Both contemporaries and historians have focused on the high-profile 1874 Belfast Address in which John Tyndall was widely perceived as promulgating atheism. Although some historians have instead interpreted him as a pantheist or an agnostic, it is clear that any such labels do not accurately capture Tyndall’s religious position throughout his life. By contrast, this paper seeks to chart Tyndall’s religious journey from 1840 (when he was in his late teens) to the autumn of 1848 when he commenced his scientific studies at Marburg. Although he had been imbued with his father’s stern conservative Irish Protestantism and opposition to Catholicism, as a youth he seems for a time to have been attracted to Methodism. Later, however, he questioned and rejected his father’s religious views and was increasingly drawn to the more spiritual outlook of Ralph Waldo Emerson and Thomas Carlyle, along with a more radical attitude to politics.

Keywords: John Tyndall; Ralph Waldo Emerson; Thomas Carlyle; Protestantism; Methodism

After his famous—or perhaps infamous—Belfast Address at the annual meeting of the British Association for the Advancement of Science in 1874, John Tyndall was widely charged with expounding the unacceptable doctrine of materialism and thus with promulgating atheism.1 Although many of Tyndall’s contemporaries and some subsequent historians have read the Belfast Address as demonstrating that Tyndall was an atheist, others have labelled him a pantheist, while others still have portrayed him as an agnostic.2 Despite disagreement over which label applies best to Tyndall, these commentators have all sought the single noun that captures the essential quality of Tyndall’s religious commitments. Yet the recurrent focus on his 1874 Address and on assigning a label to him ignores the question of his own religious journey. His upbringing was neither atheist nor pantheist nor agnostic; instead he was born into a strict Protestant3 household in County Carlow, Ireland, and brought up in the Protestant faith, sharing to some degree his father’s hostility to Roman Catholicism. How, then, did he depart from his father’s religion to develop a very different religious perspective that included the rejection of many aspects of organized religion? That is the main thrust of this paper. However, in tracing his changing attitudes to various aspects of religion, it will become apparent that such terms as atheist, pantheist and agnostic are inadequate descriptions of Tyndall’s views, which demand a far more nuanced and historically sensitive analysis.

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The evidence presented here is gleaned from letters and journal entries that Tyndall wrote between May 1840, when he was posted by the Ordnance Survey of Ireland to Youghal, County Cork, and October 1848, when he left England for Marburg to work in the laboratory of Robert Bunsen. Stephen Kim calls this early part of his life his years of ‘study and apprenticeship’. Thus we shall be concerned primarily with a period spanning about eight and a half years. Although the year of his birth is not known with certainty, Tyndall was about 18 years old at the start of this period and about 27 when he left for Marburg. During that time he matured greatly: at the start he had just moved away from home, and his father still exerted a significant influence on him; they shared approximately similar views on politics and religion. By October 1848 not only had he emigrated from Ireland and spent more than five years working as a surveyor in England, but he had also substantially reassessed both his political and his religious views. 

As this paper is concerned with Tyndall’s changing attitudes to religion, it necessarily engages the wider issue of how individuals develop cognitively, emotionally and religiously. Although a substantial literature exists on this subject, Carl Jung’s notion of individuation provides a helpful framework and vocabulary for characterizing Tyndall’s changing religious identity during the period under discussion. For Jung and his followers the process of individuation is marked by such indicators as the maturity of the person’s attitudes and assumptions, the quality of the relationships that he or she maintains and his or her ability to act in accordance with his or her disposition as an autonomous individual. Although individuation may be a long-term continuous process, Jung divided it into three stages that often overlap. The first stage involves containment and nurturing, principally by the real or symbolic mother, thus enabling the child to gain an increasing degree of physical and emotional autonomy. In the second (‘adapting/adjusting’) stage, which usually begins at around the time of puberty, the figure of the father plays the leading symbolic role. To cope with the challenges of being an autonomous person in an often hostile world, the youth adopts the norms instilled by parents and by society at large (often with some testing of the boundaries) so as to fit into the community. By contrast, the third and final stage of individuation is marked by centring and integration: ‘The task in this stage of life ... is ... to become a centred and whole individual who is related to the transcendent as well as the immediate concrete realities of human existence.’ The individual now strives for—and to some degree achieves—an awareness of self that separates that person from his or her socially adapted persona. For Jung, the evolution of a person’s religious identity is a crucial part of the process of individuation. Although there is little available evidence relating to Tyndall’s childhood and early upbringing—corresponding to the first stage—the early extant letters (dating from his late teens) indicate that he experienced a very close but sometimes tense relationship with his father as he began to move from Jung’s second stage to the third. 

A long letter of July 1852 to the Irish physicist Edward Sabine, who had become his foremost patron among the community of scientists in London, provides further evidence of Tyndall’s relationship to his father. As Sabine had extended the hand of friendship, Tyndall felt obliged to furnish him with ‘a brief sketch of my life history’, which prompted him to reflect on his father, who had died five years earlier:

my father was a poor man, who made a livelihood by selling leather and shoes, during a portion of his life he was a policeman. In these few words I sum up all his shortcomings. I
have nothing more to say against him, for a man of more inflexible integrity and intrinsic truthfulness of heart I have never met.\(^ \text{10} \)

A similar phrase—‘an example of inflexible integrity’—also occurs in a later letter in which Tyndall described his father to a female admirer.\(^ \text{11} \) Thus despite praising his father for his integrity, Tyndall’s addition of the adjective ‘inflexible’ makes the phrase far more sinister. Whereas integrity is generally considered a human virtue, inflexibility implies a rigidity that can place an immense strain on interpersonal relations. Although Tyndall greatly admired his father, he is portrayed in these two letters as stern and unbending and as having imposed his resolute will on his son. On some issues, especially the importance of integrity and truthfulness and commitment to the Protestant work ethic, Tyndall willingly adopted his father’s outlook. Yet, as will be argued below, he increasingly distanced himself from other aspects of his ‘inflexible’ upbringing so that, by his mid twenties, he had achieved a high degree of self-awareness as exemplified by the Jungian third stage of individuation.

