The problem of disenchantment: scientific naturalism and esoteric discourse, 1900-1939
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FIVE SCHOOLS OF NATURAL THEOLOGY: RECONCILING SCIENCE AND RELIGION

It ... is almost a duty of the scientific man, however little he may desire or feel himself competent for the task, to attempt to rebuild as well as destroy, and to state, so far as he can, what is his view of the matters in which hitherto the priest and the philosopher have, with insufficient knowledge of external nature, been left to themselves.

Frederick Soddy, *Science and Life* (1920), 150.

**INTRODUCTION: THE REVIVAL OF NATURAL THEOLOGY**

Natural theology was an integral part of natural philosophy in the early modern period and up until the Enlightenment. This changed with the professionalization of the natural sciences in the 19th century. Victorian scientific naturalism was forged in the context of the new profession’s boundary-work and emancipatory programme against clerical control of education and knowledge production, and in this context, theology became a “negative Other” of natural science. In addition to this, the post-Kantian philosophy of science that dominated much thinking in epistemology after the Enlightenment had clearly separated religion and science as two distinct domains, not to be conflated or mixed.

After a few decades of relative obscurity, however, natural theology re-emerged with new vitality, although not as an integrated part of research. Instead, new institutional platforms were created where scientists, philosophers and scholars could meet to discuss religious and spiritual implications of current research. In the context of new institutions, lecture platforms, and publication forums, a number of new natural theologies were forged from the raw materials provided by contemporary debates in the natural sciences. By taking scientific knowledge about the natural world as a starting point for developing new positions on human values, ethics, the afterlife, and the relation between the divine and humanity, these new natural theologies clearly broke with the dictums of a disenchanted world. In this chapter, which concludes our
discussion of the problem of disenchantment in the major scientific disciplines, we shall look closer at the systems of new natural theology that emerged at the beginning of the 20th century, relate them to their scientific contexts, and discuss the major institutions and forums in which they were created.\(^1\)

I will distinguish between five schools of natural theology that were present in the period between 1900 and 1939. These five schools will be presented as a series of successive speculative practices, sometimes overlapping, but generally following a historical succession which mirrors conceptual developments in the natural sciences that we have discussed in previous chapters. Some of the schools were highly influential at the time, but have since withered away or been cast into oblivion. Some influenced later streams of thought, but have largely been forgotten in their original form due to the source amnesia of later authors. Others have become canonical and foundational to schools of thought that are still very much alive today, with only minor adaptations and supplements added by later disciples.

My main objective is to describe and analyse the situation in a specific historical period, explain the conditions from which these schools arose, and their relation to each other and to broader cultural concerns. I will however also, as far as possible, try to assert the fate of each school in a broader historical perspective. This, I believe, will contribute to our current understanding of science-religion debates, as well as the intellectual and cultural background and scientific foundation of a number of trends that are still with us today. Before presenting each of the five schools, however, I will first discuss the major institutions that facilitated the new natural theologies. At the end of the chapter, I will suggest some striking theological trends in these schools, which reveal intriguing structural similarities with what is nowadays often seen as “Western esotericism”.\(^2\)

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1. **The Institutions of Natural Theology**

The new natural theologies of the early 20th century were for the most part created by scientists and philosophers, with the occasional humanities scholar, theologian, and

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1. This project should be seen as a continuation of Peter Bowler’s foundational work in *Reconciling Science and Religion* (2001).
2. See especially Hanegraaff, *Esotericism and the Academy*.
autodidact pulling his part. If we define natural theology substantially, in terms of the intellectual effort to do speculative theology on the basis of natural knowledge, then we might identify this activity in a number of locations inside and outside of academia, and at a number of different levels of scholarship – including in newspaper and magazine articles, Theosophical, occult, and spiritualist publications. If, however, we focus on more systematic and self-conscious attempts to mobilise scientific and academic professionals to invest in natural theology, then our perspective gets considerably narrower, and a small number of institutions and publication outlets emerge as particularly important. On the institutional level, I will focus on three forums in particular. In order of importance, these are the Gifford Lectures in Natural Theology, the Society for Psychical Research (with daughter and sister societies), and the Alchemical Society. Let me briefly justify the selection.

**THE GIFFORD LECTURES**

The Gifford Lectures provide the most important site for the developments that concern us in this chapter. Held at the four Scottish universities of Aberdeen, Edinburgh, Glasgow, and St. Andrews every year since their inception in 1888, these lectures have engaged such scientists and philosophers as William James, Hans Driesch, Henri Bergson, Arthur Eddington, Alfred North Whitehead, Niels Bohr, and Werner Heisenberg to speak about the benefactor’s, Lord Adam Gifford, desired topic: natural theology. Several of the lecture series later became ground-breaking publications in their own right. James’ *Varieties of Religious Experience* and Whitehead’s *Process and
Reality remain among the most famous and are still widely read, but we shall encounter a great number of other important works produced in this setting.

The origin of this highly influential lecture platform is found in the will of Lord Adam Gifford (1820–1887), a successful barrister and judge from Edinburgh. Gifford was known as a brilliant and clear-thinking man by his contemporaries, and had a reputation as an advocate and judge who cherished common sense above technicalities and bureaucracy. In addition to his professional and personal reputation, however, he was also known for his deep interest in "philosophical religion", and was widely used as a lecturer on the topic. His interest in such topics was influenced by the American transcendentalist Ralph Waldo Emerson (1803–1882), whom Gifford had seen lecturing in Edinburgh in 1843.5 Upon reaching old age, Gifford would recall Emerson’s lecture as 'far from impressive'; nevertheless, it had kindled a long-lasting interest which would lead him to donate a big sum of money at his death to form the Lectures in Natural Theology.6

A sum of £ 80,0007 was bequeathed to Scotland’s four existing universities, towards the establishment of ‘a Lectureship or Popular Chair for “Promoting, Advancing, Teaching, and Diffusing the study of Natural Theology,” in the widest sense of that term’.8 Lord Gifford’s will continued to “define”, in a highly ornate way, what was meant by natural theology ‘in the widest sense’, namely:

The Knowledge of God, the Infinite, the All, the First and Only Cause, the One and the Sole Substance, the Sole Being, the Sole Reality, and the Sole Existence, the Knowledge of His Nature and Attributes, the Knowledge of the Relations which men and the whole universe

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5 Witham, Measure of God, 19-20.
6 Ibid., 19.
7 In 1888 this was a significant amount. If going by a simple retail price index calculation – i.e. the relative price of typical products that an average consumer would buy – it is equal to £6,950,000 in 2010. However, to estimate the full economic significance of the sum as set aside for funding a specific project, we should look at its relation to the total UK economy. In that case, measured as a share of the Gross Domestic Product, £80,000 was as large a share of the 1888 economy as £87,500,000 was in 2010. Calculations and analysis are obtained from measuringworth.com.
8 Lord Gifford’s will, dated 21 August 1885, has been made available on the Gifford Lectures' website: http://www.giffordlectures.org/will.asp (accessed 5 December, 2011).
bear to Him, the Knowledge of the Nature and Foundation of Ethics or Morals, and of all Obligations and Duties thence arising.⁹

Gifford gave instructions for how the lecturers were to be chosen, and what kind of conditions were to apply. Importantly in an age when British universities were still largely held under a regime of confessional censorship, the lecture platform was to be completely non-confessional and liberal: ‘The lecturers appointed shall be subjected to no test of any kind, and shall not be required to take any oath, or to emit or subscribe any declaration of belief, or to make any promise of any kind; they may be of any denomination whatever’.¹⁰ Furthermore, Lord Gifford stressed the role that science was to have in these lectures, writing that the lectures should treat their subject as a strictly natural science, the greatest of all possible sciences, indeed, in one sense, the only science, that of Infinite Being, without reference to or reliance upon any supposed special exceptional or so-called miraculous revelation. I wish it considered just as astronomy or chemistry is.¹¹

Theology was to be based on a rigidly scientific basis; knowledge through “revelation” was to be strictly avoided. In other words, Gifford wanted no separation of metaphysics and ethics from the domain of scientific inquiry. Despite the claim of being non-denominational and requiring no formal oath, test, or commitment from their speakers, the lectures were thus clearly based on a specific theological agenda. Above all, the Gifford Lectures were predicated from the beginning on a rejection of the intellectual sacrifice, as we defined it in chapter one. Ethics, metaphysics, and theology not only could, but ought to be considered ‘just as astronomy or chemistry’ – that is, simply as special fields of natural science. Any claim to special divine revelation was a disqualification, and there was no room for strict biblical literalism.

Another very crucial set of directions which Gifford stated in his will concerned outreach and popularization. First of all, ‘lectures shall be public and popular, that is, open not only to students of the Universities, but to the whole community without matriculation, as I think that the subject should be studied and known by all, whether

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⁹ Lord Gifford’s will, unpaginated.

¹⁰ Ibid.

¹¹ Ibid.
receiving University instruction or not’. The fees should be kept as small as possible, to ensure that as many as possible would be able to attend, since Gifford consider that ‘such knowledge [of natural theology], if real, lies at the root of all well-being’. Finally, a publication scheme was encouraged: patrons were advised to ‘make grants from the free income of the endowments for or towards the publication in a cheap form of any of the lectures’. These directions and recommendations would turn out to be crucial for the future influence of the Gifford Lectures.

The affordable volumes that would come out of the lectureships with the help of Gifford’s money have reached a wide readership and had an impact on thinking about religion and science both in educated lay audiences and among specialists of the many disciplines touched upon by the lecturers. The importance of the financial contribution cannot be overestimated; without Lord Gifford’s lectures, books such as *Process and Reality* and *Varieties of Religious Experience* would never have been written. It is crucial to note in this regard that it was not so much any pre-existing interest in “natural theology” on behalf of all of these thinkers that brought them to the Gifford’s, nor – in the beginning at least – any big honour associated with lecturing in this setting. Rather, it appears that the considerable amount of money paid to lecturers was absolutely essential in establishing its position. As the German theologian Otto Pfleiderer remarked about his own lectures in 1894: ‘The honor is not great but the honorarium is colossal’. Over the years the relative size of the honorarium would decline, but for each illustrious scholar recruited to the programme in this early phase, the institution gained in social and cultural capital. By the middle of the 20th century, the Gifford Lectures had reached the point where money would be unnecessary to secure the best speakers; with the honour firmly established, and the original mission perhaps more liberally interpreted, the Gifford’s have since gone on to produce solid scholarship in

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12 Ibid.
13 Ibid.
15 We are in other words talking of a standard transaction of monetary capital for social and cultural capital. Cf. Pierre Bourdieu, ‘The Forms of Capital’.
disciplines such as history, anthropology, mainstream philosophy, and popular science.16

THE SOCIETIES FOR PSYCHICAL RESEARCH
Another institution that has had a great influence on the development of new natural theologies in the early 20th century is the Society for Psychical Research, and its many daughter and sister organisations in Europe and the United States. Although these societies will be given a much more detailed treatment in Part Three of this book, a brief introduction is in order already at this stage. The original British SPR was established in 1882 by a group of scholars and friends based at the University of Cambridge, and was dedicated to the study of “psychic phenomena” from a strictly scientific perspective.17

Among the psychic phenomena that interested the society were the mediumistic phenomena connected with spiritualism, the phenomena of mesmerism, haunted houses and apparitions, and “thought-transference”. Separate committees were initially established to allocate resources to each of these domains.

The society soon attracted an impressive number of Victorian scientists, scholars, and intellectuals. In addition to the coterie of Cambridge scholars who had founded the society – especially professor of philosophy Henry Sidgwick, and the classicists Frederic Myers and Edmund Gurney – one would find physicists such as William Barrett and Oliver Lodge as central members, while later Nobel laureates Lord Rayleigh, J. J. Thomson, Charles Richet, and Henri Bergson would all at some point feature on lists of

16 Among the later lecturers we find, for example, the Cambridge historian Owen Chadwick, whose influential _Secularization of the European Mind_ started as Gifford lectures. The very influential analytic philosopher Alfred J. Ayer’s lectures resulted in the book _The Central Questions of Philosophy_, which is a general introduction to analytic theories of knowledge. Hannah Arendt lectured on aspects of thinking, judgment and free will, Paul Ricoeur lectured on hermeneutics, the anthropologist of religion Mary Douglas lectured on ‘Claims of God’, and the high-profile cosmologist, humanist, and sceptic Carl Sagan produced his crypto-pantheistic _Varieties of Scientific Experience_ in the context of the Gifford lectures. In addition, several scholars who are considered experts on the relation between science and religion from a historical perspective have given Gifford lectures in the last few decades, notably Ian Barbour ( _Religion in an Age of Science_, 1989), John Hedley Brooke, and Geoffrey Cantor (co-authors of _Reconstructing Nature_, 1995). A full list of lecturers, topics, and publications can be obtained from the Gifford Lectures’ website.

17 Standard histories of this period include Gauld, _The Founders of Psychical Research_; Turner, _Between Science and_; Oppenheim, _The Other World_.

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members and officers of the society. Arthur Balfour, Sidgwick’s brother-in-law and later Prime Minister of the United Kingdom, was a long-standing member and even acted as president of the society between 1892 and 1895. The SPR was very much an elite institution, founded and run by members of high society. Balfour – who is today perhaps best known for drafting the 1917 Balfour Declaration when he served as foreign minister – is a good illustration of the overlap between the various institutions of new natural theology, for he was also invited to give a Gifford Lecture in 1914, published as *Theism and Humanism*, while still serving as vice-president of the SPR.

British psychical research should furthermore be seen as part of the general movement of Victorian naturalism, but one that challenged the dominant position taken by such demagogues as John Tyndall and T.H. Huxley. Whereas Huxley had launched the concept of “agnosticism” to describe the proper naturalistic attitude towards religion and the various claims related to religion in all its forms, psychical researchers emphasised the empirical dimension of religious claims. To these researchers, the survival of the soul after death, for example, was a strictly empirical question that could be investigated through scientific experiments with spiritualist mediums, and through the study of apparitions and so-called “veridical hallucinations”.\(^\text{18}\) Furthermore, one believed that knowledge of the soul’s qualities and potentials, far beyond that of normal physical existence, could be achieved through the study of such “supernormal” faculties as telepathy and clairvoyance, vindicating a minimum of “spirituality” on which a “scientific religion” could be based. It is particularly in this aspect that psychical research is of interest to the study of new natural theologies, for it has created a discourse on religion, science, and human experience that has impacted on a number of other fields, and been interconnected with several schools of new natural theologies.

