DURING the decades following the publication of Darwin's *Origin of species* in 1859, religious belief in England and in particular the Church of England experienced some of the most intense criticism in its history. The early 1860s saw the appearance of Lyell's *Evidence of the antiquity of man* (1863), Tylor's research on the early history of mankind (1863), Renan's *Vie de Jésus* (1863), Pius IX's encyclical, *Quanta cura*, and the accompanying *Syllabus errarum*, John Henry Newman's *Apologia* (1864), and Swinburne's notorious *Atalanta in Calydon* (1865); it was in this period also that Arthur Stanley was appointed Dean of Westminster, and that Bills were introduced in Parliament to amend or repeal the 'Test Acts' as they affected universities. They were the years that witnessed Lyell present the case for geology at the British Association at Bath (1864), the first meeting of the X-Club (1864), and the award of the Royal Society's Copley Medal to Charles Darwin. These were the years in which, as Owen Chadwick has put it, 'the controversy between "science" and "religion" took fire'.

To be sure, only part of this criticism arose directly from the new work of science. From within the Established Church discussion focused on theological issues as central as everlasting punishment, redemption, the nature of the Trinity, and the social role of the Church. From without, the role of the Church and its schools was debated in the universities and in Parliament. The rigours of clerical ritualism, given added force by the political manoeuvres of the papacy, were exciting dissatisfaction throughout Europe. Finally, successive conquests of biblical criticism, proceeding from German example, created fresh rifts which became indelibly associated with the use of new 'scientific' methods of scholarship.

Of course, the confrontations of science and religion were made more complicated, at both social and intellectual levels, by a conflation of issues concerning the sufficiency of natural theology, the doctrine of revealed truth, the belief in biblical literalism, and the unfettered search for new knowledge. The last issue, in particular, has much to do with the difficult relationship we now perceive between the self-defining, self-generating ethos of scientific inquiry, and broader political and philosophical concepts of intellectual freedom. We can hardly neglect to ask whether we may see in the 'warfare' between science and religion an important reflexion of a much more general concern about the realities of...
political and intellectual repression, a concern which may have given less immediate alarm in England of the 1860s than in mid-century Italy, France, and Germany, but which was certainly no less evident. To what extent was 'freedom of expression' in matters of science seen as a 'test case' for freedom of political and religious expression generally? And, if there was an association of this kind, how did these issues, assimilated in the rhetoric of Victorian liberalism, affect the rhetoric of the debate about 'Man's place in Nature'?

These questions, and others like them, have provided the overall framework for recent inquiries. Such questions, which in our own case derive from work on the mid-Victorian scientific intelligentsia, require a detailed study of the structures and mentalities of different elements in the world of science, where, not surprisingly, political purposes, religious beliefs, and scientific attitudes are often difficult to separate.

A striking example of the importance and difficulty of relating discussion about the nature of knowledge and the requirements of belief to the general context of political and theological debate, is provided by the publication in 1865 of the Declaration of students of the natural and physical sciences. This Declaration, generated in a desperate attempt to maintain, in the face of new knowledge, 'a harmonious alliance between Physical Science and Revealed Religion', embodied the assumptions and claims that were to inform debates on scientific naturalism for at least the next quarter of a century.

1. The Declaration

In early 1864 the embers of Essays and reviews provided the spark. In February, in an historic decision considered by some as the 'final triumph of the secular over the ecclesiastical jurisdiction' in England, the Privy Council voted on an appeal to quash the synodical sentence of the Dean of Arches against Rowland Williams and H. B. Wilson. Colenso's appeal to the Privy Council was still in progress. Consequently, by the spring of 1864 the Church was in an uproar. In despair at the legal vindication of the Essayists, 10,906 clergymen (nearly one half of the clergy of England and Ireland) united in protest against them by way of a 'Declaration' to the Archbishop of Canterbury. This 'Oxford Declaration' declared 'from belief' that the Church 'maintains without reserve or qualification the Inspiration and Divine Authority of the whole Canonical Scriptures, as not only containing but being the Word of God'. These clergy were, in limited terms, successful, and Essays and reviews was formally condemned by both Houses of Convocation in June 1864. But the victory was short-lived. Lord Chancellor Westbury ridiculed Convocation, and its guiding spirit, Bishop Wilberforce, in his famous verdict that the synodical judgement was simply 'a well lubricated set of words—a sentence so oily and saponaceous that no one can grasp it'. If 'Soapy Sam' Wilberforce
could never forget this sobriquet, nor would the world forget Disraeli's remark at the Oxford Diocesan Conference in November 1864, when he announced his famous preference for the side of the Angels.\footnote{The Scientists' Declaration, 1864-5}{\footnote{8}}

On Saturday, 16 April 1864, a group of London chemists, styling themselves ‘Students of the natural and physical sciences’, decided to follow the example of the Oxford Declarationists. On Thursday, 21 April, Canon Christopher Wordsworth presented their hurriedly circulated memorial, bearing 28 signatures, to the Lower House of the Convocation of Canterbury.\footnote{9}

We, the undersigned Students of the Natural Sciences, desire to express our sincere regret, that researches into scientific truth are perverted by some in our own times into occasion for casting doubt upon the Truth and Authenticity of the Holy Scriptures. We conceive that it is impossible for the Word of God, as written in the book of nature, and God's Word written in Holy Scripture, to contradict one another, however much they may appear to differ. We are not forgetful that Physical Science is not complete, but is only in a condition of progress, and that at present our finite reason enables us only to see as through a glass darkly; and we confidently believe, that a time will come when the two records will be seen to agree in every particular. We cannot but deplore that Natural Science should be looked upon with suspicion by many who do not make a study of it, merely on account of the unadvised manner in which some are placing it in opposition to Holy Writ. We believe that it is the duty of every Scientific Student to investigate nature simply for the purpose of elucidating truth, and that if he finds that some of his results appear to be in contradiction to the Written Word, or rather to his own interpretations of it, which may be erroneous, he should not presumptuously affirm that his own conclusions must be right, and the statements of Scripture wrong; rather, leave the two side by side till it shall please God to allow us to see the manner in which they may be reconciled; and instead of insisting upon the seeming differences between Science and the Scriptures, it would be as well to rest in faith upon the points in which they agree.

We therefore pray, that the Bishops and Clergy in Convocation assembled, and of the Church of England, will do all in their power to maintain a harmonious alliance between Physical Science and Revealed Religion.\footnote{10}

The final paragraph, aimed directly at Convocation, was deleted by the memorialists on finding that it offended many potential signatories. In May the revised document, retitled a ‘Declaration’ was circulated. Its intention was to draw attention to the nature of the conventional ‘Test’ of belief in the Thirty-nine Articles to which all members of the Church of England and graduates of Oxford and Cambridge Universities were required to subscribe; and to state explicitly a ‘Fortieth Article’ of religious belief to which all Christian men of science should be asked to subscribe.

Once a signature was successfully obtained, the certificate was mounted in a book kept for the purpose. Some signatures were written into this book directly; a few others were signed in by proxy. The volume was
eventually deposited in the Bodleian Library, Oxford, and a printed list of signatures, in alphabetical order, published.\textsuperscript{11}

The text of the Declaration indicates the continuing strength of the tradition of a theology of nature in the ‘common context’ of Victorian intellectual life.\textsuperscript{12} It held to the importance of interpreting scripture in the light of new scientific findings, and also to the belief that God, and by implication God’s Word, is implicit in the order of nature and could be elucidated through sound empirical investigation. Such investigation would presumably produce a view of the world in which ‘truth’ in scripture and in nature would be identical. A charitable reading would also suggest that the Declaration, extremely moderate in tone, argued for a compromise, or an armistice, between the ‘two sides’.

On the other hand, the Declaration did set specific constraints upon the interpretation of scripture which the less charitable could extend to interpretations of natural phenomena, and in this sense it appeared highly dangerous. Moreover, the simplistic language of the Declaration, if it deliberately embraced a large cross-section of opinion, specifically lacked a cutting edge. Perhaps it could give some men of science an opportunity to ‘justify’ themselves, but these advantages would appeal to few. As the \textit{Saturday review} commented:

\begin{quote}
The declaration itself is a good illustration of the double faces which such documents are apt to assume. They are drawn so as to seem very trivial and unmeaning to those who are asked to sign them, and who scan their wording closely; but they are timed so as to seem important and full of meaning to the mass of careless readers, who only take into consideration the particular juncture selected for signing them. This scientific declaration, construed quite strictly, lays down simply that the Supreme Being has not told a falsehood \ldots But coming at this particular moment, no one would doubt that its practical meaning was to give a general endorsement to the traditional interpretation of the book of Genesis, and to express a conviction that, however irreconcilable the statements upon scientific matters contained in that book might seem to be with the conclusion of science, the time would surely come when the two would be found to agree with perfect accuracy. Of course, this is a belief which a great many people hold, and for which there is a great deal to be said; but it is not a self-evident proposition, nor is it an integral portion of the Christian Creed. It might be proved that the cosmogonical parts of Genesis were a corrupt interpolation; or that they were written by the author of the book, but without Divine warrant; or that the Divine warrant was extended only to the moral and spiritual inferences drawn from them, and not to the scientific accuracy of the statements made; and in any of these cases the Nicene Creed and the Apostles’ Creed would be wholly unaffected.\textsuperscript{13}
\end{quote}

2. The protagonists

Despite this sceptical response, the Declaration proceeded. The principal movers in its production were the first five signatories: Alexander William Gillman (1843–?), Herbert McLeod (1841–1923), John
Stenhouse (1809–90), Charles Edward Groves (1841–1920), and David Howard (1839–1916); and the last signatory, the chemist and paint manufacturer, Capel Henry Berger (1839–68). These six were far from being well-known religious controversialists—indeed, they are disturbingly obscure. We know little of their background, and excepting a few fragmentary records, virtually nothing of their dealings with other scientists. In so far as Berger deliberately kept his signature to the end, we may suspect that he was the instigator of the manifesto—he was a member of the same group of London Plymouth Brethren as Philip Gosse (who also signed) and it seems at least possible that he found the problem of reconciling scientific advances with biblical fundamentalism particularly difficult. Indeed, the fact that many of the orally agreed signatories are in Berger’s handwriting more than confirms that he was the leader of the project.

