

P. B. Shelley and the Science of Life

Sharon Ruston¹

The Problem with Defining Life

After a particularly bad attack of ophthalmia and pain caused by a kidney stone, Shelley (1792–1822) wrote to Claire Clairmont: ‘I can do you no other good than in keeping up the unnatural connexion [sic] between this feeble mass of diseases & infirmities and the vapid & weary spirit doomed to drag it through the world’.² Shelley’s description of his living body is not the irrational complaint of a patient but a contemporary medical definition of human life. From the 1790s onwards the body had come to be seen among scientists as a mass of diseases, heading steadily towards death, while the ‘unnatural connexion’ which held the body together in life was acknowledged to be the greatest mystery. The study of vitality had become, by the time of Shelley’s letter, one of the most intensely argued and notorious subjects in science. An *Edinburgh Review* article published in 1814 asserted (albeit mockingly) that ‘there is not, at this moment, a term which is used with greater ambiguity, than the term Life’.³

The term death, too, was causing problems; the French *Encyclopédie* defined two kinds of death, ‘incomplete’ and ‘absolute’, claiming that the first kind could be ‘cured’.⁴ The work of the Humane Society in Britain during the Romantic period publicized the surgeon’s ability to ‘resurrect’ persons drowned. Emerging from these discussions, there was a widely publicised debate on the nature of life between the London surgeons John Abernethy and William Lawrence, which took place in their lectures to the Royal College of Surgeons between 1814 and 1819.

In this paper I will examine these theories and Shelley’s knowledge of the so-called ‘science of life’, to see how recognising this new context for his work can change the way that we read even canonical poems such as ‘Ode to the West Wind’.

Vitality became a site of contention during the revolutionary upheavals of the late eighteenth century and provided a metaphor that could be used to reflect on these political events. In the conservative backlash that followed in Britain during the early nineteenth century, metaphors of vitality were used to serve different ends, both to reinforce and to radically question a fear of political change. Conservative thinkers such as Thomas Malthus speculated that the potential of revolution to animate might also be a potential to destroy and consume: ‘the French Revolution [...] like a blazing comet, seems destined either to inspire with fresh life and vigour, or to scorch up and destroy the shrinking inhabitants of the earth’.⁵

¹ Address for correspondence: Department of English, Keele University, Staffordshire, ST5 5BG; s.ruston@engl.keele.ac.uk.

² F. L. Jones, *The Letters of Percy Bysshe Shelley*, 2 vols (Oxford, Clarendon Press, 1964), II, 257, 16 January 1821.

³ ‘An Inquiry [sic] into the Probability and Rationality of Mr. Hunter’s Theory of Life; being the subject of the first Two Anatomical Lectures delivered before the Royal College of Surgeons, of London. By John Abernethy’, *Edinburgh Review*, 23 (1814), 384–98 (pp. 384–85).

⁴ Daniel Arasse, *The Guillotine and the Terror*, trans. by Christopher Miller (Harmondsworth: Penguin, 1989), p. 37. The *Encyclopédie* continues with ‘[t]hat there is no remedy for death is an axiom widely admitted; we, however, are willing to affirm that death can be cured’, Arasse, p. 37.

⁵ Thomas Malthus, *Essay on the Principles of Population*, ed. by Antony Flew (Harmondsworth, Penguin, 1970), p. 67.

Alternatively, the revolution was represented by its supporters as a galvanising force, which woke and roused the ‘inert’; it was new life infused into an otherwise dead body. Poetry too had this potential to animate: Milton’s voice, had he lived in these times, would have been a vital force to revive an England which Wordsworth described as ‘a fen / Of stagnant waters’.⁶ Romantic texts proliferate vitalist language and metaphor; as Nicholas Roe has written, in the period ‘the vitality debate surged from science into literature’.⁷ The physiological debate in England over the nature of vitality offered poets and political commentators alike a means to express their fears and hopes.

The historical moment that witnessed the beginnings of Romanticism also marked a new way to define and understand the idea of life. By the year 1800 a new concept of life had emerged, likening the life of animals to human and even plant life. Life was for the first time considered a universal state and the political ramifications of this idea are clearly seen in the literature of the period. Previous to this, life had been considered the body’s natural condition, and death the mysterious and unaccountable Other. Ideas changed as Romantic scientists recognized that the state all matter tended towards was that of death and dissolution (as described by Shelley in the quote at the beginning), and, instead, *life* became the subject of scientific speculation. Unfortunately, life was a tricky subject to study; it was not constant, could not be artificially created or reproduced and was so precarious as to be endangered by attempts to study it. The animal rights movement evolved during this period in response to such experiments as that alluded to in Anna Barbauld’s poem ‘A Mouse’s Petition’ (*Poems*, 1773) and painted by Joseph Wright of Derby, ‘An Experiment on a Bird in the Air Pump’, (1768, National Gallery, London).

The search for a principle of vitality was motivated, on all sides, by this new definition of life. Trying to understand what the principle of life could be, scientists of the Romantic period asked two key questions: How could life exist in so many bodies organised so completely differently, from an oyster to man? And, what was the fundamental distinction between living and dead beings? So much depended on the answers to these questions. Crucially, a theory of life could be (and was) held to prove or disprove the existence of a soul, or immaterial mind. As this suggests, scientific discussions of life were exploited to support political and theological opinions. In the Royal College debate, John Abernethy’s conservative vitalism was in many ways the voice of the status quo, representing the establishment’s concern with national security in a time of crisis. Whether or not this was Abernethy’s main objective, the science of life was used by all as a discursive field of combat. Abernethy’s particular brand of vitalism can be viewed as the dominant ideology of the Romantic period, with William Lawrence as the dissident voice, challenging and questioning this ideology. Lawrence was clearly perceived as a threat to the stability of the country and he was linked throughout with others who questioned cultural orthodoxies. Science was used by vitalists to sustain a particular model of power and by materialists to question and disrupt that orthodoxy. Marilyn Butler places a *Quarterly Review* article attacking Lawrence within the context of its ‘consistent, orchestrated campaign against cultural subversion’, the targets of which included Shelley and Byron.⁸

⁶ Stephen Gill (ed.), ‘London, 1802’, ll 2-3, *William Wordsworth: A Critical Edition of the Major Works*, (Oxford: OUP, 1984), p. 286.