Psychical research provided a number of forums for developing and disseminating knowledge that fed into the broader field of natural theology. The *Journal of the Society for Psychical Research* (1882 to present) and the *Journal of the American Society for Psychical Research* (1907 to present) are important sites, as are the proceedings of these societies. Furthermore, a number of important books were written and published by members of the SPR, building on the experimental and theoretical discourses of psychical research, and popularising their possible philosophical

implications. This kind of work, furthermore, bridged many disciplines, especially physics, biology, and psychology. The SPR thus helped facilitate speculative exercises of new natural theology intersecting with all of these fields.

THE ALCHEMICAL SOCIETY

The Alchemical Society is the final institution to be included here. In comparison with the two other institutions it is by far the smallest, in terms of size, duration, output, and impact alike. The Alchemical Society only existed for three years, from 1912 to 1915, cut short by the Great War. Nevertheless, it deserves inclusion here because it is a striking example of a highly significant trend. As was the case with the SPR, the Alchemical Society was structured as a normal scientific association, with a board of officers, open meetings with papers and responses, and the publication of proceedings which included reviews of related science publications in addition to the papers presented at general meetings and minutes of discussions. When one looks at the society's membership, however, one finds that it included not only chemists and historians of chemistry and alchemy, but also Theosophists, psychical researchers, and other occultists.

This intriguingly mixed membership was reflected even on the level of officers. The president Stanley Redgrove was a professional chemist, but also wrote numerous books and articles on spiritual implications of modern science. The occultist and self-taught scholar Arthur Edward Waite was an Honorary Vice-President of the society, and so was Isabelle de Steiger, a central occultist in the late-Victorian occult revival, with connections to people such as Mary Anne Atwood, Anna Kingsford, and H. P. Blavatsky. De Steiger was also involved with the SPR, as was the ordinary member of council, Clarissa Miles. Miles was a dowser of some repute, and had also published research on telepathy in the SPR journal in 1908. As if there were not a strong enough occult presence in the Alchemical Society already, Ralph Shirley, the editor of *The Occult*

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19 For the list, see 'Report on First General Meeting', *Proceedings of the Alchemical Society*, Vol. 1.1, 1.
20 For Waite and de Steiger's involvement with the Alchemical Society, see Morrisson, *Modern Alchemy*, especially chapter one. For de Steiger's place in the history of Victorian occultism, and particularly her relation with Mary Anne Atwood, see Godwin, *Theosophical Enlightenment*, 232, 240-241, 245-246. See also her autobiographical work, de Steiger, *Memorabilia*.
21 Clarissa Miles, 'Experiments in Thought-Transference'. On her work on dowsing, see the review by two psychical researchers in William Barrett and Theodore Besterman, *The Divining Rod: An Experimental and Psychological Investigation*, 160-165.
Review, was appointed Honorary Vice-Secretary in March 1913 – thus formalising ties between the Alchemical Society and Shirley’s occult publishing venture.22

The Alchemical Society is an interesting institution because it gives a face to a borderland between science and occultism that was important for the development of some of the new natural theologies we will be discussing. Furthermore, the link with The Occult Review is important, as it adds a social and institutional dimension to the overlap in content. Redgrove, the president of the Alchemical Society, was one of the decidedly most productive contributors to The Occult Review. A count reveals that he published as many as 244 items in total between 1908 and 1940. These were articles, notes, and book reviews covering topics as diverse as modern physics and chemistry, alchemy, mathematics, modern philosophy, Rosicrucianism, hermeticism, mysticism, magic, psychical research, spiritualism, and 19th century occultism in general. The review literature is particularly interesting, as it shows how new natural theologies were being received by the occultist press.

2 FIVE SCHOOLS OF NATURAL THEOLOGY

The renewed interest in the early 20th century in combining natural science with religion led to the creation of five distinct, although sometimes overlapping, schools of natural theology. In this lengthy section, I will discuss each of these schools in turn, relating them to each other and to the shifting context of scientific discovery, innovation, and controversy that we have considered in preceding chapters. In a roughly chronological order of appearance, the five schools that will be discussed are: 1) ether metaphysics; 2) psychic enchantment; 3) theologies of emergence; 4) modern alchemy; and 5) quantum mysticism. All of these schools exemplify the desire to pursue religion on the grounds of science, or to create a worldview in which there is a harmonious and overlapping relationship between the two. In doing this, they represent rejections of disenchantment, born, as a rule, from the world of academia.

I will discuss the major publications that went into the creation of these theologies, present the main ideas of the works, the development and provenance of these ideas, and situate the works and their authors in the appropriate contexts.

Although much of the material that makes up each of these schools has been created in the context of one or several of the institutional spaces discussed above, other contexts also exist and will be discussed when relevant.

(I) ETHER METAPHYSICS

With “ether metaphysics” I refer to the attempt to make use of the physical concept of the ether to connect science and religion, and to suggest answers to a wide range of metaphysical questions. The questions typically addressed by ether metaphysics may be distinguished as three connected types: 1) cosmological questions concerning the nature and connectedness of the cosmos, and the relation between the divine, the world, and humanity; 2) questions of anthropology, concerning the nature of human beings, “souls”, and the relation between minds and bodies; 3) questions of cognition or epistemology, concerning the potentials of humanity’s mental faculties and their capacity for knowledge, both of the world, of other minds, and of “higher realities”.

This school is an intriguing and on several levels paradoxical one. It has by far the oldest roots of the five schools distinguished here, being largely a product of 19th century physics. In the 20th century, theories of ether were becoming increasingly anachronistic. As far as support from the scientific community goes, the metaphysics of ether in the 20th century was thus largely a one-man show, run by Sir Oliver Lodge (1851–1940) – a respected physicist in the late Victorian period who became increasingly involved with spiritualism and psychical research after the turn of the century. The development of ether metaphysics as a school of natural theology in the early 20th century was thus in a collaboration between a very limited number of scientists, and a larger number of occultist writers, basing themselves on a physical worldview that already belonged to the past.

The ubiquitous role of the ether in Victorian physics was briefly mentioned in chapter four. As a result of Thomas Young’s celebrated 1801 double-slit experiment, which had successfully produced an interference pattern between two beams of light demonstrating that light behaved as waves rather than particles, physicists had inferred the existence of a luminiferous ether to explain how light waves could travel through seemingly empty space. The scientific legitimacy of the ether was thus built on

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23 I have previously developed this characterisation of ether metaphysics in Asprem, ‘Pondering Imponderables’.
hypothetical inference and deduction rather than direct observation. This use of deductive reasoning and inference – breaking with Newton’s famous dictum to “feign no hypothesis” (hypotheses non fingo), and the whole inductivist empiricism of natural philosophy24 – would become absolutely central to the metaphysics of ether as well. In the context of Maxwellian physics, the ether was eventually used to explain much more than just the phenomena of optics.25 Electricity, magnetism, and even matter itself were all understood as essentially etheric phenomena. Thus, Lord Kelvin launched the theory that matter was composed by vortices in the ether, while Hendrik Lorentz and J. J. Thomson temporarily defended an “electromagnetic worldview” in which the ether was essential.26

A school of ether metaphysics was already taking shape among Victorian physicists, related to the success of Maxwell’s field theories and the explanatory power of the ether.27 For some, this took on the proportions of natural theology, at least by suggesting answers to questions of cosmology. One notable example is found in the correspondence between the Irish ether physicist George Johnston Stoney (1862–1911) and his nephew, the prominent Maxwellian physicist George FitzGerald (1851–1901).28 Stoney connected ether mechanics with an idiosyncratic reading of George Berkeley’s subjective idealism. Unlike the classical mechanics of Descartes and Newton, where motion and matter together constitute the fundamentals, Stoney contended that only motion was fundamental. Pondering the question of what, then, was really moving, Stoney and FitzGerald were compelled to think in terms of thoughts in a divine mind: ‘Can we resist the conclusion that all motion is thought?’, FitzGerald asked.29 Could it be that the phenomenal world is produced by motions in the great universal “Mind of God”, or, as FitzGerald would put it, ‘that all Nature is the language of One in whom we live,

24 See P. M. Heimann, ‘Ether and Imponderables’, 64; on the shift from induction to hypothetic deduction, see Larry Laudan, ‘The medium and its message’; cf. Laudan, Science and Hypothesis, 130.
25 For a full discussion, see Hunt, The Maxwellians.
26 For the etheric vortex theories of atoms, see ibid., 212-216. For the electromagnetic worldview, see McCormmach, ‘H. A. Lorentz and the Electromagnetic View of Nature’.
27 For discussions of this aspect of ether physics, see especially Cantor, ‘The Theological Significance of Ethers’; Noakes, ‘Religion and Politics in Late-Victorian Physics’; Grean Raia, ‘From Ether Theory to Ether Theology’; Asprem, ‘Pondering Imponderables’.
and move, and have our being’". Another notable contribution to this genre was the controversial *Unseen Universe*, published anonymously in 1875 by physicists Balfour Stewart and Peter Guthrie Taite. This book used the ether to defend the existence of vast invisible realms beyond the known universe, sustaining Christian notions of deity, the spiritual body, and an afterlife, even attempting to make supernaturalism consistent with the laws of thermodynamics. It will be remembered from chapter two that thermodynamics was one of the scientific grounds on which Victorian naturalism claimed to discredit the possibility of supernatural agency. Although controversial, this type of metaphysical speculation was entirely in line with an ether physics that was explicitly trying to dispense with the category of “matter” as being fundamental, while basing everything in physics on an invisible, intangible, all-pervading, interpenetrating, and absolute substance.

The situation was already much different by the end of the first decade of the 20th century. At that point, Einstein’s special relativity had emerged on the scene, and the wave theory of light was again losing ground to the new, vaguely corpuscular theory of light quanta. Maxwell’s field theories were shown to be expressible in Einstein’s new relativistic language, which had no use for an absolute reference frame. Apparently, there was not much need for the ether anymore, and the concept was gradually phased out of physics. The new natural theology of ether therefore had to be based on quite different conceptual resources, in addition to the old Victorian physics. This was largely supplied by occultism, spiritualism and psychical research, forming a curious feedback loop with Oliver Lodge’s writings. Exploring the emergence of this modern variety of ether metaphysics takes us through a curious network of relations, connecting Theosophical speculations with the impact of trench warfare during WWI, spiritualist séances with Maxwellian field theory, and psychical research with an increasingly outmoded ether physics.

While the whole field of ether metaphysics is broad and includes literature spanning scientific as well as occult publications, the classics of the genre considered as a new natural theology are found in the post-1900 oeuvre of Oliver Lodge. By the turn

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30 Ibid.

31 Note that this was a slow process, and that Lodge was not alone among older generation to still cling to a notion of ether. However, he was certainly the most extreme one. Cf. Goldberg, ‘In Defense of Ether’.

32 For details on Lodge’s life, consult his biography, Jolly, *Sir Oliver Lodge*. 

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of the century, Lodge had left practical work in physics, dividing his efforts between administrative tasks as principal of Birmingham university (from 1900 to 1919), work in psychical research (he was president of the society from 1901 to 1903, and again in 1932), delivering popular lectures, and writing numerous works of popular science and intellectual debate. It was the beginning of a tremendously voluminous career as a writer, and it is only possible to discuss a few selected pieces from his vast production. Among the popular books Lodge authored before the outbreak of the Great War we find several titles that deal with natural theology in the sense of arguing for the compatibility of science and Christian theology, including *The Substance of Faith Allied with Science* (1907), *Man and the Universe* (1908), *Immortality of the Soul* (1908), and *Reason and Belief* (1910). In addition to these, Lodge published in the general area of science and metaphysics, notably his widely discussed *Life and Matter* (1905), which provided a thorough criticism of Ernst Haeckel’s monistic materialism. As Lodge wrote in the introduction, the book’s aim was entirely metaphysical, ‘intended to formulate, or perhaps rather to reformulate, a certain doctrine concerning the nature of man and the interaction between mind and matter.’ The book *Modern Problems*, published in 1912, collected several ‘essays on debatable subjects’ that he had published elsewhere or given as lectures over the years. In addition to essays on politics, war, economics, and social reform, there were essays on philosophical issues such as free will and determinism, and one engaging with the philosophy of Henri Bergson. Lodge also published a number of more mainstream popular science books. One of these was the short book *The Ether of Space* (1909). It was first and foremost an introduction to ether theory – and an astonishingly outmoded introduction to electrodynamics for 1909 – but it also contained some hints of ether metaphysics, such as when it suggested the connections between the mind, senses, ether, and ‘Acquaintance with the External World’.

It was, however, with the Great War that Lodge’s career would take a turn towards a more exotic and unusual form of natural theology in which spiritualism was

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34 The latter, entitled ‘Balfour and Bergson’, was originally written on invitation to the *Hibbert Journal* earlier in 1912, as a response to Arthur Balfour’s criticism of Bergson. Lodge knew both men personally through their involvement with psychical research. See Lodge, *Modern Problems*, 24-53.

merged completely with ether theory and the vitalistic notions that he had defended in works such as Life and Matter. After losing his son Raymond in the trenches in 1915, Lodge joined séances with a number of spiritualist mediums who claimed to attain contact with the fallen young soldier. Convinced that he had indeed communicated with his deceased son through different mediums, Lodge went on to write and publish the best-selling book, Raymond, or Life after Death (1916), detailing his experiences from these séances. Lodge soon became a spiritualist celebrity – a status he shared with the author Arthur Conan Doyle, who had also lost a son in the trenches – and he would spend much time lecturing on the survival of death, the spiritualist hypothesis, and psychical research. In 1919 he published The Survival of Man: A Study in Unrecognised Human Faculty, where an overview of psychical research up until that point was given to reinforce and defend his now clearly stated conviction that the survival of man after bodily death was 'based on a large range of natural facts'. The same year Lodge published an intriguing article in The Hibbert Journal, entitled ‘Ether, Matter, and the Soul’, in which ether theory was used in a more explicit manner to fit the spiritualist hypothesis of survival with a physical world picture based on ether. A few years later the book Ether & Reality: A Series of Discourses on the Many Functions of the Ether of Space (1925) appeared, which once again defended ether theory and expounded a fully-fledged ether metaphysics. After several similar publications, reiterating the major points, Lodge's life's work was finally completed with My Philosophy (1933), a book that was still interpenetrated by ether, now decades after his colleagues had moved on to very different fields of inquiry. Lodge's continued preoccupation with the theories of a bygone age has led one scholar to describe his final book as 'a Victorian work in the midst of the twentieth century'.