The following examples indicate that by 1848 Tyndall manifested traits associated with Jung’s third stage. Shortly before departing for Marburg he delivered a farewell lecture to the boys at Queenwood College, where he had been teaching.\(^ \text{12} \) In this impressive rhetorical performance Tyndall urged his young audience not to buckle to social convention but to live their lives according to their consciences and to commit themselves to the search for truth. ‘Truth’, he insisted, ‘is not a thing built upon human institutions; to set the matter right the architecture must be reversed. Truth is independent of human action.’ He then turned to the Bible for inspiration; biblical texts, he asserted, ‘are to my mind by far the most valuable literary commodity that we possess’. His chosen text was 1 Corinthians 2:15: ‘He that is spiritual judgeth all things.’\(^ \text{13} \) In the previous verse Paul had postulated the ‘natural man’ who is cut off from ‘the Spirit of God’; subsequently, in verse 15, he contrasted this ‘natural man’ with the person who achieves spiritual awareness by the ability to make moral judgements. Tyndall clearly considered that he was endowed with this spiritual power. Drawing on his reading of the Bible and the romanticism and transcendentalism that he had imbibed primarily from Carlyle and Emerson, he exhorted each of his auditors to be honest to himself and to respond to his conscience—the still, small voice within. He urged his pupils to commit themselves to the higher life of the spirit.\(^ \text{14} \)

A second example dates from a few months earlier, when Tyndall penned a lengthy reflection on the need to be honest to oneself and to avoid being swayed by others. Thus he stressed the importance of making up one’s own mind about important issues. He portrayed himself as a freethinker, but not in the anti-religious sense because he possessed a firm commitment to the truth and importance of the Bible and adhered to a belief in the power of the Spirit.\(^ \text{15} \)

The above examples dating from 1848 indicate that Tyndall had by then achieved a high degree of self-awareness, including the kind of transcendental religious beliefs that Jung associated with the third stage of individuation. Also relevant is his journal entry for 11 October 1848, when he commented on his friend William Ginty, with whom he had worked closely on the Ordnance Survey of Ireland several years earlier. Ginty, he noted, seemed not to have changed (matured) with time: ‘He has gone a certain depth and now works in a lateral direction—[he] collects more facts, but finds no deeper meaning in them. I had a higher destiny once marked out for Ginty.’\(^ \text{16} \) Tyndall was clearly
disappointed to discover that, in contrast with himself, Ginty had not developed spiritually but was, as it were, stuck in Jung’s second stage.

**EARLY YEARS: PROTESTANTISM AND METHODISM**

Because the earliest surviving Tyndall letters date from May 1840, his earlier views on religion are difficult to ascertain. His mother was descended from a Quaker farming family in County Carlow, but it is unlikely that she retained any Quaker beliefs or practices at the time that she married John Tyndall Snr, a Protestant and Orangeman who had served in the Irish constabulary but then worked as a boot and shoemaker in Leighlin Bridge, County Carlow. Tyndall Snr was closely allied to the local Protestant squirearchy. His landlord was Captain William Richard Steuart, who lived nearby with his wife, Elizabeth, in Steuart’s Lodge. Steuart had served as High Sherriff of Carlow in 1821, was a local magistrate and sometimes employed John Snr on his estate. His other patrons included John Alexander (a wealthy and successful mill-owner), Hugh Faulkner (a magistrate who had served as High Sheriff) and Richard Boyle Barnard, the Dean of Leighlin. It was the Dean who persuaded John Tyndall Jr not to emigrate to America after he had been dismissed from the Ordnance Survey in 1843. Culturally the Tyndalls, father and son, belonged to the Irish Protestant community.

In the early letters there are a few references to John Tyndall’s views on religion. Five months after he left Leighlin Bridge for Youghal, a close family friend asked him, on behalf of his sister Emma, whether he was ‘as fond of going to evening prayer there as you were in Leighlin Bridge’. This suggests that he had earlier been a regular attender at the Parish Church in Leighlin Bridge or at St Lazerian’s Cathedral in Old Leighlin, some two miles away. Moreover, in a letter written almost a decade later to his friend and confidant the mathematician Thomas Archer Hirst, Tyndall admitted that for a period of two years earlier in his life, he had been strongly drawn to religion: ‘I would have given anything to have been a Christian’, he admitted. Moreover, he had ‘read books calculated to bring about this consummation’ but singled out one particularly influential text: ‘The reading of Dr Burnet’s account of the death of Rochester the infidel set me on my feet, as a believing Christian for some time.’ Gilbert Burnet’s *Some Account of the Life and Death of John Wilmot, Earl of Rochester* (1680) is a classic work of Christian apologetics in which Bishop Burnet persuaded the seriously ill Rochester of the truth of Christianity and the error of his previous immoral lifestyle and of his opposition to religion. This work was intended to evoke a deep commitment to Christianity among its readers, especially waverers, and it seems to have succeeded with the young Tyndall.

The above evidence indicates that Tyndall experienced a period of intense religious searching, presumably before he left home in May 1840. Moreover, he seems to have been drawn particularly to Methodism, with its strong emotional appeal. In one of his few childhood reminiscences written many years later Tyndall recalled that as ‘a boy’ he avidly read a Methodist magazine, probably the *Wesleyan-Methodist Magazine*, a monthly issued by the Wesleyan Methodist Book Room in London. He recounted that he had been especially attracted to a series of exciting stories entitled “The Providence of God asserted,” and in them the most extraordinary escapes from peril were recounted and ascribed to prayer, while equally wonderful instances of calamity were adduced as illustrations of Divine retribution. It is not known how Tyndall came to be reading a
Methodist magazine, because no Methodist featured prominently among his family’s friends and there was no Methodist chapel in Leighlin Bridge, although there was one about eight miles away, in Carlow.

In the previously quoted letter of December 1849 to Hirst, Tyndall proceeded to inform his friend:

This want [of Christian feeling] within myself was near driving me to join the Methodists, expecting that their praying and groanings and religious excitements would arrest the dry rot of my soul. All this I have gone through, Tom, this has been the forge in which my present creed has been hammered into shape.  

Presumably in response to the conviction engendered by reading Burnet’s conversion of Rochester, the young Tyndall felt a deep need for spiritual sustenance and had been drawn to the evangelical beliefs of Methodism. He was particularly drawn to the religious enthusiasm of the Methodists. Thus it seems that Methodism was an important early stage in his religious odyssey that later led him to a very different view of organized religion.

A further pertinent reference to Methodism appears in a letter dating from October 1840—a few months after he arrived at Youghal—in which the family friend quoted above wrote: ‘I am told you are turned Methodist and a most exemplary character, I suppose when you come home you will be making converts though I tell you before hand that you will never make one of me.’