⁷ Nicholas Roe (ed.), *Samuel Taylor Coleridge and Sciences of Life*, (Oxford: OUP, 2001), p. 2.

⁸ Mary Shelley, *Frankenstein, or The Modern Prometheus: The 1818 Text*, ed. by Marilyn Butler (Oxford and NY: Oxford University Press, 1993), p. 228. Other recipients of the *Quarterly*’s attack that Butler singles out are William Cobbett, William Hone, John Bellamy, and Richard Carlile, p. 228.

John Abernethy and William Lawrence

The vitality question was explored by such figures as Thomas Beddoes (1760–1808), Erasmus Darwin (1731–1802), Humphry Davy (1778–1829), Joseph Priestley (1733–1804), and William Smellie (1740–1895). It was not until the second decade of the nineteenth century, however, that the search for the principle of life triggered a public debate, that between surgeons John Abernethy and William Lawrence. Abernethy was a respected teacher and surgeon at St Bartholomew’s Hospital; he gave a lecture to the new Royal College of Surgeons in 1814, which he claimed was based on the writings and conversation of the celebrated John Hunter, to whom he had been apprenticed. In this lecture, Abernethy put forward his theory of life: he did not believe that life depended on the organisation of the body (its physical make-up) but that it existed as a material substance ‘superadded’ to the body.

His opponent, Lawrence, had once been his talented protégé, and had risen through the ranks of the medical profession with great speed. He was supremely different in character and intellectual ability to his mentor; in contrast he was well-read, eloquent, handsome and polite (Abernethy cultivated a rude and disinterested bedside manner). Influenced by the French materialists to a degree considered dangerous by Abernethy and the conservative element of his colleagues, Lawrence proceeded to demolish and ridicule with great style and inventiveness his old master’s arguments in lectures to the same body, the Royal College of Surgeons, which he also then published.⁹

Abernethy features in a number of contemporary cartoons that give a sense of what the public at this time thought of doctors, or at least of him. In one he is asked to consult with a Lawyer; they both seem as bad as each other.¹⁰ The lawyer says: ‘I’ve an Ulcer on my leg; I’ll get you to see it and give me advice’ to which Abernethy replies: ‘Hello! What are you about there? Put out your tongue man –ah – there ‘tis – I see it – I’m satisfied – quite enough. Shut up your leg man; shut it up, shut it up; here take one of these pills every night going to bed’. But after this rather brusque consultation, A is only paid a shilling by his patient. When he demands ‘Why D—e, this is but a shilling’ the lawyer turns his arguments on him: ‘aye there ‘tis; I see it; I’m satisfied; quite enough, quite enough man; shut it up, shut it up’. Clearly they both feel dissatisfied with the treatment given by the other.

In another, law and physic are again linked in a cartoon that makes fun of the professions, comprising six scenes, the whole of which is sarcastically titled ‘The March of Intellect’.¹¹ Poetry features in one scene of this cartoon, in a reference that must be to Humphry Davy’s experiments with laughing gas in which he involved Coleridge, Robert Southey and Roget. The ‘Physic’ scene reveals Abernethy again prescribing a wonder pill that can cure anything and refusing to allow his patients to tell him of their ailments. He says: ‘Hold your tongue here! Take these pills all of you, and d’ye hear, every hour catch up your leg and hop to the devil’.

Another cartoon features ‘Abernethy’s Patent Remedy’, in which he tells a woman ‘Put out your tongue Madam!! Keep it so’.¹² While this cartoonist might have more sympathy with Abernethy than the lady, this cartoon still conveys Abernethy’s well-known rudeness,

⁹ William Lawrence, *An Introduction to Comparative Anatomy and Physiology; two Introductory Lectures, delivered at the Royal College of Surgeons on the 21st and 25th March, 1816* (London, J. Callow, 1816).

¹⁰ *John Abernethy*, Coloured etching (Wellcome Library), image number V0000018.

¹¹ *The March of Intellect*, Coloured etching by R. Seymour after himself, 1829 (Wellcome Library), image number V0000019.

¹² *John Abernethy*, Coloured etching by S. W. Fores, 1825 (Wellcome Library), image number, L0015720.

even for his aristocratic patients. He was famed for refusing to touch a patient, once swearing at a patient with an ulcerated throat who asked him to look down his throat.¹³ He was also known popularly as ‘My Book Abernethy’ because he would simply advise patients and student alike to read his book, rather than commenting on their particular case.¹⁴

Abernethy and Lawrence gave six alternate lectures at the Royal College from 1814 to 1819, when the Lawrence was forced to publicly recant his theory. Organization was the buzz word of the day, and Lawrence claimed that Abernethy’s notion of life as an independent matter superadded to the body was outmoded. Instead, he perceived life as simply the working operation of all the body’s functions, the sum of its parts. Abernethy supported his argument (that life was superadded to the body) by pointing out that living and dead bodies usually had the same ‘organisation’; therefore, life could not be *dependent* upon organisation. His ideas were based on ask John Hunter’s work in comparative anatomy, which seemed to show that animal substances ‘devoid of apparent organization’ were also living.¹⁵ In Abernethy’s mind, organisation could not be the key since the body’s matter is essentially inert; life is given to the body in the form of a ‘superadded’ element, without which the body would remain dead. ‘The matter of animals and vegetables is, however, an aggregate mass; it is as we express it, common matter, it is inert; so that the necessity of supposing the superaddition of some subtile and mobile substance is apparent’.¹⁶ Marilyn Butler’s reading of *Frankenstein* notes the influence of Abernethy’s theory of life on Victor, who first creates a body and then gives it life in some unspecified way.