What were the major ideas expressed in this vast literature, and in what sense do they constitute a new natural theology? To begin with, Lodge’s “ether of space” becomes the mediator not only of optics and electromagnetism, but also a means for connecting the fields of religion and science. This is most clear in books such as Ether and Matter

36 Lodge, The Survival of Man, viii.

37 Including titles such as Why I Believe in Personal Immortality (1928), Phantom Walls (1929), Beyond Physics, or The Idealization of Mechanism (1930), The Reality of a Spiritual World (1930), Demonstrated Survival (1930), and Conviction of Survival (1930).

38 David B. Wilson, ‘The Thought of Late Victorian Physicists’, 33
and *My Philosophy*, but it is present in the argumentation in much of his other work. To look closer at the precise functions played by ether, and how Lodge finds that science supports specific forms of “theology”, we should return again to the distinction between cosmological, anthropological, and cognitive aspects of the metaphysics of ether. The *cosmological* dimension of ether metaphysics was already present in the 19th century, as the cases of Stoney, FitzGerald, Stewart and Tait attest to. Lodge’s general perspective on this does not diverge much from theirs, in that he, too, may be seen to operate with an idealistic notion of the ether – something which truly becomes apparent in his *Beyond Physics*, subtitled *The Idealisation of Mechanism*. The ether’s cosmological function is clear enough: it embraces the entire cosmos, and interpenetrates all objects. This much was standard physics. In Lodge’s version, building on the vortex theories of Lord Kelvin and others, the ether was also the origin of all things, including matter, and thus served as a kind of *prima materia* or *Urstoff*. In addition, Lodge considered the ether to be the only truly permanent and unchanging entity in the universe. In a poetic turn of language, heavily laden with religious sensibilities, Lodge would describe the emotional reaction spurred by pondering the cosmic ether in the following way:

> By a kind of instinct, one feels it [the ether] to be the home of spiritual existence, the realm of the awe-inspiring and the supernal. It is co-extensive with the physical universe, and is absent from no part of space. Beyond the furthest star it extends; in the heart of the atom it has its being. It permeates and controls and dominates all. It eludes the human senses, and can only be envisaged by the powers of the mind.

The latter sentence refers to the fact that the ether cannot be seen or experienced in any way, not even manipulated through experimental procedures, but that it can only be known through theoretical inference. For Lodge, this entirely abstract concept was nevertheless felt to be ‘the home of spiritual existence’.

To understand the full scope of Lodge’s ether metaphysic, however, we must see the cosmological function in relation to the anthropological. These connections were summed up in a rather pompous manner at the end of *Ether and Reality*, where Lodge

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39 For the development of etheric vortex theories of atoms, see e.g. Bruce J. Hunt, *The Maxwellians*, 212-216.


wrote that ether ‘is the primary instrument of Mind, the vehicle of Soul, the habitation of Spirit. Truly it may be called the living garment of God.’ To understand what exactly was meant with this, we need to look closer at the place of the ether in Lodge’s thought about human minds, souls, and of life itself. Central to Lodge’s more idiosyncratic ideas on these topics is the concept of the “etherial body”. This concept developed through Lodge’s writings between 1900 and 1933, mostly in the context of psychical research, and especially in response to encounters with spiritualism.

The earliest confirmed instance of Lodge using the term “etherial body” is in his 1902 presidential address to the SPR. At this point, the term had already been developed in the literature of Theosophy. Part of a broader reorientation of Theosophical doctrine, the second generation Theosophists Annie Besant and Charles Webster Leadbeater reinvented the society’s esoteric doctrines on subtle bodies, and developed a new conception of the “etherial body” or “double”, which was supported by the same type of inferential reasoning that was common in ether physics. Outside of the more obscure literature of the Theosophical journals, one could read about the concept in two recent publications by Charles Webster Leadbeater, *The Astral Plane* (1900), and *Man and His Bodies* (1902). It is likely that Lodge knew about these publications and was familiar with their basic content, seeing that there was much overlap between the society he was a president of, and the Theosophical society. Nevertheless, we do not find even a single reference to Theosophical sources in his work. This could very well be a deliberate act of sanitisation; at any rate, we are left with nothing more than a suggestion, and must instead proceed to look at the way Lodge develops this concept in the context of his own work.

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42 Lodge, *Ether and Reality*, 179.

43 This predates the first mention noted by intellectual historian David Wilson, who dated the term to Lodge’s 1908 book on *Science and Immortality*. Wilson, ‘The Thought of Late Victorian Physicists’, 34; cf. Lodge, ‘Presidential Address [March 1902]’, 47.

44 See especially Besant, ‘Man and His Bodies’ (two installations, 1896). Central to this reorientation on the lines of late-Victorian physics was the programme of ‘occult chemistry’ initiated by Leadbeater and Besant around the same time. As we shall see in chapter eleven, this Theosophical research programme was entirely based on ether physics; when the first monograph publication of results appeared in 1909, it even came with an appendix entitled ‘The Aether of Space’ – the only scientist referenced in it was Sir Oliver Lodge. Besant & Leadbeater, ‘Appendix’ to *Occult Chemistry*, vii-viii. Cf. Besant, ‘Occult Chemistry’ (1895).
Lodge’s first mention of ethereal bodies must be seen in the context of a crisis in psychical research at the turn of the century. Not only had two of the SPR’s leading members, Henry Sidgwick and Frederic Myers, died within a short lapse of time, but there was also a growing realisation that one of the society’s most central explanatory concepts had failed. This was the idea that telepathy, a term coined by Myers, was the operative function in séance phenomena, and that telepathy operated through a mechanistic transmission of “thought-waves” propagating through the ether, in exact analogy to Maxwellian field theory. This theory, which was offered as an alternative to the spiritualistic hypothesis of survival (it was assumed that mediums telepathically received information from the living instead of actually communicating with the dead), had been conceived of and expressed by Lodge himself in the 1880s. However, as experimental evidence of telepathy from card guessing trials and other relatively small-scale quantitative studies began to pile up, the researchers started noticing a feature that could not be reconciled with the theory of electromagnetic brain-waves. The distance between sender and receiver in telepathic communications appeared to be without relevance to the results obtained, thus contradicting what was known about electromagnetic phenomena in general. Indeed, it smacked of the very “action-at-a-distance” model that the British ether physicists so much deplored.

Instead of distrusting the data – either for failing to reveal a true correlation with distance, or for being due simply to methodical errors or trickery in the first place – the SPR physicists were compelled to suggest increasingly more esoteric mechanisms and interpretations to account for the results. In successive presidential addresses to the Society over the years 1902-1904, both Lodge and William Barrett (president in 1904) dismissed the brain-wave hypothesis, while opening up for increasingly speculative interpretations. According to Barrett, the hypothesis of brain-waves was ‘only unscientific talk, we know of nothing of the kind’. Lodge now seemed to agree,

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45 For a thorough discussion of the crisis in psychical research at the beginning of the century, see chapter eight below.

46 Lodge, ‘Experiments in Thought Transference’, 191. For a closer discussion of explanatory strategies in psychical research, see chapter eight.


48 Barrett, ‘Presidential address [January 29th 1904]’, 333.
speculating that mediumistic phenomena might be purely ‘spiritual and psychical
events’.\footnote{Lodge, ‘Presidential Address [1903]’, 19.}

By the early 1900s Lodge had thus already come to reconsider the spiritualistic
hypotheses of survival. In addition to the scientific reasons discussed above, he had
personal reasons for taking this turn. Lodge’s original scepticism towards mediums had
been tried already in 1889, when he attended sittings with Leonora Piper, the Boston
medium sent for testing at Cambridge by William James.\footnote{For Lodge’s response to these sittings, see Lodge, \textit{The Survival of Man}, 190-343; cf. Jolly, \textit{Sir Oliver Lodge},
92-95.} During these sessions, Lodge
believed he was brought into contact with his dead aunt; as he later recounted he had a
hard time explaining how the medium was able to replicate the aunt’s whole mannerism
and way of speech down to the most quirky little detail. In his autobiography Lodge
remembered how the 1889 investigations of Mrs Piper had him ‘thoroughly convinced
not only of human survival, but of the power to communicate, under certain conditions,
with those left behind on the earth’.\footnote{Lodge, \textit{Past Years}, 279.}

It was “trance lucidity”, or the \textit{mental} phenomena of spiritualism, that prompted
Lodge to take the survival hypothesis seriously.\footnote{Cf. Lodge, ‘Presidential Address [1902]’, 38-43.} The “physical phenomena” had always
been less popular among SPR researchers, always remaining under the suspicion of
trickery and fraud. Lodge was no exception, readily admitting that ‘apports, scents,
movements of objects, [and the] passage of matter through matter, bear a perilous
resemblance to conjuring tricks’, further cautioning that ‘in so far as mediums find it
necessary to insist on their own conditions [during séances], so far they must be content
to be treated as conjurers’.\footnote{Ibid., 48.}

There was, however, one highly contested physical phenomenon Lodge would
admit some reality for: the phenomenon of “materialisation”. Again Lodge could trace
his conviction back to personal experience. In 1894-1895 he had witnessed the Italian
medium Eusapia Palladino (1854–1918) producing “ectoplasm”, an ethereal (at least in
the non-technical sense) substance often pouring forth from the medium’s own

\footnote{Lodge, ‘Presidential Address [1902]’, 38-43.}
organism, in which parts of an evoked spirit could take on physical form.\textsuperscript{54} Sometimes it would involve the production of “spirit arms”, extending from the body of the medium. In other cases the ghostly figure of a spirit would show its face, or even present itself in full figure to the sitters. The typical approach of SPR researchers had been to suspect conscious fraud in such cases. Lodge, on the other hand, commented that he ‘could conceive it possible, if the evidence were good enough, that some other intelligence or living entity, not ordinarily manifest to our senses’ did in fact produce these unusual phenomena.\textsuperscript{55} The exact origin and nature of such intelligences he remained quite undecided about: they could be deceased human beings, but equally well discarnate, ‘extraspatial’ beings – or even extraterrestrials from far off inhabited planets!\textsuperscript{56}

It was in this precise context that Lodge first advanced the idea of an etherial body: from a physical point of view, materialisations could be allowed if the discarnate entities possessed ‘what may be called an etherial body’.\textsuperscript{57} If in possession of such a body, it was even likely that the entities were already ‘in constant touch with our physical universe’, since the ether is continuous with matter. This was not so far from the views expressed by Tait and Stewart’s \textit{Unseen Universe} in 1875. During materialisation, however, an etherial body could ‘utilise the terrestrial particles which come in its way, and make for itself a sort of material structure capable of appealing to our ordinary senses’.\textsuperscript{58} Sometimes, Lodge added, the physical form acquired by an etherial body might be too weak to be seen by our eyes, but still solid enough to be captured on a photo. This would account for the hugely popular “spirit photography”,
which, Lodge hastily added, he personally had yet to be convinced was a genuine phenomenon.

As we saw in the brief overview of Lodge’s oeuvre, the Great War dramatically increased his commitment to spiritualism for yet more personal reasons. During this phase of his life, a more developed idea of the ethereal body was put forth. A particularly clear example is found in an article published in the liberal Christian Hibbert Journal in 1919, entitled ‘Ether, Matter, and the Soul’. The first part of the article was a popular-scientific account of the nature of electricity, electrons, and matter. Now fourteen years after Einstein’s papers on special relativity had been published, the central concept of this account was still the ether: matter was still viewed in the Victorian nomenclature of ‘modified ether’.59 But Lodge was prepared to go much further than this. Continuing his previous speculation on the ethereal body, Lodge hypothesised that ‘every sensible object has both a material and an ethereal counterpart’.60 While we only have direct, everyday knowledge of one of these bodies, ‘we have to infer’ the ethereal counterpart.61 As Lodge put it a few years later: ‘Matter we apprehend early, when young children, but as we grow up we infer the Ether too, or some of us do’.62 This, no doubt, paralleled the centrality of hypothetical inferences in ether physics in general.

The most striking innovation from his earlier writings on the ethereal double was Lodge’s suggestion that to every material object – not just human beings, or even living things – there was a corresponding ethereal body. This means that we must picture Lodge’s cosmology as containing an entire parallel universe of unseen things, consisting of perfect and eternal duplicates of all that exists (and, indeed, that has ever existed) in our material, corruptible world. Lodge now held that this extension of the concept was necessary from a purely physical point of view. Without a corresponding ether body ‘there could be no unity or coherence or any individual object at all – nothing but a dust of disconnected atoms’.63 Among its many mechanical properties, the ether was, after all, supposed to be ‘the medium of cohesion, it is that which holds the particles together’.64

60 Ibid., 257.
61 Ibid.
62 Lodge, Ether and Reality, 166.
64 Ibid.; cf. idem, Ether and Reality, 160.
Lodge seemed to be saying that the ether bodies gave form to substance; furthermore, these forms were eternal and indestructible, but nevertheless real, and not mere abstractions. In a sense, the world of ideas had been made immanent through the ether.

The individual, form-providing ether bodies shared the ‘perfect properties’ of the all-pervading, undifferentiated ether of space: it was permanent, perfect, indestructible; the ether knew no ‘temporal disabilities’, such as fatigue, friction, or dissolution. This had implications for a topic even more profound: the nature of the human soul. At the one hand we seem close to a philosophical conception of the soul as the “form” or “defining essence” of man; on the other, we find in Lodge’s conception a possible foundation for a spiritualist understanding of the survival of personality.