Gillman—whose grandfather lived with Coleridge (and treated him with laudanum) and whose father was the chairman of the Prudential Assurance Company—was a brewery chemist and former student of the Royal College of Chemistry. Howard, ‘a zealous churchman’ who gave liberally to the building funds of London churches, was a grandson of Luke Howard. An occasional student at the Royal College of Chemistry between 1858 and 1860, he entered the family pharmaceutical business and had a distinguished career as an industrialist. Stenhouse, a staunch Presbyterian and the most distinguished of the protagonists, was a pupil of Liebig and famous for his work on narcotics. Then aged 54, his shaky signature reminds us that a stroke paralysed him in 1856 and that Charles Groves, his private assistant and collaborator, in fact executed all his research. Groves himself was a High Anglican, and later became the editor of the Chemical Society’s *Journal* from 1885 to 1889. W. A. Tilden, who was briefly employed by Stenhouse, recorded later that:

> both were of earnest religious convictions, and the ‘Doctor’ [Stenhouse] who could only sit and watch operations, was much disposed to talk during work, which was not unfrequently interrupted by controversy on subjects connected with their respective religious views, Stenhouse being a Presbyterian and a great admirer of the famous preacher Charles Spurgeon, while Groves as a high Churchman stood up for the episcopal establishment.

Groves was a former student at the Royal College of Chemistry, where his fellow Anglican, McLeod, was Hofmann’s assistant. Herbert McLeod, described as ‘deeply religious’, later became a distinguished F.R.S., best known for his magnificent editorial work on the *Royal Society catalogue of scientific papers* (1867 to 1925).

From what we know of these six men it is not easy to formulate a consistent set of behavioural explanations. The Declaration reveals a sense of fear, both of science and of biblical criticism; it also reveals, beneath a
mask of apparent reasonableness, a serious confusion of objectives. It makes no distinction between scientific fact and hypothesis, or between experiment, discovery, and verification. Theologically it fails to distinguish between literal authenticity and literal belief. Finally, it signal-ly fails to define the process of ‘elucidating truth’, and sets no critical standards for men of science, apart from the doubtful goal of bland compromise. At a time when fresh accomplishments in scientific research and Tennysonian visions of progress were vaulting men to new thresholds of understanding, a dampening appeal to the limitations of ‘our finite reason’ appears distinctly otiose. Indeed, one can only wonder at the means by which the protagonists themselves proposed to reconcile the claims of their science and their theology.

From the foregoing, however, two points do stand out. First, the protagonists seemed deliberately to avoid sectarian appeals presumably in order to capture the largest possible number of scientific signatories. In this they succeeded. The signatories were drawn from all branches of organized Christianity; some even drew attention to themselves as Roman Catholics or Baptists, although these denominational labels were suppressed in the printed Declaration.20

Secondly, the whole exercise seems to have been something of a Royal College of Chemistry ‘plot’. It seems improbable that the document had any official blessing from the College, and it was certainly not mentioned in the College Minutes. But McLeod seems to have been mainly respon-sible for the postal appeals, while personal signatures were collected at McLeod’s laboratory at the Royal College of Chemistry, and at the private laboratory of Stenhouse in Rodney Street, Pentonville. Moreover, no fewer than 39 so-called ‘students’ of the Royal College of Chemistry signed the document,21 a fact that did not pass unnoticed by those who complained sarcastically of the lack of experience among the signatories,22 who (as they themselves confessed privately23) were largely unknown. McLeod, in particular, was thought to be over-reaching himself by acting without the approval of either A. W. Hofmann or the sanction of the Department of Science and Art.24

3. The reaction

According to Augustus De Morgan25 (who, as professor of mathemat-ics at the ‘Godless institution in Gower Street’, took a savage delight in the Declaration), papers for signature were sent to Fellows and members of all scientific societies. One wonders who financed the appeal, for there must have been a considerable postal expense. By our calculation, in 1865 there were 6480 members of scientific societies of London, including 673 British Fellows of the Royal Society. According to Leone Levi’s analysis of the ‘progress of learned societies’ reported to the British Association in 1868, there were roughly 40 000 people contributing to, or interested in,
science in 1867. We may estimate, therefore, that potentially 40,000 people could have signed the Declaration had they all been approached; but realistically the field was nearer 5,000. It was not the first 'Declaration' on 'science and religion' to be circulated among scientific men since the publication of Essays and reviews. Indeed, in February 1861 William Spottiswoode and John Lubbock memorialized men of science in support of Frederick Temple and his colleagues, and obtained the signatures of Darwin, Lyell, Horner, George Bentham, Thomas Graham, George Airy, and George Busk. By no means all the 'scientific party' signed, however—exceptions included J. D. Hooker and J. F. Herschel—and many refused on the grounds that such statements might either pledge men 'to partisanship in matters in their nature excessively recondite', or 'create a fission in the "body politic" of scientific men' which would 'countenance a belief amongst outsiders that our religious differences influenced our scientific views'. The danger, in Hooker's view, of aligning 'the young protagonists in science', whose opinions were 'of no weight in religious matters' against 'men of older standing and opposite tendencies (who have nevertheless the confidence of the public)', was sufficient reason to avoid such declarations.

If sympathetic scientists could resist declarations in aid of science, so clergymen could resist declarations defending the prerogative of the Church. Thus Bishops Tait and Thirlwall rejected the Oxford Declaration as a 'melancholy Declaration' to which signatures were obtained 'by a kind of moral torture' and 'in a way quite unworthy of the character of those who put it forth'. Half of all the Anglican clergy stood aloof and when it was presented at Lambeth, only four of the 28 bishops lent it their support.

In the event, the London chemists could have profitably taken into account the experience of these earlier memorials. But the 'scientific Declarationists' were not deterred, and proceeded to muster 717 signatures by the time the document was published in the middle of May 1865.

In the meantime, the first critical public reactions against the Declaration began to appear. Charles Daubeny of Oxford, an Anglican chemist, geologist, and botanist, writing in The Times in July 1864, spoke out for those who might have rejected the petition without wanting to put their objections to paper. He found the document of 'doubtful expediency and likely to lead to much misconception'. Since lawyers and other professional laymen were unlikely ever to circulate similar declarations, it implied that scientists 'are peculiarly liable to the charge of infidelity'. This he denied, admitting, however, that 'persons who take a perverse pleasure in opposing received doctrines have forged into weapons wherewith to assail Christianity' certain recent scientific ideas. But such perverse people were not men of science; indeed, to judge from
Essays and reviews, the critics, with the exception of Powell, were found among the clergy themselves.

Some opponents of Essays and reviews had used Colenso's reputation as a writer of arithmetic textbooks to suggest he was a 'scientist-heretic', but Daubeny had no sympathy for this argument; Colenso was, in his view, an Anglican Bishop, of some mathematical, or at least arithmetical reputation... who, so far from being addicted to the study of nature, betrayed how little his pursuits in early life had taken that direction, by confessing that the first doubts which came across his mind as to the reality of an Universal deluge had been suggested to him in Africa by a native convert.

Nevertheless, by whatever naïve means Colenso had come by his doubts, Daubeny clearly shared Colenso's feelings about Divine inspiration. Hence he could not sign a Declaration that appeared to emanate doctrinally from 'the narrowest' scriptural inspiration:

I am not prepared to declare that conclusions honestly arrived at in the course of scientific investigations, as for instance those relating to the age of the world, the antiquity of the human race, or the prevalence of a deluge over parts of the globe not at the time inhabited by man, ought, as a matter of Christian duty, to be suppressed and ignored.

The whole appeal, thought Daubeny, was the work of 'over-zealous' individuals who would misguidedly 'entangle their scientific brethren within the meshes of a Declaration which, however speciously worded, would have the effect of checking the progress of truth, by inculcating as a duty the suppression of any facts or deductions resulting from inquiries into Nature, which might not harmonize with Scriptural statements on subjects beyond the domain and scope of Revelation.

There, with this rather verbose comment, the matter could have ended if the promoters had been wiser men. But, through August and September 1864, they continued to collect signatures. Among their early conquests was Sir David Brewster, a devout evangelical Presbyterian and the most eminent signatory captured by the Declarationists. (His degrees and orders occupy thirteen printed lines.) Brewster had waxed indignant in defence of science and Galileo in his Martyrs of science (1841). Twenty years on, the issue was now the 'reconciliation' of science and religion.

By September 1864 Berger had collected 210 signatures, including those of the physicists Joule and Smeel, the astronomers Glaisher and Main, the geologists Bowerbank and Sedgwick, and the chemists Anderson and Richardson. Typical of the appeals sent out was that received by the mathematician Thomas Archer Hirst, then just beginning his professional career in London:

Deal, 7 September 1864.

Sir,

I beg to call your attention to the accompanying Declaration, now in course of signature among scientific men, which it is proposed to issue when
a sufficient number of names have been obtained. I trust that you will
approve of the spirit of the Document and the terms in which it is ex-
pressed, and solicit the favour of your signature to be appended to the
Memorial.

