
> Whose eyelids curtain'd up their jewels dim,
> Endymion: yet hourly he had striven
> To hide the cankering venom, that had riven
> His fainting recollections. Now indeed
> His senses had swoon'd off: he did not heed
> The sudden silence, or the whispers low,
> Or the old eyes dissolving at his woe,
> Or anxious calls, or close of trembling palms,
> Or maiden's sign, that grief itself embalms:
> But in the self-same fixed trance he kept,
> Like one who on the earth had never stept– (74)

Endymion is the only Carian to have traversed the boundary between earth and heaven. What he has heard in the Hymn to Pan and in the circle of wise men is irreconcilable with his new universal knowledge.

There can be no doubt as to the cause of Endymion's 'fainting recollections.' He has been transported beyond the proper realms of human experience and he is suffering from the consequences of losing faith in a safe and familiar heaven. Endymion explains to his sister Peona, that in his sleep, a heavenly lover has transported his imagination, catapulting him from the hills of Latmus into her own cosmic realm. And the goddess's heaven is awake to findings of contemporary astronomy. For example, as Cynthia places Endymion under her enchantment, he begins to see strange and wondrous visions. His description evokes images of Herschel's glittering spiral nebulae or star clouds which 'shap[ed] visions all about [his] sight/ Of colours, wings, and bursts of spangly light' (78). Endymion's body remains on earth but his mind is free to understand the universe with god-like access – a universe where 'stars began to glide/ And faint away' (79) and 'dart their artillery forth' (80). These are not the 'fixt' stars of Newtonian cosmology but the dangerous, brilliant, mutable stars of the Romantic-era heavens. Endymion looks above and sees the via lactia spreading out before him: 'Methought I lay/ Watching the zenith, where the milky way/ Among the stars in virgin splendour pours' (78). Here Keats references the relative youth or virginity of our own galaxy, a fact revealed by Herschel who had proved that the

universe was made up of galaxies far more ancient and complex than our own. When Cynthia first appears to Endymion her hair flies in the cosmic wind – a wind so powerful it 'balances the heavy meteor-stone' (80) – and becomes a three-dimensional 'fluttering pavilion' that is 'blue, and over-spangled with a million/ Of little eyes, as though […] wert […] shed,/ Over the darkest, lushest blue-bell bed,/ Handfuls of daisies' (79–80). And Keats acknowledges Herschel's infinite cosmos by comparing the significance of human history to a 'Swart planet in the universe of deeds!' (89).

Keats's references to contemporary astronomy in the poem, while frequent, do not contain his most significant engagement with the universalism debate of the early nineteenth century. Unlike Eramus Darwin, it is not Keats's intention to instruct upon the most recent advances in the science, or to privilege one universal hypothesis over another. As part of the poem's wider exploration of earthly and divine realities, *Endymion* instead deals primarily with the challenges posed to the imagination and imposed upon the human experience by a cosmos that had become both wondrous and frightening. What Endymion comes to know of the Universe through his trysts with Cynthia – the visions of a colourful, expanding, swirling alien world, where he has been 'lapp'd and lull'd along the dangerous sky' (80) – has a cataclysmic effect upon him and his ability to return to his mortal life in Caria.

Peona assumes, rightly, that his melancholy sickness has been caused by some powerful knowledge of the gods or heavens that he cannot bear: "'Brother, 'tis vain to hide/ That thou dost know of things mysterious/ Immortal, starry; such alone could thus/ Weigh down thy nature'" (77). Here the heavenly realm is portrayed by Keats as possessing a kind of terrible power which, Endymion says, gave his 'eyes at once to death: but 'twas to live' (80). Knowledge of the brilliant expansiveness of the heavens has been thrust upon Endymion and has left him paralysed. He cannot take pleasure in those things that once gave him happiness. Endymion explains that, now, his 'higher hope/ Is of too wide, too rainbow-large a scope,/ To fret at myriads of earthly wrecks' (83). This new perspective of earthly life, its diminished scale and importance, has rendered it meaningless for Endymion. He is still looking down from amongst the stars and is revolting against the cares, dreams and hopes of an earth-bound existence. Endymion's experience when faced with this infinite cosmos, whereby the Earth's centrality to the Universe is shattered once and for all, reflects a popular anxiety about the importance or meaning of the human experience during Keats's lifetime.

But Endymion also believes that he has found a unifying principle, a universal 'essence' that beckons the human mind to knowledge of itself. When Peona recognises something 'high perplexing' in her brother's face (77). Endymion explains his new insight.

> Wherein lies happiness? In that which becks
> Our ready minds to fellowship divine,
> A fellowship with essence; till we shine,
> Full alchemiz'd, and free of space. Behold
> The clear religion of heaven! (83)

This 'clear religion of heaven' that Endymion is called to worship supersedes the 'fond imaginings' that make up the 'old piety' of Latmus. Importantly, Endymion's new understanding of the cosmos evokes Herschel's theories of nebulosity, even as he speaks about the human experience of love and friendship:

> – that moment we have stept
> Into a sort of oneness, and our state
> Is like a floating spirit's. But there are
> Richer entanglements, enthralments far
> More self-destroying, leading, by degrees,
> To the chief intensity: the crown of these
> Is made of love and friendship, and sits high
> Upon the forehead of humanity.
> All is more ponderous and bulky worth
> Is friendship, whence ever issues forth
> A steady splendour; but at the tip-top,
> There hangs by unseen film, an orbed drop
> Of light, and that is love: its influence,
> Thrown in our eyes, genders a novel sense,
> At which we start and fret; till in the end,
> Melting into its radiance, we blend,
> Mingle, and so become a part of it… (83–84)

The 'oneness' of the spirit is condensed as a star – but not forever. Gravity, that 'self-destroying' force, has 'by degrees' led to the 'chief intensity,' the cataclysmic explosion of matter that 'issues forth/ A steady splendour' of 'light' and 'love' and at which humanity might 'start and fret' until we, too, are made into star dust when 'Melting into its radiance, we blend,/ Mingle, and so become part of it.' Coming to understand this universal truth – that human kind is sublimely overwhelmed by heaven's infinity yet also intimately connected to all that exists – will, according to Endymion, benefit 'all the congregated world' (84).

Ultimately Endymion is mistaken. The poem shows that attaining earthly happiness through universal knowledge is impossible. And it is this impossibility that attracts

Keats's interest. It is the infeasibility of living with a complete understanding of an infinite and fathomless Universe – and the implications of a mutable universe, born out of its own remains – that forms meaning in *Endymion*. Eventually, Keats's poem suggests, humanity will be compelled to cast this knowledge aside. We, as Peona tells Endymion, must not 'tease' our 'pleasant days, because' we cannot 'mount/ Into those regions' (82). We must not 'sully the entrusted gem/ Of high and noble life with thoughts so sick' (83). This is what Endymion is unable to do. Cynthia realises that her lover's earthly life has been spoiled by his intimate knowledge of the Universe. Endymion has too 'far strayed from mortality' to return (137) and she must '*kissing snatch*' him into '*endless heaven'* (138).

For many critics, the meaning of *Endymion* is complicated or compromised by the events that take place just before poem's ending. Jack Stillinger argues that the introduction of the seemingly mortal maiden (really Cynthia in disguise) that Endymion eventually falls in love with 'represents a last-minute reversion to the realm of the ideal.' Stillinger further notes that 'the emphasis in this elaboration, since so many lines are given to it, would seem to fall on the necessity of Endymion coming to terms with the real world and human existence.'[101] Barry Gradman, meanwhile, observes that Keats discovers 'in the course of his long poetic odyssey that the visionary realm, despite its prodigious allure, cannot by itself encompass his maturing apprehension of the truth of human experience. He will discover that poetry cannot "simply tell the most heart-easing things."'[102] Similarly, Li Ou notes that 'The happy ending of Endymion is achieved by casting himself into an intense "fellowship" with all the realms of the actual world, the Indian maid included, rather than a dogmatic search for an abstract ideal.'[103] Yet the 'happy ending' of *Endymion* relies on the Indian maiden, supposedly an icon of the real, being subsumed into the heavens. After all is said and done, Endymion has been unable to exist with the real, human, earthly. This aspect of the poem, certainly reflected the concern of those writers and thinkers of the early nineteenth century who struggled to reconcile the implications of Romantic-era astronomy with the narrative of human centrality that had existed before.

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[101] Stillinger, 'Introduction,' xviii–xix.

[102] Barry Gradman, *Metamorphosis in Keats* (New York: New York University Press, 1980), 11.

[103] Li Ou, *Keats and Negative Capability*, 117.

Negative capability, as it exists in Keats's epic, allows the poet to explore the anxiety surrounding the emergence of new universal knowledge within his culture. Not only is Keats's heaven negatively capable – it houses Greek mythology, contemporary cosmology and, perhaps, the 'Astronomy of the Hindoos'[104] – but the poem itself contains an allegory that advocates uncertainty. Perhaps Keats was inspired by the opacity of Herschel's nebula or the nebulosity of the astronomer's theories themselves. Perhaps, on the other hand, Keats saw Herschel and his colleagues as being 'irritable' in their 'reaching after fact and reason'. Yet it is no wonder that, like the happy Carians who prayed for the door to 'universal knowledge' to remain closed, Keats would privilege the ability to remain 'content with half-knowledge.'

[104] A point made by Professor Deirdre Coleman at the 'Voyaging Romantics' conference at Victoria University, Wellington in September 2012.

Chapter Five:

Eternity, History and *Hyperion*

1. The World's Eternity

The tension between ancient and modern understandings of the eternal universe appeared in print culture throughout the lifetimes of William Herschel and John Keats. In 1782, only months after the monumental power of Herschel's telescopes (and the promise of his technology for future discoveries about the universe) had become widely known, *The European Magazine and Monthly Review* published an essay on the cosmology of the classical Greek scholar Ocellus Lucanus. The reprinting of Ocellus Lucanus's 'On the Nature of the Universe' by 'T. T.,' reasserted a classical worldview that was increasingly under threat by the developments of modern science:

Gentlemen,
August 21, 1782

From such of your readers as possess any taste for ancient Philosophy, every attempt to restore its decaying credit will, I persuade myself, meet with a candid reception; and, perhaps, those who have no inclination this way, may, at least, find some entertainment, in contemplating the ruins of a system, once fair and flourishing, and which will ever be venerable, both from the antiquity and authority of its founder. The following then is a paraphrase on part of a small Greek tract, 'On the Nature of the Universe,' by Ocellus Lucanus, a disciple of the celebrated Pythagoras, remarkable for the elegant conciseness of its composition, and the subtle arguments by which the opinion of the world's eternity is established.[1]

The pathos towards 'the ruins of a system, once fair and flourishing' that T. T. appeals to in his reader, works to reassert the validity of Lucanus's opinion about 'the world's eternity.' Writing into an age when the idea of the 'decaying credit' of 'ancient Philosophy' would have evoked a passionate response from advocates for the timelessness of classic wisdom – it would 'ever be venerable' – the essay seeks to emphasise continuity, steadfastness and permanence, not only in the universal search for enlightenment, but in the universe itself. By associating Lucanus with 'the celebrated' Pythagoras (whose followers, unlike those of Aristotle, had hypothesized

[1] T. T, 'On the Nature of the Universe,' *The European Magazine and London Review* September (1782): 180–182, 180–181.

that the earth formed part of a heliocentric system) the author also stressed the currency of the philosopher's ideas. It helped, too, that Lucanus's theories about the universe, like many of those expressed by the Pythagoreans, appeared remarkably 'modern.'