Not only did Tyndall feel an emotional bond with Methodism but he also worked closely with several Methodists on the Ordnance Survey of Ireland. For example, John Tidmarsh, who worked with Tyndall and roomed with him, was a Methodist from Cork. In June 1841 Tidmarsh reported to Tyndall that 3000–4000 people had been present at a service he had attended in Cork and that the ordination of several Methodist preachers would soon take place.

In late July 1842, shortly before leaving Cork to join the English Survey, Tyndall informed his father ‘I have three or four methodists preaching to me daily, very nice fellows indeed and I think consistently religious.’ These ‘fellows’ were the other civilian assistants working on the Survey of Ireland. Moreover, when living in Preston and Halifax in the mid 1840s he frequently attended services at Methodist chapels.

However, he became increasingly critical of Methodism’s anti-intellectualism and its overly literal reading of the Bible. For example, after visiting the South Parade Wesleyan Chapel in Halifax one Sunday in 1845 he noted that the preacher ‘had a smattering of geology, a dim perception of astronomy and rushing blindly into the subjects he more than once knocked his head against a planet and cracked his shins upon a ledge of millstone grit. I think Methodists are in general too literal in their interpretation of scripture.’

Although he occasionally continued to attend Methodist chapels he was, as we shall see, increasingly drawn to a different kind of Christianity.

Despite such criticisms of Methodists, in 1855 Tyndall expressed to Hirst his abiding sense of loss in having forsaken the Methodism of his youth. Returning to his lodgings in Pentonville, north London, he encountered two young men on the footway distributing tracts to a rabble of big and little boys which surrounded them. One as he handed the tract to each pronounced in a low voice ‘the Sabbath’—the other, an older hand or perhaps of a warmer temperament, exclaimed as he distributed his ware ‘Christ the only Saviour’—I stood and watched them for some time.
time with no small interest, for I could discern beneath the wildness of the enthusiast’s eye
the working of that spirit which keeps the world out of the mud. As far as intellect and
recognition of intellect go I was never better than I am at present, but there was
something at the heart of these methodist fanatics which I lacked and which I longed
for—Not of course to make use of it as they did, but to apply it to my own private
purposes.28

Tyndall was very aware of the emotional characteristics of the people he met, and he
frequently felt an aversion towards those who appeared cold and unemotional, including
those scientists who valued the intellect far above the heart. Instead he was attracted to
the ‘warmer temperament’ of these Methodists, just as he sided with ‘men of warm
feelings’ in his Belfast Address two decades later.29 In this letter to Hirst he also
acknowledged that he ‘longed for’ but lacked the emotional intensity manifested by these
Methodist missionaries. Moreover, he recognized that their form of spirituality was
needed to save the world, and his phrase ‘out of the mud’ resonates with the salvationist
ethic of Psalm 40:2: ‘He brought me up also out of an horrible pit, out of the miry clay’.

TYNDALL’S ANTI-CATHOLICISM

The Tyndalls, father and son, like many Anglo-Irish families, viewed the Roman Catholic
population as the historical enemies of Protestantism. Anti-Catholic diatribes appeared in
the Protestant press, and clergymen repeatedly denounced Catholicism from their pulpits.
Although few Catholics occupied positions of power or owned land, most Protestants
feared that the rise of Catholic political power would destroy the time-honoured and
natural dominance of the Protestant population. Thus they strenuously opposed such
organizations as the Catholic Association and the mass movement dedicated to repealing
the union between Ireland and Britain, both of which were led by the charismatic Daniel
O’Connell.

Anti-Catholicism featured prominently in the early letters that passed between Tyndall
and his father. For example, they discussed several anti-Catholic books and tracts, such as
Matthew Poole’s A Dialogue between a Popish Priest and an English Protestant (1667),
Jeremy Taylor’s A Dissuasive from Popery to the People of Ireland (1664) and a recent
attack on O’Connell published as The Authentic Report of the Rev. Dr. [Henry] Cooke’s
Speech at the Great Conservative Meeting Held in the Circus, Wellington-Place, Belfast,
on Thursday, January 21, 1841 (1841). After receiving another anti-Catholic tract from
his father, Tyndall commented: ‘That piece you sent me against popery was excellent, he
was an hardy brat that wrote it.’30

Opposition to Catholics was particularly evident during the hard-fought General Election
of 1841, when Daniel O’Connell and his Repeal Association engaged in agitation in County
Carlow, where one of his sons was standing as a candidate. Tensions rose sharply between
the two communities and an uncle of Tyndall’s wounded two people with shotgun pellets
when Catholic priests led a mob through the streets of Leighlin Bridge on the evening of
27 June. According to Tyndall’s father, the people of Leighlin Bridge ‘were all willing to
steep their hands in his blood’.31 Owing to fear of public riots the army was summoned
to maintain peace in Carlow. A fortnight later Tyndall, then stationed in Kinsale, joined
the celebrations when his father announced ‘the glorious intelligence of Colonel Bruen’s
return for Carlow, also that of Mr Bumbury’s after one of the most tremendous struggles
that ever took place in any County'. The Protestant and Conservative Colonel Henry Bruen and Thomas Bunbury were successful in beating the Repealers, albeit by a narrow margin. Tyndall’s father also reported that in ‘Leighlin [Bridge] neither Roman [Catholic] nor Protestant speaks to each other and a system of exclusive dealing is now in full vogue’, as Catholics no longer patronized his shop.

During the 1841 election Tyndall resided in a relatively peaceful part of County Cork. However, he was attacked by a group of fishermen brandishing green boughs—a symbol of Irish nationalism. He did not fight back but appeased his attackers with some whiskey and thereby defused a potentially dangerous situation. The strife between Protestants and Catholics was an integral part of Tyndall’s upbringing and it later informed both his Belfast Address and his opposition to Irish Home Rule. Yet over the next few years he came to question and reject the stereotypical opposition between both communities.

A revealing event occurred in April 1841 while Tyndall was living in Youghal. Despite his antipathy towards Catholicism, he spoke in support of Catholicism in a debate in which the respective merits of Catholicism and Protestantism were compared. A member of the audience later praised his oratorical skill: ‘Tyndall’, he wrote, ‘led off splendidly … and closed his [speech in] twenty minutes in a rare flow of most telling language, and the room rung with applause.’ His opponent—his friend William Ginty, who spoke for the Protestant side—was overwhelmed. That Tyndall could play the devil’s advocate indicates not only his early ability as a debater and rhetorician but also his intellectual playfulness and his refusal to conform to his father’s religion and its attendant prejudices. At least in debate he could view the world from a Catholic perspective.