I am Sir, your obedient servant
Herbert McLeod.39

Unfortunately Hirst destroyed his first reply ‘in a prudent moment’ and
simply sent a curt refusal that the Declaration’s ‘spirit by no means meets
with my entire approbation’.

If Hirst spoke for a section of the younger generation and Daubeny
spoke for a section of the more established, of a far greater intellectual and
national stature was the scientist and philosopher Sir John Herschel,
whose capture by the Declarationists would have surpassed even the glory
of Brewster. Faraday had not signed.40 Would Herschel join them?

Herschel’s swift and decisive reaction, which he (and Berger)
allowed the Athenaeum to publish on 17 September (reprinted in The Times
three days later) was uncompromisingly direct:

I consider this movement simply mischievous, having a direct tendency (by
putting forward a new shibboleth, a new verbal test of religious partisan-
ship) to add a fresh element of discord to the already discordant relations
of the Christian world. I do not deny that care and caution are apparent
on the face of the document I am called on to subscribe. But no nicety of
wording, no artifice of human language, will suffice to discriminate the
hundredth part of the shades of meaning in which the most worldwide
differences of thought in such subjects may be involved.41

In essence Herschel found the declaration troublesome, quite apart from
the truth or falsehood of its proposition—a problem which he had pre-
viously discussed in his Discourse on the study of natural philosophy (1830).

To Berger himself, Herschel replied that even to ask for his signature
was ‘an infringement of that social forbearance which guards the freedom
of religious opinion in this country with especial sanctity’ (this was only
35 years after Catholic Emancipation!); but this opinion was certainly
not to be ‘construed into a profession of Atheism or infidelity’. De Morgan
thought this a ‘stinging answer’, and confided to his fellow-mathematician
Sir William Rowan Hamilton that ‘the result will be a warning not to
apply to science to make declarations which are—under very distorted
phrases—intended to support ecclesiastics in (exhi)biting their sinuosity’.42

The Saturday review took a similar stance:

The unfortunate mania which possesses so many people for inviting their
neighbours to purge themselves from heresy will seriously aggravate a
difference of opinion, which is a very quarrel as it stands; and if Sir John
Herschel shall have done anything to check this fashion, he will have
rendered good service to Christianity.43

Herschel’s views were shared by the politician, traveller, linguist,
hymnologist, and former editor of the Westminster review, Sir John Bowring
(1792–1872), who was approached by Stenhouse. Bowring argued that there were not simply 'two truths', the religious and the scientific, for two truths could not contradict one another anyway; now was the time 'to emancipate ourselves from the tyranny of all dogmatizing creeds'. The cause of truth was better served by latitudinarianism in inquiry.

The issue was ventilated again during the British Association meeting at Bath, between 14 and 23 September 1864, when fresh attempts were made to canvas signatories. Attention focused on the Presidential Address of Sir Charles Lyell, in which he appeared to shift his ground from plutonism to hydrothermalism and to admit fossils (Eozoon Canadense) in Azoic, or pre-Cambrian, rocks. The Saturday review saw Lyell's address as cautious and frank, and was satisfied that:

While shibboleths and counter-shibboleths are being industriously circulated to fetter the investigations of scientific inquirers, we may trace, in the modest tone which prevailed at the meeting of the Association, a much more trustworthy safeguard against undue presumption than any which the most amply signed declaration could possibly supply.

Thomas Hirst, who was to become the Association's General Secretary in 1866, was pleased to notice the applause with which every protest against fettering science by religious dogmas was received. Colenso has done good work, the first fruits of which are already evident in the increased courage which scientific men have acquired to expressing [sic] frankly their convictions.

The Bath meeting did witness some feeling for the opposite views. The editor of The Bath Chronicle, which reprinted the letters by Herschel and Bowring that had appeared in The Times nine days earlier, saw a conspiracy at work among a 'dangerous clique' which was assuming a prominent place in the Association, and may make it as deservedly unpopular as it is now deservedly popular. From circumstances which transpired at the Bath Congress we think there can be no doubt that a certain section are endeavouring to use the influence of this grand Scientific League in furtherance of heretical teachings, as a prop to the Scepticism which has of late years met with disciples even in the ranks of duly authorised Christian Ministers. When men, however accomplished they may be, begin to act upon their limited reason against Revelation, and oppose their crude deductions against the inspired truth of Scripture, we feel that they trespass beyond the bounds of lawful research, and are led by intellectual conceit into rash and delusive imaginings. Heaven forbid that we should do aught to limit intellectual enquiry—what we deprecate is the puffed up pretension that strives by hasty generalisations in the name of Science to over turn faith in the Book of Books.

Others, however, saw the matter in a different light. In an article entitled 'Sir John Herschel and the New Test', the Saturday review joined in condemning the 'inquisitors', 'very active of late', requiring 'oaths of abdication' among men of science. It was clear, however, that scientists
and theologians were divided and that blame attached to both sides: some men of science

... seem to value their studies, as an Orangeman values his religion, chiefly for the opportunity it gives them of making their natural enemies uncomfortable. It is impossible to read some recent speculations upon delicate scientific questions without seeing that the author has his old antagonists, the parsons, in his mind’s eye all the time, and is experiencing the same kind of glee as a small boy feels when he is tying a tin kettle to a dog’s tail.49

Certainly no one was more violent in his opposition to the Declaration than De Morgan who, as a contributor to the Athenaeum,50 gave wide publicity to his view that the Declaration would do ‘irreparable damage’. Like Herschel and Bowring, and Daubeny, De Morgan regarded the Declaration as a ‘vote of censure on free inquiry’; but even more, as he wrote in October 1864, as a theological plot to prevent theological inquiry itself.51 ‘This Declaration sins in nothing except the assumption that theology is perfect, and the discordance between theological assumption and scientific theory are to be left side by side until it shall please God to allow us to see the manner in which they may be reconciled.’52 ‘Is this the way which it has hitherto pleased God that we shall be allowed to see? Not at all: apparent contradictions have never been reconciled without an examination of both sides.’53

He then printed in the Athenaeum a clever Broad Church paraphrase of the Declaration for ‘Students of theology and nature’, to which he added:

We, the undersigned Students of Theology and of Nature, desire to express our sincere regret, that common notions of religious truth are perverted by some in our own times into occasion for casting reproach upon the advocates of demonstrated or highly probably scientific theories. We conceive that it is impossible for the Word of God, as correctly read in the Book of Nature and the Word of God as truly interpreted out of Holy Scripture, to contradict one another, however much they may appear to differ . . .54

Perhaps Herschel and Bowring would feel more disposed to sign this, De Morgan speculated. Perhaps the geologist Adam Sedgwick would sign, for De Morgan felt certain the Declarationists had only the signature of an obscure ‘Adam Sedgwick, M.D.’ (He was wrong!)55

Privately, De Morgan had penned an even more delicious translation of the ‘illogically worded’ declaration for the benefit of his fellow logician, Hamilton:

Colenso and others are inquiring into the distinction between historical record and revealed doctrine. This won’t do; our system is so shaky that it will not stand substantial repair. Why! we dare not knock in a nail, for fear the rotten beam should crumble. We must have a declaration that two truths cannot disagree. Some must sign for love, and more for fear; we must say in conversation that none but an atheist would refuse to sign.56
Efforts to collect further signatures continued during October, and De Morgan instanced their failures: Richard Owen, Faraday, Whewell, Airy, Lyell, Murchison, Tyndall, and, notably, Sabine.57

The Declaration was in the foreground of events surrounding the first meeting, on the 3 November 1864, of the X-Club, whose nine members dedicated themselves to a ‘devotion to science, pure and free, untrammeled by religious dogmas’58—a sentiment underlying the recommendation of George Busk, one of the X-Club, that the Royal Society should award its Copley Medal to Charles Darwin.59

At the end of the month, on 30 November 1864, the issue found an echo in Sabine’s presidential address to the Royal Society, and particularly in the citation accompanying the award of the Copley Medal to Charles Darwin for his ‘Important researches into geology, zoology and botanical physiology’. After deliberately excluding Darwin’s Origin of species from the grounds of his award in his spoken address, Sabine, challenged by Huxley and Hooker, softened his published address with a weak defence that ‘every real bona fide inquiry into the truths of nature is in itself essentially legitimate’.60

In the meantime De Morgan dropped his anonymity, for he had at last been solicited by the Declarationists—like a ‘grocer’s supplication for tea and sugar patronage’61—and blasted forth against a hostile Jericho. To Herschel’s reasons for rejection—intrusion and tolerance of different views—he added, in a letter to the Athenaeum of 19 November 1864, his own speciality of logic:

Even if I did regret [the divorce of religion and science] I should be ashamed to put my name to bad chemistry made to do duty for good reasoning. The declaration is an awkward attempt to saturate sophism with truism; but the sophism is largely left in excess.

The promoters were ‘lineal successors of Tony—Fire—the faggot’ whose ‘unholy fire must be trodden out’ or at least confined to theology. The whole exercise was in bad taste and liable, as Daubeny had said, to produce intolerant disputes and partisanship within the scientific community.62 Sarcastically, he offered his signature, provided it was asterisked, and his letter was also published. Perhaps De Morgan’s ferocity was not unconnected with his interest in Spiritualism, which gave his protest for freedom of inquiry63 a special significance.