Lodge complained that philosophical and theological notions of the human soul have always been vague, unclear, and incomprehensible. Now for the first time, by considering the etherial counterpart to the human body, we have the prospect of an intelligible conception of the soul: ‘We shall find, I think, that we possess, all the time, a body co-existent with this one that we know – a body essentially substantial and related to space and time, not really transcendental, but yet in no way appealing to our present senses’. This last point is important for understanding the epistemic status attributed to “the soul” thus conceived. Since the etheric body is immanent, not transcendent, it becomes a possible object for scientific investigation – even though we cannot perceive it directly with our ordinary senses. By conceiving the soul in terms of ether, it becomes an object of “scientific” natural theology. It must, however, also be seen in connection with the desire for a scientific validation of the spiritualist survival hypothesis. Providing an alternative to the mechanistic hypothesis of telepathy was very much a reason why Lodge had proposed ether bodies in his 1902 address to the SPR, as we have seen. In his 1919 essay the connection was explored somewhat further; Lodge contended that there was interaction with both etherial and material bodies during “psychic actions”, ‘and not only with one, as hitherto contemplated by perhaps the majority of philosophers’. While theoretical constructs of telepathy had only referred to communication between living brains, Lodge now offered a model where the ether body played a more active part.

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66 Ibid., 258.
67 Ibid., 259.
If the ether body is involved with psychic actions generally – and one of the principal properties of the ether is its perfection and indestructibility – could it be that, after death, the ‘etherial portion ... actually continues its psychic connection, apart from any material counterpart’? This, Lodge contended, ‘is a question for evidence, not for dogmatism’. Such evidence, furthermore, could be found in the research programme of the SPR, particularly through carefully crafted investigations of spiritualist phenomena.

When psychic investigation guided by ether metaphysics had become sufficiently advanced, Lodge argued, one could expect astonishing technological breakthroughs and applications. There is a hint of a possible future technology when Lodge writes that:

The interactions which are possible between the matter of this planet and the ethereal bodies or souls associated with spiritual intelligence will ... be understood; and with this knowledge, under proper regulation, a new power will be gained; and this new power will be utilised and put into action.

Lodge does not specify what this power would be, but among the consequences of its discovery he lists knowledge of the meaning of human life, and ‘familiar intercourse across the veil or gulf of death’. It is clear that he envisages some kind of psychic power, related to the control of the ether body, which would grant efficient access to higher knowledge.

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There is one final aspect of Lodge’s conception of the ether body that we need to consider, namely its connection with the concepts of “Mind” and “Life”, and the relation to vitalism. David Wilson noted that, for Lodge, “life”, “mind”, and “spirit” all refer to ‘the same human entity’. While it is true that there is a close connection, equating the concepts comes at the price of overlooking some nuances that, although they might seem trivial at first, are actually quite significant. Grean Raia rightly gives attention to

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68 Ibid.
69 Ibid.
71 Wilson, ‘The Thought of Late Victorian Physicists’, 33 n. 13.
the fact that Lodge’s conception of these terms were informed by various philosophies of life and mind prominent in the early 20th century, especially Bergson’s vitalistic response to the theory of evolution, along with the psychological theories of Myers and James. All these thinkers belonged to Lodge’s social and intellectual network within the SPR, and he personally knew and corresponded with them.

Following Bergson’s example, Lodge considered life and mind to be closely connected concepts. Firmly placed in a vitalist discourse, life is seen as an “animating principle”, possessing the ability to animate matter by creating “protoplasm”. From there, however, Lodge embraced a concept of evolution, and viewed mind as emerging from animated matter. When mind has thus “come into” physical reality, mind had the mysterious power of exerting force over matter, manipulating and reorganising it through the movement of animated bodies. This vitalistic notion, not unlike Hans Driesch’s entelechy, which we discussed in the previous chapter, was present in Lodge’s thinking at least since his 1905 attack on Haeckel’s philosophy. In 1908 he expressed it like this:

Life is not matter, nor is it energy, it is a guiding and directing principle; and when considered as incorporated in a certain organism, it, and all that appertains to it, may well be called the soul or constructive and controlling element in that organism.

In his 1912 article discussing the philosophy of Bergson, Lodge made it clear that “life”, although conceived vitalistically, should not be seen as adding anything to matter in terms of energy or force; instead, life works through directing what is already permanently present in the world, and it always works with the laws of physics, never in any way against them – or despite them, as Bergson sometimes seemed to suggest. This, in the end, brings Lodge to consider the familiar concept of teleology as being at the base of life, and particularly in its aspect as mind. As Grean Raia has adequately summed it up:

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72 Grean Raia, ‘From Ether Theory to Ether Theology’, 39 n. 28.
73 See Lodge, Ether and Reality, 159.
74 Lodge, Immortality of the Soul, 22.
75 Lodge, Modern Problems, 39-41.
76 Ibid., 42-53.
Mind was Life, but in a higher condition. As Life advanced to Mind, and Mind likewise attained higher states of what Lodge [following Bergson] called "becoming", Mind organized more and more complex states of matter. Thus, there was a kind of tandem evolution, matter and mind (form and content), advancing together in reciprocal complexity, two parts of a unified whole.\footnote{Grean Raia, 'From Ether Theory to Ether Theology', 39.}

The connecting medium for all of this vitalistic and teleological activity was the ether and the ethereal body. Lodge was now prepared to go further than recognising the ether as being merely a medium. Instead he speculated that the differentiated ether of the ethereal body was the real seat of animation itself, the “vessel” of both life and mind: “it is the Ether which is really animated, and ... this animated ether interacts with matter; I suggest that the true vehicle of life and mind is Ether, and not matter at all.”\footnote{Lodge, \textit{Ether and Reality}, 166.} Lodge held the vitalistic “animating principle” to be itself an etheric phenomenon with an existence independent of matter, as opposed to something that had itself evolved from matter following ordinary mechanistic principles. It was entailed in evolution, true, but rather as its active, igniting spark, not as its product. Although he would sometimes define his vitalistic conception closely to Bergson's \textit{élan vital}, Lodge had argued along these lines for some time already. For instance, a vitalistic conception was at the base of his attack on Haeckel's “monistic philosophy” at the beginning of the century.\footnote{The vitalistic thrust is particularly clear in the rejection of Haeckel's purely materialistic conception of the origin and development of life. See Lodge, \textit{Life and Matter}, chapters III, VI, IX, X.} Lodge's vitalistic orientation was thus independent of Bergson. Furthermore, while it also bears resemblance to Driesch's vitalism, Lodge never refers to Driesch, or indeed to any other major or explicit vitalistic philosopher besides Bergson. Instead, as I will suggest later, theories of vitalism seem to have been “home grown” in British psychical research.

The location of the life principle and the connected concept of mind, that 'higher kind of animation',\footnote{Lodge, \textit{Ether and Reality}, 162.} in the ether rather than in matter is a fundamental assumption of Lodge's argument for the possibility of survival. Lodge considered ether bodies to be indestructible, just like the undifferentiated ether of space. If life and mind, therefore, were dependent on the material bodies only for purposes of interacting with the

\footnote{Grean Raia, 'From Ether Theory to Ether Theology', 39.}
\footnote{Lodge, \textit{Ether and Reality}, 166.}
\footnote{The vitalistic thrust is particularly clear in the rejection of Haeckel's purely materialistic conception of the origin and development of life. See Lodge, \textit{Life and Matter}, chapters III, VI, IX, X.}
\footnote{Lodge, \textit{Ether and Reality}, 162.}
material world, but not for their existence as such, then it was indeed very likely that life, mind, and even personality, could survive the death of the material body – even in a more unrestrained and perfect constitution, dwelling perhaps eternally in the “unseen universe” of etherial existence.

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This discussion of Lodge’s ether metaphysics has taken us through a bewildering set of arguments, presented in a number of different contexts, and dealing with a number of conceptual issues, from ether physics to vitalism, from telepathy to the survival of death. The concept of etherial bodies stands at the heart of these discussions. It is through this concept, more than any other, that Lodge’s thinking becomes a full scale natural theology based on a metaphysics of ether. The ether body is offered to explain the relation between the soul and the body, the nature of life and mind, and, through general reflections on the nature of ether, the concept is used in support for eternal life. Most importantly in this context, however, it is based on a physical concept, the luminiferous “ether of space”, which is supposed to bring all the connected issues into an empirical domain reachable by science. It is in this, more than anything else, that ether metaphysics constitutes a natural theology.

Ether metaphysics provided a worldview that emphasised the immanence of the divine, through the all-encompassing, interpenetrating, but invisible ether. This medium functioned as a kind of “world soul”; it was the seat of animation in general, the source of life, and also the plane on which much mental functioning was thought to take place. Furthermore, by the existence of etherial bodies and the possibility of working on the etheric plane, where the soul properly had its domain, possibilities were opened for attaining higher forms of knowledge: telepathy and clairvoyance were possible in one’s own lifetime through such uses of the ether, as was contact with the dead and with other “extraspatial” beings and “spiritual intelligences” that might exist in the vast reaches of the etheric realm. There was even the promise that such esoteric epistemologies might one day be tamed by a sufficiently advanced psychical research, and tapped through new psychic and etherial technologies for the benefit of humanity at large. These technologies would eventually make it possible to answer those eternally vexing questions of human values and the meaning of life.
Ending this discussion, we should briefly reflect on the broader contemporary and historical impact of ether metaphysics. Lodge's work was widely read in his own days, and was part and parcel of the wider popular interest in spiritualism between the World Wars. He provided a leading example for those who wished to connect spiritualism, science, and a liberal form of Christianity. However, the metaphysics of ether was built on scientific resources that were getting increasingly obsolete while the system was being constructed. Its scientific basis had been rendered completely obsolete by the time Lodge wrote his final book on the subject in 1933. Meanwhile, a new generation of scientists and popularisers were writing about such exotic things as wave/particle duality, the relativity of space and time, complementarity, and the uncertainty principle. In this period of rapid scientific change, ether metaphysics was already doomed to its demise. Its impact on mainstream audiences since has thus been minimal.

There is, however, one segment in which the etheric school of natural theology has remained influential, and that is in occultism. A kind of feedback loop was formed between Lodge and the Theosophists, in which his earlier work influenced the reconceptualization of “ether bodies” and the “etheric plane” in Theosophy, before these, in turn, were adopted by Lodge himself and given further legitimacy through his work in psychical research and ether metaphysics. Indeed, if we want to consider ether metaphysics in a broader sense, and not only through its most “scientific” and “elite” spokesperson, we must also integrate the occult milieus in which these ideas were incubated. We have already seen that the developments in second generation Theosophy are very significant in this respect. But we may also extend the focus to look at the way ether theories were received and discussed in a major “non-denominational” occultist press such as *The Occult Review*. When I went through the entire catalogue of articles, and looked closer at the twenty articles published in this occultist journal with “ether” or “etheric” in their titles, there was one striking observation to be made: while the earliest articles, particularly those appearing between 1914 and 1918, deal with typical Theosophical speculations on “etheric planes” and bodies, the later ones, published in the 1920s and 1930s seem to be more interested in the scientific aspects of ether. At first sight, this is contrary to what one would expect, given that ether theories were getting more rather than less marginal from a purely scientific standpoint. The reason for the switch in focus in the occultist interest in the ether, however, becomes
evident when one takes a closer look: the journal published a review of Lodge’s *Ether and Reality* in 1925, which sparked a number of follow-ups and a significant late reception of ether theory.\(^81\) The editorial of the following issue, for example, was dedicated to ‘The Ether of Space’, clearly using it as an occasion to revive esoteric darlings of the past:

> The ether, though postulated by the Brahmins of those days, and regarded as a reality in the teaching of mediaeval mystics such as Boehme, for instance, in his mystical philosophy, has not been accepted and recognized in the scientific world generally until the commencement of the present century, and even now it is regarded by some merely as a plausible hypothesis. Recent discoveries, however, which have a very practical bearing on everyday life, such, for instance, as wireless telegraphy, seem absolutely to demand its recognition; for, apart from the assumption of its existence, the *modus operandi* on which the whole system is based appears to be inconceivable.\(^82\)

It is rather remarkable to note the utter ignorance displayed by the author (most likely the editor Ralph Shirley) as to the history of the ether in physics; the claim that ether ‘has not been accepted and recognized’ by science ‘until the commencement of the present century’, and that ‘recent discoveries’ have finally made it acceptable, clearly amounts to turning the whole history of ether physics on its head. A better understanding of the works discussed is evident in some of the other articles published in *The Occult Review* during this period, particularly those written by Stanley Redgrove, the founder of the Alchemical Society. In 1930, Redgrove published a review of another of Lodge’s books, *Beyond Physics*, in which he not only lauded the vitalistic and idealistic conceptions of Lodge’s physics, but also delivered a sharp criticism of the aging physicist’s failure to take into account the newer developments of his discipline.\(^83\)

In the context of *The Occult Review*, Redgrove was however pretty much alone in stressing the importance of looking at newer theories than those of Victorian ether physics. It is interesting to note that articles on relativity are much more scarce than articles on ether, even as late as the 1920s and 1930s. The first one appeared in 1921, and was a book review of a popular introduction to general relativity, again written by

\(^{81}\) Edith Harper, ‘Review of *Ether & Reality* by Oliver Lodge’.

\(^{82}\) Editor [Ralph Shirley], ‘The Ether of Space’, 1.

Redgrove. Another observation is that, when "relativity" was mentioned, we find completely metaphorical extrapolations of the concept into philosophy, experience, and mysticism that appear completely uninformed of the physical theories. Relativity was at the very least being discussed in The Occult Review, which is more than can be said about quantum theory: somewhat surprisingly, quantum mechanics appears not to have been mentioned at all. On this basis it seems that the reception of relativity and quantum physics in occultism was a very slow process, and that occultists largely remained concerned with the physical theories of yesteryear rather than with what was happening in contemporary physics.84

(II) PSYCHIC ENCHANTMENT

Several strong lines of interconnection and overlap exist between ether metaphysics as it was developed in the writings of Oliver Lodge and what I will here call “psychic enchantment”. They share an origin in late-Victorian psychical research, but represent different directions of development. While ether metaphysics developed out of the physicist branch of psychical research, the school I will discuss here grew out of the other major strand of the prospective discipline, oriented towards psychology, with links to physiology, biology, and philosophy. In the early stages of psychical research, the pioneers of this stream of thought were figures such as Frederic Myers and William James. However, at the beginning of the 20th century, new generations would pick up the thread, and develop new variations of psychic enchantments. This section will introduce some main figures, developments, and motifs, but a full treatment of parapsychology will be saved for Part Three.