Indeed, T. T. could not have foreseen in 1782 just how germane Lucanus's reflections upon eternity would appear when placed alongside Herschel's work on nebulosity and the transience of the material universe. The following passage, quoted (and presumably translated) by T. T. in his essay, speaks directly to Herschel's thought experiments about the 'natural history' or evolution of the heavens and his focus on the different 'species' present in the stellar universe.[2]

> The world has always appeared to me eternal, for the following reasons: If any one asserts it to be created in time, he must inevitably acknowledge a possibility of its decay; but as it cannot be shewn from what antecedent matter it was produced (for this matter must be prior to the universe, and so the whole was not created), so neither is it possible to conceive of any separate matter, into which the universe may be dissolved, and which shall still remain after its corruption; for indeed as the universe implies the whole, the beginning of every thing must depend on its origin, and from its destruction the destruction of every thing must ensue; but since this is impossible, it is better to believe it without beginning or end.[3]

If the universe had come into being, according to Lucanus, then it had been 'created in time' – the heavens had a past and, consequently, a future. But as it was impossible to conceive of any 'antecedent matter' that could bring all things into being – that was 'prior' to the universe, without actually being *of* the universe – Lucanus believed (or thought it 'better to believe') that the universe was indeed eternal and 'without beginning or end.'

The discoveries that Herschel would go on to make about the relation between stellar and nebulous matter both supported and contradicted Lucanus's theory of universal perpetuity. On the one hand, Herschel disproved that the universe was, as the Greek scholar argued, 'destitute of generation and decay.'[4] He had shown that the universe was indeed home to both creation and dissolution – that universal matter

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[2] Extensive quotations from Herschel's scientific papers on these subjects can be found in 'Chapter Four: Nebulosity and Negative Capability in *Endymion.*'

[3] T. T., 'On the Nature of the Universe,' 181.

[4] T. T., 'On the Nature of the Universe From Ocellus Lucanus,' *The European Magazine and London Review* December (1782): 420–430, 429. The typescript of this 'continued' essay gives the author's name as J. T. but, for clarity and consistency, I refer to the author as T. T. throughout.

could 'become' and also waste away. Herschel had also convincingly argued that universal objects existed 'in time,' and that it was possible to measure the age of a galaxy's 'past and future existence.'[5] On the other hand, however, Herschel's nebulous hypotheses identified universal transmutation rather than total annihilation. Nebulae, stars and star clusters, as Herschel recognised, existed on a developing continuum (if not a life-cycle) that told the story of the same cosmos. The universe, then, was united under the same physical laws. All, according to Lucanus's logic too, was related. 'Again, whatever is contained in the bosom of the universe, immediately depends on it for support […] thus light is necessary to the sight, and thus even the sun and moon, the wandering as well as the fixed stars, are limited by those general laws, which exist in every part of the world.'[6] It was, according to Lucanus, also 'necessary to the perpetuity of [the universe's] duration, that what it produce[d] in others, and what it generate[d] in itself, should mutually accord in one.'[7] Herschel had found nothing to the contrary.

T. T.'s argument about eternity, via the philosophy of ancient Greece, contained a canny antidote to all past and future speculations about the ultimate demise of the universe. To witness the signs of decay and dissolution in bodies as complex as galaxies, as Herschel would go on to do – to see mortality enter the far off regions of the heavens – even this would not be enough to discredit the eternal universe. 'As the universe implies the whole,' Lucanus had argued, 'the beginning of every thing must depend on its origin, and from its destruction the destruction of every thing must ensue.'[8] But this was 'impossible.' The 'remains' of a universal apocalypse would still belong to the universe. The universe might die but it could never end.

Importantly, Lucanus's universal theory was reconcilable within a Christian cosmology, even as it denied the existence of 'creation.' The Greek scholar had allowed for the possibility of a divinity who had imbued the universe with its own eternity.

> If any one is still inclined to believe the universe may be dissolved, we add, it must either perish by the power of something without itself, or of something within: –

[5] William Herschel, 'Astronomical Observations Relating to the Sidereal Part of the Heavens, and its Connection with the Nebulous Part: Arranged for the Purpose of Critical Examination,' *Philosophical Transactions of the Royal Society* 104 (1814): 248–284, 283.

[6] T. T., 'Universe,' September, 181.

[7] T. T., 'Universe,' December, 429.

[8] T. T., 'Universe,' September, 181.

Without itself is impossible, for separate from the universe no being can be found, much less has it reason to dread any enemies within, for it must surely be greater and more powerful than these, especially since it governs, and bestows life, upon all things. Since, therefore, it is in no danger of any external, or internal assaults, it must remain superior to the power of change, and entirely free from the sorces of decay.[9]

The idea of an omnipresent and creating (but not created) 'being,' accorded surprisingly well with the Genesis narrative. Lucanus's granter of life is free from 'any external, or internal assaults' but is universally invested or entwined in all things. Such reasoning rendered the republication of Lucanus's ideas less threatening to a Christian paradigm than it might otherwise have been.

At the time of T. T.'s recirculation of Lucanus's theories about the nature of the universe in 1782, Isaac Newton stood as the scientific figure who had most successfully walked the tightrope between progressive scientific breakthroughs and religious conservatism. Indeed, Newton's personal belief in an all-powerful God stood at the centre of his *Principia* (1687), despite the fact that the seminal treatise argued that natural law – and not divine will – was responsible for the eternal movement of celestial bodies through space.[10] God had a place in Newton's system, but as creator and occasional corrector, not the force of planetary orbit itself. Over the centuries, a popular narrative of Newton's position emerged which held that the Englishman's mathematics were responsible for replacing the 'All Mighty' creator with an imperfect craftsman – a 'clockmaker' – who had set the mechanics of the clock in motion before stepping aside.[11]

Gottfried Leibniz (1648-1716) had initiated this reading of Newton's work. Leibniz concluded that if God was required 'to wind up his watch from time to time,' He must lack 'sufficient foresight to make it a perpetual motion.' [12] Leibniz also observed that God would be obliged 'to clean [his watch] now and then by an extraordinary concourse, and even to mend it, as a clockmaker mends his work.'[13] This, according to the German philosopher, was blasphemy. The idea implied that the Creator was neither

[9] T. T., 'Universe,' September, 182.

[10] Isaac Newton, quoted in Edward B. Davis, 'Myth 13: That Isaac Newton's Mechanistic Cosmology Eliminated the Need for God,' in *Galileo Goes to Jail and Other Myths About Religion and Science*, ed. Ronald L. Numbers (Cambridge, MA: Harvard University Press, 2009), 115–122, 120–121.

[11] Davis, 'Myth 13,' 120–121.

[12] Gottfried Leibniz, quoted in Davis, 'Myth 13,' 115–117.

[13] Davis, 'Myth,' 121.

omnipotent nor omnipresent.[14] In actual fact, Newton believed that God must have an active, present role in the workings of the heavens. He figured God as the ultimate 'Ruler,' both 'eternal' and 'infinite.' God was literally the temporal and physical space of the universe.

> This Being governs all things, not as the soul of the world, but as Lord over all, and on account of his dominion is wont to be called Lord God, or *Universal Ruler* […] He is eternal and infinite, omnipotent and omniscient; that [h]is duration reaches from eternity to eternity; his presence from infinity to infinity; he governs all things, and knows all things that are or can be done. He is not eternity or infinity, but eternal and infinite; he is not duration or space, but he endures and is present. He endures forever, and is every where present; and, by existing always and everywhere, he constitutes duration and space.[15]

According to both Lucanus and Newton, the creator had not been created, nor was there anything prior to God. Just as the Greek scholar had argued for a universe 'entirely free from the forces of decay,' Newton had argued for a universal 'Being' that had existed 'always and everywhere.'

Herschel's findings about universal mutability and decay threatened to cast doubt upon the already fraught issue of eternity and the divine in the eighteenth century. Newton had been venerated for his ability to keep God's work alive within the universe and to prove himself a devout Christian as well as a man of genius. Due to the nature of his discoveries, Herschel would have a more difficult time doing the same. Indeed, the uncertainty Herschel introduced into the heavens led him to be labelled 'irreligious' by at least one colleague.[16] And a broadside, published after Herschel's death, illustrates the potentially revolutionary implications of the German-born astronomer's findings.

In 1830, E. Batchelor reported the discovery of William Herschel's lost observational journals.[17] The pamphlet, entitled *Wonderful Prophecies*, *of that Famous Astronomer & Philosopher*, *Sir William Herschell*, *(Astronomer to their late Majesties George III. and IV.)* claimed that the natural philosopher had seen more in the stars

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[14] Edward Dolnick, *The Clockwork Universe*: *Isaac Newton*, *the Royal Society and the Birth of the Modern World* (New York: Harper Collins, 2011), 312–313.

[15] Sir Isaac Newton, quoted in Richard Henry Popkin, *The Third Force in Seventeenth-Century Thought* (The Netherlands: E. J. Brill, 1992), 186.

[16] Constance A. Lubbock, *The Herschel Chronicle* (Cambridge: Cambridge University Press, 1933), 197.

[17] *Wonderful Prophecies of* […] *William Herschel* (London: E. Batchelor, 1830).

than had been discussed in his scientific papers. The extracts from Herschel's 'prophecies' were allegedly 'abridged from a MS recently found by the Representatives of that celebrated Man, in his Private Observatory at Datchet, near Windsor; distinctly pointing out the great REVOLUTIONS now taking place in various parts of Europe – the Recognition of the Rights of Man – the Downfall of Despotism – the Extensions of Christianity, and every important Event likely to occur the civilised World.' According to the pamphlet, Herschel had made the following prediction:

> In the Autumn of [1830] there will be a rare lunar phaenomenon, which occurs on Thursday Sep 2. (here follow some unimportant remarks). About this time we may expect to hear of great Revolutions and commotions! The blood of patriot citizens will be shed in defence of their popular and chartered immunities [.] A great spirit of Union will arise, and go forth to all quarters of Europe, and such will be his amazing effects, that in less than 3 years from that period there will not be a despotic monarchy in existence!

It just so happened that Herschel's journals had been 'discovered' the same year as multiple revolutions had swept across Europe. Herschel, it seemed, had used his unprecedented knowledge of the stars to divine the uprisings that had taken place in France, Belgium, Poland, Italy, Germany and Greece in 1830.[18]

The pamphlet also contained a number of woodcut drawings relating to Herschel's prophecies. At the left, Hercules is depicted fighting the three-headed dog Cerberus (who, in Greek mythology, is charged with standing guard over the inmates of Hades) while prisoners escape. In the bottom right, a French officer brandishing the flag 'Ecco Homo,' drives away members of the Catholic Church.[19] According to the pamphlet, Herschel had foreseen the 1830 'July Revolution' that had taken place in France and that had triggered a wave of rebellion across Europe. King Charles X was forced to abdicate to Louis Philippe when he attempted to enforce press censorship, reduce the franchise and remove the checks on the power of the monarchy imposed by the chamber of deputies.[20] Louis Philippe, in turn, had agreed to a more liberal constitution that limited the power of the Church in state affairs. Herschel had discovered the upheaval of whole galaxies of stars – was it difficult to believe that he had also seen the future dissolution of ancient systems of political and social power?

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[18] Clive H. Church, *Europe in 1830*: *Revolution and Political Change* (Winchester, MA: Allen & Unwin, 1983).

[19] Identified as the aristocratic champion of reform in France, Louis-Philippe, by the curators at the British Museum.