In Ireland, Hamilton, fortified by gossip from De Morgan, followed the issue of what he labelled ‘the Fortieth Article of Religion’64 with great interest. On learning of Herschel’s reply, he drolly speculated, in the Athenaeum of 31 December 1864, about who had drawn up such a declaration, ‘At least we are not in this case asked to sign for “the love of God” ’ (a reference to the 39 Articles). Hamilton obviously waited with keen anticipation the pleasure of saying, No!
The Scientists' Declaration, 1864–5

I am happy to say, that I have not been hitherto asked to sign the document; perhaps an Astronomer is regarded as scarcely a Student of the Natural Sciences.

If I were a Professor of Mathematics I might have a still better chance of escaping.

But when the invitation came in December 1864, he declined simply on grounds that the Declaration lacked authority.

At the end of 1864, when there was still no sign of publication, De Morgan speculated that the 'young' promoters were experiencing difficulties from the withdrawal of names, the poverty of the list, and the 'manifest absurdity of a scientific protest which has no scientific authority'. The manuscript list, however, reveals few withdrawals and at last, in May 1865, the Declaration was published. The Chemical news reported that 'for the small charge of twopence, anyone can possess this Directory of Orthodoxy'.

4. The signatories

(i) THE ROYAL SOCIETY AND THE DECLARATION

If this were all the Chemical news was prepared to say about it, despite the presence of chemists on the list, De Morgan probed more deeply in the Athenaeum. In particular, he examined the list for Fellows of the Royal Society, 'as the oldest, largest and highest' of learned societies. His analysis, which we shall extend, is of considerable interest. Indeed, of all the possible scientific groups represented among the signatories perhaps none occupied a position more central than the Royal Society. Even though Fellows constituted less than ten per cent of the total list, their views would have undoubtedly counted for a great deal in society generally. For many years the religious attitudes of Fellows of the Royal Society have attracted the attention of historians of science and religious apologists. It therefore seems appropriate to digress briefly in order to consider the religious profile of the Society as revealed by the Declaration. Was there, for example, any connexion between the Declarationists and the 'amateurs' whom Babbage and Granville described in 1830? Or did the 'scientists' revolt' of the 1830s and 1840s bring into the Society more tolerance of religious diversity?

It would be extremely interesting to chart a religious tableau for the Fellowship in this period, similar in intention to those now being constructed for the early Fellows in the middle of the seventeenth century. For the moment, unfortunately, an elaborate statistical analysis lies beyond our resources, and we have deliberately restricted ourselves to a few descriptive comments.

On St Andrew's Day 1864, there were 605 Fellows. Of this number 65 (or roughly ten per cent) had signed the Declaration. Now, as De Morgan fairly observed, one had to 'abate one out of ten as inaccessible,
living abroad, travelling, etc., and [therefore] we must see that eight have refused where one has consented. Refused, remember; for "yes" or "no" has been put to everyone'.75 He then used the Babbage-Granville characteristic of 'the F.R.S. who Fairly Represents Science', namely the criterion of publication in the Philosophical transactions. (He recognized that many scientists published elsewhere, but claimed that this did not seriously affect the argument.)76 Of the 605 Fellows alive in 1864, 166 had published in the Philosophical transactions (or 27 per cent); of these, only 18 were signatories.77 De Morgan therefore asserted that the Declarationists captured only about one out of nine Fellows who published scientific work. If one disregards De Morgan's severely exclusive criterion of scientific status and accepts instead the authority of the Dictionary of national biography, 48 of the 65 may be considered 'scientific'. Of the 65 Fellows who signed the Declaration, the majority (44) were elected before the reforms of 1847–8; of these, 15 were 'amateurs'. Of the 21 elected in or after 1848, only one (General Sir Henry Rawlinson, an Assyriologist) could be considered an 'amateur'. Eleven of the 65 were clergymen of the Church of England, eight of whom were elected before 1848. Although there may have been a predisposing tendency to have signed the Declaration 'attacking' science among those elected before 1848 (whose average age in 1865 was 66) as against those elected after the reforms (whose average age was 55), there is no justification for asserting that scientific or 'amateur' status per se necessarily reflected attitudes towards the Declaration. Nor did age seem material.78 The Declaration was, quite simply, a list of scientists with a point of view.

Perhaps only a dozen of the Fellows of the Royal Society listed in Table 1 are particularly well known to historians of science (Brewster, Challis, Calvert, Gilbert, Glaisher, Gosse, Harley, Joule, Moseley, Reade, Sedgwick, and Stenhouse). Of these, Brewster, Sedgwick, and Joule were undoubtedly the promoters' most distinguished signatories. Brewster's daughter later recalled:

... with what kind of proud satisfaction he put into my hands a list of scientific men of high standing [sic] who had avowed their faith in Scripture. He referred to this as a token that there was no natural tendency in science to shake the faith of men in the Word of God, and no justice in regarding men of real science as more inclined to infidelity than others.79

Sedgwick signed, considering the Declaration 'a kind of peace offering by a body of men who were honestly searching after truth and ready to abide by it wheresoever found'.101 As for Joule, John Tyndall was distinctly disparaging; Joule, he wrote to Debus, had 'put his name to that drivel-lying declaration which they are now sending round regarding Science and Religion. It appears to me that he has never yet raised himself into the real region of philosophy to which his experiments point'.102

One would have liked to see a pattern emerging among the Fellows
# Table 1

**Signatory Fellows**

<table>
<thead>
<tr>
<th>Name</th>
<th>Dates</th>
<th>Date of election to Royal Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rev. Henry Hervey Baber</td>
<td>(1775-1869)</td>
<td>1816</td>
</tr>
<tr>
<td>J. Hutton Balfour</td>
<td>(1808-1884)</td>
<td>1856</td>
</tr>
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<td>T. Graham Balfour</td>
<td>(1813-1891)</td>
<td>1858</td>
</tr>
<tr>
<td>James Bateman</td>
<td>(1811-1897)</td>
<td>1838</td>
</tr>
<tr>
<td>Samuel Husband Beckles*</td>
<td>(1814-1890)</td>
<td>1859</td>
</tr>
<tr>
<td>Thomas Bell</td>
<td>(1792-1880)</td>
<td>1828</td>
</tr>
<tr>
<td>Rev. Joseph Bosworth</td>
<td>(1789-1880)</td>
<td>1829</td>
</tr>
<tr>
<td>*James Scott Bowerbank</td>
<td>(1797-1877)</td>
<td>1842</td>
</tr>
<tr>
<td>*David Brewster</td>
<td>(1781-1868)</td>
<td>1815</td>
</tr>
<tr>
<td>*Charles Brooke</td>
<td>(1804-1879)</td>
<td>1847</td>
</tr>
<tr>
<td>Alexander Bryson</td>
<td>(1802-1869)</td>
<td>1854</td>
</tr>
<tr>
<td>Major T. Seymour Butt*</td>
<td>(1805-1890)</td>
<td>1836</td>
</tr>
<tr>
<td>*Rev. James Challis</td>
<td>(1803-1882)</td>
<td>1848</td>
</tr>
<tr>
<td>General Francis Rawdon Chesney</td>
<td>(1789-1872)</td>
<td>1834</td>
</tr>
<tr>
<td>Rev. Henry Christmas (Noel Fearn, pseud.)</td>
<td>(1811-1868)</td>
<td>1842</td>
</tr>
<tr>
<td>Rev. William Clark</td>
<td>(1788-1869)</td>
<td>1836</td>
</tr>
<tr>
<td>Earl of Enniskillen*</td>
<td>(1807-1866)</td>
<td>1829</td>
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<tr>
<td>*Frederick Crace Calvert</td>
<td>(1819-1873)</td>
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<td>Edward William Cooke</td>
<td>(1811-1880)</td>
<td>1863</td>
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<tr>
<td>Mathew Curling Friend*</td>
<td>(1792-1871)</td>
<td>1820</td>
</tr>
<tr>
<td>*Joseph Henry Gilbert</td>
<td>(1817-1901)</td>
<td>1860</td>
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<tr>
<td>*James Glaisher</td>
<td>(1809-1903)</td>
<td>1849</td>
</tr>
<tr>
<td>*Philip Henry Gosse</td>
<td>(1810-1888)</td>
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<tr>
<td>Rr. Admiral William Hutcheon Hall</td>
<td>(?1797-1878)</td>
<td>1847</td>
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<tr>
<td>Rt. Hon. Robert Adam Christopher</td>
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<tr>
<td>Nisbet-Hamilton*</td>
<td>(1804-1877)</td>
<td>1833</td>
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<tr>
<td>John Scandrett Harford</td>
<td>(1785-1866)</td>
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<tr>
<td>*Rev. Robert Harley</td>
<td>(1828-1910)</td>
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<tr>
<td>James Heygate*</td>
<td>(1829-1872)</td>
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<tr>
<td><em>John Higginbottom</em></td>
<td>(1798-1876)</td>
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<tr>
<td>John Hogg</td>
<td>(1800-1859)</td>
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<td>*Samuel Elliott Hoskins</td>
<td>(1799-1883)</td>
<td>1843</td>
</tr>
<tr>
<td>Charles Hood*</td>
<td>(1805-1889)</td>
<td>1843</td>
</tr>
<tr>
<td>Robert Hudson*</td>
<td>(1801-1883)</td>
<td>1834</td>
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<tr>
<td>*Robert Hunt</td>
<td>(1807-1887)</td>
<td>1854</td>
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<tr>
<td>Cuthbert William Johnson</td>
<td>(1799-1878)</td>
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<tr>
<td>Percival Norton Johnson*</td>
<td>(1793-1866)</td>
<td>1846</td>
</tr>
<tr>
<td>Charles Handfield Jones</td>
<td>(1819-1890)</td>
<td>1850</td>
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<tr>
<td>*Thomas Rymer Jones</td>
<td>(1810-1880)</td>
<td>1844</td>
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<tr>
<td><em>Thomas Wharton Jones</em></td>
<td>(1808-1891)</td>
<td>1840</td>
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<tr>
<td>*James Prescott Joule</td>
<td>(1818-1889)</td>
<td>1850</td>
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<tr>
<td>George Lowe*</td>
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<tr>
<td>*John Denis Macdonald</td>
<td>(1826-1880)</td>
<td>1859</td>
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<tr>
<td>Gilbert Wakefield Mackmurdo*</td>
<td>(1799-1869)</td>
<td>1839</td>
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<tr>
<td>Rev. Robert Main</td>
<td>(1808-1878)</td>
<td>1860</td>
</tr>
<tr>
<td>Sir John Maxwell, Bart.</td>
<td>(1791-1866)</td>
<td>1829</td>
</tr>
<tr>
<td>Name</td>
<td>Dates</td>
<td>Date of election to Royal Society</td>
</tr>
<tr>
<td>-------------------------------------------</td>
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</tr>
<tr>
<td>*Rev. Henry Moseley</td>
<td>(1801–1872)</td>
<td>1839</td>
</tr>
<tr>
<td>Sir Edwin Pearson(^{94})</td>
<td>(1802–1883)</td>
<td>1833</td>
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<tr>
<td>Gen. Sir Henry Creswicke Rawlinson</td>
<td>(1810–1855)</td>
<td>1850</td>
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<tr>
<td>Rev. Joseph Bancroft Reade</td>
<td>(1801–1870)</td>
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</tr>
<tr>
<td>Sir John Richardson</td>
<td>(1787–1865)</td>
<td>1825</td>
</tr>
<tr>
<td>Henry D. Rogers(^{95})</td>
<td>(1808–1866)</td>
<td>1858</td>
</tr>
<tr>
<td>Rev. Adam Sedgwick</td>
<td>(1785–1873)</td>
<td>1821</td>
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<tr>
<td>William Sharp</td>
<td>(1805–1866)</td>
<td>1840</td>
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<tr>
<td>Alfred Smee</td>
<td>(1818–1877)</td>
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<tr>
<td>Samuel Reynolds Solly(^{96})</td>
<td>(1781–1866)</td>
<td>1823</td>
</tr>
<tr>
<td>John Spencer Stanhope(^{97})</td>
<td>(1787–1873)</td>
<td>1816</td>
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<tr>
<td>*John Stenhouse</td>
<td>(1804–1886)</td>
<td>1848</td>
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<tr>
<td>Alexander John Sutherland(^{98})</td>
<td>(1811–1867)</td>
<td>1846</td>
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<tr>
<td>*Col. William Henry Sykes</td>
<td>(1790–1872)</td>
<td>1843</td>
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<tr>
<td>Alexander Tweedie</td>
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<td>Nathaniel Bagshaw Ward</td>
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<tr>
<td>John Waterhouse(^{99})</td>
<td>(1806–1879)</td>
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<td>James Whatman(^{100})</td>
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<td>Rev. John Wilson</td>
<td>(1804–1875)</td>
<td>1845</td>
</tr>
<tr>
<td>James Yates</td>
<td>(1789–1871)</td>
<td>1839</td>
</tr>
</tbody>
</table>