Seen as a school of new natural theology, psychic enchantment may be defined as the attempt to take poorly understood, often “unconscious” sides of the human mind, together with various types of “anomalous” behaviour and experience, as a starting point for actively countering a “disenchanted worldview”. The frequent postulation of anomalous hidden powers of the mind is central to this branch of natural theology. As these capricious and mysterious powers of minds and organisms ran counter to the mechanisation and “disenchantment of life”, they were offered up as a possible

84 Additional indications of this trend will be discussed in chapter eleven, where I discuss the reception of relativity and quantum physics in the context of second-generation Theosophy.
foundation for an alternative, reenchanted worldview. The scientific context is found in the discourses discussed in chapter five, especially the vitalism controversy in biology, the eclipse of Darwinism, the methodological debate in psychology, as well as in philosophical discussions concerning free will and determinism. However, it is within psychical research and parapsychology that these academic discourses are fully utilised in support of agendas for reenchantment.

Since psychical research and the development of modern parapsychology in the 1920s and 1930s will be considered at length in the next part of this study, I will restrict myself at present to introducing some major trends. A fuller discussion of their development, particularly in relation to the attempts of making parapsychology “truly scientific” and an integral part of the official university system, will be provided in Part Three.

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A convenient starting point for the natural-theological school of psychic enchantment may be found in the monumental but peculiar work of the classicist turned pioneer psychical researcher Frederic Myers (1843–1901).85 As Frank Miller Turner has put it, ‘Myers was determined to discover by the methods of science the existence of the human soul, which earlier religious and philosophical writers had apprehended intuitively’.86 To Myers, and a generation of other intellectuals standing in the midst of the late-Victorian conflict between science and religion, the old dogmas of the institutionalised religions had lost their appeal, and seemed now empty and unconvincing. Furthermore, it seemed that any religion of the future would have to be based on solid scientific foundations. This, of course, is a familiar theme by now, and it is precisely the effort to realise it that made psychical research produce several avenues of natural theology. Myers’ own contribution rested not only on carefully collecting data, testing mediums, and building up a base of evidence for survival, but also on developing a complicated psychological and metaphysical theory of the mind.

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85 For a recent and imaginative discussion of Myers’ approach to psychical research, see Jeffrey Kripal, *Authors of the Impossible*, 36-91. However, cf. F. M. Turner, *Between Science and Religion*, 104-133. See also my own discussion of Myers in subsequent chapters.

Central to Myers’ theory was the concept of the “subliminal Self”, which was only spelled out in its full form in the two volume work, *Human Personality and Its Survival of Bodily Death*, published posthumously in 1902. According to Myers, consciousness may be divided into a sub- and a supraliminal spectrum, the subliminal containing all urges, instincts, desires, motivations, and faculties that are below the threshold of our everyday awareness. While this category corresponds roughly with the notion of the “unconscious” in psychoanalysis, Myers also suggested that there was an entire “self” hidden in the subliminal, and that the extraordinary supernormal occurrences and faculties studied by psychical research happened around individuals in whom the subliminal self and various subliminal faculties were arising to the surface and mastered at will.

It was also with reference to this conception that Myers located the theoretical plausibility of survival. The possibility of survival was, furthermore, connected to Myers’ concept of the “metetherial”, meaning “[t]hat which appears to lie after or beyond the ether; ... the spiritual or transcendental world in which the soul exists”.87 To this was connected a form of vitalism, not unlike the one which Lodge developed – no doubt partially under the influence of Myers. The subliminal and the metetherial were supposed to explain the origin of life, conceived of as a particular kind of “energy” or “force”, but also its ultimate indestructibility:

earthly Life itself embodied as it is in psycho-physically individualised forms is, on the theory advanced in these pages, a product or characteristic of the ethereal or metetherial and not of the gross material world. Thence in some unknown fashion it came; there in some unknown fashion it subsists even throughout its earthly manifestation; thither in some unknown fashion it must after earthly death return.88

In a review of *Human Personality* published in the journal *Mind*, psychologist William McDougall observed that Myers’ motivation in writing the book had been not

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88 Ibid., 97. It should be noted that Myers’ theory of the subliminal Self had a deep impact on William James, and particularly on his personal views on religion and psychology, as expressed in the final chapter of *Varieties of Religious Experience*, and in its postscript. See especially James, *Varieties of Religious Experience*, 511-519, where he defends a religious conception following the general lines of Myers’ example.
only to systematise the data on survival, but also to suggest how it may be incorporated into a unified theory, which can be harmonised with ‘the general body of accepted scientific truth, and especially with the well-founded conclusions of modern biology and psychology’. This was, as we have seen in the previous chapter, an area in which McDougall would also spend much of his time speculating. As he clearly observed concerning Myers’ project,

the belief that a man’s personality can survive the death of his body implies that that personality is, or is the manifestation of, some entity that is capable of living and manifesting essentially similar forms of activity, namely thought, feeling and emotion, when its relations with the body are destroyed by the dissolution of the latter. On the other hand, modern biology has taught us to regard the body as an aggregation of individuals and its activities as the resultants of the co-ordination of the activities of these individuals ….

More precisely, Myers required some sort of mind/body dualism, even life/body dualism, to support the thesis of survival. At the same time, since Myers wanted to stay on good terms with established science he also needed to come to terms with the monistic view inherent to the conception of life in most of contemporary biology. Shortly put, Myers, and much of the programme of psychical research with him, simultaneously needed the best of two apparently irreconcilable worlds. This basic tension has remained at the core of psychical research ever since, and it is precisely in this tension that psychic enchantments seem to thrive: it seeks the scientific credibility of the established sciences without the implications of disenchantment that often seemed attached to them.

The strong connection between psychical research and vitalism is a clear albeit little explored example of this inherent tension. It is hardly coincidental that both of the period’s two most well-known proponents of neo-vitalism, the (ex-)embryologist Hans Driesch and the philosopher Henri Bergson, gravitated towards psychical research during the 1910s and 1920s. Both even served as presidents of the SPR: Bergson in 1913 – the same year as he gave his Gifford lectures in Edinburgh – and Driesch in 1926 and 1927. As we saw in the previous chapter, neo-vitalism arose within scientific

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90 Ibid., 515.
embryology around the turn of the century, with Driesch's experiments with sea urchin eggs, and the development of his concept of entelechy. As such, it was for a while discussed as a serious position on the nature of life within the embryological community. Driesch's notion of entelechy quickly grew out of touch with the scientific developments of biology, however, and instead of changing his position, Driesch kept his ideas, left the field, and drifted towards the more hospitable milieus of psychical research and philosophy of nature. Already in his Gifford lectures, published as The Science and Philosophy of the Organism (1908), Driesch had insinuated that entelechy could shed light not only on the development of living organisms, but also on the obscure question of life after death. As he drifted further away from professional biology in the years that followed, this initial hunch was developed into a full scale research program by the 1920s.

As was the case with a number of other figures we have met, it was the Great War and the difficult social and cultural situation ensuing that galvanised Driesch's already latent interest in parapsychology. Meeting Eleanor Sidgwick, the widow of the co-founder of the SPR, Henry Sidgwick, just before the war in 1913 had already made a deep impression on Driesch, but it was only in the 1920s that his views on the matter became explicit and publicised. Placed within the broader cultural crisis of Weimar Germany, particularly with the momentous revolt against “mechanism” and call for “holism”, Driesch found a new context for his vitalistic theories, and a way to expand its area of application. In 1923, Driesch published a programmatic article entitled ‘Der Okkultismus als Neue Wissenschaft’ in the German occult and parapsychological periodical, Psychische Studien, in which he argued that various “occult” phenomena could best be understood through his concept of entelechy. Indeed, by abandoning the mechanistic conception of life and mind in favour of his vitalistic theory, phenomena such as clairvoyance, telepathy, telekinesis, and even materialisation could be understood as the concentration and direction of the “life force” outside of the organism of certain exceptional individuals. On the pages of this article, and through a number of papers, lectures, articles and books written in the 1920s and 1930s, Driesch developed

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93 See Wolffram, Stepchildren of Science, 191-232; cf. Harrington, Reenchanted Science. See also my discussion of the Forman thesis in chapter four.
what Heather Wolffram has aptly characterised as a “supernormal biology”.\footnote{Wolffram, ‘Supernormal Biology’, 149-150, 155-157; cf. idem, Stepchildren of Science, 197-208.} During this period he would also attend controlled séances in the laboratory of the eccentric baron Albert von Schrenck-Notzing, who focused explicitly on “physical” phenomena such as materialisation, ectoplasm and telekinesis.\footnote{See e.g. Schrenck-Notzing, Materialisations- Phänomene (1914); idem, Physikalische Phänomene des Mediumismus (1920). Cf. Wolffram, Stepchildren of Science, 131-189.} Although Driesch followed the mainstream of Anglophone psychical research on this matter, keeping a generally sceptical attitude, he nevertheless had a theory ready for the controversial phenomena in his concept of entelechy: granted that the normal development of organisms is pushed by a non-material directing force, which organises and builds matter along certain teleologically pre-arranged paths, then the only exceptional thing with the physical phenomena is that they happen outside of the boundaries of the organism itself. Some of the phenomena, however, happen in clear continuity with the organism, such as when ectoplasm is excreted from various orifices of the medium’s body. On Driesch’s vitalistic reading, all these phenomena could be characterised as “exteriorisations” of the life principle.\footnote{Driesch, ‘Presidential Address: Psychical Research and Established Science’, 173; idem, Parapsychologie, 101-102; cf. Wolffram, ‘Supernormal Biology’, 156-157.}

In 1926 Driesch was elected president of the SPR, even though he had never performed any actual research in the area himself.\footnote{Driesch, ‘Presidential Address’, 172.} His lack of practical experience was, however, never a concern; Driesch’s theoretical work on vitalism had already been enthusiastically received by the psychical research community, and it was considered to be a significant enough contribution to the field to warrant Driesch’s presidency. As Wolffram suggests, Driesch ‘challenged the epistemological assumptions of a number of sciences including biology and psychology’, and his theory of entelechy seemed to offer a ‘scientific basis for the rejection of both mechanism and materialism’.\footnote{Wolffram, ‘Supernormal Biology’, 155-156.} In fact, the conscription of Driesch’s theories was part of a much larger tendency within psychical research to incubate vitalistic notions of mind and life as potent psychic enchantments. As mentioned already, Bergson had been elected president of the SPR just before the outbreak of war. Bergson’s brand of vitalism, which had its scientific and philosophical
basis in evolutionary theory rather than in experimental embryology, based on the
case of élan vital and focused mainly on notions of creativity, freedom, and novelty
(it notably excluded not only mechanism, but teleology as well), was already being
discussed in the British psychical research community – as evidenced by the previously
cited essays of Arthur Balfour and Oliver Lodge.

The SPR did not strictly need to import fashionable vitalistic philosophies from
the continent, as they merely added to strongly vitalistic leanings already present in the
work of nearly all the main British psychical researchers. The works of Myers, Lodge,
and William McDougall all display strongly vitalistic attitudes to the concepts of life and
mind. McDougall’s defence of “animism” and purpose-driven evolution, explored in the
previous chapter, was partially defended on grounds of psychical research. In the
1922 edition of his Vitalismus als Geschichte und als Lehre Driesch himself included
McDougall’s Mind and Body (1911) as evidence of a psychology that supported neo-
vitalism. Lodge, on his part, had attacked the materialistic monism of Haeckel and
postulated vitalistic views of his own, based on his ether metaphysics rather than on
sound biology. Considering these striking affinities it becomes clear that psychical
research, in its search for psychic enchantments, had strong leanings towards vitalism
from the start.

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Two further considerations concerning the importance of psychic enchantment remain
to be made, both having to do with the relative success of this particular school in terms
of impact and staying power. The eventual success of psychic enchantment would only
come after the discourse of psychical research had gone through another phase of major
reorientation. The first and most fundamental factor in this regard is the increasing
emphasis placed on experimentation and quantitative methodologies in parapsychology
from the late 1920s onwards. At the forefront in this experimental turn was the
American botanist turned psychical researcher, Joseph Banks Rhine, who, from 1929,
established a programme for experimental parapsychology under the supervision of

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99 McDougall, Mind and Body, 349-350
100 Driesch, Vitalismus, 207.
101 For a detailed discussion of this trend, see chapter eight below.
McDougall at Duke University, North Carolina. The new American experimentalist programme signalled a move away from the largely anecdotal form of reporting that had dominated the earliest forms of psychical research, but also from the “qualitative” investigations of individual high-profile mediums and psychics that had remained popular among continental researchers in particular. It also signalled an increased focus on strengthening the actual factual and evidential basis of the discipline through meticulous technical work in laboratories, at the expense of the more lofty and speculative philosophical vein that characterised people like Driesch. But perhaps most important of all, the experimentalist programme succeeded in establishing itself in an academic context, launching a scientific journal, supervising PhDs, and starting the route to full professionalisation. In short, a new kind of scientific legitimacy was secured for the experimentalist programme in psychical research, now re-branded as professional, academic “parapsychology”.

The second important factor is popularisation. Psychical research had always had a broad outreach, with strong publishing ventures and lecture schemes spreading psychic enchantments to the masses. However, with the new experimentalist programme, this outreach seemed to move from “occult publishing” to the more “legitimate” genre of popular science. Rhine was himself an important entrepreneur in this respect, for not only did he make sure to write popularising books about the mysterious world of parapsychology as soon as the first positive experimental studies were in, but he also made use of the new and powerful medium of radio – even broadcasting tests of “extra-sensory perception” live on the air every week for a whole year. By the outbreak of World War II, parapsychology had attained a completely new status, based on a professionalised, experimental research programme with a growing popular outreach, which largely continued to play on the philosophical and worldview...

102 See Asprem, ‘A Nice Arrangement of Heterodoxies’ for the process leading up to this. It will also be discussed in more detail in chapters eight and nine.

103 Schrenck-Notzing is again a clear example, but we should also mention the various researches of the French Institut Métapsychique International (founded 1919), and the many regional groups of the SPR.

104 The first one being Rhine, New Frontiers of the Mind (1937).

related questions that had previously dominated psychical research. This combination set the stage for a veritable psychic re-enchantment of the educated classes of the post-war West.