[20] 'July Revolution,' in *The Oxford Dictionary of World History* (Oxford: Oxford University Press, 2006).

WONDERFUL PROPHECIES,

OF THAT FAMOUS

ASTRONOMER & PHILOSOPHER,

Sir William Herschell,

(Astronomer to their late Majesties GEORGE III. and IV.)

Abridged from a MS. recently found by the Representatives of that celebrated Man, in his Private Observatory, at Datchet, near Windsor; distinctly pointing out the great REVOLUTIONS now taking place in various parts of Europe – the Recognition of the Rights of Man—the Downfall of Despotism – the Extension of Christianity, and every important Event likely to occur the civilized World

THE Astronomical Observations of the laborious Dr. Sir W. HERSCHELL, have gained for him so much celebrity in every part of Europe, and his Political Prophecies point so distinctly to the great events now taking place in various quarters of the world, that the reader will require no apology from me, for introducing the following extracts from the private Diary of that distinguished man.

Although many years may yet elapse before all the events referred to may be fulfilled, yet many of them are so obviously coming to pass, that we rest for the future with feelings of conscious-ness for their fulfilment.

1830. "In the Autumn of this year there will be a rare lunar phenomenon, which occurs on Thursday, Sept 2. (here follow some unimportant remarks) About this time we may expect to hear of great Revolutions and commotions! The blood of patriot citizens will be shed in defence of their popular and chartered immunities A great spirit of Union will arise, and go forth to all quarters of Europe, and such will be its amazing effects, that in less than 5 years from that period there will not be a despotic monarchy in existence!

Popery will receive a blow and the jesuitical manœuvres of a besotted priesthood will be frustrated. The cause of Liberty will flourish in spite the machinations of hoodwinked ministers, and their wicked designs will recoil on their own heads! The people are claiming their proper stations in the scale of nature, and 'princes will learn to rule in righteousness.'

I have allowed 5 years for the accomplishment of a great political regeneration; but I am of opinion that it will not be done without great moral energy, if not physical force, in some continental states= the Scion of Liberty must be watered with the patriot gore, and the red flag of battle will again be unfurled.

From what I can see by the stellar configurations, there will be some vacant thrones, the "divine right of kings" being no longer acknowledged by the people. Pay attention to this ye rulers of France, Spain, Italy, Portugal and Belgia, "lest your kingdoms be taken from you and given away to others!"

In casting my eyes to the New World, I see her making rapid advances in civilization, and the arts of peace. Her straight forward course is a pleasing contrast to the crooked policy of a great European nation Would to God rulers would not forget the great example shewn by this youthful giant, and learn to recognize their own, in the nation's interest! Time is a severe schoolmaster, but he teaches lessons which fools will learn in no other.

And what is the cause of all this? ..the people are beginning to *think*, they embody their thoughts in forcible language to their respective governments, and if no attention is paid to their petitions, they will *act*, firmly, resolutely and triumphantly.

All this is bringing about the designs of Providence; he will work his sovereign will amidst the jarring elements of human policy, and forward his designs in a way diametrically opposite to the speculations of man; let no man dare to question His designs, or to arraign His judgment, but, as far as human agency is available, endeavour to accelera e the great events now hanging over us, un il Bigotry and Slavery are only remembered as "things which were!"

LONDON:

Printed by E BATCHELOR, No 75, Mosse Lane, Bishopsgate-St.

12. Broadside containing 'extracts' of political prophecies of the revolutions occurring in Europe attributed to William Herschel. Herschel, of course, was a loyal subject to his King, sought to isolate his astronomical discoveries from any radical associations and wrote nothing of the kind. Printed by E. Batchelor, London, 1830.

It is difficult to determine whether Batchelor's audience would have immediately recognised this pamphlet as a hoax. While the broadsheet's overt political propaganda would have alerted most readers to the dubiousness of its claims, some may have been willing to believe that Herschel had seen the future in the stars. Perhaps Herschel had indeed declared the end of ancient feudalism. 'From what I can see by the stellar configurations, there will be some vacant thrones, the "divine right of kings" being no longer acknowledged by the people. Pay attention to this ye rulers of France, Spain, Italy, Portugal and Belgia.' If the realm of heaven was not eternally fixed, then surely the 'divine right of kings' was not interminable.

E. Batchelor's pamphlet cast Herschel and his cosmology in a revolutionary framework that would have surprised Herschel, a grateful receiver of royal patronage. Herschel had adapted, rather than challenged Newton, when he applied his law of universal gravitation beyond the solar system and he had also adopted Newton's position at the nexus of science and religion. Herschel, too, had embraced the High Church of England, attended regular services all his life, and was vocal in his continued belief in a universal God.[21] In 1802, for example, upon gaining an audience with Napoleon Bonaparte in Paris with the eminent French physicist and astronomer Pierre Simon Laplace, Herschel had been confronted with a question about Creation.[22] In his journal, Herschel explained that Bonaparte had demonstrated a keen interest in, and good knowledge of, astronomy. But the ruler had also demanded answers from the two scientists about where the immensity of the sublime universe had come from.

> The first Consul then asked a few questions relating to Astronomy and the construction of the heavens to which I made such answers as seemed to give him great satisfaction. He also addressed himself to M. La Place on the same subject, and held a considerable argument with him in which he differed from that eminent mathematician. The difference was occasioned by an exclamation of the first Consul's, who asked in a tone of exclamation or admiration (when we were speaking of the extent of the sidereal heavens) 'and Who is the author of all this!' Monsieur Dela Place wished to show that a chain of natural causes would account for the construction & preservation of the wonderful system, this the first Consul rather opposed. Much may be said on the subject, by joining the arguments of both we shall be led to 'Nature and nature's God.'[23]

[21] Michael Hoskin, *Discoverers of the Universe*: *William and Caroline Herschel* (Princeton: Princeton University Press, 2011).

[22] According to Hoskin, Laplace's 'nebular hypothesis of the solar system chimed with William's vision of the large-scale universe' [*Discoverers of the Universe*, 166].

[23] William Herschel, quoted in Hoskin, *Discoverers of the Universe*, 167.

Herschel, the more diplomatic of the two astronomers, knew better than to assign the magnificence of the universe to 'a chain of natural causes.' Herschel understood that in order for his ideas about the scale and changeability of the heavens to be accepted by the majority, he would have to marry them to a Christian world-view. In 'joining the arguments of both' – Napoleon's faith in a great 'author' and Laplace's belief in the creative and destructive forces of nature – Herschel had arrived at a solution that did justice to both Romantic-era astronomy's discoveries about the natural history of the heavens, and to the culture's presiding belief in the power of an eternal God. Thus Herschel presented 'Nature and nature's God' – an everlasting being who had designed a perpetually shifting material universe.

Perceptively, Herschel had also judged Napoleon's personal investment in a universe both divinely ordained and shifting. Indeed, Herschel's cosmology had the power to support the religious and political legitimacy of Napoleon's rule. As a supporter of the French Revolution, and a military campaigner who had stepped into the power vacuum it had created, Napoleon must have supported any challenge to the eternal right of kings. As a First Consul, who would crown himself Emperor within two years, Napoleon must also have appreciated Herschel's framing of the new cosmology, his proposition that change was divinely ordained.

Napoleon was certainly not the only figure with a vested interest in containing the revolutionary potential in Herschel's findings. All those who were compelled to acknowledge the mutability of the universe because of their allegiance to the scientific method on one hand, but to reaffirm a Christian belief in the interminable rule of god on the other, were forced to engage in paradoxical thinking about the universe. This paradox, which held that the universe was both permanent and ephemeral, defined Romantic cosmology.

2. All Change, No Death

Each contradictory proposition of the eternity paradox attracted writers and thinkers at the turn of the nineteenth century, according to their own political agendas. Establishment figures, religious leaders, political moderates, conservatives and, indeed, most parties interested in maintaining the status quo, preferred the comforting social, political and religious stability implied by the idea of universal permanence. But

Herschel's cosmology was, at least in part, a rejection of this concept. Given the potentially revolutionary implications of William Herschel's cosmology, then, it is surprising that the astronomer did not attract more criticism from conservative quarters. Unlike the geologist James Hutton, Herschel had escaped vicious and sustained attacks from the religious and political establishment. This fact is particularly surprising if one considers the similar contribution the two scientists made towards understanding the continuity of physical laws throughout the universe (or uniformitarianism).

Romantic-era astronomy and geology both introduced a narrative of the cosmos that included what I have called a 'paradox of eternity.' This term is an adaptation of Stephen Jay Gould's masterful identification of a 'paradox of the soil' existing within early geology.[24] Hutton, according to Gould, recognised that soil was 'generated from eroding rocks' and was therefore 'a product of destructive forces.' Hutton knew that 'the process that sustain[ed] life' would 'eventually destroy it.'[25] Each paradox – of 'eternity' and 'of the soil' – can be understood as indicating a scientific rhetoric equally invested in two seemingly contradictory paradigms for thinking about the world – one that emphasizes continuity, and the other that emphasizes change. Nothing is eternal, Herschel and Hutton argued, except the eternal and universal natural laws that proscribe that nothing is eternal. Positing these two extremes ultimately created a balance, a position of neutrality from which controversial findings could be defended from attacks from the social, religious and scientific establishments. A succinct expression of the 'paradox of the soil' and consequently the 'paradox of eternity' can be found in John Playfair's summary of Hutton's theory:

> Amid all the revolutions of the globe the economy of Nature has been uniform, and her laws are the only things that have resisted the general movement. The rivers and the rocks, the seas and the continents have been changed in their parts; but the laws which direct those changes, and the rules to which they are subject, have remained invariably the same.[26]

[24] Stephen Jay Gould, *Time's Arrow*, *Time's Cycle*: *Myth and Metaphor in the Discovery of Geological Time* (Cambridge, MA: Harvard University Press, 1987), 76 ff.

[25] Gould, *Time's Arrow*, *Time's Cycle*, 77.

[26] John Playfair, quoted in Charles Lyell, *Principles of Geology*, *Being An Attempt to Explain the Former Changes of the Earth's Surface*, *By Reference to Causes Now in Operation* [1830-1833] (London: Penguin, 1997), 415. Lyell, the most successful proponent of Huttonian geology draws on Playfair's quote to argue the non-threatening validity of Uniformitatianism, or the belief that the name natural laws have existed in the universe throughout space and time.