Nevertheless, Tyndall evinced particular antipathy towards the Roman Catholic priesthood, whom he considered to be bigoted and ignorant, especially of modern science. Thus in his ‘Apology for the Belfast Address’ (1874) he attacked ‘the Catholic hierarchy of Ireland’ for failing to offer students at the Irish Catholic University an adequate education in science. Catholic antipathy towards science also featured in a letter of September 1841 in which Tyndall recounted an incident that had occurred while surveying in County Cork. Returning to his lodgings one evening he met a trainee priest, whom he described as manifesting ‘dark ignorance’. The encounter also evoked an image from Shakespeare: ‘There was no speculation in those eyes / Which he did glare with’. His account continued:

At length the silence was broken by the Monkish gentleman, who questioned me about the [Ordnance] Survey. From this the conversation turned on schools. He was loud in the praise of father Foley’s college; there fair sciences smiled and the learned lore of antiquity was unfolded. … You have read a good deal of science? said I—Yes—You read Euclid of course? Not all—You have then read his first six books—No!!! I asked him a few more questions the result of which proved to me that he hardly knew his multiplication table. Alas thought I you’ll make a hopeful hand at turning a gospel sod.

Yet Tyndall himself benefited from tuition by an excellent model of a liberal, well-educated Catholic who was thoroughly versed in Euclid. His own schoolmaster, John Conwill, had taught him Euclidean geometry and the two often delighted in exchanging mathematical problems. However, it is clear that although Tyndall respected certain individual Catholics who were not fettered by dogma and could express their own individuality, he was scornful of the priesthood and of Catholic institutions that controlled their followers and kept them in a state of abject ignorance.
Despite Tyndall’s opposition to the institutions of Roman Catholicism, he was nonetheless not insensitive to the religion’s spiritual dimensions. For example, during Easter 1842 he had attended Mass at the historic South Chapel (Church of St Finbarr, South), Cork, and had been impressed by the statue of ‘The Dead Christ’ by John Hogan. On another occasion he recalled attending Mass at St Wilfrid’s Chapel, Preston, on Christmas Day 1843 with Laurence Eivers, a fellow civil assistant working on the English Survey. At the end of the service Eivers took Tyndall’s arm and led him to the font to be sprinkled with holy water. Luckily another friend intervened and he was saved from being anointed.

Although Tyndall’s visits to Catholic churches were rare, in his letters and journal he made frequent reference to his attendance at other religious services. For example, while working on the Survey of Ireland in Youghal he reported to his father that he had heard a sermon by a clergyman who ‘dragged the scarlet covering from the beast [and] exposed him to his hearers in his naked deformity’. (The Catholic Church has frequently been called ‘the Beast’ by its detractors and has been identified with that creature in Revelation 13:1–8; likewise the Catholic Church has been symbolized by the colour scarlet, the ‘whore of Babylon’ having been ‘arrayed in purple and scarlet colour’ (Revelation 17:4) and sitting ‘upon a scarlet covered beast’.) A further example occurs in a letter of April 1842 in which Tyndall informed his father that he had been impressed by a lecture ‘on the invocation of Saints and Angels’ by John Bleakley, the curate at Christ’s Church, Cork.

In his journal (whose main extant run begins only at the end of October 1843) he recorded his frequent attendance at both Anglican churches and dissenting chapels. When in Preston he often attended Trinity Church or the Wesleyan Chapel on Luke Street. In Halifax he attended either Holy Trinity Church or Mr Priddie’s Zion Chapel. Later, when teaching at Queenwood College, Hampshire, he attended Broughton Church, East Tytherly Church or the Baptist Chapel at Broughton. Over the period covered by this paper he was a fairly regular Sunday worshipper, sometimes attending both morning and evening services. Sometimes, however, he failed to attend services if he had to spend Sundays working long hours as a surveyor.

As well as church attendance he often recorded his reactions to sermons. At Broughton in particular he was starved of decent sermons: ‘To [Broughton] church and endured two hours silent agony, the preacher is most viciously bad, he has no more soul than a turnip, he has an ugly accent and a most incorrect emphasis.’ A few months later he recorded that he ‘heard a stupid sermon at Broughton [Baptist] chapel’. Although he criticized many of the sermons he heard, a few preachers received his praise. For example, ‘I like the poor stammering old servant of God [Edward Phillips] infinitely better than the Broughton apostle.’ Another example occurred when he was at Sowerby in Yorkshire and ‘heard an excellent sermon on the parable of the pharisee and the publican.’ On occasion he appreciated a sermon although he disagreed with its content; thus in July 1845 he ‘heard a very beautiful sermon at Trinity Church [Halifax] though I could not subscribe to the preacher’s doctrine of human depravity.’

While in Preston he also attended the Hall of Science to hear two anti-religious lectures by the socialist and freethinker Emma Martin, who attacked Christianity as detrimental to human happiness and as ‘opposed to knowledge’. Tyndall ended his account by noting that ‘her every word was a dagger, driven home by a glance of the most expressive
sarcasm’. He may have been sympathetic to her criticisms of some of the repressive aspects of Christianity, such as the portrayal of the present life as miserable and sinful, with happiness attainable only in the future life. Yet despite his openmindedness in attending two atheistical lectures at the Hall of Science he remained unconvinced by Martin’s onslaughts, offering only a mild rejoinder: ‘Her arguments however I am of opinion could be successfully opposed.’

By far the majority of his comments on sermons were negative. The defects of many of the preachers he heard seem to have contributed to his growing antipathy towards conventional organized Christianity. He especially disliked the dogmatism, anti-intellectualism and sheer incompetence of many preachers. By contrast, he complimented those clergymen of high moral and intellectual calibre whom he encountered, such as his unnamed companion on an overnight journey from Yorkshire to London who ‘appears quite averse to the cant so prevalent with many of his cloth, he spoke rationally and earnestly and what he said was enforced by the evidence of manly intellect which sat visibly upon his brow.’ Although he found that some clergymen were intellectually and morally impressive, he regarded most as merely demonstrating the inadequacy of institutionalized religion.