(III) Theologies of Emergence

Vitalism was not the only alternative to mechanistic materialism in the life and mind sciences in the early 20th century, but was part of a much broader anti-mechanistic and anti-reductionist current of thought surrounding the natural sciences. In chapter five we saw that, in terms of actual scientific recognition, positions related to organicism and holism were much more significant. Organicist positions stressed that higher-order entities, such as organisms or minds, could not be fully accounted for by an analysis of their constituent parts and the relations between them: the whole, in short, was more than the sum of its parts. This tricky position was generally opposed to reductionism and mechanism while it typically had less problems with materialism and monism. Organicists thus tried to dodge the bullet of dualism, a position that vitalists and proponents of psychic enchantments were almost always implicitly or explicitly afflicted with.

Doing this consistently was, however, a tricky feat to achieve, and it is perhaps not so surprising that organicists were often regarded as covert vitalists by their more mechanistic colleagues. The most influential philosophical current attempting to put organicism on a conceptually solid ground was “emergentism”. This is a school of philosophy of science that is still very much alive today, especially within the philosophy of biology and the philosophy of mind. Contemporary emergentists typically recognise a heritage to an interwar discourse developed by Samuel Alexander, Conwy Lloyd Morgan, and Charlie Dunbar Broad in particular, which commonly goes

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106 For a discussion of the value questions in Rhine era parapsychology, see especially David Hess, *Science in the New Age*, 76-85.

107 For the full argument of this claim, see Asprem, ‘Psychic Enchantments of the Educated Classes’.

108 See, for example, the discussions in Allen, ‘Mechanism, Vitalism and Organicism’, 267-269; Gilbert & Sarkar, ‘Embracing Complexity’, 3-5.

109 See, for example, the recent volume by Mark A. Bedau & Paul Humphreys, eds., *Emergence: Contemporary Readings in Philosophy of Science* (2008).
under the heading of “British emergentism”. However, while this heritage is recognised, the attempts of contemporary philosophers to harmonise their own views with those of the British emergentists in a transhistorical dialogue obscures the fact that this line of thought originally grew out of an explicit concern with natural theology. In fact, the first major work on emergence, Alexander’s Space, Time, and Deity, was given as Gifford lectures in natural theology in Glasgow in 1917, published in two volumes in 1920. The Stanford Encyclopedia of Philosophy’s entry on ‘Emergent Properties’ is even ready to describe Alexander’s philosophy as being ‘very close in detail to a standard form of non-reductive physicalism’, comparing some of his passages with the views of Jerry Fodor, glossing over the fact that Alexander’s notion of emergence was embedded in a heavily metaphysical and theological system that stands very far away from contemporary analytical philosophy of science.\textsuperscript{110} The connection to natural theology goes beyond Alexander, however: the influential term ‘emergent evolution’ was introduced by another series of Gifford lectures given by psychologist Conway Lloyd Morgan at St. Andrews in 1921. These lectures were published as Emergent Evolution in 1923, and were largely a commentary on Alexander’s previous lectures. Thus, when the philosopher C. D. Broad published his Mind and Its Place in Nature in 1925 – the only one of the three foundational works of emergentism not to have been developed as Gifford lectures\textsuperscript{111} – he could draw on (and sanitise) points that had already been made in the context of natural theology. In the present section we shall have a look at the philosophical content of British emergentism, but above all assess its theological aspect. As with the previous schools, I will also discuss the impact and spread of these natural theologies of emergence.

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British emergentism was constructed over the course of only a few years, from 1917 to 1925, by Alexander, Lloyd Morgan, and Broad. Although the problems these authors addressed were largely connected to the question of life, none of them were biologists

\textsuperscript{110} O’Connor & Yu Wong, ‘Emergent Properties’, unpaginated.

\textsuperscript{111} Instead, it was based on his Tarner Lectures in the philosophy of the sciences, established at Trinity College, Cambridge, in 1916. Interestingly, the first man to give these lectures was Alfred North Whitehead, who would give Gifford Lectures a decade later, contributing to the broader field of emergence theology by developing his “process philosophy”.
by profession. This points to a crucial feature of the controversies for defining and explaining life in the early decades of the 20th century: it was a highly interdisciplinary contest, with different disciplinary interests squaring off for authority over the field. The question of reductionism and mechanism in the study of life was, furthermore, loaded with connotations of which scientific discipline is the more "fundamental". According to the "disenchanted" perspective, life is capable of being reduced ultimately to chemistry, which is furthermore reducible to physics - everything can, theoretically, be explained from that level upwards given sufficient computational power. If this view could be challenged, one would have come a great deal further in claiming true autonomy and independence for the field of biology and the phenomenon of life more broadly. Emergence theory seemed to offer precisely this, and much more besides

All of the three authors mentioned above defined emergence in defence of a middle position between what we might see as two extremes on the "enchantment-disenchantment" axis – that is, between a vitalistic dualism on the one hand, and a monistic mechanism on the other. Alexander, for example, stated that

Life is not an epiphenomenon of matter but an emergent from it. ... [furthermore] there seems to be no need for postulating ... a new substance, a directing principle, or, as Prof. Hans Driesch calls it, an 'entelechy' or 'psychoid'.  

The fine points of this statement become clearer if we turn to Lloyd Morgan's commentaries. Lloyd Morgan stresses an epistemological distinction between "emergents" and "resultants". The distinction is essential to emergentist thinking: while emergents represent something entirely novel in nature, supervening on new kinds of relations between existing entities, resultants are the merely additive features of a system which can be calculated and predicted by adding up the parts that make up the whole. The distinction is crucial for differentiating emergentism from both mechanistic and vitalistic positions:

112 Alexander, Space, Time, and Deity, vol. 2, 64.

113 One should take note that this distinction has a longer history, running at least back to John Stuart Mill. Mill made a distinction between "heteropathic" and "homeopathic" effects, which George Henry Lewes later renamed with the nouns "emergent" and "resultant", in rough correspondence with Mill's original distinction.
The essential feature of a mechanical ... interpretation is that it is in terms of resultant effects only, calculable by algebraic summation. It ignores the something more that must be accepted as emergent. It regards chemical compound as only a more complex mechanical mixture, without any new kind of relatedness of its constituents. It regards life as a regrouping of physico-chemical events with no new kind of relatedness expressed in an integration which seems, on the evidence, to mark a new departure in the passage of natural events.114

Morgan follows up by simultaneously allying emergence to naturalism and the modesty of ‘proper science’, while eschewing popular vitalistic notions as ‘questionable metaphysics’:

The gist of [emergent evolution] is that such an interpretation [i.e. the mechanistic one] is quite inadequate. Resultants there are; but there is emergence also. ... That it cannot be mechanically interpreted in terms of resultants only, is just that for which it is our aim to contend with reiterated emphasis. But that it can only be explained by invoking some chemical force, some vital élan, some entelechy, in some sense extra-natural, appears to us to be questionable metaphysics.115

C. D. Broad reiterated these distinctions in somewhat new terms a few years later. In his own terms, Broad distinguished between “substantial” and “emergent” vitalism, referring to the two clusters of positions which we have, I think less confusingly, preferred to name “vitalism” and “organicism”:

I think that those who have accepted [Substantial Vitalism] have done so largely under a misapprehension. They have thought that there was no alternative between Biological Mechanism ... and Substantial Vitalism. They found the former unsatisfactory, and so they felt obliged to accept the latter. ... [H]owever ... there is another alternative type of theory, which I will call “Emergent Vitalism”, borrowing the adjective from Professors Alexander and Lloyd Morgan.116

114 Morgan, Emergent Evolution, 8.
115 Ibid.
Broad, being an eminent representative of 20th century British analytic philosophy, is also the one who presents the most concise technical definition of his own emergentist position, defined both elegantly and rigorously in contradistinction to mechanism. I will end this more general introduction to emergence theory by quoting it:

Put in abstract terms the emergent theory asserts that [1] there are certain wholes, composed (say) of constituents A, B, and C in a relation R to each other; [2] that all wholes composed of constituents of the same kind as A, B, and C in relations of the same kind as R have certain characteristic properties; [3] that A, B, and C are capable of occurring in other kinds of complex where the relation is not of the same kind as R; and [4] that the characteristic properties of the whole R(A, B, C) cannot, even in theory, be deduced from the most complete knowledge of the properties of A, B, and C in isolation or in other wholes which are not of the form R(A, B, C). The mechanistic theory rejects the last clause of this assertion.117

Mechanism and emergence are thus separated primarily by a point of epistemology: is it possible, even in principle, to predict higher-level properties from lower-level facts? Reductionistic and mechanistic philosophy answers this question in the positive, while emergence theory holds such prediction to be impossible, even given the most complete knowledge and the strongest possible computational power. This means that emergence is in conflict with the epistemological dimension of disenchantment.

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In addition to shedding light on the epistemology of the special sciences, broader implications concerning worldview were very much present in these debates of emergence as well. In fact, all of the above authors discuss emergence in the context of broader concerns about worldview. For two of them – Alexander and Morgan – religion was a major concern. Alexander’s development of emergence as a technical term in his Gifford lectures in Glasgow between 1916 and 1918 is often mentioned as initiating the new wave of British emergentist philosophies in the 1920s. It is, however, more precise to say that the concept was created in a dialog between Alexander and Morgan; Alexander himself states that the basic idea of emergence is taken from Morgan’s

117 Ibid., 61.
Instinct and Experience, from 1912.\textsuperscript{118} A few years later, Morgan would spend the entire first lecture of his own Gifford’s in 1922 giving an interpretation of Alexander’s version of emergent properties.\textsuperscript{119}

Alexander was certainly in need of interpretation. His two volume work was a highly speculative treatise of metaphysics, which tried to account for reality \textit{in toto}, including extensive discussions of theology that were absolutely central to his whole project. This theological ambition has obviously been a source of confusion for contemporary philosophers who want to include this forefather in their canon of emergentist philosophy of science. Thus, for example, a dictionary entry on ‘Emergent Properties’ writes that ‘Alexander’s views are embedded within a comprehensive metaphysics, some crucial aspects of which are, to these readers, obscure’.\textsuperscript{120} Similarly, the author of a recent survey article of British emergentism, Brian McLaughlin, admitted some hesitation when discussing Alexander, because ‘to be frank, I find apparently conflicting passages in his texts and I am uncertain how to resolve the apparent conflicts’.\textsuperscript{121} The author decided that he would spare the reader from these conflicts and instead ‘note a reading of Alexander’s texts that I find plausible’.\textsuperscript{122} The conflicts and contradictions are very real, as we shall see, but deliberately ignoring them, and not least their main source, also means to ignore the decisively most central concept in Alexander’s work: ‘Deity’, or ‘the quality of deity’. In fact, McLaughlin does not mention this concept even once in his survey of British emergentism, and neither is it found anywhere else in the anthology on emergentist philosophy that the article is part of.\textsuperscript{123}

What Alexander calls ‘the quality of deity’ is, however, inseparable from the concept of emergence as it is used within his at times supremely confusing metaphysical system.\textsuperscript{124} As with the other emergentist systems, Alexander uses emergence to present

\textsuperscript{118} Alexander, \textit{Space, Time, and Deity}, 14. The relevant reference is the last chapter of Morgan’s book (‘Finalism and Mechanism: Body and Mind’), which discusses at length the conflict between mechanism and vitalism.

\textsuperscript{119} The crucial first series of these lectures were published as \textit{Emergent Evolution} in 1923. The second follow-up series was published as \textit{Life, Mind, and Spirit} in 1926.

\textsuperscript{120} O’Connor & Yu Wong, ‘Emergent Properties’, unpaginated.

\textsuperscript{121} McLaughlin, ‘The Rise and Fall of British Emergentism’, 31.

\textsuperscript{122} Ibid.

\textsuperscript{123} Bedau & Humphreys, eds., \textit{Emergence}.

the image of a “layered reality” where “higher” levels of being emerge from more fundamental “lower” ones. In Alexander’s scheme, the layers range from the most fundamental level of “Space-Time” itself, up through the material phenomena of physics and chemistry, to the organic phenomena of life and the mental phenomena of mind, all the way up to the ‘quality of deity’. To picture these levels, and the relation between them, we may borrow a diagram from Lloyd Morgan’s exposition of Alexander’s system, which neatly pictures the main concepts (figure 8).

Figure 8: Morgan’s figure depicting some points in Alexander’s system. The line S to T represents the most fundamental reality of “Space-Time”. The successively higher levels of matter, life, and mind, arise along the mid axis of emergence, pushed forward by a creative nisus (N), or force, immanent to the universe. At the apex of the triangle is the culmination of the process of emergence, the quality of “deity” (D). Reproduced from C. L. Morgan, *Emergent Evolution*, 11.

The triangle pictures how the higher orders of matter, life, and mind emerge from the base line (S, T) of Space-Time. The triangular form is meant to suggest that Space-Time encompasses the whole of reality in its extension, but not in its qualities: along the upward axis of emergence we get a gradual narrowing down of new phenomena, which are all nevertheless found within Space-Time, as full and complete separate and finite parts of it. The central axis along which these novel qualities are represented to emerge is what Alexander called the nisus of the universe (N), pushing reality onwards towards novelty. More specifically, the aim of this nisus is the ‘quality of deity’, shown here at the apex of the triangle (D).

The nisus of the universe is intimately connected with time in Alexander’s system, but here in a special understanding of the concept that lies closer to Bergson’s conception of *duration* than to the Einsteinian notion of a fixed space-time continuum.
This is only one example out of many confusing double-uses of the same term, which makes Alexander’s work particularly obscure. The concept of nisus is the key to unlocking the links between Alexander’s emergentism and his theology. While emergence as such simply suggests that genuinely novel “qualities” arise from increasing complexity in the internal relations of entities, the addition of a driving nisus weds this emergence of novelty more firmly to a notion of progress of a teleological, directive type.