Lawrence’s 1816 lectures introduced surgical students to the same subjects as those broached by Abernethy’s earlier lecture, but offered a completely different and opposite view of life. Whereas Abernethy represents the principle of life as the cause of living phenomena, Lawrence sees it as the result of the working operation of the living body. It was partly Lawrence’s free use of and unproblematised reference to the French materialists that contributed to his being labelled one of their camp.¹⁷ He openly expressed his admiration of French physiologists Georges Léopold Chrétien Frédéric Dagobert Cuvier (1769–1832) and Marie François Xavier Bichat (1771–1802), and aligned himself with them in promoting the concept of organization. Bichat had famously defined life as ‘the sum of the functions, by which death is resisted’.¹⁸ In Bichat’s model, both organic and inorganic matter are subject to, and controlled by, the same invariable physical laws. The fundamental difference between these types of matter is found in the internal functions of the living body itself. The

¹³ ‘The Late Mr. Abernethy’, *Metropolitan Magazine*, 1 (1831), 182–86 (p. 185). In the same obituary article the anonymous author remembers the form that consultations with Abernethy would usually take ‘he would not permit his patients to talk to him much, and often not at all; and he desired them to hold their tongues and listen to him while he gave a sort of clinical lecture upon the subject of the consultation’, p. 184.

¹⁴ Sir D’Arcy Power, ‘Epoch-making books in British surgery’, *British Journal of Surgery*, 17 (1929–30), 369–72 (p. 369).

¹⁵ John Hunter, *A Treatise on the Blood, Inflammation, and Gun-shot Wounds* [...] (London, George Nicol, 1794), p. 78.

¹⁶ John Abernethy, *An Enquiry into the Probability and Rationality of Mr. Hunter’s Theory of Life: being the subject of the first two anatomical lectures delivered at the Royal College of Surgeons, of London* (London: Longman, Hurst, Rees, Orme and Brown, 1814) and *Part of the Introductory Lecture for the Year 1815, Exhibiting some of Mr. Hunter’s Opinions Respecting Diseases delivered before the Royal College of Surgeons, in London* (London: Longman, Hurst, Rees, Orme, and Brown, 1815) [bound together], *Enquiry*, p. 41.

¹⁷ June Goodfield-Toulmin, ‘Some Aspects of English Physiology: 1780–1840’, *Journal of the History of Biology*, 2 (1969), 283–320, p. 311.

¹⁸ Xavier Bichat, *Physiological Researches on Life and Death*, trans. by F. Gold (London, Longman, Hurst, Rees, Orme, and Brown, 1816), p. 21.

distinctive property of a living animal is its ability to ‘transform [...] into its proper substance the particles of other bodies, and afterwards rejects them when they are become heterogeneous to its nature’.¹⁹ It is this ability to *transform* that distinguishes the living body for Bichat and throughout his work he emphasized the continually changing aspect of life; he believed chemical analysis of once living substance was ultimately worthless because ‘the state of the vital powers in the organs [...] changes at every moment’.²⁰

Though Abernethy gave his lectures on what he called ‘Mr Hunter’s Theory of Life’ he did add his own gloss on Hunter’s theory, making an analogy between life and electricity, and then, going even further, identifying life *as* electricity. To support this he turned to another well-known and acknowledged expert in his field, and claimed that Humphry Davy had proved this of electricity. Davy in 1814 was a successful and prominent chemist in the Royal Society and his most important discoveries had involved recognizing the uses of electricity in chemical experiments. Abernethy’s interpretation of these findings must have surprised Davy; he was being praised for successfully proving that electricity performed a vital operation in both dead and living matter. Abernethy describes Davy’s achievement:

That electricity is something, I could never doubt, and therefore it follows as a consequence in my opinion, that it must be everywhere connected with those atoms of matter, which form the masses that are cognizable to our senses; and that it enters into the composition of every thing, inanimate or animate. If then it be electricity that produces all the chemical changes, we so constantly observe, in surrounding animate objects, analogy induces us to believe that it is electricity which also performs all the chemical operations in living bodies.²¹

The proof that electricity is ‘something’ is key to Abernethy’s idea of the relationship between electricity and life. The term identifies electricity as a substance, a thing, which exists independently of the body it enters. Importantly, it is independent and separate from the body it acts upon, superadded to that body. This definition was essential for Abernethy’s religious and moral convictions, which were supported by his physiological beliefs.

Lawrence, in his lectures, was a well-read and eloquent speaker, delighting his audience with inventive comic representations of Abernethy that displayed his literary knowledge. Through these means Abernethy becomes a figure of fun, consigned ‘to the vault of the Capulets’, while his theory of life is ridiculed. Taking the part of Hamlet to Abernethy’s Polonius, Lawrence writes: ‘this vital principle is compared to magnetism, to electricity, and to galvanism; or it is roundly stated to be oxygen: ‘Tis like a camel, or a whale, or like what you please’ (*Introduction*, pp. 167, 169).²² Focusing on the theory that life was like electricity, which would instantly have been recognized as Abernethy’s personal

¹⁹ Xavier Bichat, *Physiological Researches on Life and Death*, trans. by F. Gold (London, Longman, Hurst, Rees, Orme, and Brown, 1816), p. 23.