TYNDALL’S CHANGING POLITICAL AND RELIGIOUS ATTITUDES

None of Tyndall’s letters contain an extensive account of the Preston riot of 13 August 1842, when he witnessed the shooting by soldiers of striking cotton workers whose wages had been reduced owing to the economic downturn. Four strikers were killed and many wounded. A few days later he briefly informed his father that ‘the thing was confined to those working in the factories who were puffed into insurrection by the harangues of some Chartist delegates’. In line with his Conservative upbringing he accepted the use of force as legitimate and was insensitive to the rioters’ plight and to the aims of Chartism. Over the next few months, however, Tyndall’s political attitudes changed in response to the killings and also to other events. In particular, he was appalled by the factory system that he witnessed in Lancashire and by the poverty and oppression of the workers. Thus by—if not before—June 1843 he seems to have adopted a far more liberal, if not radical, political outlook. In a letter, which has not survived, he explained this significant change to his parents, who were clearly unsympathetic. Accordingly in his next letter he indicated that he understood that his parents—especially his mother—would ‘not relish’ his new outlook, adding ‘I shall make just one remark in connexion with our two last letters and that is that the God of protestantism never intended that it should be established by unjust means’ (emphasis added). In other words, Tyndall was challenging the morality of the Conservative Protestantism maintained by his family and especially by his ‘inflexible’ father. That worldview now seemed utterly immoral and he began examining his conscience, resulting in a much more liberal attitude not only in politics but also in religion.

This personal change affected his attitude towards Catholics and Catholicism as he also questioned and consciously rejected the intense antipathy generally espoused by Irish Protestants. For example, after returning to Leighlin Bridge for an extended visit he attended church one Sunday early in 1844 and listened to a sermon by a Mr Cather, whom he described as ‘a bigotted anti-repealer’. This preacher had argued that ‘popery [was] at the bottom of it all’—all of Ireland’s social and political problems. Yet Tyndall
now firmly eschewed this conventional Protestant appraisal of Ireland’s ills and instead he argued that poverty—not popery—was a far better explanation of Daniel O’Connell’s success in mobilizing Catholics to participate in political agitation. Tyndall accepted that, like the exploited workers of Lancashire, the Catholic poor in Ireland were motivated by poverty in rising to challenge their oppressors. Another example of his changing attitude occurred in March 1847 when he was returning from Ireland after visiting his father, who was gravely ill. On board ship he encountered a ‘surprisingly clever’ young lady who ‘contended that Roman Catholics did not know the way of salvation’. His response was to endeavour ‘to loosen prejudice by adducing the strongest reasons I could in justifying popery’.

From his newly acquired perspective Tyndall combated religious prejudice, not only that directed by Protestants against Catholics but also the anti-Protestantism adopted by Catholics. Thus he criticized a friend named John Walker, whom he described as ‘a highly intelligent young fellow and liberal on all points but one—Religion—he is a rigid Catholic.’ Walker, he complained, ‘is prepared to tilt against protestantism’. Attempting to stand above the time-honoured fray between the two communities, Tyndall proceeded to assert that he was not ‘a champion of the protestant cause’. An 1846 journal entry helps us to appreciate how far he had travelled in the religious odyssey that had begun with his Protestant Irish upbringing. In one journal entry he described July as the ‘notorious “12th”’ of July, the day when members of the Orange Order celebrate the Protestant victory over the Catholic army of James II at the Battle of the Boyne (1690). It was, he wrote, 

a day which acts like a caustic on old sores; a day when to their shame be it spoken even surpliced bigots lend their countenance to the commemoration of things which every man with eyes clear enough to behold the universal brotherhood of God’s family must deplore, a day whose associations every lover of his kind must wish swept into irrevocable oblivion!’

Five or six years earlier he could not have penned this condemnation of Protestant arrogance or this call for ‘universal brotherhood’.

For most Irish Catholics Daniel O’Connell was perceived as the Liberator or the Emancipist, while most Protestant contemporaries viewed him as a dangerous revolutionary who sought to spread terror and undermine the Union between England and Ireland. Yet, after O’Connell’s death on 15 May 1847, Tyndall wrote in his journal a lengthy and balanced appreciation. Although critical of O’Connell’s readiness to pursue ‘the dazzling and the captivating’ and his dishonourable neglect of truth on many occasions, Tyndall nevertheless considered that he had been a major figure in Irish politics and had improved the political condition of the country.

Although Tyndall’s opposition to Catholicism softened during the mid 1840s, he continued to view the Roman Catholic Church as a highly conservative institution that was authoritarian, repressive and opposed to the progress of knowledge. Moreover, he extended these kinds of criticisms of Catholicism to other religious denominations including the Protestantism into which he had been brought up. In contrast with the personal and non-denominational form of Christianity that he now increasingly encompassed, he seems to have recognized that all institutionalized religions constrained the individual and encouraged uniformity of opinion. Thus one of his principal objections to all such religions was that they imposed limits on individual intellectual freedom.
Another of Tyndall’s recurrent criticisms of many followers of organized religion was their unerring belief in the correctness of their own views and their prejudice towards any alternative religious principles. He therefore sought to stand above the fray and gain comfort from those who, like himself, could transcend the depressingly familiar and entrenched tribal positions. In this respect he particularly liked and valued Josiah Singleton, a fellow teacher at Queenwood College. According to Tyndall, Singleton was a ‘deeply pious churchman’—presumably an Anglican—who was ‘very tolerant tho’ very pious; he holds his own opinions fast but treats mine at the same time with due leniency’.\(^57\) Tyndall and the chemistry teacher, Edward Frankland, supported Singleton in a controversy at the school that nonetheless resulted in Singleton’s being forced out by the head teacher, George Edmondson, and by Edmondson’s wife (who was Singleton’s sister).\(^58\) Tyndall also enjoyed the company of two gentlemen whom he met in Blackpool, ‘one a learned Doctor, the other an enquiring young Catholic—both treat their holy religion with great levity, in fact they seemed to care as little about it as I do.’\(^59\) Dogma was the curse of religion.

A further difficulty for Tyndall was that each denomination offered its own, apparently definitive, interpretation of scripture. Conflict inevitably arose when each denomination claimed that its unique understanding of the Bible gave it access to God-given truth. In response to a Methodist friend’s passionately held views on free will and original sin, Tyndall perceived ‘the injustice of binding men to a belief in any particular interpretation [of the Bible] when interpretations were so various and nothing [could be accepted as] determinate’.\(^60\) Instead he sought to transcend the petty wrangling over theological issues that divided the different denominations. He himself was drawn towards a transcendent stance in which the ‘Great Spirit … from time to time expresses himself audibly among the sons of men [and] dwells far below the scrum of sects’. He looked forward to a time when ‘methodism, churchism and many other isms … [would] sink and a purer[,] lovelier and more practical faith [would emerge]—a faith which Jesus taught and John understood shall bend with benignant influence over our altered world.’\(^61\) That religion was to be firmly grounded in the Bible, as ‘[I] consider the purity of the Scriptures one of the highest proofs of their divine origin’\(^62\).