This becomes clear when we try to unravel what is meant by the ‘quality of deity’, which nisus is said to point towards. Alexander discusses deity at length, in the process making a number of apparently contradictory claims about it. Deity is intimately connected with his attempts to define God, on the one hand, and with a discussion of the relation between different levels of emerged existents, on the other. We read, for example, that ‘deity is not so much the quality which belongs to God as God is the being which possesses deity’. But at the same time, deity is as we have seen just one step on the ladder of emergence and hence simply a local, finite event within space and time. Trying to grapple with these ideas we read further that ‘Deity is … the next higher empirical quality to mind, which the universe is engaged in bringing to birth.’ At this point we see the contours of a bizarre theology in which God, or rather a being or beings with the quality of deity, will be created by the universe at some point in the future, as a kind of God at the End of History. This deity would emerge from the quality of mind, itself an emergent of life, which earlier had emerged from matter, and so on, down to the fundamental level of Space-Time. This emergent god would exist within the universe itself, and occupy only a very limited place in it. To use Alexander’s own terminology, it would be a finite god.

This rather intriguing possibility, however, is immediately contradicted when Alexander suddenly writes something quite different about deity:

For any level of existence, deity is the next higher empirical quality. It is therefore a variable quality, and as the world grows in time, deity changes with it. On each level a new quality looms ahead, awfully, which plays to it the part of deity.

125 Alexander, Space, Time, and Deity, vol. 2, 343.
126 Ibid.
127 Ibid., 348. My emphasis.
Now deity is defined as whatever comes next on a certain level of emergence. The elements of the periodic table would once have been the anticipated “deity” of the primordial plasma after the Big Bang, and the first living cells the deity of non-living chemical compounds. Whatever will emerge at a later point in time that has a greater order of existence than can be fathomed by our consciousness, then, is merely a manifestation of deity relative to our own limited existence. In other words, ‘the relation of deity to mind is not peculiar to us but arises at each level between the next higher quality and the distinctive quality of that level’.\(^{128}\) Whatever the deity of our human consciousness may be, it is sure to come, according to Alexander, as the universe is constantly generating deity through ‘that restless movement of Time, which is ... the nisus towards a higher birth.’\(^{129}\)

Struggling with these apparently opposing and contradictory definitions of deity, Alexander reflects on the distinction between a “finite” and an “infinite God”. The finite god is a hypothetical being (or beings) who will emerge with the quality of deity, out of the quality of mind, thus being to mind what minds are to bodies. This process is also described as a limited portion of Space-Time achieving the quality of deity, which furthermore includes in itself the “lower” portions of Space-Time, “all the way down”.\(^{130}\) However, a continued succession of such finite gods could in principle be produced throughout the history of the universe. If this was all, the theology of emergence comes across as a strangely polytheistic one. As Alexander writes,

> if the quality of deity were actually attained in the empirical development of the world in Time, we should have not one infinite being possessing deity but many (at least potentially many) finite ones. Beyond these finite gods or angels there would be in turn a new empirical quality looming into view, which for them would be deity – that is, would be for them what deity is for us. Just as when mind emerges it is the distinctive quality of many finite individuals with minds, so when deity actually emerges it would be the distinctive quality of many finite individuals.\(^{131}\)

\(^{128}\) Ibid., 349.

\(^{129}\) Ibid, 348.

\(^{130}\) Ibid., 354-356.

\(^{131}\) Ibid, 361.
In contradistinction to these myriad finite gods that the universe continuously produces through its nisus towards higher births, Alexander asserts that there is also an “actual infinite God”. This God, furthermore, is inseparable from the broader emergentist framework, and particularly the concept of nisus: ‘As actual, God does not possess the quality of deity but is the universe as tending to that quality. ... Only in this sense of straining towards deity can there be an infinite actual God.’ \[132\] It is this latter conception of God, as ‘the whole universe, with a nisus to deity’ which, according to Alexander, is ‘the God of the religious consciousness’ – even though the religious mind often ‘forecasts the divinity of its object as actually realised in an individual form’.\[133\]

Having thus struggled to define two possible “types” of deity, where one is finite and the other infinite, Alexander goes on to treat separately the question of whether each of these types truly exist, at the present moment. His answer to these questions show in concrete detail what Alexander envisioned the two types of deity to be like, and what their true relation was.

[D]o finite beings exist with deity or are there finite gods? The answer is we do not know. If Time has by now actually brought them forth, they do exist; if not, their existence belongs to the future. If they do exist (“millions of spirits walk the earth”) they are not recognisable in any form of material existence known to us; and material existence they must have; though conceivably there may be such material bodies, containing also life and mind as the basis of deity, in regions of the universe beyond our ken.\[134\]

The existence of finite gods, which would quite literally be discrete entities within space and time, is left an open empirical question; however, if they do not exist, they will surely do so in the future, because of the universe’s particular nisus. Concerning the existence of infinite deity, the complexity rises:

Does infinite deity exist? The answer is that the world in its infinity tends towards infinite deity, or is pregnant with it, but that infinite deity does not exist; and we may now add that if it did, God – the actual world possessing infinite deity – would cease to be infinite God and

\[132\] Ibid. My emphasis.
\[133\] Ibid., 362.
\[134\] Ibid., 365
break up into a multiplicity of finite gods, which would be merely a higher race of creatures than ourselves with a God beyond.  

This is the essential paradox at the core of Alexander’s thinking: actual infinite deity can only remain infinite by not being limited by existence. Emergence may thus be seen as the solution to a theological paradox: the non-existence of infinite deity is that it is always in the future, it is always becoming. It is in this sense that the universe is pregnant with infinite deity:

Infinite deity then embodies the conception of the infinite world in its straining after deity. But the attainment of deity makes deity finite. … God as an actual existent is always becoming deity but never attains it. He is the ideal God in embryo.

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In showing the theological framework from which emergence, so to say, emerged, I have focused on the relatively obscure work of Alexander. The justification for this is that his work was seminal, instigating the whole school of emergence theory in philosophy of science and beyond, even though that school has since taken other directions. However, Alexander was certainly not alone in embedding emergence firmly in a theological framework. One could, for example, very well have cited Morgan as well. In fact, while he claimed a thoroughly naturalistic attitude for his speculations, Morgan also explicitly stated that he wanted to challenge the notion that naturalism somehow precluded theology, or precluded that which was usually seen as “supernatural”. In the introduction to his lectures, Morgan asked whether ‘naturalistic interpretation suffices, or whether some further supra-naturalistic explanation is admissible … not as superseding but as supplementing the outcome of scientific enquiry’. His answer, from the outset, was positive: ‘I shall claim that it is admissible, and that there is nothing in emergent evolution, which purports to be strictly naturalistic, that precludes an acknowledgement of God’. A major goal for the whole field, then, was to argue that

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135 Ibid.
136 Ibid.
137 Morgan, Emergent Evolution, 2. Emphasis added.
138 Ibid.
emergentism, while elucidating much within the special sciences, also provides room for divine activity within nature, thus reconciling theology and naturalism.

Through the 1920s, emergentism became a rather fashionable intellectual current, which mobilised under its banner a number of organicist, holist, “gestalt”, and neo-naturalistic positions in philosophy, biology, psychology, and theology. When William McDougall published the book *Modern Materialism and Emergent Evolution* in 1929, Morgan and Alexander were already seen as the key theorists, with some of the nomenclature of Broad added (notably the distinction between “Substantive” and “Emergent Vitalism”). A number of other authors were identified as belonging to this stream of thought as well, including the whole field of gestalt psychology and gestalt theory in the German life sciences, together with a number of earlier authors working on questions related to the philosophy of mind. 139 As a “school”, then, there was much internal divergence, and far from all emergentists were explicitly theological. To quote McDougall,

> Many thinkers of very different schools are converging towards the one centre; some of them seemingly ignorant of those who are marching along other of the convergent lines. The leaders of the *Gestalt* school have shown no interest in Emergent Evolution and are apparently largely concerned to save the principle of Psycho-physical Parallelism. Professors Alexander and Lloyd Morgan are concerned chiefly to save God and the coherence of the evolutionary scheme. Professor Whitehead is concerned to save the unity of the natural world and seems indifferent and even a little hostile to the *Gestalt* workers, and not directly interested in biological evolution or the psycho-physical problem. 140

Notably, McDougall found ‘the most thoroughgoing and consistent and the least objectionable of all’ systems of emergence in a “non-Alexandrian” work – namely in the American philosopher Roy Wood Sellars’ influential book *Evolutionary Naturalism* (1922). 141 Sellars developed this work independently of Alexander and Morgan, but found very similar answers to the same basic problems. 142 Sellars’ project of crafting a

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142 See especially Sellars, *Evolutionary Naturalism*, 320-343.
“new naturalism” to replace the Victorian variety is interesting in many respects; for example, remaining largely nondenominational and irreligious, it may be considered a landmark work in the development of secular humanism in that it advocated a full naturalisation of ethics. Sellars resisted the tendency of reductionism, while holding that questions concerning human value and ethics are basically empirical questions belonging to higher levels of emergence. Contrary to the axiological scepticism of the “disenchanted” view, Sellars’ emergentist naturalism holds that ethics is perfectly possible without any “intellectual sacrifice”. Ethics, furthermore, does not belong in metaphysics, but is a field of empirical enquiry. Value is not intrinsic, and “the good” is always a relational property: ‘Ethical metaphysics results from a wrong ordering of categories, a neglect of their setting and context.’

Returning to the more overtly theological uses of emergentist thinking, we should note that Alfred North Whitehead’s so-called process philosophy also belongs to this wider stream of thought. Whitehead’s *Process and Reality* is yet another example of a series of Gifford lectures in natural theology turning into a book that has since become highly influential on generations of philosophers and theologians. Whitehead’s main ambition was nothing short of a reform of the whole of philosophy, including the interpretation of natural science. It was an explicitly holistic type of philosophy, which Whitehead termed from the outset ‘the Philosophy of Organism’. Similar to Alexander and Morgan, Whitehead’s philosophy came with a theology as well, which has since grown into a school of its own under the banner of “process theology”. Formulated with a heavy influence from Whitehead’s mathematical expertise, process philosophy has a terminology and manner of conceptualisation all its own. It remains, however, a philosophy and theology of emergence, in that it emphasises the emergence of novelty, of creation as an evolutionary process (e.g. ‘the actual world is a process, and ... the process is the becoming of actual entities’).

143 Sellars, *Evolutionary Naturalism*, 341-343.
144 Ibid., 343.
146 The primary custodian of process theology over the last four decades has been David Ray Griffin, whom we met in chapter two as a contemporary “re-enchantment theorist” and a proponent of the notion that modern science has been a destructively disenchanting force in the world.
147 Whitehead, *Process and Reality*, 30. This passage is cited from Whitehead’s overview, definition and systematisation of sets of categories. Thus, ‘actual entity’ in the above quote is a technical term which is
God that is, essentially, panentheistic: that is, God is the world, as in a state of constant creation, but is also much more than the world in its finite aspect. ‘God’s immanence in the world in respect to his primordial nature is an urge towards the future based upon an appetite in the present’. There are obvious similarities between Whitehead’s appetitive god and Alexander’s god in embryo. While Alexander, Whitehead, and Morgan may differ on certain theological and philosophical specifics, they all seem to share a tendency towards panentheism, which rises particularly from taking considerations of evolution, emergence, and organicism as the basis for metaphysical speculation.

In concluding this section, I should like to note two points of historical consequence. First, “emergent evolution” and the attendant theologies of emergence may be characterised as a 20th century resurgence of an older form of natural theology, although indubitably with new form as well as content. Evolutionary and organicist views of the cosmos were central to romanticism, and we find ideas that are similar to Alexander’s expressed in German Naturphilosophie, particularly in Friedrich W. J. defined, in the most general sense, as ‘the final real things of which the world is made up’. Ibid., 24. The notion of the world as a process creating final entities is very similar to the view of Alexander, where the role of “process” is played by “nisus”.

148 For a systematic overview of panentheism, as used here, in contradistinction to other theological positions (including theism, deism, pantheism, and pandeism), see John Culp, ‘Panentheism’. See also my discussion of this theological opposition at the end of the present chapter.

149 Whitehead, Process and Reality, 43.

150 One such theological difference is that Whitehead’s process theology seems more readily orthodox than Alexander’s, particularly when it comes to the relation between the divine and the world. For Whitehead, the world in its processual totality is brought forth by God’s constant appetite for that which has already been conceptually “prehended” by the godhead. Thus, God is there from eternity, while the world is temporal and constantly being created. Alexander’s work, on the other hand, permits a much more heterodox reading: here there is a greater dependence of God on the world, even to the extent of the world itself being the womb which carries the ideal god in embryo. It is not so much God that holds the world in himself from the beginning before realising it through constant creation, as the world, with its nisus towards deity, which creates God. For Whitehead’s theology vis-à-vis common monotheistic positions, see e.g. Whitehead, Process and Reality, 484-497. See also one of the earliest commentaries on Whitehead, written by his admiring student, Dorothy M. Emmet, Whitehead’s Philosophy of Organism, 242-273.
We also find this organicist and evolutionary emphasis in English and American literary romanticism, as has been attested by Frederick William Conner. Despite the relative historical proximity, however, we do not find any clear evidence of direct influence from the German romantics on the early 20th century emergentists. Schelling, for example, is not cited by any of the main developers of this school. Instead, their likeness should be attributed to dealing with similar conceptual problems, and, at least partially, from making use of shared sources. Thus, for example, it is not a coincidence that emergentism is developed towards the end of the “eclipse of Darwinism”, at a time where purposive and teleological models of evolution, including neo-Lamarckian theories, were being discussed. From the standpoint of the history of science, this phase in the history of evolution has certain commonalities with the pre-Darwinian phase in which the German romantics were writing. Another factor is that, despite the common theological stress being laid on the distinction between the creator and the created, notions of nature itself being active and creative do have a longer history in Western thought. One notable predecessor is found in the notion of natura naturans as distinguished from natura naturata, going back to medieval scholasticism, but becoming central to Spinoza’s system. As Frederick C. Beiser has noted, the project of Schelling’s absolute idealism was, curiously, to reconcile Plato and Spinoza; furthermore, Spinoza was a substantial influence on Alexander. The question of whether Spinoza permits a panentheist reading along emergentist lines remains open, despite the common assertion that Spinoza’s theology was simply “pantheistic”.