²⁰ Xavier Bichat, *Physiological Researches on Life and Death*, trans. by F. Gold (London, Longman, Hurst, Rees, Orme, and Brown, 1816), p. 81.

²¹ John Abernethy, *An Enquiry into the Probability and Rationality of Mr. Hunter’s Theory of Life*: being the subject of the first two anatomical lectures delivered at the Royal College of Surgeons, of London (London, Longman, Hurst, Rees, Orme and Brown, 1814) and Part of the Introductory Lecture for the Year 1815, Exhibiting some of Mr. Hunter’s Opinions Respecting Diseases delivered before the Royal College of Surgeons, in London (London, Longman, Hurst, Rees, Orme, and Brown, 1815) [bound together], *Enquiry*, p. 49.

²² William Lawrence, *An Introduction to Comparative Anatomy and Physiology; two Introductory Lectures, delivered at the Royal College of Surgeons on the 21st and 25th March, 1816* (London, J. Callow, 1816), pp. 167, 169.

addition to the debate, Lawrence states unequivocally that ‘the truth is, there is no resemblance, no analogy between electricity and life [...] Electricity illustrates life no more than life illustrates electricity’.²³

Lawrence argued throughout his altercation with Abernethy that science should have nothing to do with political or religious opinion, while Abernethy stated explicitly that there was a moral purpose to his theory of life: it was no less than a matter of national importance for Abernethy that his audience accept that life, mind and, by analogy, the soul, were separate entities. Once this has been accepted, he could argue that ‘the distinct and independent nature of mind, incites us to act rightly from principle’.²⁴ Indeed for Abernethy, the nature of vitality was, he believed, a matter for the conscience to decide rather for objective scientific investigation. He told his audience at the Royal College that ‘The contemplation of this subject at large, is fitter for meditation in the closet than for discussion in the lecture room’.²⁵ Abernethy was not unaware of the ideology his interpretation of vitality supported, typified as it was by a system of hierarchies and controlling external powers. If his theory of life was accepted,

Thus even would psychological researches enforce the belief which I may say is natural to man; that in addition to his bodily frame, he possesses a sensitive, intelligent, and independent mind: an opinion which tends in an eminent degree to produce virtuous, honourable, and useful actions.²⁶

The separate existence of an independent principle of life is used to argue that man needs an entity of this nature in order to be virtuous. If physiological studies can prove that it is ‘natural’ for humans to be controlled and regulated by a superadded principle, the legitimacy of externally governing bodies is justified. Abernethy provides evidence for Edmund Burke’s treatise that individuals need to have their inclination, will and passions controlled ‘*by a power out of themselves*’, condoning the conservative establishment’s oppressive political, religious and moral actions in the guise of a physiological debate.²⁷

²³ William Lawrence, *An Introduction to Comparative Anatomy and Physiology; two Introductory Lectures, delivered at the Royal College of Surgeons on the 21st and 25th March, 1816* (London, J. Callow, 1816), pp. 170–71.

²⁴ John Abernethy, *Physiological Lectures; Delivered before the Royal College of Surgeons of London in the year 1817; Exhibiting a General View of Mr. Hunter’s Physiology, and of his researches in Comparative Anatomy*, in *The Surgical Works of John Abernethy*, 3 vols (London, Longman, Hurst, Rees, Orme and Brown, 1820), p. 50.

²⁵ John Abernethy, *An Enquiry into the Probability and Rationality of Mr. Hunter’s Theory of Life: being the subject of the first two anatomical lectures delivered at the Royal College of Surgeons, of London* (London: Longman, Hurst, Rees, Orme and Brown, 1814) and *Part of the Introductory Lecture for the Year 1815, Exhibiting some of Mr. Hunter’s Opinions Respecting Diseases delivered before the Royal College of Surgeons, in London* (London, Longman, Hurst, Rees, Orme, and Brown, 1815) [bound together], *Enquiry*, pp. 87–88.

²⁶ John Abernethy, *An Enquiry into the Probability and Rationality of Mr. Hunter’s Theory of Life: being the subject of the first two anatomical lectures delivered at the Royal College of Surgeons, of London* (London: Longman, Hurst, Rees, Orme and Brown, 1814) and *Part of the Introductory Lecture for the Year 1815, Exhibiting some of Mr. Hunter’s Opinions Respecting Diseases delivered before the Royal College of Surgeons, in London* (London, Longman, Hurst, Rees, Orme, and Brown, 1815) [bound together], *Enquiry*, p. 95.

²⁷ Edmund Burke, *Reflections on the Revolution in France, and on the Proceedings in certain Societies in London relative to that Event* (London, J. Dodsley, 1790), p. 89; this passage is quoted by L. S. Jacyna, ‘Immanence or Transcendence: Theories of Life and Organization in Britain, 1790–1835’, *Isis*, 74 (1983), 311–29 (p. 323).

Both Abernethy and Lawrence used their physiological studies to ‘enforce’ their political and religious beliefs. Lawrence compared Abernethy’s superadded vital principle with ‘Bow Street’ or the ‘Old Bailey’, arguing that virtue is encouraged and regulated by volitional means, without need of or recourse to an external God or a future state.²⁸ In contrast, dualists such as Abernethy continued to insist that man would act morally only if authority (both divine and civic) and a system of reward and punishment were enforced from outside the self. It is easy to see who Shelley would have backed.