A crucial aspect of Tyndall’s increasing self-awareness was his insistence on making up his own mind and not being dependent on the views of others. This is a particularly relevant indicator of his having achieved Jung’s third stage of individuation. Freedom of thought, as Tyndall came to believe, extended beyond religion to all aspects of life. He reflected on this issue after an uncomfortable discussion with Edmondson, who seemed too easily influenced by others. ‘Recent circumstances’, wrote Tyndall, ‘have caused me to dwell upon man’s individuality and a necessity for self-reliance’, self-reliance being the title of one of Emerson’s essays.\(^63\)

Tyndall particularly despised those who used religion as a tortuous intellectual exercise, such as the preacher he heard in Carlow who ‘spent half an hour in splitting hairs about baptism and circumcision’.\(^64\) Likewise, when a friend discoursed on free will and original sin he ‘suggested the necessity of a very wide liberality in these speculative matters’.\(^65\) Such unproductive theological disputes, he believed, were a travesty of true religion, which should enable people to lead better, more moral, lives. Religion should therefore influence our daily labours. The issue of practicality was emphasized in an entry dating from 20 October 1844, when he attended morning service at an Irish Presbyterian church but disliked the ‘very flowery sermon—Though highly poetical there was very little
practical in the discourse.’ That evening, however, he heard Hugh Stowell, the rector of Christ Church, Salford, preach ‘a capital discourse, simple, warm and practical’.66

Although Tyndall now sought a higher form of spirituality, enriched spiritual experience was not an end in itself but was of value because it enabled a person to live truthfully. Spirituality had to inform human agency, and he viewed himself as actively shaping his own mental state and his actions. Thus he was strongly opposed to the doctrine of passive obedience—‘the duty of man to be content with the state into which it pleased God to call them’—which he considered constrained people’s actions and would lead to ‘the exclusion of laudable exertion’.67 Indeed, the shoemaker’s son turned surveyor, turned teacher (and soon to begin laboratory work in Marburg) saw himself as an intelligent skilled workman bent on self-improvement. ‘Man on earth is intended to be an active agent’, he wrote to a correspondent (probably Ginty). Citing John 21:25, he proceeded to point out that Jesus had been a doer, not a thinker nor a ‘sayer’. He ended that letter with an affirmation of the Protestant work ethic: ‘Work—Work—Work is man’s great business here.’68

As already stated, by the end of the period covered by this paper Tyndall considered himself to be a freethinker. Although the term freethinker is usually applied to those who rejected all religion, Tyndall sought to free himself from the need to adhere to the norms and dogmas imposed by any particular Christian sect or denomination and particularly the ‘inflexible’ Protestantism of his father. This is clear from the exchange he had with Robert Martin,69 a Methodist, in June 1847 over Martin’s attempt to prove from scripture the natural depravity of humankind. Tyndall questioned Martin’s arguments and his specific interpretation of certain biblical passages. In conclusion Tyndall noted that he could not conceive ‘that a good and merciful God would ever make our eternal salvation depend upon such slender links, as a conformity with what some are pleased to call the essentials of religion.’ Then he added a revealing autobiographical note: ‘I was long fettered by these things, but now thank God they are placed upon the same shelf with the swaddling clothes which bound up my infancy.’70

NATURE, SCIENCE AND RELIGION

Although he had previously worked as a surveyor for several years, Tyndall’s engagement with science was rather limited until he began teaching at Queenwood College in August 1847.71 Having to teach not only surveying but also a range of scientific subjects to his pupils he immersed himself in science and also formed a close friendship with a more knowledgeable science teacher, Edward Frankland, who encouraged him in his scientific studies. In the valedictory lecture he delivered to pupils at Queenwood he explained his decision to devote himself to the study of science at Marburg by appealing to a conventional religious justification. Science, he claimed, was the study of the divinely created Book of Nature: ‘What are sun, stars, science, chemistry, geology, mathematics—but pages of a book whose author is God! [In leaving Queenwood to study science in Germany] I want to know the meaning of this book, to penetrate the spirit of this author’,72 Tyndall was articulating a natural theological argument in suggesting that the study of nature would lead to a better understanding of science but also an enhanced appreciation of God the creator. A similar sentiment was expressed in a poem he penned a fortnight later that ended: ‘And tell the stars and tell yon rising sun, / Earth with her thousand voices praises God!’73
Towards the end of the same lecture he urged his pupils to feel close to God: ‘Every good thought of your hearts comes from God. You feel him stirring in every noble impulse .... This is the only practical way of making the acquaintance of the great spirit, to feel him within, to let him speak through your lips and life.’ This liberating religion of the spirit was vastly richer than the stilted theologies offered by the institutionalized religions that he now insistently criticized. He also contrasted this powerful sense of engagement with the divine with ‘the feebleness of scientific deductions’. Religion was a matter of profound spiritual feeling and not an intellectual enquiry. Indeed, he went on to acknowledge that natural theology is of very limited scope: ‘The wintry light of science shews us up there in heaven an omnipotent mechanic who framed our universe and keeps it in repair; but science can shew us nothing of the moral attributes of this great being.’ Natural theological arguments drawn from science can do no more than demonstrate the existence of the divine being who created and sustains the Universe. By contrast, he stressed the importance of the moral and spiritual life.

EMERSON AND CARLYLE

It is important to remember that Tyndall had been a poet long before he began teaching scientific subjects at Queenwood and that he was immersed in the poetry and the serious literature of the age. In the early 1840s Byron had been his mentor, but by the time Tyndall delivered his valedictory lecture he was captivated by the metaphysical ideas of Thomas Carlyle and of the American poet and essayist Ralph Waldo Emerson. Several months earlier—in January 1848—he had heard Emerson lecture in Halifax and had purchased his works, which he avidly read. (An Emersonian connection can be found in the last passage quoted above; the phrase ‘wintry light’ appears in a similar context in Emerson’s 1836 essay Nature.) A few weeks after his encounter with Emerson, Tyndall wrote to Hirst, who was increasingly becoming one of his main confidants:

In Emerson you behold one of the noblest souls that ever was struck in clay—every time I rise from his book I find a new vigour in my heart—he teaches one to be so independent that you almost feel disposed to quarrel with himself just to shew how little you cared about even him. There are many parts of his writings very difficult, especially some portions of the Transcendentalist, and Idealism—The rule he lays down will I believe make all clear—let us by enacting our best insight by doing that which we feel to be right, strengthen our powers and purify our vision, and all will be understandable—There is a world of meaning in those two words he uses so emphatically I ought.’