In the early 1830s Charles Lyell drew upon Playfair's words to emphasize the attraction of Hutton's Uniformitatianism (the belief that the same natural laws had existed in the universe throughout space and time). In a similar way, Herschel argued that the physical laws that existed in the solar system extended into a universe of eternal change. What emerged from the new cosmology of Herschel and Hutton, then, was a vision of the universe that encompassed dynamic change, growth and renewal but only within the confines of established and stable natural laws. This conservative framing of potentially threatening hypotheses might have appealed to both sides of politics. Monarchists could maintain the supremacy of the so-called natural laws that maintained the power of the ruling elite, while those agitating for reform could be comforted that change was inscribed onto the destiny of all things. In theory, the eternity paradox should have kept everyone happy. However, there was no getting around the fact that Huttonian time scales directly contradicted the 6000 years given as the Earth's age in the Holy Scriptures. And because Hutton's theories were based on the slow erosion and reformation of the earth, there was no room for catastrophic biblical events such as the Great Deluge in telling the story of the formation of the world. According to Christian teachings, God had created the universe, had called it into being, and then had infused it with his own eternity. The world had a beginning in God, and could only find its end in God. Hutton, on the other hand, had argued that upon the earth, the eternal cyclical movements of the soil meant that there could be 'no vestige of a beginning, no prospect of an end.'[27]

Contemporary astronomy was more easily reconciled with the Christian idea of Creation. The Old Testament, while setting out the exact age of the earth, contained little information on celestial regions beyond implying that light had been given to Earth on the fourth day. Herschel's findings, unlike those of Hutton, were therefore not opposed to the claims of the Holy Scriptures. Herschel, too, had no credible competition in the form of opposing contemporary schools of thought. Huttonians, on the other hand, came up against Neptunists who offered alternative theories of the earth more in keeping with biblical teachings. Even the most ardent critics of geology's perceived rejection of the Creation found ways to accommodate Romantic-era

[27] James Hutton, quoted in Dennis R. Dean, *James Hutton and the History of Geology* (Ithaca, NY: Cornell University Press, 1992), 262. Despite attempts by those outside of the geological discipline to marry scientific findings with biblical evidence, Dean argues that 'Scriptural corroboration' rather than 'Scriptural literalism' was practised by many geologists and that by the late eighteenth century, those who relied exclusively on biblical evidence had been 'excluded from serious geological discussion' [93–94].

astronomy. For example, while a series of essays on 'Creation and Geology' that ran in *The Imperial Magazine* throughout 1820 ridiculed that science's claims about the eternity of matter, astronomers were described as presenting 'an august system,' that accorded with 'Revelation.'[28] The heavens had been created according to the Mosaic account and the modern astronomy could easily be merged with this narrative.

> The work of the fourth day of Creation consisted in the formation of the *Sun*, *Moon*, and *Stars*; or of all the orbs of light which are visible in every direction in the expanse of heaven. It did not consist in the Creation of them, as to the *matter* of which they are composed; not in the *modeling* of them into their particular figure; nor in the *proportioning* of their respective magnitudes; nor in appointing their station or particular design. All these arrangements seem to have taken place already. The operations of the first day, provided the matter – those of the second, the distribution of their various masses – and those of the third, their consolidation and figure. The work of the fourth day is therefore to be considered merely as a *distribution* or *transfusion* of the light which was created on the first day, with our *Sun*, and with the millions of other *Suns* […] dispersed and stationed throughout the vast universe.[29]

Indeed, according to this essayist, Herschel's findings only served to prove the sublime magnificence of the Creator.

> The immense number of stars, which are rendered visible with Dr. Herschell's large telescopes, within a small space, make it reasonable to conclude, that in the whole heavens there are above eighty millions of stars. And if each system to which each of these stars is a sun, consist of as many planets and satellites as does our solar system, how immense must be the number of bodies which traverse the expanse of heaven! And, for the Almighty to operate on all these at once, as the Mosaic account intimates he did, what a display does it afford of his infinite power and wisdom![30]

Unlike Geologists who had argued that there was no beginning or end in the cycle of the earth's formation and dissolution, Herschel had not speculated about the numerical ages of particular galaxies or stars. He had only intimated that the lives of stars played out over vast periods of time. In one of his final papers, and perhaps in reaction to essays such as the series that appeared in *The Imperial Magazine*, Herschel allowed himself one small concession. When speaking of the breakdown of whole star systems, Herschel argued that 'no doubt can be suggested on account of the great length of time such a division must have taken up, when we have an eternity of past duration to recur

[28] 'Essay on Creation and Geology,' *The Imperial Magazine* November (1820); 924–934, 930.

[29] 'Essay on Creation,' 924.

[30] 'Essay on Creation,' 927–928.

to.'[31] Here the astronomer had cleverly disguised the implications of his statement. As Michael Hoskin notes, in this statement 'it is not clear whether he intends "eternity" in the literal sense or as shorthand for "immense periods of time"' – another meaning of the term during the astronomer's lifetime.[32] Herschel did not seek out religious controversy and his ability to negotiate the eternity paradox paid off for him both professionally and financially. Though he rarely mentioned God or the Almighty in his scientific treatises, he was able to remain a respected and venerated figure who stood apart from attacks of atheism or Deism, from the kinds of people who would seek to explain away the universe on purely material grounds.

The essayist on 'Creation and Geology' recognised the distinction too. For Herschel was canny enough not explicitly to proclaim, like the Huttonians, that the exact same laws had operated in the universe at large throughout time. This was an idea abhorrent to biblical literalists. 'We are utterly at a loss to conceive where, all the while, [materialists] place Omnipotent Creative Power; that they should conceive light at its formation to move by the same laws, or only with the same velocity, that it was to do afterwards. Such a method makes no distinction between the creation of things, and their use after they are created.'[33] The *Imperial Magazine* essayist was not arguing that astronomers like Herschel were wrong in their suppositions about the universe, rather that in the act of creation, God had designed universal physical laws. The Creator was not himself bound by the laws of his creation. In this way, the claims of modern astronomy were easily accounted for.

> Whether the rumoured notion of astronomers, that some of the fixed stars are at such an immense distance from this earth, that their light, though light travels with the amazing velocity of 200, 000 miles in a second, has not yet reached it since the creation, be true or not, signifies nothing in this place. We are not speaking of what might afterwards happen, but of what took place at the creation.[34]

This meant that while the universe had undergone change since the Creation, the Creator had not. God was the eternal 'Alpha and Omega' in an unstable universe.

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[31] William Herschel, 'Astronomical Observations Relating to the Construction of the Heavens, Arranged for the Purpose of a Critical Examination, the Result of which Appears to Throw Some New Light Upon the Organisation of the Celestial Bodies,' *Philosophical Transactions of the Royal Society* 101 (1811): 269–336, 287.

[32] Michael Hoskin, *The Construction of the Heavens*: *William Herschel's Cosmology* (Cambridge: Cambridge University Press, 2012), 72.

[33] 'Essay on Creation,' 926.

[34] 'Essay on Creation,' 926.

The Mosaic succession, then, has now existed for nearly 6000 years, but after it shall have run millions of ages more, should it endure so long, what difference would this mode of reasoning make? Would it remove a single difficulty respecting the active exertions of the Supreme Being in eternity before the commencement of this supposed extraordinary duration of time? Would eternity past be rendered shorter, or more completely occupied, by this fancied extended duration? Surely not. God did not necessarily require to be idle from eternity, though he was not occupied in creating the universe till the time specified by Moses.[35]

'Forever,' as a time scale, paled in comparison to God's eternity, which extended far beyond the existence of the universe. Only God stood against his own universal laws. In fact, God had created 'change' when he had become 'occupied in creating the universe.'

Even the most devout recognised that change was intrinsic within God's creation and the perfect example of this resided within man himself. The drive towards revolution had led to humanity's fall. Man's impatient hankering after change was just a part of a wider universal impulse: 'His presiding influence keeps by me through the whole current of my restless and everchanging history […] and the same Being […] is now at work in the remotest domains of Nature and of Providence.'[36]

As the examples above reveal, the positive reception Herschel received within the culture was not a result of the astronomer's hypotheses merely being laid aside. Marilyn Gaull has argued that the kinds of challenges Herschel's new cosmology posed to the established order of things were too volatile, too politically and socially dangerous, to be allowed to enter into the public imagination. She argues that Herschel's discoveries were dismissed in favour of the more palatable Newtonian vision of the universe which

survived because it was politically more useful than any other, because it vindicated many different political systems ranging from the monarchy of George III to the tyranny of Napoleon, to the democracy of the young republic in America that enshrined its order, symmetry, rationality, and hierarchy in its constitution and flag. Consequently, everyone, George III, his enemies and heirs, supported a Newtonian astronomy which seemed to affirm everyone's right to govern as he chose rather than the contemporary astronomy which postulated an explosive, dynamic, evolving, asymmetrical, boundless universe, a universe that aesthetically would have won the

[35] 'Essay on Creation,' 933.

[36] 'Art. I. – A Series of Discourses on the Christian Revelation, Viewed in Connection with the Modern Astronomy,' *The British Review*, *and London Critical Journal* (August 1817): 1–30, 12.

hearts of those who cultivated the sublime but one that was politically very dangerous – reflecting the political realities of revolutionary Europe.[37]

According to Gaull, Herschel's version of the universe was simply ignored in favour of Newton's cosmology in almost all cultural production. But this claim is contradicted by the wide distribution of Herschelian ideas throughout the popular press – in newspapers, periodicals and educational treatises – as well in the art and poetry of the period. It also sets Herschel's cosmology into an over-simplified opposition with that of Newton and minimises the extent to which the former scientist's observations, mathematics and theoretical work was indebted to the latter.[38] I argue, instead, that the radical implications of contemporary astronomy's discoveries about universal change were intentionally stabilised by a foregrounding of Herschel's discovery of fixed universal laws.

John Bonnycastle, for example, was careful to stress the eternal nature of universal laws. He argued that the study of 'refraction' was 'extremely useful, not only as it prepares us gradually for the light of the sun, but also as it occasions twilight, and by that means prolongs the duration of the day.' He instructed his readers that 'Nature' had 'established these gradations, to heighten our pleasures by variety' and that while 'the scene is perpetually changing […] the order of things is immutable and eternal' (277). Bonnycastle quoted a well-known philosophical poem to make his point. Edward Young's *Night Thoughts, on Life, Death, and Immortality* had also been published as *The Complaint: The Infidel Reclaimed* in 1798. Young's musings on the natural rhythms of life and death illustrated Bonnycastle's lesson perfectly.

> Look nature through, 'tis revolution all,
> All change, no death: day follows night, and night
> The dying day; stars rise, and set, and rise;
> Earth takes th' example: see the Summer gay,
> With her green chaplet, and ambrosial flow'rs,
> Droops into pallid Autumn; Winter gray,
> Horrid with frost, and turbulent with storm,
> Blows Autumn and his golden fruits away,
> Then melts into the Spring; soft Spring, with breath,
> Favonian, from warm chambers of the south,
> Recals the first: all, to reflourish, fades;
> As a wheel, all sinks, to reascend. (277)

[37] Marilyn Gaull, 'Under Romantic Skies: Astronomy and the Poets,' *Wordsworth Circle* 21 (1990): 34–41, 36.

[38] See Michael Hoskin, 'The English Background to the Cosmology of Wright and Herschel,' in *Cosmology*, *History*, *and Theology*, eds. W. Yougrau and A. D. Breck (New York: Plenum Press, 1977) and 'Newton, Providence and the Universe of Stars,' *Journal for the History of Astronomy* 8.77 (1977): 77–101.

Whether writers, thinkers, philosophers (natural or otherwise) believed in the eternity of matter – or in the wisdom of a Creator God who had invented the universe and had set its laws in motion – all were bound to the eternity paradox. The universe was either eternal, had not been created, but was home to perpetual revolution. Or God, the eternal being, had created a universe of change. The underlying conclusion of each party's argument was the same. 'As a wheel, all sinks, to reascend': 'All change, no death,' was written into the fabric of the universe.

3. Universality

Eternity can be thought of as the enemy of history, of circumstance, of particularity. Pondering eternity, its timeless neutrality, seems to extinguish the temporally specific detail of history's materiality. Similarly, hope for reaching immortality or an eternal afterlife seems to act as a refuge from, or reward for, experiencing the unpleasant circumstances that often arise in mortal life. From this view, thinking of eternity or immortality offers a perspective whereby human history and difference is diluted or rendered insignificant in the face of what Keats's calls, in *Hyperion*, 'aching time' (64).