Appealing for his theory of life to be considered only on scientific merit, Lawrence emphasized that the existence of the soul was an independent issue which he did not intend to discuss: ‘the theological doctrine of the soul, and its separate existence, has nothing to do with this physiological question’.²⁹ This debate was in many ways a test case for the emerging notion of scientific objectivity. Of course, Lawrence was not permitted this freedom and critics of his lectures argued that his real aim was to prove that the soul did not exist. Lawrence’s open declaration of the influence of French writers on his work was interpreted by Abernethy’s supporters as both a political and physiological betrayal. He was denounced as a materialist and an atheist. Not only Abernethy, but a number of outraged medical and non-medical critics attacked Lawrence’s lectures. He became a notorious figure and the debate was covered by all the journals of the day.

In 1819 Lawrence published his most radical book, *Lectures on Physiology, Zoology, and The Natural History of Man*, and the issue was presented as a matter of national concern. He was represented as inculcating the young susceptible minds of trainee British surgeons with precisely the same ideals that had led to the French revolution. 1819 was, of course, the year of the Peterloo Massacre, followed by the so-called ‘gagging acts’ and other repressive measures taken by a ruthless government. Lawrence fell victim to this zealotry and 1819 saw the publication of a number of pamphlets, books and journal articles calling for his resignation. Such a hysterical response was unsurprising, considering the current political climate; In April 1819 the governors of Bridewell and Bethlem hospital held their annual elections and ruled to suspend Lawrence from his position as surgeon. Despite his protestations never to be silenced, Lawrence was persuaded to write a letter to the governors retracting his ‘infidel opinions’ and promising to ‘suppress and prevent the circulation of his book’.³⁰ His book was withdrawn less than a month after having been published and after receiving his letter the governors reinstated Lawrence.

The matter did not end there, however. After a pirate edition of the *Lectures* was published in 1823, and Lawrence applied for copyright for his book. Lord Eldon refused it on the grounds that the material it contained was blasphemous, seditious and immoral. Eldon’s part in the silencing of Lawrence linked him with the radical writers and poets who had suffered similarly at the hands of the Lord Chancellor, including Byron, Southey, and Shelley himself. One book published in the aftermath of Lawrence’s 1819 *Lectures* was titled *The Radical Triumvirate, or the Infidel Paine, Lord Byron, and Surgeon Lawrence*.³¹ The *Monthly Magazine* supported Lawrence through these trials and published his letter to the governors of the hospital, in parallel columns alongside ‘the never-to-be-forgotten abjurations

²⁸ William Lawrence, *Lectures on Physiology, Zoology, and The Natural History of Man, delivered at the Royal College of Surgeons* (London, J. Callow, 1819), p. 12.

²⁹ William Lawrence, *Lectures on Physiology, Zoology, and The Natural History of Man, delivered at the Royal College of Surgeons* (London, J. Callow, 1819), p. 8.

³⁰ Anonymous article, *Monthly Magazine*, 53 (1822), 524–44 (p. 544).

³¹ Anon, *The Radical Triumvirate, or Infidel Paine, Lord Byron, and Surgeon Lawrence, Colleaguine with the Patriotic Radicals to Emancipate Mankind from All Laws Human and Divine. A Letter to John Bull, from an Oxonian Resident in London* (London, Francis Wesley, 1820).

of Galileo'.³² The message is clear: Lawrence is regarded as the injured victim of conservative repression, whilst the analogy also implies that his theory of life will prove to be the true one. Richard Carlile published Lawrence's *Lectures* and the 1816 *Introduction* together, with the following inscription: 'to John, Earl of Eldon, Lord High Chancellor of England, as the result of his injustice in refusing to establish the author's right of property in them. By the publisher'.³³ The *Lectures* continued to be published until the ninth edition in 1848.

While Lawrence had belittled Abernethy's notion of a 'party' of 'modern sceptics' there was public acknowledgement of a group of radical thinkers to which Lawrence belonged. The people who had written book-length defences of Lawrence's theory of life included the surgeon Sir Thomas Charles Morgan, (husband of the poet and novelist Sydney Owenson), and the naturalist Thomas Forster, Thomas Love Peacock's friend and correspondent. There clearly was something in the public's perception of Lawrence as politically radical: in a private letter to William Hone, Lawrence makes it clear that the book's suppression was a matter of expediency and expresses his admiration for Hone's 'much greater courage in these matters'.³⁴

Marilyn Butler has written that 'Percy Shelley's intellectual association with Lawrence is in fact better hidden than his wife's'.³⁵ Butler's edition of *Frankenstein* as a dramatic reworking of the issues raised in the vitality debate has done much to bring the debate and its literary repercussions to the attention of Romantic critics. Shelley's interest in science is well documented, yet no critic has looked in depth at his interest in the 'science of life' as Lawrence called it.

Percy Bysshe Shelley's Idea of Life

From a young age Shelley possessed an air-pump among other chemical apparatus, and his letters are filled with questions and theories concerning the nature of vitality. In 1811, after he had been expelled from Oxford, Shelley moved to London and in the company of his eldest cousin John Grove a qualified surgeon, and his younger brother Charles, who was at this time training to be a surgeon in St Bartholomew's Hospital, Shelley attended Abernethy's lectures and read his book on the *Constitutional Origin and Treatment of Local Diseases*.³⁶ At this time Lawrence was Abernethy's apprentice and demonstrator in lectures. Lawrence was a contemporary of Shelley's cousin John and they were up against each other in the event of a post for a hospital surgeon falling vacant (in the election Grove stood down to allow Lawrence to obtain the post). Grove, Abernethy and Lawrence were all members of

³² Anonymous article, *Monthly Magazine*, 53 (1822), 524–44 (p. 542).

³³ Lawrence may have been involved with this publication, or at least not frowned upon it since Carlile may have been a friend; see Owsei Temkin, *The Double Face of Janus* (Baltimore, Johns Hopkins University Press, 1977), pp. 355–56. Lawrence visited Carlile in his last illness, Temkin, p. 357.