* An asterisk indicates the Fellow published in *Philosophical transactions*. All appear in the *D.N.B.* except those annotated.

who signed, which would enable us to draw conclusions concerning the possible influence of age, status, and the coincidence of scientific and religious attitudes generally. The list in Table 1 is, however, so small that it is extremely difficult to draw such substantive conclusions. One may reasonably speculate that the list includes a smaller proportion of mathematicians, physicists, engineers, and physicians than the proportion of these disciplines within the Royal Society at the time, and proportionally more astronomers, chemists, surgeons, biologists, and geologists than would be found in a distribution by discipline of Fellows in the 1860s.\(^{103}\)

For a wider view, however, we must turn from the Royal Society to the other scientific societies. In doing so we may add a few details to the picture that De Morgan described.

(ii) OTHER SIGNATORIES

These comments about the age and fields of interest of the signatories apply only to Fellows of the Royal Society. What of the other 652? Of that number, probably about 500 bore some claim to be considered 'men of science'. Among the better known of these (21 of whom were subsequently elected to the Royal Society, see Table 2) were: Thomas Anderson, J. Lloyd Bullock (a pharmaceutical manufacturer and a founder of the Royal College of Chemistry), Edward Divers, Alexander
The Scientists' Declaration, 1864–5

Stewart Herschel (Herschel's son!), Edward J. Mills (then another factotum of Stenhouse), Frederick Penny, J. H. Pepper (of Pepper's Ghost), W. H. Perkin, and Thomas Richardson.

Table 2
SIGNATORIES WHO BECAME FELLOWS AFTER 1865

<table>
<thead>
<tr>
<th>Name</th>
<th>Dates</th>
<th>Date of election to Royal Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>James Risdon Bennett</td>
<td>(1809–1891)</td>
<td>1875</td>
</tr>
<tr>
<td>Rev. Miles Joseph Berkeley</td>
<td>(1803–1889)</td>
<td>1879</td>
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<tr>
<td>John Jeremiah Bigsby</td>
<td>(1792–1881)</td>
<td>1869</td>
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<tr>
<td>William Carruthers</td>
<td>(1830–1922)</td>
<td>1871</td>
</tr>
<tr>
<td>George Dickie</td>
<td>(1812–1882)</td>
<td>1881</td>
</tr>
<tr>
<td>Edmund Divers</td>
<td>(1837–1912)</td>
<td>1885</td>
</tr>
<tr>
<td>Sir Walter Elliot</td>
<td>(1803–1887)</td>
<td>1878</td>
</tr>
<tr>
<td>Charles Edward Groves</td>
<td>(1841–1920)</td>
<td>1883</td>
</tr>
<tr>
<td>Alexander S. Herschel</td>
<td>(1836–1907)</td>
<td>1884</td>
</tr>
<tr>
<td>John Eliot Howard</td>
<td>(1807–1883)</td>
<td>1874</td>
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<tr>
<td>John Whitaker Hulke</td>
<td>(1830–1895)</td>
<td>1867</td>
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<tr>
<td>Edward Hull</td>
<td>(1829–1917)</td>
<td>1867</td>
</tr>
<tr>
<td>Sir George Johnson</td>
<td>(1818–1896)</td>
<td>1872</td>
</tr>
<tr>
<td>Herbert McLeod</td>
<td>(1841–1923)</td>
<td>1881</td>
</tr>
<tr>
<td>Edmund J. Mills</td>
<td>(1840–1921)</td>
<td>1874</td>
</tr>
<tr>
<td>Sir William Henry Perkin</td>
<td>(1838–1907)</td>
<td>1866</td>
</tr>
<tr>
<td>Thomas Richardson</td>
<td>(1816–1867)</td>
<td>1866</td>
</tr>
<tr>
<td>William Chandler Roberts</td>
<td>(1843–1902)</td>
<td>1875</td>
</tr>
<tr>
<td>George James Snelius</td>
<td>(1837–1906)</td>
<td>1887</td>
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<tr>
<td>George James Symons</td>
<td>(1838–1900)</td>
<td>1878</td>
</tr>
<tr>
<td>John Wood</td>
<td>(1825–1891)</td>
<td>1871</td>
</tr>
</tbody>
</table>

Note: All appear in the D.N.B. except those annotated.

Of interest are a few unsolicited comments with which some signatories embroidered their signatures. The naval surgeon, J. D. (later Sir John) MacDonald, F.R.S., signed 'with perfect concurrence, well knowing that “a little knowledge is a dangerous thing” and is the basis of so much presumption amongst us poor weak human beings’. The Revd W. Lockwood, a Fellow of the Linnean Society (no. 359), offered his signature with the honest observation that ‘I can hardly class myself with scientific men’. Vice-Admiral William Ramsay (no. 579) agreed with the spirit, not the wording, of the document: ‘I believe that the scriptures are given to show us the way to salvation, and not to give instruction either directly or indirectly in the natural sciences.’ By signature 647, it is obvious that the promoters were finding great difficulty in obtaining further scientific signatures. The end of the list was dominated by solicitors and clergymen, and even a sprinkling of mustered foreigners. No
women were among the signatories. Most of the men were upwards of fifty years of age.

De Morgan’s greatest scorn was reserved for the totally unqualified signatories. In the letter ‘B’ (taking his cue from ‘Berger’) he calculated eight names possessing no degrees:

one is an ‘acting paleontologist’ [to the Geological Society of Ireland], one is F.K.Q.C.P., which we do not know how to elongate, unless it be into ‘Fellow of the Kew Queer Collection of Plants’,\textsuperscript{10} [another] is described as ‘Missionary to China’,\textsuperscript{11} and one only as ‘J. P.’.\textsuperscript{12}

Indeed, nearly 100 names bear no degree or qualifications; others were obviously of school teachers, including some from Harrow, Berger’s old school.\textsuperscript{13}

De Morgan was perhaps intolerant of Irish medical qualifications, but his other criticisms seem justified. No wonder the Saturday review was so scathing:

\begin{quote}
A considerable number of the signatories are not of sufficient importance to have made it worth their while to inform the world whether they thought science and religion reconcilable or not. No doubt, however, it was an inviting opportunity of placing the fact that they were men of science beyond the reach of any captious doubt.\textsuperscript{14}
\end{quote}

The largest single group among the other signatories was, as might be expected, the medical profession, with 251 signatures (35 per cent), followed by the Fellows of the Geological Society with 116 signatures (18 per cent), the Chemical Society with 78 signatures (12 per cent), the Linnean Society with 73 signatures (11 per cent), and the Astronomical Society with 64 signatures (9.8 per cent). In proportion to the membership of these learned societies, the Declarationists represented about 13 per cent of the Geological Society, 23 per cent of the Chemical Society, 16 per cent of the Linnean Society, and 14 per cent of the Astronomical Society. (The medical signatories represented only 2 per cent of the something like ten thousand people who could be described as ‘medical men’.)