More generally, Tyndall had embraced many of Emerson’s main themes, including his emphasis on transcendentalism and individualism, discussed above.

Tyndall’s letters and journal likewise show his increasing attraction to the writings of Carlyle, who was a close friend of Emerson’s. Writing to Hirst in November 1848, Tyndall admitted ‘for my own part I owe to him [Carlyle] and Emerson more than to any other men living’. Although Tyndall was later to correspond and meet with Carlyle, in late June 1844 he read Past and Present (1843). Journal entries show that he closely studied Chartism (1840) in May 1847, The Letters and Speeches of Oliver Cromwell (1845) in July 1847 and On Heroes and Hero Worship (1841) in July and August 1847. His comments on these works indicate their impact. For example, after reading Past and
he wrote: ‘The writer [Carlyle] must be a true hero. My feelings towards him are those of worship[,] “transcendental wonder” as he defines it.’ Frank Turner has captured the salient aspects of Carlyle’s notion of religion when he notes that Carlyle ‘conceptually separated religion and spirituality from their contemporary institutional and dogmatic incarnations. Religion for Carlyle was wonder, humility, and work amidst the eternities and silences. The true realm of religion and the spirit was the inner man; all else was unessential externality.’ By the time Tyndall departed for Marburg he had adopted these aspects of Carlyle’s religious philosophy.

Reading Emerson and Carlyle greatly assisted Tyndall’s religious development. These authors not only acted as mentors whose views helped shape Tyndall’s attitudes but they assisted him in framing his emerging outlook and also augmented his self-confidence as the process of individuation progressed. Moreover, some of the human characteristics they emphasized were ones that Tyndall valued as his father’s son, such as truthfulness and the work ethic. Several historians have discussed the impact of the philosophies of Emerson, Carlyle and later Johann Gottlieb Fichte on Tyndall’s later thinking and especially on his conception of the natural world. In particular, Stephen Kim has traced these influences on Tyndall’s subsequent writings and what he calls Tyndall’s ‘transcendental materialism’. Although this paper does not aim to trace Tyndall’s thought beyond the summer of 1848, the arguments presented here are generally commensurate with Kim’s analysis.

Was Tyndall a pantheist?

This paper is not intended to connect Tyndall’s religious views dating from 1840–48 with his later philosophy of nature or the opinions he expressed in his Belfast Address of 1874. As historians have generally focused on that Address, the aim here has been to illuminate an earlier period in Tyndall’s adult life and to construct a very different Tyndall from the one generally portrayed. Care has been taken not to read history backwards by projecting his later views back on to his earlier biography. Moreover, this paper’s main concern has been with Tyndall’s changing views about religion. During the period under discussion he moved far from what he saw as the parochial and intolerant Protestantism of his parents’ community and instead began to develop his own spirit-centred religious position. Only towards the end of this period did he begin to devote himself to the study of the sciences and, later still, he developed his own philosophy of nature. It is noticeable that before embarking for Marburg, Tyndall’s journal entries make very few references to nature and far more to human nature.

One of the main implications of this paper, which is anti-essentialist in orientation, is that labels such as pantheist, atheist and agnostic are inadequate as descriptions of the young Tyndall. Whether such labels are appropriate to his later career is an open question, but any such claims need to be closely tied to specific historical contexts. Although pantheism is open to a wide range of definitions, it is clear that Tyndall was not a pantheist in the period 1840–48, because although he often referred to God in his early journals, his notion of God was conventional and he made no attempt to equate nature and God. For example, in his valedictory lecture at Queenwood, he appealed to the traditional notion that nature is ‘a book whose author is God’. If Tyndall was indeed drawn to pantheism, that would seem to have occurred later in his life. As Barton has
shown, the historical evidence for Tyndall’s serious exploration of various aspects of pantheism began only after his departure for Marburg and specifically in his correspondence with Hirst during the period 1849–53.86

There is, however, one early journal entry in which Tyndall does seem to have participated in a form of pantheism, possibly even pantheistic worship. On Sunday 30 May 1847 he did not attend church but walked in a rural location (including an orchard) near Halifax, where he engaged in an argument with Robert Martin over free will and original sin. Tyndall described Martin as a ‘knotty logician, ... frolicsome spirit, ... [and] abstract reasoner’, terms that would seem applicable to Tyndall himself. It is not clear what happened next but he seems to have participated in a revelry involving Martin and also possibly Robert Allen, Allen’s wife (Margaret),87 and ‘two fair girls’. In his journal Tyndall subsequently noted that many

would brand our conduct yesterday as impious in the highest degree—Our temple floor was the grass of the orchard, our roof the embowering apple branches clustered with fading blossoms. ... our hearts expanding to the influences around us, unwrinkled [?] by religious bile, unpossessed by bigotted egotism or pharisaic exclusiveneness: wishing health and happiness to the world and sending nobody to the devil!88

In participating in this joyful pagan-like celebration of nature, which seems to have exhibited sexual overtones, Tyndall guiltily acknowledged that he had transgressed the social norms of organized religion. What he experienced was freedom of the spirit.

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NOTES


Formally the United Church of England and Ireland.

Many of the letters cited in these notes are published in G. Cantor and G. Dawson (eds), *The correspondence of John Tyndall*, vol. 1 (Pickering & Chatto, London, 2015) and are here cited as ‘Letter’, followed by the letter number. For other letters, the class-mark in the archives of the Royal Institution is given, for example RI MS JT/1/10/5239. For the period 1841–48 there are three overlapping volumes of Tyndall’s journal: RI MS JT/2/13a (1841–48), RI MS JT/2/13b (1848–55) and RI MS JT/2/14 (1847–50). Entries will be cited as ‘Journal’, followed by the date.

Kim, *op. cit.* (note 2), p. 27. Kim’s second and third periods cover the years 1848–53 and 1853–87 respectively.

Tyndall’s date of birth is usually given as 2 August 1820. However, because there is no firm evidence concerning the year and there is some reason to doubt the year generally cited, he may have been born in 1821 or even 1822. The ages given in the text relate to a birth date of 2 August 1821.


In his early letters his mother was rarely mentioned. By contrast, he was much closer to his father, with whom he frequently exchanged letters of a personal nature.

Journal, 5 July 1852.

Letter to Fanny Smith: Journal, 6 December 1853.


The verse reads: ‘But he that is spiritual judgeth all things, yet he himself is judged of no man’ (emphasis added).