Here I consider whether Keats's rendering of the eternal and the immortal in *Hyperion*: *A Fragment* (1818) reveals an engagement with contemporary political debates about eternity, or, if instead, it exposes the poet's long-suspected artistic indifference to historical, political and humanitarian circumstance. This latter conception of Keats had its genesis in nineteenth and early twentieth-century Keatsian scholarship which emphasized the sensuous, inward looking aspects of Keats's poetry, but was also curiously supported by the radical New Historicist critique of Jerome McGann. In 'Keats and the Historical Method in Literary Criticism' (1979), McGann took issue with the way that Keats had been read outside of his own historical context. But he also argued that in doing so, Keats scholars had imbibed the poet's own ahistorical impulse.[39] He argued, for example, that 'To Autumn' (1819) turned away from the social, economic and political turmoil that England was experiencing at the

[39] Jerome McGann, 'Keats and the Historical Method in Literary Criticism,' *Comparative Literature* (1979): 988–1032. Also see *The Romantic Ideology*: *A Critical Investigation* (Chicago: University of Chicago Press, 1983).

time the poem was written.[40] Indeed, according to McGann, the whole *Lamia* volume of poems 'represented Keats's effort to show his readers how they might, by entering his poetic space, step aside from the conflicts and tensions which were so marked an aspect of that period.'[41] According to Paul Fry, McGann's contention was essentially this: 'there had been bad harvests for the last several years […] but in 1819 there was a good one, and Keats was lulled by its transitory munificence into writing the ahistorical myth of its eternal return.'[42] I agree with Fry that McGann's position becomes problematic when it forces meaning onto Keats's poetry and denies Keats's profound involvement with the idea of human experience's convergence with human history, even while it avoids explicit descriptions of the most high profile events of his time.[43]

In his use of the term 'eternal,' however, Fry puts his finger on one of McGann's best insights into Keats's work. While McGann argues that the eternal or universal aspect of aesthetic pleasure is a refuge that Keats both seeks and creates for his readers, he also positions 'the eternal' or 'the universal' as historic sites. Walter Jackson Bate, (according to the venerable old model of Keats scholarship) noted that pedantry in New Historicism's efforts to attach the material aspects of Keats's life to his literary works, were merely superficial attempts to understand his poetry. For example, Bate decried 'attempts […] to determine a particular vase or urn that Keats may have had in mind when he wrote ["Ode on a Grecian Urn" (1819)]. Especially with a poem so distinguished for its universality, one thinks of Keats's own remark […] that "they are very shallow people who take everything literal."'[44] According to Bate, the emotional reach of the ode across the centuries proved that historical specifics were unnecessary for – or even bothersome to – 'real' Keats scholarship. Responding to Bate's approach, McGann argued that the 'universality' of the ode was 'surely no more

[40] McGann, 'Keats and the Historical Method,' 1017.

[41] McGann, 'Keats and the Historical Method,' 1017.

[42] Paul H. Fry, 'History, Existence, and "To Autumn,"' *Studies in Romanticism* 25.2 (1986): 211–219, 211.

[43] Nicholas Roe's summary and development of this argument, is seminal. Nicholas Roe, *John Keats and the Culture of Dissent* (Oxford: Oxford University Press, 1997). For a concise summary of the evolution of critical thought relating to Keats and his material context see Nicholas Roe, 'Introduction,' in *Keats and History*, ed. Nicholas Roe (Cambridge: Cambridge University Press, 2005), 1–16.

[44] Walter Jackson Bate, quoted in Jerome McGann, 'Keats and the Historical Method,' 1008.

extensive than the "universality" of any great poem. Moreover, this "universality"' was 'a direct function of certain historical specifics.'[45]

> The special character of poetry and art—its universal or eternal aspect so-called—is that it permits its audience to encounter the human experience of the poem as finished, not only in respect to the poem's immediate, specified circumstances, but in terms of all human history (past and future). The poem, like all human utterances, is a social act which locates a complex of related human ideas and attitudes. Unlike non-aesthetic utterance, however, poetry's social evaluations are offered to the reader *under the sign of completion*.[46]

According to McGann, the 'universal or eternal aspect' of Keats's poetry, of all poetry, is the illusion of completion. Paradoxically, 'the human experience of the poem as finished' lends it a resolved character that is readily transportable across cultural and temporal lines. But a universalising encounter with the poem, according to McGann, is dependent on historical context. In fact, in the case of to the 'Ode to a Grecian Urn,'

> part of the poem's fiction—and this is why scholars spent so much time trying to find the 'original' urn—is that the urn it describes is an actual urn comparable to the Townley, Borghese, or Sosibios vases. Not to grasp this fact about the poem means that we do not see the importance of when the poem was written, and by whom, and where it was published. But the poem itself insists that we react to its historical dimensions, and in so doing it forbids that we understand its 'universality' outside of the ode's special historical context.[47]

In other words, McGann argues, the poem will always speak its own history, and it is this aspect of a poem that forms the authentic part of its 'universality.'

This insight is important because it connects the particularity of Keats's historical moment to its 'eternal' appeal. History does not distract from, or obscure, the profound meanings present in Keats's poetry, but gives rise to them. By demonstrating that the inverse proposition is equally true, I intend to support McGann's argument in terms that do not entirely fit with his understanding of Keats's 'escapism.'[48] I argue, then, that while reconstructing the historical context of his poetry speaks to its eternal aspect, the thematic treatment of the eternal also reveals Keats's engagement with his own historic circumstance.

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[45] McGann, 'Keats and the Historical Method,' 1009.

[46] McGann, 'Keats and the Historical Method,' 991.

[47] McGann, 'Keats and the Historical Method,' 1009–1010.

[48] McGann, *The Romantic Ideology*, 117.

4. By Course of Nature's Law

Despite decades of scholarship on the subject of Keats and history, the question remains: was Keats intending to write an ahistorical epic in *Hyperion*: *A Fragment*? This seems unlikely, given that *Hyperion* is about the overthrowing of the Titans by the Olympians. It is a story of revolution, albeit an oxymoronic immortal revolution. Written between 1818 and 1819, in reactionary England, by a poet who was part of what Nicholas Roe has famously described a 'culture of dissent,' it is no surprise that critics have almost always read the fragmentary epic as an equivocal expression of revolutionary feeling. Kenneth Muir's position on this subject is exemplary.

> I am not suggesting that Keats's political views found direct expression in *Hyperion*, and still less that it is an allegory of the French Revolution. But it is not fanciful to suggest that the revolutionary climate of the time contributed to, if it did not suggest, the subject of the poem. It is, on one level, a poem of Progress.[49]

Muir's reading initially appears incontestable. After all, 'politics was not an alien subject to Keats.'[50] As Thomas A. Reed explains, Keats's

> parents knew financial hardship; he too never escaped money troubles. For most of the first twenty years of his life, England was at war with France. The period after 1815 was marked by what contemporaries called distresses—crop failures, bankruptcies, labor agitation, what Keats felt himself as 'Bailiffs, Debts, and Poverties of civilised life.' Keats struggled to understand what poetry was to be during the Regency. In *Hyperion*, he fashioned part of his answer.[51]

In other words, Keats was a man, like any man, who was a product of the particular political forces that created his financial, social and intellectual environment. But could the argument about Keats and history be taken further? Could Keats be seen as being particularly, even distinctively involved in the political polemic of his day? As a result of the 1986 special issue of *Studies in Romanticism* that was dedicated to 'Keats and Politics,' and the criticism that this scholarship sparked, in 1997 Nicholas Roe was able to argue that it was no longer possible to 'view Keats as a poet wanting political interests, priorities, and commitments.'[52] Roe contributed significantly to debate on the

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[49] Kenneth Muir, 'The Meaning of *Hyperion*,' in *John Keats: A Reassessment*, ed. Kenneth Muir (Liverpool: Liverpool University Press, 1969), 103.

[50] Thomas A. Reed, 'Keats and the Gregarious Advance of Intellect in *Hyperion*,' *ELH* 55.1 (1988): 195–232, 197.

[51] Reed, 'Keats and Intellect in *Hyperion*,' 197.

[52] Roe, *Culture of Dissent*. See also Roe, *Keats and History*.

subject by charting the networks of radical politics that Keats was entwined in all his life.[53]

Yet it does not necessarily follow that Keats's reimagining of Saturn's myth is the stuff of radical propaganda. Rei Terada has recently noted that, despite the fact that *Hyperion* and its (less cosmologically enriched) revision, *The Fall of Hyperion*: *A Dream* (1819)

> are always read as some sort of reflections on revolution, it's been interestingly hard for readers to make sense of the *Hyperion* poems allegorically. Scholars […] suggest that the fragments depict a revolt that Keats would support. But there are problems [...] with casting the Olympian gods as republican revolutionaries and the Titans as superannuated despots.[54]

Terada identifies three main problems with this approach. First is Keats's positioning of the narrative – the poem begins *after* the fall of the Titans and this ultimately precludes any opportunity for giving voice to revolutionary ideas.[55] Another problem is the fact that the Titans and the Olympians represent factions, rather than classes, and this makes it difficult, according to Terrada, for them to be assigned a particular bias.[56] Finally, she notes that a 'paucity of information reads as historical opacity, as the poem does not use events to orient meaning.'[57] In other words, there are not the kinds of details (historic or political) that enter into, for example, Shelley's mythological poetry, and which help to locate the personalities, polemics, and other particularities, of specific revolutionary events. Terada's arguments are persuasive, and I am likewise hesitant to assign a simple narrative correlation between Keats's poems of 1818 and 1819 and the American and French Revolutions of the previous century.

But does all this mean that Keats is merely an 'escape artist,' more than ready to exchange politics for transcendence and the real world for an immortal realm? In courting the eternal in *Hyperion*, is Keats seeking to elevate his poem from his own circumstances – to secure for it the 'immortal fame' that he so wished for himself (*Letters* 1.393-394) – and which would seem to depend on a stripping of specific historical detail from his poetry and in exchanging the particular for the universal?

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[53] Roe, *Culture of Dissent*, 6.

[54] Rei Terada, 'Looking at the Stars Forever,' *Studies in Romanticism* 50.2 (2011): 275–309, 283–284.

[55] Terada, 'Looking at the Stars Forever,' 284.

[56] Terada, 'Looking at the Stars Forever,' 284, n.26.

[57] Terada, 'Looking at the Stars Forever,' 284.

According to Reed, the failure of Keats's poem, its inevitable incompletion, stems from the poet's disingenuous exchange of personal politics for crowd-pleasing ontology.

> Keats's method of fitting history and religion to his story of the gods, with its powerful teleology, conflicts somewhat with his commonsense liberal politics and his agnosticism, and this conflict contributes to the collapse of the poem. Unlike Wordsworth, Keats could find no transcendent meaning for his careful sympathy with single lives; at the same time, the workings of his 'Providence' could yield nothing grander than a world with, on the whole, less evil. He sets out to describe the grand force of progress and the ineluctable nature of historical change, but his original plan is displaced in its working out by the examples of *The Excursion* and *King Lear*.[58]

Reed's observations, while perceptively locating the thematic drive of the epic in the 'grand force of progress and the ineluctable nature of historical change,' reveals the critic's own palpable disappointment in a perceived lack of political rhetoric in the poem. The 'transcendent meaning' that Reed cannot find in *Hyperion*, suggests that the work has failed on both counts. It is neither a useful expression of Keats's 'commonsense liberal politics' nor a 'grander' synthesis of universal themes. Indeed, any purpose in the poem has been 'displaced' by the work of defter hands – in the examples of Wordsworth and Shakespeare and their more competent handlings of the solitary recluse and tragic king.