As far as the geologists are concerned, none of the signatories was on the Council of the Geological Society in 1864–5 (although some were from time to time officers of the society). While Sedgwick signed, other influential geologists (notably Murchison, Lyell, and W. L. Hamilton, the President of the Society in 1864–5, did not). One suspects that those in the Geological, and other societies, who did sign, represented a significant ‘backbench’, possibly provincial, element.

More detailed studies of these fairly significant minorities could be revealing. How did systematic religious views (and, by implication, systematic belief systems generally) inform the actual work of men of science? More specifically, how did these individuals see the connexion between their science and their beliefs. Such questions function at both
cognitive and institutional levels. It is well known that epistemological assumptions and social values momentarily governing scientific fields or disciplines have worked either to encourage or resist intellectual or institutional transformations. Did the values of the Declarationists operate to oppose experimentation in some fields or to intensify study in others?

It is also clear that certain institutions are particularly prominent among the signatories to the Declaration. For example, we have already noted that all the protagonists were close to the Royal College of Chemistry; that thirty-nine ‘students’ of the college signed (one of whom, G. J. Snelius, became F.R.S.); and that others had been taught at the college or taken its chemistry classes while studying at the Royal College of Mines. It is, however, extremely difficult to proceed from these facts to larger historical generalizations. Although it would be important to be able to demonstrate epistemological justifications for the chemists’ support of the Declaration (and to compare their views on religion with, say, the defence of vitalism against the development of animal chemistry), such possibilities are at present mere speculation. We may also speculate that the chemists who signed did so, not only through belief but through social pressure as well, owing to the strong ‘old-boy network’ which had come to exist around the Royal College of Chemistry by 1865. This network was directly inspired by the College’s first director, A. W. Hofmann. Although Hofmann did not sign the document, given his close friendship with Herbert McLeod (who went to Germany with him for a time during 1865), it seems unlikely that he would not know about it. It is also conceivable that the loss of Hofmann to Germany in 1865 made the staff and students of the College, both past and present, fear for its future. Consciously, or unconsciously, they may have wanted to stress the ‘orthodoxy’ of chemistry, and of their beloved institution, through the Declaration.

5. Conclusions

By 1866 the dust had begun to settle. Although the Declaration would be cited as late as 1880 as evidence of the fundamental unity of scientists, its force was spent. Several of its supporters, including Berger and Brewster, soon died, Brewster being mourned by one clergyman as a great man ‘quite contented to make the Bible [his] all’. The Declaration today is nearly forgotten, remembered only as a rear-guard defence of scriptural belief. At the time its chief effects were to be seen not only in the beginning of the X-Club, but also in the foundation of the ‘Victoria Institute or Philosophical Society of Great Britain’. The mandate of the Victoria Institute was

to investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great
truths revealed in the Holy Scripture, with the view of defending these truths against the opposition of science, falsely so-called.\textsuperscript{121}

Its prolegomena, composed in 1865, by James Reddie, a civil servant given to writing pseudo-scientific tracts, recounted events since Essays and reviews and described the need for a ‘defence movement’ against the ‘undue influence of scientific coteries’. Reddie appealed for a ‘Science of Science . . . a proper correlation of all the various sciences into one grand and consistent Philosophy, which will be the interpretation of the nature of those things as ordained by the one true God’. By December 1866 200 members had been enrolled, among whom at least 11 were F.R.S.s (Sir H. Barkly, J. F. Bateman, T. K. Callard, The Archbishop of Canterbury, Revd J. Challis, Revd W. H. Dallinger, Sir J. Fayrer, F. Bisset Hawkins, Revd T. R. Robinson, Rt Hon Lord Teignmouth, and Canon H. B. Tristam) and at least 30 others had some claim to scientific knowledge.\textsuperscript{122}

In the last analysis, what did the Declaration demonstrate? In Berger’s view the Declarationists were attempting to combat the prevailing opinion that the study of science necessarily tends to infidelity; to show that the deepest researches and a belief in the most wonderful discoveries of our day, are not incompatible with a belief in the Bible; that men of science, and those who study nature for business or pleasure may be and are true Christians.\textsuperscript{123}

Many Victorian men of science would have found no difficulty in subscribing to this position. If there were difficulties in supporting the Declaration, they arose more from the fear of sterile controversy and discord among men of science, and from an aversion to the imposition of theological tests, than from an active objection to the Declarationists’ claims and intentions. These fears underlay the promotion of science teaching at Rugby by J. M. Wilson, who encouraged studies which would ‘help free our successors from the same partition of soul, the same divided allegiance, from which the present generation suffers’.

At present there is secret, if not avoided, hostility between religion and science, or at any rate a distrustful toleration; nothing but active cooperation will permanently reconcile them. To endeavour not to see the results and tendencies of modern science is folly in the highest degree. The study and knowledge of the seen is sure to react on the study of the unseen; and he will entertain these studies in perfect harmony, and he only, in whom the scientific and religious ideas are allowed to grow up, not in antagonism, but fearlessly and freely, side by side, cooperating in the formation of a reverent, active, and independent mind, and well-balanced judgement.\textsuperscript{124}

Huxley, Tyndall, and Spencer would have agreed that a study of science induced lofty ideas, but would have denied that these ideas necessarily supported religious belief. However, a large number of working scientists
in the 1860s and 1870s probably did agree with Wilson; certainly the close connexion between Public Schools and the Church implied that most scientific sympathizers on the staffs of such schools would have supported him and were not disposed to join Huxley's metaphysical crusade of scientists clad in shining armour, battling against dark forces of theological obscurantism.

In the wake of the Declaration debate, and with the gradual fragmentation of the common context provided for so long by natural theology, one sees a gradual differentiation of attitudes among men of science. There were those who pronounced themselves to be agnostic or atheist and therefore anti-religious; there were those who remained religious (or uncritical) and who refused to join issue; and there were those who sought to reconcile their activities with their beliefs, either by attempting a reconciliation through (a) a new understanding of biblical literalism, through (b) faith, or through (c) a complete separation of science and religious belief in distinct intellectual compartments. Thus there were some men of science, including George Romanes and John Hall Gladstone, and teachers like James Wilson, who tried, by discovering ambiguities in scripture to stress that Christianity, tested in the white heat of scientific study, would emerge tempered and stronger for the experience. John Gladstone, using the current vocabulary of militancy, wrote:

The store houses of natural science have often been ransacked for weapons against the old book; the defenders of the faith have sometimes shrieked with alarm, and the assailants have sung their paean in anticipation of victory. Earthworks which form no part of the original fortress have been easily carried, but the citadel itself has remained unshaken and the very vigour of these repeated attacks has proved how impregnable are its valuable walls.

Second, there were careful attempts, such as W. H. Freemantle's *Gospel of secular life* (1882), to urge that religion in fact embraced all forms of inquiry and that no conflict was necessary. More often, however, it appears that the third, and preferred, solution to the problem was to 'reconcile' by 'separation'—to create, in effect, two separate systems of values, two needs, which in A. J. Balfour's influential expression 'stand . . . upon perfect equality'.

By the turn of the century, the practice of holding public meetings of scientists, called together to give their reasoned views on the reconciliation in their own lives, of the demands of science and the rewards of religion, was clearly acceptable. But by then the social and intellectual dominion of science had become firmly placed, so firmly indeed, that it would itself become the target of those who pressed the claims of 'higher truth'.
science. Chadwick instances two forms of opposition between science and religion: (1) opposition arising from the teachings of science as opposed to the literal teachings of the Bible, and (2) opposition arising from the fact that scientific explanations require a system of uniform naturalistic and fundamentally materialistic notions of causation, independent of metaphysical explanation. To these we must add a third possibility: the opposition of free inquiry to the unquestioning acceptance of prescribed dogma. Ironically, the Declaration sowed the seeds of its own destruction, in effect reporting a vote widely interpreted as 'nine to one for unfettered publication of thought'. Yet at the same time it succeeded in demonstrating that the learned scientific community would not parody the theologians and raise its voice against its 'Colenso-Huxleys' or 'Wilson-Tyndalls'. It would not institute club-law to intimidate those who thought differently. How the remorseless critic De Morgan rejoiced that the list of signatures was to be interred by Berger in the Bodleian Library, a relic of Victorian bigotry, for some remote historian to disclose:

The Declaration has proved something: we know that the followers of natural knowledge did not raise their voices against inquiry; we know that they would not. Science was asked to say Don't tell me! and she answered, I like to be told.131

This separation of free inquiry from a supposed slavish obedience to literalism—a problem loaded with explosive overtones, at a time when the Church of England was itself anxiously studying the implications of the Syllabus errorum132 and when the Papacy's political role in Italy seemed defined in terms of ecclesiastical resistance to political liberalism—was an important factor in the Declaration debate. In Britain the long struggle to abolish religious tests, beginning in 1864 and lasting until 1871, is revealed in the pages of Hansard as of fundamental political importance. The sense of mortal conflict with the enemies of intellectual freedom, mirrored in the work of Draper and White, was echoed in the lives of embattled agnostics. The devices of 'reconciliation' undoubtedly helped 'save the phenomena', but the consequences of this contemporary separation included a scientific creed separated not merely from religious orthodoxy but from all value systems not specifically functional to scientific endeavour. This creed gave a contextual foundation to the claims of positivist 'objective' science, which rejected the intellectual mediations that an earlier generation found essential. The debate surrounding the Declaration of 1865 crystallized this rejection and provoked questions which escaped easy answer.