³⁴ This letter quoted in Goodfield-Toulmin's article is not dated, although the paper watermark is '1820': it accompanied a copy of Lawrence's *Lectures*, Goodfield-Toulmin, 'Some aspects of English physiology', p. 319. Hugh J. Luke discovered that both Shelley and Lawrence subscribed to the public fund set up for Hone after he was tried on three occasions in 1817 for blasphemous libel, Hugh J. Luke jnr, 'Sir William Lawrence: Physician to Shelley and Mary', *Papers on English Language and Literature*, 1 (1965), 141–52 (p. 150).

³⁵ Mary Shelley, *Frankenstein, or The Modern Prometheus: The 1818 Text*, ed. by Marilyn Butler (Oxford and NY, Oxford University Press, 1993), p. xlix.

³⁶ *Surgical Observation on the Constitutional Origin and Treatment of Local Diseases; and on Aneurisms*, 5th edn (London, Longman, Hurst, Rees, Orme, and Brown, 1820)

the hospital's Medical and Philosophical Society. On two occasions Grove presented books to the library of this Society and both of these books have specific connections to Shelley.

In fact at this point in his life Shelley had determined to become a surgeon himself. Letters written at the time confirm this determination and during the spring and summer of 1811 he walked the wards with Charles Grove, in his post as box carrier to one of the surgeons, and attended Abernethy's lectures each morning. Shelley not only would have gained medical knowledge, and it is clear that he approved of Abernethy's emphasis on constitutional health since he quotes him in his 1814 *Essay on the Vegetable Diet*, he also lived within a circle of medical men, many of whom were to be key players in the debate between Lawrence and Abernethy. Lawrence himself became Shelley's doctor and friend, and Shelley remained a patient of Lawrence throughout his residence in Britain, seeing him throughout the 1814 to 1819 debate; Shelley finally moved to Italy on Lawrence's advice. The conversations with John Polidori in Geneva on 'the principles of life' (to which, as is well known, Mary Shelley was a 'silent but devout' listener), were on a topic that Shelley would have been well qualified to discuss.

Shelley engages with the problems and questions raised in the vitality debate in a number of ways. In his poetry, he uses 'life' as a concept in numerous senses and often with conflicting definitions, from the demonic triumph of 'Life' in the poem of that name, to the femme fatale called 'Life' in *Una Favola*, to the 'veil which those who live / Call Life' in the sonnet 'Lift not the painted veil'. Almost the final line of Shelley's final poem, 'The Triumph of Life', unfinished at his death, has the question 'What, then, is life?' At times he uses physiological detail to describe the life of plants, animals, and all living things; at other times, he uses the same knowledge to make philosophical comment on a much grander scale: Shelley's 'Power' or 'Necessity' can be likened to the principle of life which contemporary scientists believed animated all living beings. The different theories of vitality that were available provided Shelley with metaphors to describe the distance he felt from his contemporary world as well as the excitement he felt at the prospect of change. They supplied him with a means to imagine revolution and utopia. Each version of vitality given in this period had distinct political motivations and associations, and the vitality debate offered a versatile and intricate set of ideas for Shelley's poetry and prose. The questions raised by the search for a principle of life involved characteristically Shelleyan concerns: the possibility that there is a principle of life at all problematises the idea of a self, which Shelley was continually trying to escape from.

Shelley's interest in the science of life can be seen in such texts as his essay *On Life*, which begins with the following:

Life, and the world, or whatever we call that which we are and feel, is an astonishing thing. The mist of familiarity obscures from us the wonder of our being. We are struck with admiration at some of its transient modifications; but it is itself the great miracle. What are changes of empires, the wreck of dynasties with the opinions which supported them; what is the birth and the extinction of religions and of political systems to life? What are the revolutions of the globe which we inhabit, and the operations of the elements of which it is composed, compared with life? What is the universe of stars and suns [of] which this inhabited earth is one and their motions and their destiny compared with life?³⁷

³⁷ 'On Life', *Shelley's Poetry and Prose*, ed. by Donald H. Reiman (New York, W. W. Norton, 1977), pp. 474–75.

Writing *On Life* Shelley expresses his astonishment at the ‘wonder of our being’. This is not the Shelley we thought we knew, the poet whose central, canonical works we are accustomed to reading for his views on politics, religion and science. In this essay, he demotes those subjects in favour of the mystery of our physical life, a greater miracle to him than the creation of the universe, or past and present political systems and religious beliefs. In this essay, Shelley couches the problem in similar terms to the disparaging *Edinburgh Review* article which made fun of its contemporaries’ inability to define either life or death.³⁸ But here Shelley argues that it is precisely this familiarity with life that gets in the way of our exploring it. Shelley recognizes that life is a concept so central to our being that it is difficult to appreciate that it is a phenomenon we know nothing about. He calls for his reader to rethink their preconceptions about life and to consider it in a new way, as a mystery that might be analysed and possibly even explained, just as the revolutions of the earth have been. His efforts are part of a Romantic objective: the Preface to Wordsworth’s and Coleridge’s *Lyrical Ballads* and Shelley’s *Defence of Poetry* both claim the importance of making the familiar unfamiliar.³⁹