This kind of irritation with Keats's political poetics is the product of awkward comparisons, attempts to match historical – or, in the case above, literary – personalities or events, 'like for like,' with Keats poetry. The resultant incongruity manifests in the type of critique of Keats's work that Reed and Jerome McGann exemplify, but which has been worn away by their respondents who see the poet's politics in more than his rendering of 'character' and 'setting,' and, indeed, in more than his biography and letters.

The most recent Keats edition of *Studies in Romanticism* entitled 'Reading Keats: Thinking Politics,' will be responsible for shifting the paradigm about Keats and history once again.[59] The collection's aim, to quote its introduction, is to 'inflect the conversation about Keats's politics by exploring the ways in which the poetry might be

[58] Reed, 'Intellect in *Hyperion*,' 197.

[59] Emily Rohrbach and Emily Sun, 'Reading Keats, Thinking Politics: An Introduction,' *Studies in Romanticism* 50.2 (2011): 229–237.

said to "think" politics even—or, especially —*in* what one might call its aesthetics.'[60] Guest editors Emily Rohrbach and Emily Sun explain their interest 'in a politics of Keats's poetry that is not exhaustively explained by reference to historical "context."'[61]

The publication of this special edition is good news for Keats scholars. Surprisingly, it is even good news for those Keats scholars who are wary of driving an artificial wedge between historical context and politics in this way. This is because the scholarship contained in this edition of *Studies in Romanticism* emphatically repositions Keats's aesthetics as a plausible site for politics. It reminds us of the subtle but important difference between acknowledging that the poems reflect politics, are born of their particular historical environment, and registering that they have something singular or extraordinary to say about existing in such an environment. That the *Studies in Romanticism* special issue on Keats achieves this by attempting to isolate politics, not from the idea of history, but from historical detail or context, creates, I think, some interesting openings for the scholarship that is to come after it.

Terada's essay, for example, which is entitled 'Looking at the Stars Forever,' takes as its departure point a moment in *Hyperion* where the eponymous god of the Sun is the only remaining Titan to be overthrown. Unsure of his fate, he looks out towards the 'universal space' (*Poems* 255) from which the disembodied voice of his father Coelus (or Uranus, God of the sky) offers him advice:

> Ere half this region-whisper had come down,
> Hyperion arose, and on the stars
> Lifted his curved lids, and kept them wide
> Until it ceas'd; and still he kept them wide:
> And still they were the same bright, patient stars.
>
> (256)

Of this passage, Terada asks: 'why does [Hyperion] stand and look at the stars as though in response to the voice? […] And when we are told that the stars "were the same," why is this supposed to be news? Does it imply that Hyperion was watching for change?'[62] In the wake of a cataclysmic upheaval of the established universal order, I argue, these lines certainly do imply that Hyperion was looking for other signs of celestial movement. It may appear strange to Terada that Hyperion looks for change in

[60] Rohrbach and Sun, 'Reading Keats: Thinking Politics,' 231.

[61] Rohrbach and Sun, 'Reading Keats: Thinking Politics,' 231.

[62] Terada, 'Looking at the Stars Forever,' 275–276.

what are, traditionally, symbols of changelessness. But not if we consider that the immortal Titans had, until recently, been symbols of constancy, too. And not if we take into account the complex scientific and political circumstances that Keats invokes at the very mention of stars and their constancy in this passage.

Just as scholars have traditionally been frustrated with the supposed absence of politics in his poetry, there is a similar and related frustration with Keats's apparent refusal (in contrast to Blake and Shelley) to exploit the metaphors of upheaval and revolution that were offered by the 'modern astronomy.'[63] Only Nicholas Roe has recognised its importance within the context of Keats's epic:

> *King Lear* was an important influence on *Hyperion*, in Keats's conception of the 'poor old King' Saturn and his concern with sight and looking, but in other respects astronomical observation was integral to the poem's meanings too. While the mythic action of *Hyperion* was invigorated by Keats's knowledge of astronomy, the astronomer's inability to gaze upon a brilliant object was a reminder of the human frailties experienced by Apollo in assuming his powers as god of the sun, of poetry, and medicine. While medicine has frequently and rightly been cited as a deep influence on Keats's calling as a poet, *Hyperion* suggests that astronomy was an important factor too in the making of a poet intensely aware of human limitations, for whom the sublime of artistic achievement was appropriately figured by solar radiance in eclipse: 'A sun—a shadow of a magnitude' ('On Seeing the Elgin Marbles,' 14). At the very least, we might conjecture that the poet who in *Hyperion* Book I could imagine the voice of a Titan in utter defeat, might first have assumed that role in the schoolyard orrery at Enfield: 'I represent stupendous Saturn…'[64]

What astronomy offers Keats, according to Roe, is not only inspirational 'invigoration' – a refreshed source of poetic imagery. Instead, Keats's 'knowledge of astronomy' increases his 'aware[ness] of human limitations' and acts as a 'reminder' of ' human frailties' and of the imperfection of the visionary imagination. Hyperion's star-gazing in Book I embodies Roe's point perfectly. Like the men and women of Europe, who, upon learning about Herschel's revolutionary discoveries, might have turned their eyes towards the heavens, Hyperion had seen 'the same bright patient stars.' It was the observer who had changed, not the stars themselves. As Roe suggests, Keats's poem not only incorporates cosmological imagery, but puts it to use. In this case, Keats draws upon unique, historically specific astronomical detail, in order to make a point about the limits of earthly perspective within the sublime scope of a universe of stars.

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[63] See 'Introduction': 'section 5. Astronomy and Romantic Literature,' for further discussion and citations.

[64] Roe, *Culture of Dissent*, 38– 39.

In another essay from the special issue of *Studies in Romanticism* dedicated to Keats, history, and politics, Jonathan Mulrooney notes that, despite the fact that 'Shelley's and Byron's poetry attended to the political occasions of their day more explicitly than anything Keats wrote, in verse at least […] Keats's aesthetics are as deeply historical, as deeply political, as those of any other Romantic-era poet, because they perform poetry's failure to eventuate particular historical ends.'[65] Certainly, Keats does not attempt to mobilise astronomical imagery to further his own political ends. Indeed, he seems to be aware of the problems of using contemporary astronomical imagery, bound as it was by the eternity paradox, as simple code for progressive change. And Keats doesn't seek to rescue the new cosmology from the conservative associations needed to legitimise its claims, as Shelley does in *Queen Mab* and *Prometheus Unbound*.[66]

In the same essay, Mulrooney argues that *Hyperion* houses an anachronistic quality or 'out-of-timeness' that prompts an emotional and historical response from its reader: 'Perhaps more than any of Keats's other poems, *Hyperion* dramatises the attempt of human consciousness to situate itself in a sensory realm of experience that will not bend to its will.'[67] 'Instead of political or social quietude, or the transcendence of history posited by New Historicism's "Romantic Ideology,"' Mulrooney argues, 'Keats's poetry demands a vital and unceasing engagement with an historical world that is nothing less than a "vale of Soul-making" (*Letters* 2.102).'[68] This reading of the poem, while undoubtedly responsive to Keats's interest in the convergence of emotion and history, locates neither politics nor history, but meta-politics and meta-history. What this reading uncovers is another 'eternal' aspect of Keats's poetry that is overwhelmingly mobile, which could be 'true' in many a time and place. In other words, Mulrooney's argument about the 'timelessness' of Keats's *Hyperion*, despite claiming to do otherwise, reasserts the old ideas about Keats's universalism, his eternal appeal.

But Keats's *Hyperion* is about both timelessness *and* time, both eternity and the eternal progression of change. As such, Keats's use of cosmological imagery

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[65] Jonathan Mulrooney, 'How Keats Falls,' *Studies in Romanticism* 50.2 (2011): 251–273, 269.

[66] See Carl Grabo, *A Newton Among Poets*: *Shelley's Use of Science in* '*Prometheus Unbound*' (Chapel Hill: University of North Carolina Press, 1930) and Cian Duffy, *Shelley and the Revolutionary Sublime* (Cambridge: Cambridge University Press, 2005), 24 ff.

[67] Mulrooney, 'How Keats Falls,' 268.

[68] Mulrooney, 'How Keats Falls,' 269.

constructs a discernable and specific historical and political context within the poem. Keats weaves into his epic an intricate and temporally 'present' response to the complications posed by science and politics to traditional poetic ideas about the timelessness of eternity. This aspect of the poem derives from *Hyperion*'s commentary on, and ultimate acceptance of, the eternity paradox – a historically unique strategy for dealing with the contradictory paradigms inherent in imagining the universe at the turn of the nineteenth century. The eternal, then, in Keats's poem, is not merely a state that transcends or elicits the historical or political, but is a state that embodies it.

5. Fallen Divinity

In *Hyperion*, there is a poisoning of eternity with the 'disanointing' oil of mortality (*Poems* 258). Just as Herschel's cosmology had infected the stellar universe with earthly decay, Keats's immortal Titans have fallen victim to the relentless natural force of change. Saturn – first born of Cœlus and once ruler of the gods – has been supplanted by the revolutionary Olympians. He is sick, 'palsied' (250). His disciple, Thea, succumbs to the physical frailties of mortal life: 'One hand she press'd upon that aching spot/ Where beats the human heart, as if just there,/ Though an immortal, she felt cruel pain' (249). A new universal system has ascended, and Coelus, father of the Titans, laments his children's fall:

> Divine ye were created, and divine
> In sad demeanour, solemn, undisturb'd,
> Unruffled, like high Gods, ye liv'd and ruled:
> Now I behold in you fear, hope, and wrath;
> Actions of rage and passion; even as
> I see them, on the mortal world beneath,
> In men who die. (255–335)

The frantic energy of earthly cares – the 'fear, hope, and wrath,' the 'rage and passion' of uncertain humanity – have all tarnished the once 'undisturb'd' heavens. Importantly, though, the Titans 'fall' ill, they yield to human passions, but they do not die. Their 'eternal essence' is 'distraught,' but it is not destroyed.

Keats's so-called 'struggle' with John Milton in his epic has long been of interest to scholars.[69] But perhaps the most important divergence from *Paradise Lost* is simply this: Keats does not restore or preserve the eternal sanctity of heaven in *Hyperion*. What is emphasized in Keats's reimagining of the Miltonic Fall is the mortal contamination of the entire universe, not just of earth, not just of woman and man. God wins the battle in Genesis and *Paradise Lost*. Saturn loses in *Hyperion*. Divine order, the guarantee of ultimate rest and refuge in Milton's rendering of God's heavenly paradise,[70] is inverted by Keats to create a version of eternity that is no longer peaceful, and which is influenced by the same disruptive concerns as an earth-bound existence. For Saturn, there is no heavenly sanctuary, no respite in all the universe. Instead Saturn's cosmos strongly resembles Herschel's three-dimensional, unrelentingly material, space:

> Search, Thea, search!
> Open thine eyes eterne, and sphere them round
> Upon all space: space starr'd, and lorn of light;
> Space region'd with life-air; and barren void;
> Spaces of fire, and all the yawn of hell. (250)

Here, heaven is not a place of eternal peace and comfort. It contains only 'void[s]' desolate and 'barren' interspersed with starry 'spaces of fire.' While the planetary spheres of Thea's eyes remain 'etern[al],' she now sees with the fatalistic perspective of the 'men who die.'