NOTES
1 Owen Chadwick, The Victorian Church (London, 1970), Part II, p. 3.
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2 Colenso's appeal began in June 1864 and lasted until December 1864, with judgement given on 20 March 1865. The appeal swung on the legal question of the jurisdiction of the Natal Bishopric and not on Colenso's theology. He was found legally still Bishop of Natal. His return to South Africa in 1865 subsequently provoked a schism when the Canterbury Convocation resolved to appoint a new Bishop of Natal in 1867.

3 Chadwick, op. cit. (1), p. 84.


5 Hansard, Parliamentary debates, 3rd ser. dxxvi, col. 1546 (15 July 1864), also quoted in Standish Meacham, Lord Bishop, the life of Samuel Wilberforce (Cambridge, Mass., London, McLeod, but Wordsworth (later Bishop of Lincoln) attributed it to Stenhouse.

6 According to Berger (see note 10, below), this memorial was prepared by Gillman and McLeod, but Wordsworth (later Bishop of Lincoln) attributed it to Stenhouse.

7 The chronicle of Convocation, being a record of the proceedings of the Convocation of Canterbury (1861–64), Lower House, 21 April 1864, p. 1577. No discussion is recorded and no signatures are listed. According to Berger (see note 10, below), this memorial was prepared by Gillman and McLeod.


9 The only description of the Declaration we know is that of E. G. W. Bill, 'The Declaration of students of the natural and physical sciences, 1865', Bodleian Library record, v (1954–5), 262–7. In 1872 the Revd A. H. Berger, a former student of Corpus Christi College, Cambridge, and a son of Capel Berger, presented to the Cambridge University Library a bound collection of replies to the Declaration, together with his father's recollections of the episode. This volume is today kept in the University Archives, Cam. Add.5989 (hereafter 'Berger, Documents'). We are indebted to J. D. Burchfield and D. B. Wilson for having brought this volume to our attention. Interestingly, the Declaration has recently been given fresh prominence. See C. A. Russell, 'The end of an era?', Unit i6 of Science and belief: from Copernicus to Darwin (London, 1972), pp. 66–7.

10 Bodleian MS. Add.C.102, which also contains the printed version, 13 × 9 inches, xx + 67 leaves, presented by Capel Berger. The original signatures occupy 64 pages of this handsome green morocco-bound volume. The printed pamphlet with its alphabetically arranged names was placed in the front and labelled by hand, 'Key to the Volume of Original Signatures'. Inked in against each name was a number referring to the numerical order of signatures in the volume.


12 Saturday review, 24 September 1864, p. 396.

13 Although Berger's is the last printed signature (no. 716), the manuscript closes with a late-comer (no 717), Robert Oxland, professor of chemistry at Toland Medical College, San Francisco. His signature obviously arrived after publication. Berger attended Harrow, became an active colour chemist, but died of poisoning at the age of 29; see T. B. Berger, A century and a half of the House of Berger (London, 1910), p. 62, and Journal of the Chemical Society, cxix (1906), p. iv.

14 Saturday review, 24 September 1864, p. 396.

15 Chadwick, op. cit. (1), p. 7, gives McLeod the honours. Berger's role was first established by Bill, op. cit. (10), and is confirmed in Berger, Documents, op. cit. (10).

16 A. W. Gillman, Searches into the history of the Gillman or Gilman Family . . . (London, 1895), pp. 194–5, with portrait. He entered the R.C.C. at the age of 13, and from 15 to 19 he was Hofmann's private assistant; see A. W. Hofmann, Theories of modern chemistry (London, 1865), p. ix.

17 Obituary (by J. M. Thomson), in Journal of the Chemical Society, cxi (1917), 342–7; Essex review, xxvi (1917), 29. Although Berger (Berger, Documents, op. cit. [10], p. i) cited Howard as a protagonist, there is no evidence that he played a major role in the proceedings.

18 W. Tilden, obituary of Groves, in Journal of the Chemical Society, cvii (1920), 464–6. Groves left £10 000 to the Royal Institution for the Groves Endowment Fund for Promotion of Scientific Research. Whatever their subsequent fame (or, in the case of Gillman and Berger, obscurity), only Stenhouse was well known in 1864; hence Hamilton's sarcasm in addressing his reply to 'Rev. Charles Grove [sic], or C. E. Grove, Esq', and De Morgan's rhetorical 'fancy a person, whose very name is unknown to scientific men, and is not to be found in the London [Post Office] Directory, at the address given for it, calling upon the Herschels and Hamiltons to sign a Declaration?'; see De Morgan, Athenæum, 31 December 1864, pp. 894–5. Of course, Groves was using Stenhouse's address as a postbox.
over, to force a declaration on the students of science. There might be more point in extorting
must certainly be put on the declaration nuisance now growing up. It is especially hard, morc-
Sir William Rowan Hamilton (3 vols., Dublin,
the students of religious newspapers like the British Banner or Record'.

temperament; but perfectly decided in his course of action'; see Robert Percival Graves, Life of
they thought him a timid man. They were much mistaken. Herschel is of a nervous and diffident
Faraday claimed his views were already public knowledge; see Berger, Documents, op. cit.

position, see D. M. Knight, 'Professor Baden Powell and the inductive philosophy', Durham
study of the evidences of Christianity' contained in the volume entitled 'Essays and reviews'. By a lay graduate,
in an anonymous pamphlet, A few words of apology for the late Professor Baden Powell's essay 'On the

societies; i.e. the figure of 40,000 refers solely to membership of natural and physical science
societies. For membership figures for 1860, see R. M. MacLeod and E. K. Andrews, Selected

metropolitan societies.

Herschel to Spottiswoode or Lubbock (c. February 1861).

J. D. Hooker to J. Lubbock, 29 February 1861, quoted in Leonard Huxley, Life and
letters of Sir J. D. Hooker (London, 1918), ii. p. 54.

Ibid.

A. P. Stanley, quoted in Cockshut, op. cit. (6), p. 198, and referring to a report in the

The printed version has 716 signatures. See note 14.

The Times, 21 July 1864, p. 9, reprinted in C. P. Daubeny, Miscellanies (Oxford
and London, 1867), vol. ii., separately paginated section IV, p. 130.

As to his friend Powell, who had died in 1860, Daubeny had already delivered a defence
in an anonymous pamphlet, A few words of apology for the late Professor Baden Powell's essay 'On the
study of the evidences of Christianity' contained in the volume entitled 'Essays and reviews'. By a lay graduate,
(Oxford, [71860]), reprinted in Miscellanies, op. cit. (33), ii. section IV, pp. 25–40. For Powell's
position, see D. M. Knight, 'Professor Baden Powell and the inductive philosophy', Durham

Daubeny, Miscellanies, op. cit. (33), ii. section IV, p. 131.

Ibid., p. 192.

Ibid., i. Preface, p. xviii.

Conceivably Bowerbank misunderstood the Declaration's purpose, for he also subscribed
to Colenso's Defence Fund, at least, according to De Morgan, in Athenaeum, 7 January 1865, p. 22.

The journals of T. A. Hirst (Royal Institution), 11 September 1864. See Brock and
MacLeod, Life of Hirst, op. cit. (2). Hirst's reply is not in Berger, Documents, op. cit. (10).

De Morgan, in Athenaeum, 1 July 1865, p. 19, gave 30, and was so followed by Chadwick,

De Morgan, Athenaeum, 1 July 1865, p. 19.

McLeod saw this as an advantage, a pledge by the younger generation of men of science.
See Berger, Documents, op. cit. (10), p. 81. The substitution of the term 'Students' for Brewster's
recommendation, 'Cultivators', was probably an attempt to forestall criticism.

Ibid., pp. 39–40, an anonymous letter to The Times, 22 July 1864, attributed by Berger
to Hofmann's colleague, John Percy.

De Morgan, Athenaeum, 1 July 1865, p. 19.

L. Levi, Report of the British Association for the Advancement of Science, 1868 (London, 1869),
pp. 169–73, 196–7. Levi analysed the membership figures of 120 learned societies in the United
Kingdom and found an aggregate membership of 60,000, which reduced to 45,000 if an allow-
ance was made for overlapping membership. We have further reduced this figure by excluding
membership of the Royal Geographical Society, the Antiquarian Society, and various printing
societies; i.e. the figure of 40,000 refers solely to membership of natural and physical science
societies. For membership figures for 1860, see R. M. MacLeod and E. K. Andrews, Selected
science expenditure and manpower statistics, 1850–1914 (typescript, Science Policy Research Unit,
University of Sussex, 1968, 1970). Our 'realistic' figure of 5000 is derived from Levi's data on
metropolitan societies.

Horace G. Hutchinson, Life of Sir John Lubbock (London, 1914), i. 57–8. A copy of the
memorial and John Lubbock's reply can be found in Royal Society MSS., HS, 13.12.

Royal Society MSS., HS, 13.12, Herschel to Spottiswoode or Lubbock (c. February 1861).