Read in the light of the science of life, canonical, familiar poems such as ‘Ode to the West Wind’ are transformed. One of Shelley’s favourite images, that of the seed containing the plant, or of the acorn containing the oak, is repeatedly employed in theories of life put forward during this period. Shelley is interested in the acorn or seed as a metaphor for revolutionary potential, as a metaphor it incorporates the realisation that this potential may or may not be realised. Speaking to a future generation because contemporary readers did not value his writings, he hopes that a more enlightened audience might appreciate and revive the ‘withered leaves’ of his ‘Dead thoughts’. The ‘dead leaves’ are the leaves of the pages on which his poem is printed and so, what was once dead has the capacity to live again, or at least to provide for life. His words will feed the new generations beyond his death and the cycle of life goes on as Lucretius believed, ‘nothing dies, everything changes’. Literally, the leaves of the pages were once also alive and are now dead; a different kind of life is possible for them in the minds and hearts of future readers. In his note to the poem, Shelley writes ‘This poem was conceived and chiefly written in a wood that skirts the Arno, near Florence, [...] on a day when that tempestuous wind, whose temperature is at once mild and animating.’⁴⁰ The animating effects of the wind have produced this poem; there is an analogy drawn between radical poetry and the principle of vitality. Critics have recognised that ‘Ode to the West Wind’ contains within it regret at the lack of sympathy shown by contemporary readers, but while Shelley’s ideas and thoughts might lie dormant for a time, there will, he hopes, come along a readership that can waken them and make them live again. The poem expresses Shelley’s desire for a sympathetic audience, one that will provide the necessary environment for this poem to generate meaning and disseminate radical political opinion.

³⁸ ‘An Inquiry [sic] into the Probability and Rationality of Mr. Hunter’s Theory of Life; being the subject of the first Two Anatomical Lectures delivered before the Royal College of Surgeons, of London.’, *Edinburgh Review*, 23 (1814), 384–98

³⁹ ‘The principle object, then, proposed in these Poems was to choose incidents and situations from common life, and to relate or describe them, throughout, as far as was possible in a selection of language really used by men, and, at the same time, to throw over them a certain colouring of imagination, whereby ordinary things should be presented to the mind in an unusual aspect’, quoted from the 1850 Preface to the *Lyrical Ballads, The Prose Works of William Wordsworth*, ed. by W. J. B. Owen and J. W. Smyser, 3 vols (Oxford, Clarendon Press, 1974), I, 123. In the *Defence of Poetry*, Shelley claims that poetry ‘strips the veil of familiarity from the world, and lays bare the naked and sleeping beauty which is the spirit of its forms’, *Shelley’s Poetry and Prose*, ed. by Donald H. Reiman (New York: W. W. Norton, 1977), p. 505.

⁴⁰ *Shelley’s Poetry and Prose*, ed. by Donald H. Reiman (New York, W. W. Norton, 1977), p. 221n.

Shelley's poetry can live, not only in the sense that new audiences read and interpret it, but in the sense that it can have a real and tangible effect on a society. The poem becomes substituted for the vital principle itself. If successfully resurrected from obscurity, it can enliven the lives of others.

It was precisely the changes between life and death that taxed the greatest scientific minds of Shelley's day: how did life begin? What was the crucial difference between living and dead matter? The 'winged seeds' blown by the west wind are to lie like corpses until spring comes when they sprout and flower. This process begged another question: how can we be sure that a being is living (or has potential for life) when there are some that seem to be dead for long periods of time? The naturalist William Smellie, for example, spent some time examining the apparently inanimate polyp, examples of which 'afford instances of every appearance of sensation, or even of irritability, being suspended, not for months, but for several years, and yet the life of these animals is not extinguished'.⁴¹ He concludes with, 'It is possible, therefore, that life may exist in many bodies which are commonly thought to be as inanimate as stones'.⁴² Shelley's scepticism and uncertainty at the end of 'Ode to the West Wind', the question which remains crucially unanswered and sounds a plea from poet to both contemporary and future readers, also perplexed Romantic scientists. ('Oh wind, /If winter comes, can spring be far behind?') Life seemed capricious and mysterious; the leaves may not 'quicken a new birth', the Earth may remain 'unawakened'. Knowledge of the science of life offers a new vocabulary with which to analyse Shelley's poetry, one which he knowingly used and to whose theories he alluded.

Shelley knew how life was perceived to work according to William Lawrence, whose theory of life and politics he favoured. It is possible to trace the influence that Lawrence had on Shelley in the theories of life that Shelley states in his letters and his writings. In one early letter Shelley explains the way in which an acorn fulfils its potential for life:

We put an acorn in the ground, in process of time it modifies the particles of earth air & water by infinitesima[l] division so as to produce an oak; that power which makes it to be this oak, we may call it's vegetative principle, symbolising with the animal principle, or soul of animated existence.⁴³

Shelley's idea of life here is not an instantaneous infusion of life, such as is achieved by Victor Frankenstein, instead the 'animal principle' is like the 'vegetative principle', a transmuting force, which changes non-living matter into living matter. Particles of earth, air and water, are gradually modified to create a living oak tree. The anonymous author of one *Edinburgh Review* article on Abernethy's and Lawrence's debate gives a similar definition of life. Denying that there is much difference between the organization of a living being and of a being which was once living but is now dead, the reviewer argues that life is:

that sort of appropriation of foreign matter which we observe in the human body, when it converts its food into bone, and muscle, and nerve, &c.; or in a plant, when it changes portions of the elements in which it is placed, into bark, and wood, and leaves, and so forth. Those bodies alone are entitled to the appellation of living, in which, some such addition and conversion of surrounding

⁴¹ William Smellie, *The Philosophy of Natural History*, 2 vols (Dublin, William Porter, 1790), I, 13.

⁴² William Smellie, *The Philosophy of Natural History*, 2 vols (Dublin, William Porter, 1790), I, 14.

⁴³ F. L. Jones, *The Letters of Percy Bysshe Shelley*, 2 vols (Oxford, Clarendon Press, 1964), II, 110, 20 June 1811.

substances as this, is actually taking place: — all others are denominated Dead.