If mortality is the seed of universal corruption in *Hyperion*, it is also the cause of its regeneration. And it is here that Keats provides a location for some relief in an otherwise unsettling meditation on universal instability and decay. The Olympian rebellion is destined, unlike Satan's, to take. For Milton, a revolt against God's universal rule is unnatural, but in Keats's mythology, the universal 'truth' (262), or

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[69] See Mulrooney, 'How Keats Falls,' 260. See also Stuart M. Sperry, 'Keats, Milton, and *The Fall of Hyperion*,' *PMLA* (1962): 77–84; Paul Sherwin, 'Dying into Life: Keats's Struggle with Milton in *Hyperion*,' *PMLA* (1978): 383–395; Jonathan Bate, 'Keats's Two *Hyperions* and the problem of Milton,' in *Romantic Revisions* ed. Robert Brinkley and Keith Hanley (Cambridge: Cambridge University Press, 1992), 143–164; Vincent Newey, '*Hyperion*, *The Fall of Hyperion,* and Keats's Epic Ambitions,' in *The Cambridge Companion to Keats*, ed. Susan J. Wolfson (Cambridge: Cambridge University Press, 2001) 69–85. Keats himself felt that there were 'too many Miltonic inversions' (*Letters* 2.167) in his first attempt at the Hyperion myth.

[70] It should be noted, however, that the cosmic spaces between Heaven, Earth and Hell in *Paradise Lost* are alive to the substantial astronomical discoveries of Milton's time. For the long history of scholarship on this subject see Thomas N. Orchard, *The Astronomy of Milton's Paradise Lost* (London: Longmans, Green, and Co., 1896); Marjorie Nicolson, 'Milton and the Telescope,' *ELH* 2.1 (1935): 1–32; Grant McColley, 'Milton's Dialogue on Astronomy: The Principle Immediate Sources,' *PMLA* (1937): 728–762 and A. J. Meadows, *The High Firmament*: *A Survey of Astronomy in English Literature* (Leicester: Leicester University Press, 1969).

'eternal law' (262), insists upon revolutionary change. Saturn asks himself what force 'had power' enough to bring down his eternal rule:

> Who had power
> To make me desolate? whence came the strength?
> How was it nurtur'd to such bursting forth,
> While Fate seem'd strangled in my nervous grasp? (250)

The answer that the poem eventually offers in response to Saturn's questions has its basis in the eternity paradox – the theoretical position which holds that nothing is eternal, except the eternal and universal provision that nothing is eternal. Just like Herschel's cloudy nebulae, those '*laboratories* of the universe,'[71] that must be crushed in order to form a brilliant star, the Olympians have been 'nurtur'd to such bursting forth' by the very rule they are compelled to destroy. Such movement, dispossession, evolution,[72] is destined for all things. Curiously, Saturn reveals that he had foreseen his destiny long before his fall. He had clung to his throne, had 'strangled' 'Fate' within a 'nervous grasp.' Thea, 'a Goddess of the infant world' (248), though loyal to Saturn, also sees the writing on the wall.

> Then Thea spread abroad her trembling arms
> Upon the precints of this nest of pain,
> And sidelong fix'd her eye on Saturn's face:
> There saw she direst strife; the supreme God
> At war with all the frailty of grief,
> Of rage, of fear, anxiety, revenge,
> Remorse, spleen, hope, but most of all despair.
> Against these plagues he strove in vain; for Fate
> Had pour'd a mortal oil upon his head,
> A disanointing poison… (258)

Change and revolution are not exterior to the eternal universe but are the internal drive that secures its perpetuity. This is the comforting 'balm' of 'truth' that Saturn cannot face (262). Like the writers and thinkers of Keats's day, who sought to diffuse the potentially revolutionary implications of Romantic cosmology, Saturn is advised to relent, to put down arms, and accept that his fate forms part of a universal paradox of eternity. Oceanus – presented in Keats's poem as the most compelling voice among the

[71] William Herschel, 'On the Construction of the Heavens,' *Philosophical Transactions of the Royal Society* 75 (1785): 213–266, 217.

[72] According to Paul Sherwin, 'unlike the Satanic host, but like Milton himself in Keats's view, the massive yet crude Titans are the victims of evolutionary progression' ['Dying into Life: Keats's Struggle with Milton in *Hyperion*,' *PMLA* (1978): 383–395, 385].

gods – admits his conqueror Neptune's aptness to rule. He warns the Titans against attempting a restoration of the 'old allegiance':

> We fall by course of Nature's law, not force
> Of thunder, or of Jove. Great Saturn, thou
> Hast sifted well the atom-universe;
> But for this reason, that thou art the King
> And only blind from sheer supremacy,
> One avenue was shaded from thine eyes,
> Through which I wandered to eternal truth.
> And first, as thou were not the first of powers,
> So art thou not the last; it cannot be:
> Thou art not the beginning nor the end. (260– 261)

'Blind from sheer supremacy,' Saturn has failed to understand the 'eternal truth.' All things must change, all must 'fall by course of Nature's law.' So said the Romantic astronomers and geologists. Indeed, Oceanus's assertion that Saturn is 'not the beginning not the end' resonates so strongly with James Hutton's claim that he could find 'no vestige of a beginning, no prospect of an end,'[73] that it is difficult to argue that Keats's lines were not directly influenced by a knowledge of contemporary geology. Yet in his speech, Oceanus, unlike the geologists who argued for the eternity of matter, does not deny the existence of an initial spark of universal Creation. In this way, Oceanus's 'eternal truth' has more in common with Christian cosmology than the materialist teleology of scientists like Hutton.

> 'As Heaven and Earth are fairer, fairer far
> Than Chaos and blank Darkness, though once chiefs;
> And as we show beyond that Heaven and Earth
> In form and shape compact and beautiful,
> In will, in action free, companionship,
> And thousand other signs of purer life;
> So on our heels a fresh perfection treads,
> A power more strong in beauty, born of us
> And fated to excel us, as we pass
> In glory that old Darkness: nor are we
> Thereby more conquer'd, than by us the rule
> Of shapeless Chaos.' (261)

These famous lines from *Hyperion* reveal the poem's engagement with the proto-evolutionary theories of the early nineteenth century, ideas which had been explored

[73] James Hutton, quoted in Dean, *James Hutton and the History of Geology*, 262.

by figures such as Erasmus Darwin.[74] In this, Oceanus's view also aligns more clearly with Romantic-era astronomy – with Herschel's independent trajectories of stellar transmutation – than with the Huttonian cycle of birth, decay, and rebirth. The Titan's position, like that of Herschel (who had argued for 'Nature and Nature's god') calms, pacifies, placates. It reasserts the significance of Creation within a universe of eternal change. Importantly, Oceanus adopts Herschel's view of the universe to argue against a violent reactionary response to the recent rebellion. Here *Hyperion* speaks to the conservative framing of Romantic astronomy's latent revolutionary message that had taken place in reactionary England throughout Keats's lifetime.

This foregrounding of the eternity paradox in *Hyperion* infuses the poem with meanings particular to Keats's own historical context. In their responses to Oceanus's speech about 'eternal truth,' for example, Saturn and Enceladus act as mouth-pieces for would-be oppositions to material or organic conceptions of heaven. Saturn is a God in Newton's mould. He once exerted 'influence benign on planets pale' (250) but he cannot understand a universe that has become 'unhinge[d]' (260) from its mechanic operation. Accordingly, Saturn looks to belated forms of knowledge – to 'legends,' to 'the spirit-leaved book,' to 'sign, symbol' and 'portent' – to find answers about the new universal system.

> 'Not in my own sad breast,
> Which is its own great judge and searcher out,
> Can I find reason why ye should be thus:
> Not in the legends of the first of days,
> Studied from that old spirit-leaved book
> Which starry Uranus with finger bright
> Sav'd from the shores of darkness, when the waves
> Low-ebb'd still hid it up in shallow gloom;–
> And the which book ye know I ever kept
> For my firm-based footstool:– Ah, infirm!
> Not there, not in sign, symbol, or portent
> Of element, earth, water, air, and fire…' (259)

Saturn's description of his 'book' as the Word of creation (it has been recovered from Chaos and delivered to Saturn by the father of the Titans) clearly alludes to scripture. In consulting text, rather than pursuing empiricist forms of universal knowledge, Saturn takes the position of the biblical literalists of Keats's day who were determined to shun scientific evidence. In Keats's rendering, the lore of former times cannot

[74] Christopher Upham, Murray Smith, and Robert Arnott, eds., *The Genius of Erasmus Darwin* (Hampshire: Ashgate, 2005).

demystify what appears, what Saturn cannot 'unriddle,' in 'Nature's universal scroll' (260). In other words, religious revelation cannot unmask the secrets of nature's laws.

In the words of Enceladus, too, Keats gives voice to a conservative political idiom. The serpentine god represents a faction opposed to any challenge levelled at traditional conceptions of permanence, or eternal rule, a contingent that saw fit to crush rebellion 'with revenge' (264) and to attack the enemy with 'the crooked stings of fire.'

> For though I scorn Oceanus's lore,
> Much pain have I for more than loss of realms:
> The days of peace and slumberous calm are fled;
> Those days, all innocent of scathing war… (264)

It might be the 'loss of realms,' of authority and power, that Enceladus rails against, but he hides his self-interested wrath behind the rhetoric of 'peace.' 'Oceanus's lore,' the continued renewal inscribed into the eternity paradox, divorces the Titans from autocratic rule. In these lines, Keats suggests that it is this aspect of the new universal order, rather than any threat to 'slumberous calm' and 'innocen[ce],' that its opponents would respond to.

Despite the protests of Saturn and Enceladus, however, the Titans are 'in the van/ Of circumstance' (256). They cannot escape the universal force of history, of transformation. The eternity paradox prescribes that only nature's law is free from change and this rule holds true in Keats's poem. Hyperion, upon learning the fate of his fellow Titans, must be patient, must not jeopardise his proper pilgrimage across the sky. Despite the profound upheaval that has taken place among the gods, despite Hyperion's fury, his promise of revenge, the still powerful god is chained to the dictates of natural law.

> Fain would he have commanded, fain took throne
> And bid the day begin, if but for change.
> He might not:–No, though a primeval God:
> The sacred seasons might not be disturb'd.
> Therefore the operation of the dawn
> Stay'd in their birth… (255)

Hyperion, though a ruling 'primeval God,' cannot intrude upon nature's law. In his epic, then, Keats presents a universe of cataclysmic change, but also of stifling and restrictive constancy.

Hyperion, the god, cannot escape his circumstance in just the same way that *Hyperion*, the poem, cannot escape its own historical context. Upon invoking the themes of immortality and the universe, Keats's poem cannot escape the political, scientific, and religious discourse surrounding the concept of 'eternity' that belonged to its time. The new system introduced by Romantic astronomy allowed for revolution, but only within a pre-determined universal structure. True liberation from this system was impossible. Like the Titans who could not evade the natural laws that had infected their eternal essence with mortality, Keats's meditation upon the eternal could not create an aesthetic 'escape' from his own historical moment, nor fashion a position of 'timelessness' that could transcend the cultural networks that surrounded him.