J. D. Hooker to J. Lubbock, 29 February 1861, quoted in Leonard Huxley, Life and
letters of Sir J. D. Hooker (London, 1918), ii. p. 54.

Ibid.
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45 Journals of Hirst, op. cit. (39), 25 September 1864, f. 1688. Clearly too, Herschel and Bowring's efforts had been effective; Hirst copied their 'excellent' letters into his journal.

46 The Bath chronicle, 19 September 1864, p. 3 (letters of Herschel and Bowring); Editorial, 'A word about ourselves', 29 September, p. 5.

47 Saturday review, 24 September 1864, p. 386.

48 Identified from a marked file copy in Bill, op. cit. (10), p. 265.

49 A 'plot' because 'in the case of clergymen, all signs of clerical character (i.e. Revd, etc.) are erased'; see Athenaearum, 29 October 1864, p. 556. The printed list does not entirely support this slur. See below.

50 Saturday review, 24 September 1864, commented on this phrase that it was not part of Christian creed even if it was believed by many people. Quoted in Bill, op. cit. (10), pp. 264–5.

51 Athenaearum, 8 October 1864, pp. 463–4.

52 Ibid., p. 464.

53 De Morgan withdrew; see ibid., 29 October 1864, p. 566. The degree should have read 'M.A.' not 'M.D.'.

54 Graves, op. cit. (41), iii, 620 (letter of 2 October 1864).

55 Athenaearum, 29 October 1864, p. 566. Although Berger, Documents, op. cit. (10), is clearly only a selection of letters, and those who signed did not necessarily enclose letters, it is of interest that 39 of the 55 replies are negative. These include Babbage, Boole, Huxley, Playfair, Sharpey, and Stokes.

56 Journals of Hirst, op. cit. (39), 6 November 1864, f. 1702.

57 Royal Society Council minutes, iii (1864), p. 219 (3 November 1864).


59 Athenaearum, 19 November 1864, p. 672. It is possible that De Morgan knew Berger through their mutual interest in the decimal and metric systems. (Bowring initiated the British decimal system with the florin in 1849.)

60 E.g. within scientific societies. It will be recalled that De Morgan was to resign from University College, London, over the College's refusal to appoint the Unitarian Revd James Martineau to the chair of mental philosophy and logic in 1866.

61 Sophia De Morgan, From matter to spirit (London, 1863). Just before his death De Morgan was also much interested in a Free Christian Union, or multi-denominational brotherhood; however, it proved too sectarian. See Sophia Elizabeth De Morgan, Memoir of Augustus De Morgan (London, 1882), p. 365.


64 Arthur H. Tabrum, Religious beliefs of scientists, including one hundred hitherto unpublished letters on science and religion from eminent men of science (London: North London Christian Evidence
League, 1910). A second, enlarged edition appeared in 1913. Both editions, which were designed to answer the propaganda of the Rationalist Press Association, introduced an Introduction by Revd W. H. Brock, who later published, on behalf of the Christian Evidence Society, The religion of scientists; being recent opinions expressed by two hundred fellows of the Royal Society on the subject of religion and theology (London, 1932). See also K. A. Kneller, S.J., Christianity and the leaders of modern science (London, St Louis, Freiburg, 1911). This first appeared in German in Stimmer aus Marie-Loach, Katholische Monatsschrift, Heft 84 u. 85 (Freiburg, 1903). We should like to thank Father J. L. Russell for informing us of these inquiries. A recent example of this genre is Frederick E. Trinklein, The God of science: personal interviews with thirty-eight leading American and European scientists on the nature of truth, the existence of God and the role of the church (Grand Rapids, Michigan: Eerdmans, 1971).

71 C. Babbage, Reflections on the decline of science in England and on some of its causes (London, 1830); [A. B. Granville], Science without a head, or the Royal Society dissected (London, 1830). By 1860 the percentage of peers to ordinary fellows was 4.6 per cent, and the ratio of scientific to non-scientific fellows was 52.6 per cent to 47.4 per cent; see Sir Henry Lyons, The Royal Society, 1660–1940 (Cambridge, 1944), p. 341.

72 De Morgan gives 62 of 600 Fellows; see the Athenaeum, 1 July 1865, p. 19. Our figure of 605 British Fellows is taken from the 1864 Anniversary Report, Proceedings of the Royal Society of London, xiii (1863–4), 520, where the total Fellowship is given as 655, of whom 50 were foreign members.

73 This assumption is unsubstantiated and would repay close scrutiny. Inspection of the Royal Society catalogue of scientific papers suggests that the assumption was unwarranted; e.g. John Hogg published nearly 50 papers in the Philosophical magazine and many minor natural history journals.

74 De Morgan, op. cit. (72), has 19, but misread the name of Sir John Maxwell (created 1820) for the youthful James Clerk Maxwell: Chadwick, op. cit. (1), p. 8, follows this erroneous reading. Those publishing in the Philosophical transactions were Bell, Bowerbank, Brewster, Brooke, Challis, Calvert, Gilbert, Glaiser, Gose, Harley, Higginbottom, Hoskins, Hunt (who was missed by De Morgan), T. W. Jones, Joule, Macdonald, Moseley, Stenhouse, and Col. Sykes. De Morgan’s figure is correct if Hunt is substituted for Maxwell.

75 The overall median age of the signatory Fellows in 1865 was 62; on average they were within fifteen years of their deaths.


77 Barrister and geologist who found the oldest mammalian remains from rocks of Purbeck group, see F. Boase, Modern English biography [hereafter cited as Boase] (6 vols., London, 1892; reprinted, 1965).

78 Officer in Bengal Engineers; wrote miscellaneous scientific papers in India (Boase).


80 Physicist and Vice-President, British Medical Association (Boase).

81 Nottingham surgeon and temperance advocate, who wrote on tritons, tadpoles, and frogs (Boase).

82 Chemist and ironmaster (Boase).

83 Zoologist and Vice-President of Zoological Society (Boase).


85 Ophthalmic surgeon and writer on natural theology; e.g. The wisdom of the Almighty displayed in the sense of vision (London, 1851), and Evolution of the human race from apes, a doctrine unsanctioned by science (London, 1876). He contributed many papers to the Proceedings of the Royal Society of London (Boase).

86 Coal gas engineer (Boase).

87 Surgeon at St Thomas’s Hospital, London (Boase).

88 Eighth baronet, politician and economist (Boase).
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94 Lieutenant of the Yeoman of the Guard, 1836–42 (Boase).


98 Physician to St Luke's Hospital, London, interested in insanity (Boase).


100 Politician, Captain in the West Kent militia 1838–54 (Boase).

101 Berger, Documents, op. cit. (10), p. 86 (Sedgwick to Groves, 13 February 1865). Both Brewster and Sedgwick were invited to write to The Times in support of the Declarationists' 'findings'; but declined to do so on the grounds of age, infirmity and fear of controversy. The Declaration issue is not discussed in J. W. Clarke and T. M. Hughes, Life and letters of Adam Sedgwick (2 vols., Cambridge, 1890).

102 Tyndall papers (Royal Institution, London), typescript, t.2998 (n.d. but c. 16 September 1864).

103 Lyons, in The Royal Society, op. cit. (73), calculated that of the 630 Fellows in 1860, 330 could be considered scientific; and that of that number approximately 8 per cent were chemists, 10 per cent geologists, and 36 per cent in medicine. Of the 48 Fellows who could be described as 'scientific' 15 per cent were interested in chemistry, 9 per cent in geology, and 32 per cent in medicine.


105 Chemist, career spent partly in Japan. See Journal of the Chemical Society, ciii (1913), 746.

106 See text and note 18.


108 See text and note 19.

109 Philosophically minded physical chemist; professor of technical chemistry at Anderson College, Glasgow. See Journal of the Chemical Society (1921), 2130–1.

110 Athenaeum, 1 July 1865, p. 19. The signatory concerned was J. T. Banks, professor of physics at Dublin University who was an Hon. Fellow of King's and Queen's College of Physicians.

111 S. P. Barchett.

112 Alexander Beattie.

113 E.g. J. F. Mariller and Gustav Masson. For Berger's Harrow connexions, see Bill, op. cit. (10), pp. 262, 266.

114 Saturday review, 24 September 1864, quoted in Bill, op. cit. (10), p. 266.


116 Thus, the vigorous debate concerning the ethics of, and need for, vivisection may have hindered biological research. On this subject, see R. D. French, Antivivisection and medical science in Victorian Society (Princeton, 1972).


119 We should like to thank Dr Gerrylyn K. Roberts for raising these speculations concerning Hofmann and the Royal College of Chemistry. There is no evidence, however, to suggest the existence of an 'established' religion in the College. Any 'uncertainty' concerning the College's future was resolved by the appointment of Frankland (an agnostic) to succeed Hofmann, and by the move to South Kensington in 1872.


122 Transactions of the Victoria Institute or Philosophical Society of Great Britain, i (1867), Preface. Eleven signatories of the Declaration were among the founder members of the Victoria Institute.


124 Berger, Documents, op. cit. (10), p. 52 (Berger to Lord Belper, 6 September 1864).


126 Quoted in Chadwick, op. cit. (1), p. 12; T. H. Huxley, 'The Origin of Species', Westminster review, April 1860, p. 596 (reprinted in Darwinian essays [London, 1899], p. 52). Nor were they interested in doubting the efficacy of prayer; see F. Galton, English men of science (London, 1874), and Galton, 'On the causes which operate to create scientific men', Fortnightly review, old ser. xii (1872), 345-51.


130 Chadwick, op. cit (1), pp. 1-23.

131 Athenaeum, 1 July 1865, p. 20.