Journal, 25 September 1848.

Journal, 15 May 1848.

Journal, 11 October 1848.

Sarah Tyndall claimed that her grandmother had been disunited from the Quakers after she (her grandmother; Tyndall’s great-grandmother) married a non-Quaker. Sarah’s father had, she claimed, been brought up as a Quaker and he had taken her to a Quaker meeting: N. McMillan and M. Nevin, ‘Tyndall of Leighlin’, *Carloviana* 27, 22–27 (1978–79). Thus he was probably an attender but not a member of the Society of Friends. Tyndall later taught at Queenwood College, which had been taken over by the Society of Friends in 1846. Some members of staff were Quakers, such as the head teacher, George Edmondson, and a small minority of boys were from Quaker families. Tyndall would have gained some knowledge of Quakerism from his time at the school, particularly from his friend Josiah Singleton, an Ackworth-educated Quaker turned Anglican. His journal does not, however, record his presence at any Quaker meetings.

Journal, 31 January 1844.

M. Payne to J. Tyndall, 9 October 1840: Letter 0015.

This somewhat ambiguous phrase—‘to have been a Christian’—may indicate that the young Tyndall was seeking a purer and more pious form of Christianity than that practised by Protestants such as his father.

John Tyndall’s religion

23 JT to T. A. Hirst, 2 December 1849: RI MS JT/1/T/524.
24 Letter 0015.
27 Journal, 1 June 1845.
28 J. Tyndall to T. A. Hirst, 4 February 1855; RI MS JT/1/T/593.
29 Tyndall, ‘The Belfast Address’, p. 159.
30 J. Tyndall Snr to J. Tyndall, 10 September 1841: Letter 0092.
31 J. Tyndall Snr to J. Tyndall, 7 July 1841: Letter 0073.
32 J. Tyndall Snr to J. Tyndall, 19 July 1841: Letter 0078. Thomas Bunbury, a local Protestant landowner, is named Bumbury in this letter, as transcribed by Tyndall’s widow, Louisa.
33 Letter 0073.
34 J. Tyndall to J. Tyndall Snr, 11 July 1841: Letter 0075.
36 Tyndall also reported a discussion (in Journal, 5 August 1846) with a Catholic who argued that praying to the Virgin Mary was ‘an infinite insult to the Creator’ and ‘implied her omniscience and omnipresence’. As Tyndall then criticized these views, he seems to have condoned the practice of praying to the Virgin Mary.
39 J. Tyndall to J. Tyndall Snr, 5 September 1841: Letter 0089. Father Foley’s college was St Mary’s Catholic College at Youghal, which had been founded by Father John Foley in 1839.
40 Journal, 7 April 1844.
43 J. Tyndall to J. Tyndall Snr, 20 April 1842: Letter 0142.
44 Journal, 20 February 1848 and 14 May 1848.
45 Journal, 9 April 1848 and 6 July 1845. When he died in July 1851 Edward Phillips had been the curate of East Tytherley for 49 years. The sermon on ‘the pharasee and the publican’ was based on Luke 18:9–14.
46 Journal, 13 July 1845.
47 Journal, 1 and 3 September 1844.
48 Journal, 22 March 1846.
49 Only many years later did he recall the scene from the Survey office on Fishergate where he had been working: ‘Acting under orders, they [the soldiers] fired upon the people, and the riot was quelled at the cost of blood.’ J. Tyndall, ‘On Unveiling the Statue of Thomas Carlyle’, in J. Tyndall, *New Fragments* (Longmans, Green, London, 1892), pp. 392–397, at pp. 392–393.
51 J. Tyndall to J. Tyndall Snr, 29 June 1843: Letter 0213.
52 Journal, 29 January 1844. The Mr Cather was probably either Rev. J. Cather (of Galway or Wrexham) or Rev. Robert George Cather.
53 Journal, 25 March 1847.
54 Journal, 31 May 1847.
55 Journal, 12 July 1846.
56 Journal, 1 June 1847. See also the entry for 15 June 1847, in which Tyndall transcribed a paragraph from the *Nation* (29 May 1847) concerning O’Connell’s character.
57 Journal, 22 and 30 August 1847.

Journal, 19 December 1847.

Journal, 30 May 1847.

J. Tyndall to R. Sayers(?), summer 1848, RI MS JT/1/12/3973.

Journal, 12 May 1844.


Journal, 2 January 1848.

Journal, 30 May 1847.

Journal, 20 October 1844.

Journal, 19 April 1844.

Journal, 28 February 1847. ‘And there are also many other things which Jesus did, the which, if they should be written every one, I suppose that even the world itself could not contain the books that should be written.’ (John 21:25). Tyndall’s emphasis. See also R. W. Emerson, *Nature* (J. Munroe & Co., Boston, MA, 1836), p. 18.

Robert Martin had worked with Tyndall on the Ordnance Survey of Ireland and had been transferred to the English Survey, from which he was discharged (along with Tyndall) in November 1843. In 1847 he was living in Preston.

Journal, 26 June 1847.

During the period between May 1840 and August 1847 Tyndall’s main encounter with the sciences (other than mathematics and the practice of surveying) was the course of lectures he attended at the Preston Mechanics Institute in 1842–43. His Journal contains few references to science or to scientific books, compared with the numerous references to religious issues.

Journal, 25 September 1848.

Journal, 10 October 1848.

Journal, 25 September 1848.


‘And there are patient naturalists, but they freeze their subject under the wintry light of the understanding.’ Emerson, *op. cit.* (note 68), p. 92.

J. Tyndall to T. A. Hirst, 1 February 1848; RI MS JT/1/T/512.

J. Tyndall to T. A. Hirst, 23 November 1848; RI MS JT/1/T/1016.

Tyndall first wrote to Carlyle from Marburg on 6 June 1849; RI MS JT/1/T/147.


Journal, 18 July 1847.


See Haugrud, *op. cit.* (note 75); Barton, *op. cit.* (note 2); Kim, *op. cit.* (note 2).

Pantheism ‘should not be thought of as a single codifiable position. Rather it should be understood as a diverse family of distinct doctrines; many of whom would be surprised—and, indeed, disconcerted—to find themselves regarded as members of a single household.’ ‘Pantheism’, in Stanford Encyclopedia of Philosophy (http://plato.stanford.edu/entries/pantheism/; accessed 14 November 2014).

Journal, 25 September 1848.


Robert Allen was a surveyor who had known Tyndall in Preston and later moved to Halifax.

Journal, 30 May 1847.