Surprisingly, it is Saturn, defeated and deposed, who speaks the most revolutionary lines in Keats's poem. Saturn wants to flee from the natural laws that have brought about his destruction. Sensing ultimate defeat, he wonders whether he can bring an entirely new world into being – a world where past misconceptions about permanence could actually manifest and where the eternal might really be free from historical and political change. Keats never offers this to Saturn as a legitimate opportunity for escape, but in the fruitless words of questioning he gives to the ailing god, we might also hear the frustrations of a poet who acknowledges (and perhaps laments) his unbreakable ties to the circumstances in which he lives:

> 'But cannot I create?
> Cannot I form? Cannot I fashion forth
> Another world, another universe,
> To overbear and crumble this to nought?
> Where is another Chaos? (251)

Epilogue:

'The Soul of Adonais, Like a Star'

Given John Keats's deep involvement with astronomy throughout his career, it is fitting that Percy Shelley turns to celestial imagery in *Adonais* (1821), his elegy for the young poet.[1] Shelley calls on Urania, goddess of astronomy, as his muse. Stellar imagery pervades throughout: notably, the symbol of the eternal star bookends the poem. The fate of Adonais, (of Keats), is announced with a Platonic verse that unites the departed hero with a traditional symbol of permanence: Venus, the morning and evening star:

> Thou wert the morning star among the living,
> Ere thy fair light had fled;–
> Now, having died, thou art as Hesperus, giving
> New splendour to the dead.[2]

The last lines of Shelley's poem reflect the image offered in its epigraph. Here Keats is restored to immortality: 'The soul of Adonais, like a star,/ Beacons from the abode where the Eternal are' (*Major Works* 545).

Shelley, as I have suggested at the opening of this thesis, had an impressive knowledge of Herschelian science and he used it deftly in his poetry. In Keats's aesthetics, then, Shelley might have recognised the younger poet's restrained, but significant, gestures towards 'the modern astronomy' more readily than subsequent readers have done. Shelley, like Keats, would have read about the 'new planets' discovered in the wake of Herschel's landmark discovery of Uranus in 1781. He might have recognised the networks of discovery and rediscovery traced in 'On First Looking into Chapman's Homer' – not only in the motif of the adventurer – but in the unidentified astronomer, too. Shelley, like Keats, must have been familiar with the meanings attached to fluctuating 'bright stars' in his lifetime. One can only speculate the extent to which Shelley might have understood – had he read the poem, and given his own interactions with women – the ambiguity courted by Keats in his love sonnet

[1] The title 'Adonais' comes, according to Earl Wasserman, from a conflation of the Greek 'Adonis,' god of fertility, and the Hebrew 'Adonai' or 'Lord' [Zachary Leader and Michael O'Neill, 'Notes,' in Percy Bysshe Shelley, *The Major Works*: *Including Poetry, Prose*, *and Drama*, ed. Zachary Leader and Michael O'Neill (Oxford: Oxford University Press, 2003), 702–836, 798, n.529].

[2] Plato, translated by Percy Bysshe Shelley in Leader and O'Neill, 'Notes,' 798, n. 529.

to Fanny Brawne.[3] It is certain, however, that Shelley was no great admirer of *Endymion*. Nonetheless, he defended the work in his Preface to *Adonais*. 'Whatever might be' the 'defects' of *Endymion*, Shelley wrote, they did not warrant the 'venal' and 'murder[ous]' criticism the poet had received on their account (530). Perhaps among the redeeming features of the epic, what distinguished it from the 'literary prostitutes' that Shelley defined it against, was the poem's complexity, its unsettling ambivalence towards humanity's newfound relation with the divine. Within the thematic exploration of 'universal knowledge' in *Endymion*, Keats resisted any urge to proffer answers to the questions posed by contemporary astronomy. Such an approach must have appealed to the writer of 'Ode to Heaven,' with its multiple, conflicting views about eternity and the universe.

It is known, for certain, that Shelley was impressed by *Hyperion*: *A Fragment*. He declared that the poem was 'second to nothing that was ever produced by a writer of the same years' (529) in his Preface to *Adonais*. Shelley had responded warmly to Keats's reworking of the Saturnian legend. Like his own revisions of classical mythology, *Hyperion* had not merely replicated the meanings attached to the stories of the ancients. Rather, Keats's poem had transformed the myth of universal revolution, the overthrowing of the Titans by the Olympians, into a reflection upon the 'eternal' law of natural change. Shelley, as his Preface makes clear, had *Hyperion* in mind when he came to write *Adonais* and to reflect upon Keats's immortal fame.

It appears strange, then, that Shelley would return to the anachronistic symbol of the eternal star in his 'highly wrought'[4] tribute to Keats. Certainly, Shelley knew that Herschel's cosmology involved a troubling of the immortal heavens with the mortal drive towards change, towards decay. Indeed, within *Adonais* itself, we find a 'ruined Paradise' (533) where 'suns' have 'perished' (532). The moment of Keats's death is described in terms accordant, not only with Shelley's familiarity with specific horrors of Keats's illness, but also with an understanding of the mortality of heaven:

> the damp death
> Quenched its caress upon his icy lips;
> And, as a dying meteor stains a wreath
> Of moonlight vapour, which the cold night clips,
> It flushed through his pale limbs, and passed to its eclipse. (534)

[3] The poem was not published in Shelley's lifetime.

[4] Percy Bysshe Shelley, quoted in Leader and O'Neill, 'Notes,' 798, n.529.

In these lines, it appears that the same 'invisible corruption' (532) that has caused Keats's body to 'eclipse,' is a force at work throughout the universe.

But despite his knowledge of contemporary cosmology, despite his incorporation of it into his elegy, Shelley, it seems, cannot help but return to the eternal heavens when he comes to memorialise Keats. In other words, Shelley must locate an emotional reprieve, even if this means converting Keats's 'dying meteor' into an 'immortal' star. According to Anna Henchman, this is what sets Shelley's poem apart from the poetry that would come after him:

> The novelty of Tennyson's use of astronomy in *In Memoriam* can be clarified by setting his way of comparing a person to a star next to other uses of stellar imagery. In more conventional elegies, such as Milton's 'Lycidas' or Shelley's 'Adonais,' consolation is achieved only when the poet is able to let go of the deceased's earthly incarnation and to realise that the deceased has been transported into a better world. One image for such a transformation is the act of stellification, of turning the deceased into a star, as Shelley does to Keats at the end of 'Adonais.' And yet, for Tennyson, steeped in contemporary astronomy, it is no longer satisfactory to imagine a heaven hierarchically arranged, in which the stars stand for permanence and eternal life. Tennyson, like Shelley before him, maintains the elegiac convention of figuring the deceased as a star but, unlike Shelley, revises the convention, drawing on contemporary astronomical debates.[5]

According to Henchman, in *Adonais*, Shelley imagines 'a heaven hierarchically arranged, in which the stars stand for permanence and eternal life.' Zachary Leader and Michael O'Neill similarly argue that the 'artistry' of Shelley's tribute to Keats 'shows in the original way that the poem […] fulfils elegy's traditional task of supplying consolation in the last movement (stanzas 39–55) in which the idea of an afterlife for Adonais is evoked in language that reworks Platonic and Christian images and ideas, but locates permanence in the enduring significance of great poetry.'[6] In other words, the sentiments of Shelley's poem are fully expressed in its first stanza: 'till the Future dares/ Forget the Past, his fate and fame shall be/ An echo and a light unto eternity!' (531).

While there is no doubt that Shelley turns towards the idea of eternity to mitigate the tragic finality of Keats's physical passing, *Adonais* is not a 'conventional elegy.' The 'eternal' heavens are not a space of immutable stasis in Shelley's poem. Rather, *Adonais* revises the Platonic entombment of the departed within an immortal star, and, in a further tribute to *Hyperion*, places Keats within an eternal process of regeneration and renewal implicit in the floral myth of Adonis.

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[5] Anna Henchman, *The Starry Sky Within*: *Astronomy and the Reach of the Mind in Victorian Literature* (Oxford: Oxford University Press, 2014), 111.

[6] Leader and O'Neil, 'Notes,' 798, n.529.

Shelley recognises that Keats is gone, that his mortal being has ceased to be:

> He will awake no more, oh, never more!–
> Within the twilight chamber spreads apace
> The shadow of white Death, and at the door
> Invisible Corruption waits to trace
> His extreme way to her dim dwelling-place… (532–533)

But the 'invisible corruption' that calls Keats to make 'his extreme way' is the same 'eternal Hunger,' or 'law of change,' that has dethroned the likes of Saturn.

> The eternal Hunger sits, but pity and awe
> Soothe her pale rage, nor dares she to deface
> So fair a prey, till darkness, and the law
> Of change, shall o'er his sleep the mortal curtain draw. (533)

The 'balm' of truth Shelley offers upon Keats's death, the antidote to Death's 'pale rage,' echoes the comforting logic of Oceanus in *Hyperion*:

> Through wood and stream and field and hill and Ocean
> A quickening life from the Earth's heart has burst
> As it has ever done, with change and motion,
> From the great morning of the world when first
> God dawned on Chaos; in its steam immersed
> The lamps of Heaven flash with a softer light;
> All baser things pant with life's sacred thirst;
> Diffuse themselves; and spend in love's delight,
> The beauty and the joy of their renewèd might. (535–536)

'Nature's law,' which is identified by Oceanus in Keats's poem (*Poems* 260), becomes 'life's sacred thirst' for 'motion,' in Shelley's imagining. The progressive force of change (initiated in both Keats's and Shelley's poems by the 'great morning' of Creation) is regenerative – it is the cause of 'fresh perfection' in *Hyperion* (261) and the 'renewèd might' of Adonais in Shelley's poem.

Keats's transmutation is figured in terms that revise the star's symbolism as an immutable eternal object; Shelley turns the elegiac star into a metaphor for the unstoppable force of natural change.

> The leprous corpse touched by the spirit tender
> Exhales itself in flowers of gentle breath;
> Like incarnations of the stars, when splendour
> Is changed to fragrance, they illumine death
> And mock the merry worm that wakes beneath;
> Nought we know, dies. Shall that alone which knows

> Be as a sword consumed before the sheath
> By sightless lightning? – th' intense atom glows
> A moment, then is quenched in a most cold repose. (356)

'Nought we know, dies,' Shelley reasons, even the atom,[7] the very stuff of life, gives off the appearance of death before it moves into another form. The stars, then, are not eternal, nor do they die. All moves 'as it has ever done, with change and motion.' 'The incarnations of the stars' are like the flowers that Keats's bodily form 'exhales' from his grave.

Keats, like *Hyperion*'s Apollo, must 'die into life' (*Poems* 268) to become engendered with new purpose.[8] In Shelley's imagining, Keats has become 'one with Nature.' His soul is a 'pilgrim of eternity,' a traveller upon the ever-changing road of universal progression.

> He is made one with Nature: there is heard
> His voice in all her music, from the moan
> Of thunder, to the song of night's sweet bird;
> He is a presence to be felt and known
> In darkness and in light, from herb to stone,
> Spreading itself where'er that Power may move (524)

John Keats, like the star of Herschel's cosmology, is part of the grand, eternal movement of the universe:

> He lives, he wakes– 'tis Death is dead, not he;
> Mourn not for Adonais. (541)

[7] Oceanus refers to the 'atom-universe' in *Hyperion* (*Poems* 2.183).

[8] For an exhaustive analysis of these lines in *Hyperion* see Denise Gigante, *Life*: *Organic Form and Romanticism* (New Haven: Yale University Press, 2009), 208–246 and Jonanthan Mulrooney's response to Gigante in 'How Keats Falls,' *Studies in Romanticism* 50.2 (2011): 251–273, 264–270. For an earlier interpretation see Paul Sherwin,'Dying into Life: Keats's Struggle with Milton in *Hyperion*,' *PMLA* (1978): 383–395.

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