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Matter is not regarded as inert, but as capable of transforming other materials to its purpose. The ability to convert matter of one kind into another is the sign of a living body. According to the review, one clear example of this process in the human body is the circulation of blood: in the physiology of the period this operation included the conversion of blood into other vital substances, and the conversion of air and food into blood.⁴⁵ An analogy can be made here with intertextuality, which Shelley regarded as integral in the creative process. Poetry ‘creates by combination and representation’, a kind of transmutive process in which the words of other writers combine with his own.⁴⁶

Shelley’s example of the acorn and the oak is drawn on to express his concerns about identity and selfhood. Just as life transmutes other elements to itself, so living bodies must constantly shed parts of themselves in order to continue to live. In Shelley’s *A Refutation of Deism*, Eusebes expresses a further consequence of this world in which nothing perishes but everything changes: ‘no organized being can exist without a constant separation of that substance which is incessantly exhausted, nor can this separation take place otherwise than by the invariable laws which result from the relations of matter’.⁴⁷ Life is therefore, as Lawrence pointed out, inherently and essentially mutable: ‘we see a continued change, so that the body cannot be called the same in any two successive instants’.⁴⁸ This was the primary reason why Lawrence believed that empiricism was the only means by which life could be analysed, not by Abernethy’s method of proceeding by analogy. It was also one reason why the question ‘what is life’ could not, ultimately, be answered; since, to ask the question at all presupposed that life was a noun, a *something*, and denied the perpetual flux and mutability of life. After a hundred years the oak becomes earth again, as Shelley continues in his letter; at this stage he questions whether it ceases to exist: the ‘identity’ of the subject changes irrevocably. His materialist view of life prevails, however, and despite this inevitable metamorphosis, he believes that the tree continues to exist though in a different form to that it had previously embodied.

The scientific theories of life are richly suggestive for Shelley, many of his favourite tropes can be seen to have their counterpart in scientific theories of the time. Poetry is regarded by him as ‘vitally metaphorical’, both because the vitality debate produced metaphors for republicanism, universal sympathy, poetic genius and selflessness, and because the process of metaphor was inherently vital (in the sense of transformative).⁴⁹ F. R. Leavis’s famous criticism of Shelley’s images, which have ‘a general tendency [...] to forget the status of the metaphor or simile that introduced them and to assume an autonomy and a right to propagate’, describes in effect the vital or living aspect of Shelley’s metaphors, which

⁴⁴ John Abernethy, ‘An Inquiry [sic] into the Probability and Rationality of Mr. Hunter’s Theory of Life; being the subject of the first Two Anatomical Lectures delivered before the Royal College of Surgeons, of London.’, *Edinburgh Review*, 23 (1814), 384–98 (p. 386).

⁴⁵ ‘An Inquiry [sic] into the Probability and Rationality of Mr. Hunter’s Theory of Life; being the subject of the first Two Anatomical Lectures delivered before the Royal College of Surgeons, of London. By John Abernethy’, *Edinburgh Review*, 23 (1814), 384–98 (p. 386).

⁴⁶ Preface to *Prometheus Unbound, Shelley’s Poetry and Prose*, ed. by Donald H. Reiman (New York, W. W. Norton, 1977), p. 134.

⁴⁷ David Lee Clark, ed., *Shelley’s Prose: or the Trumpet of a Prophecy* (Albuquerque, The University of Mexico Press, 1954), p. 133.

⁴⁸ William Lawrence, *An Introduction to Comparative Anatomy and Physiology; two Introductory Lectures, delivered at the Royal College of Surgeons on the 21st and 25th March, 1816* (London, J. Callow, 1816), p. 138.

⁴⁹ *Shelley’s Poetry and Prose*, ed. by Donald H. Reiman (New York, W. W. Norton, 1977), p. 482.

transform as they describe and create new and newly creative images in their refusal to fix and settle.⁵⁰ There is a political meaning to this refusal; Shelley, with William Godwin, was anxious about any law or institution which imposed fixed meaning. It was important that life was mutable, and that peaceful revolution could challenge dead and static political institutions.

To return to 'Ode to the West Wind', poetry, for Shelley, is truly a vital force: envisioned in its most strict scientific sense, poetry as life is able to 'quicken' dead matter, to revive, to transmute, to mutate. Still Shelley recognised in this poem that only sympathetic readers could provide the spark needed to revive the dead leaves of his words. Writing of the 'modern literature of England' Shelley uses the vitalist argument: 'The mass of capabilities remains at every period materially the same; the circumstances which awaken it to action perpetually change'.⁵¹ He considers the material body of the corpse and the living to be the same, but the principle of vitality is needed to awaken the organised matter.

To conclude, contemporary thinking on the nature of life galvanised Shelley's writing. The medical study of vitality inspired his poetry with a new language and a way of discussing the political situation of his 'fainting country' as he called it in the poem 'England in 1819' and a way of discussing the utopian potential for renewal and rebirth. As much as the question of whether spring is coming at the end of the 'Ode to the West Wind' remains sceptical, it allows for both pessimistic and optimistic thought. Retrieving this language and these theories gives us an insight into Shelley's reading and knowledge as well as into the ways in which Shelley exploited scientific material in his writings. In Shelley's poems, theories of life are both the subject of his discussion and the means by which his political, historical, aesthetic and material convictions are expressed.

⁵⁰ Quoted in Paul Hamilton, *Shelley, Writers and their Work* (Devon, Northcote House, 2000).

⁵¹ Preface to *Prometheus Unbound, Shelley's Poetry and Prose*, ed. by Donald H. Reiman (New York, W. W. Norton, 1977), p. 134.