The second historical point to make concerns the later influence of the emergence theology of the 1920s. As Wouter Hanegraaff has showed, the field of post-war religious thinking known as “New Age” has been suffused with evolutionary ideas regarding positive transformation of self, society, and the world, often amounting to complete philosophies of nature. Hanegraaff notes that ‘New Age evolutionism is

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151 On Schelling’s Naturphilosophie and German idealism in general, see the momentous work by Frederick C. Beiser, German Idealism. For organicism in Schelling’s Naturphilosophie, see especially ibid., 515-518.
152 Conner, Cosmic Optimism.
153 For the pre-Darwinian history of evolution, including the role of the romantics, see Bowler, Evolution, 46-102.
strongly influenced by’ the trend of ‘emergent evolution’, but this influence is not given any further treatment besides being mentioned in passing in a footnote. Instead, Hanegraaff provides a rich overview of the development of religiously oriented evolutionist thought from German romanticism, through 19th century occultism, to post-war New Age culture. It may be argued that the natural theologies of emergence considered here constitute a central missing link in this larger story – one which could easily justify a study of its own.

(IV) Modern Alchemy

An alchemical discourse was revived in response to the discovery of radioactivity during the first decades of the 20th century. In the age of radioactivity, the transmutation of elements through radioactive decay and artificially produced nuclear fission, the notion of a “modern alchemy” was used to distinguish the new emerging views of matter from the chemistry of the 19th century. As such it was largely an exercise in identity construction through strategic uses of the history of science: the Daltonian paradigm in chemistry was portrayed as philosophically dull and superficial, in contrast to the “new alchemy” of the modern day, which presented a philosophy of nature in which matter was a much more interesting substance than previously thought.

I have argued that this reconsideration of alchemy, albeit somewhat superficial when used by working scientists, did project a course for modern physical chemistry that was at odds with the disenchanted view. Matter was neither completely inert, nor stable, nor even strictly predictable. Nevertheless, a new and enhanced form of control of nature emerged from this new conception as well. While they frequently emphasising the surprising new cosmology arising from the newer alchemy, scientists such as Ernest Rutherford or Frederick Soddy were in the end primarily interested in the new technical possibilities that came with the taming of transmutation. Thus, while Soddy can easily be described as a model “modern alchemist” in this sense, his vision for an alchemical science would hardly satisfy those who thirsted for a radical “re-enchantment” of the world. Soddy’s worldview was, in the end, one of secular humanism, emphasising the technical control of nature for the advancement of

155 Ibid., 466 n. 247.
156 Ibid., 462-482.
humanity’s self-determined, secular goals. Adopting his lingo to suit different audiences, Soddy was for example very clear about the absence of any deeper spiritual implications of modern science when he spoke to the Aberdeen University Christian Union in 1919:

I have been struck with one curious point in the interest aroused by the recent advances in physics in the minds of the general public. I believe it is largely due to the underlying, if unexpressed, belief that, in thus laying bare the deeper secrets of external nature, we are approaching the nearer to the solution of the problems of life and the soul. One’s scientific sense of direction tells that the further one advances towards the ultimate insoluble problems of physics, the more completely one leaves behind the phenomenon of life and all its mysteries. The advance in this direction has been from life and not towards it, and the clouded horizons towards which we move, whatever they may contain of wonder and revelation, are likely to afford little of moment to the real mystery of life.\(^\text{157}\)

Despite his earlier enthusiasm and almost animistic language when describing the world of radioactivity, when addressing an audience with explicit religious agendas Soddy preferred to defend a view almost inseparable from the disenchanted one. Indeed, in a phrase sounding almost exactly like Weber on disenchantment, Soddy claimed that ‘mystery in any real sense has been banished from the inanimate universe,’ and continued to assert that ‘[s]cience has banished the conception of deity for ever from the working of the inanimate world, which behaves in all respects as, and therefore is a simple machine left to go’.\(^\text{158}\) The real wonders of the new alchemy were to be found in technical applications and increased control over nature, and the betterment of human life predicted to emerge from new technologies.

However, the alchemical trope did also encourage a reconsideration of worldviews, allowing for scientific advances to be discussed not only in light of religious dogma, but also with reference to the heritage of Western esoteric thought. While the school of new natural theology that clustered around an appeal to modern alchemy and the new scientific ideas about matter and energy has been a whole lot less influential than the other schools we consider here, it does merit a brief discussion as one of the options that were being explored during this period. To focus my discussion, I will


\(^{158}\) Ibid., 161, 173.
return to that curious, short-lived arena for exploring the contemporary scientific and spiritual relevance of alchemy: the Alchemical Society.

The Alchemical Society was not the only social arena for discussing alchemy, and its journal was not the only outlet for such discussions in writing. It is, however, the most relevant one for our present concerns, because it was so tightly knit with mainstream science. By contrast, for example, the active alchemical milieu in France was more clearly oriented towards the broader occult milieus associated with Martinism, Saint-Yves d’Alveydre, and Papus, and also possessed a strong tendency towards practical laboratory work aimed at more traditional understandings of alchemical transmutation. The names of Fulcanelli and Eugène Léon Canseliet (1899–1982) are particularly well known, but of perhaps more importance would be the work of François Jollivet-Castelot (1874–1937), who founded the Société Alchimique de France in 1896, and published its journal, *Les nouveaux horizons* (1906–1914). Jollivet-Castelot and his network is an under-researched chapter in the history of alchemy and esotericism. He worked systematically with laboratory alchemy, and developed an essentially animistic or “hylozoic” conception of matter as part of a broader alchemical philosophy of nature, which he termed “l’Hyperchymie”.159 This philosophy had a broader cultural influence, as Castelot temporarily became the teacher of the Swedish writer August Strindberg (1849–1912), who visited him in Paris in 1895. After the Alchemical Society had been established in London, its founder, Herbert Stanley Redgrove, and its honorary president, the esteemed Scottish chemist and historian John Ferguson, were both made honorary fellows of the Société Alchimique. The favour was returned, and Castelot was made an honorary member of the English society. A report on some of Castelot’s work on transmutation (which he claimed had been successful) was subsequently published by the *Journal of the Alchemical Society*.160 A German journal devoted to alchemical topics was founded a bit later, with the *Alchemistische Blätter* (1924) published in Munich by Otto Wilhelm Barth. This journal, however, was firmly embedded in the context of Rosicrucianism, Freemasonry, and secret societies,

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159 For a brief overview of Castelot’s work and his network, see Richard Caron, ‘Notes sur l’histoire de l’alchimie en France’, 23-26.

and is even less interesting from the scientific perspective than the French.\textsuperscript{161} The unique thing about the Alchemical Society, then, is that it was embedded in mainstream scientific structures, both through membership, organisation, and links to other scientific journals and societies.

Looking at the intellectual production of the Society – in the form of lectures given at its meetings and published in the \textit{Journal of the Alchemical Society} – we find three papers that deal more explicitly with alchemy as a worldview allowing for some reconciliation of spirit and nature. The visions proposed, however, differ quite radically in their approach and main lines of reasoning. This mirrors the diversity of the group at large: the Alchemical Society housed not only spokespersons of different professions and social groups, including tenured chemists, engineers, historians, and occultists, but also different views on the nature of alchemy. In terms of using alchemy to understand modern science, and provide a bridge to new philosophies and theologies of nature on that footing, the most relevant contribution was that of Sijil Theodore Arthur Abdul-Ali (1889–1917), published in the third issue of the first volume of the journal, in 1913. Abdul-Ali was the son of an Indian-born book publisher and his English wife, and worked in London as a clerk with the Registry and Copying Division of the Board of Trade.\textsuperscript{162} Besides studying alchemy and modern science, he displayed an obvious interest in esoteric topics, publishing several articles on “Jewish mysticism” in \textit{The Occult Review}.\textsuperscript{163} He was a very active member of the Alchemical Society and served as the Society’s secretary. In October 1917, shortly after the Society stopped its meetings due to the war, Abdul-Ali was killed by an enemy airstrike while hospitalised in France, where he had been stationed with the Royal Engineers.

Abdul-Ali’s paper purported to give an ‘interpretation of alchemy in relation to modern scientific thought’, as the title suggested. Abdul-Ali was largely concerned with finding ways in which alchemical concepts could meaningfully be translated to modern

\textsuperscript{161} For a brief overview of the journal’s content, and Barth’s publishing ventures, see van Heertum, ‘Exploring alchemy in the early 20\textsuperscript{th} century, Part II’; cf. Julian Strube, \textit{Vril}, 95, 110-111, 117, 175, 178.

\textsuperscript{162} Information recorded by Department for Business Innovation & Skills, War Memorial, WW1 Project, entry on ‘S.T.A. Abdul Ali’.

\textsuperscript{163} E.g. Abdul-Ali, ‘The Metaphysical Outlook in Jewish Mysticism’; idem, ‘The Doctrine of Transcendence and Emanations in Jewish Mysticism’; idem, ‘The Unwritten Law in Jewish Mysticism’. The latter two of these were published after his death.
scientific notions, through a sort of conceptual reinterpretation of alchemical discourse. From the start, the paper was grounded in a historical and philosophical discourse that had already been created in the previous two meetings of the Society, concerning the philosophical foundations of alchemy as a science. During the first meeting in 1913, Redgrove had contrasted the epistemological foundations of alchemy and modern science through a distinction between deductive and inductive methodologies.\textsuperscript{164} According to Redgrove, alchemy had been a deductive science, in that it had started from dogmatically assumed first principles, of a theological, cosmological, and metaphysical character, and deduced knowledge of the natural world from these principles. Modern science was by contrast inductive, in the sense of working in a strictly empirical manner.\textsuperscript{165} Abdul-Ali concurred with this evaluation, and proceeded to take up a similar deductive approach himself by establishing correlations between alchemical principles and current scientific concepts.\textsuperscript{166} His stated project was to bring the ‘Hermetic’ perspective of alchemy to bear on present philosophy of nature:

All of this, of course, is of very general application. It is primarily a philosophy of the Universe. But if the Hermetic axiom be sound, what is true of the Universe is also true of every single department thereof. Hence we have here also a philosophy of nature in the narrower sense; and it is when thus considered that it comes into contact with the natural sciences.\textsuperscript{167}

Abdul-Ali focused on four interconnected doctrines: 1) the doctrine of a special “first matter” of “hyle”, as the fundamental stuff of the material world; 2) the doctrine of the four elements, contained implicitly in the first matter and subsequently, by a process of differentiation, making up the manifest material world.; 3) the notion of a divine spirit

\textsuperscript{164} See Redgrove, ‘The Origin of Alchemy’.

\textsuperscript{165} Note, however, that most historians and philosophers of science today would contest the description of modern science as “inductive”. While an appeal to inductivism had been an important part of the scientific revolution, notably emphasised in Baconian empiricism and in the methodology developed in appendices to Newton’s writings, around the late 18th century, the natural sciences developed a methodology more properly characterised as hypothetic-deductive. We have, for example, noted the enormous importance of a deductive methodology in 19th and 20th century physics.


\textsuperscript{167} Ibid., 38.
or essence, an *anima mundi* that pervades the world; 4) the idea of a *fifth essence*, which is neither the *anima mundi* nor a compound of the four elements, ‘but a mediate Spirit by which an intimate and co-operative union between these is maintained’.

Abdul-Ali’s procedure from here is predictable. He discusses each postulate in turn and attempts to link them up with contemporary scientific concepts. Thus, for example, the concept of *proto hyle* is compared to modern chemistry, particularly the Daltonian atomic theory and Mendeleev’s periodic table. After giving a relatively clear account of those theories, showing that they had been at the basis of the progress made in chemistry and physical chemistry, Abdul-Ali notes that there is a “genetic” aspect to the theory of the elements, suggesting that the elements have somehow “evolved”. This notion would easily have been found in contemporary sources: for example, Soddy’s post-radioactivity conception of matter attacked older forms of “chemical creationism”, and a similar point had been made by Gustave Le Bon in *The Evolution of Matter* (1907). On this evolutionary background, Abdul-Ali asks: ‘What are [the elements] evolved from? What is the primary “stuff” out of which they are wrought?’ This brings him to consider the electron theory and the recent (this is 1913) advances in radioactivity research. Abdul-Ali refers to the positive alpha- and negative beta radiations, and correctly observes that these suggest the atom to be made up of positively and negatively charged particles, the latter of which being the electron. On this basis, he suggests that the “protyle”, or ultimate substance, is of a dual nature: ‘It thus seems reasonable to postulate two primordial substances, or protyles, one positively and the other negatively electrified, out of which atoms have evolved’. Speculating further on the nature of the electron, Abdul-Ali reveals a good overview of the many theories that were available at the time. Interestingly, however, he still chooses to emphasise on the somewhat older *etheric* theories, that saw electrons as vortices in the ether. On these lines, Abdul-Ali suggests that both the positive and negative part of the protyle might be ether vortices:

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168 Ibid.


171 Ibid., 42.
Perhaps it would be better to suggest minute vortices or eddies in the ether, which are positive or negative according to the direction of the vortical motion constituting them. This is purely speculative; but that there is an essential and integral connection between the ether and the atom is beyond doubt.\textsuperscript{172}

The strong conviction that ether must somehow be involved would seem surprising and anachronistic had it not been for the fact, referred to several times already, that ether physics survived in various forms much longer than is often assumed.\textsuperscript{173} Thus Abdul-Ali’s article testifies to the strange space of possibilities that was open during these years: the old theories of ether remained available, while the strange new world of radioactivity and new concepts of matter and energy were slowly entering the scene.

Exploring the full range of this space, Abdul-Ali identifies three important physical concepts: \textit{energy}, described as the most fundamental concept; \textit{ether}, which ‘unites energy and matter’;\textsuperscript{174} and “\textit{ultimate atoms}”, or the (positive and negative) protyles mentioned above. The protyles Abdul-Ali describes come very close to the positive and negative “ultimate physical atoms” described by Annie Besant and Charles Webster Leadbeater as part of their “clairvoyant” exploration of the elements, which had been published in a monograph edition in 1909.\textsuperscript{175} Although it is not expressed directly, it seems likely that Abdul-Ali’s conception of positively and negatively charged “ultimate atoms” is derived from this Theosophical literature – adding further to the fusion of sources.

However this may be, Abdul-Ali holds that the three concepts of energy, ether, and ultimate atoms, display a significant resemblance to three of the alchemical concepts he introduced earlier: the “Soul of the World”, the “Spirit of the World”, and “the First Matter”.\textsuperscript{176} The Soul of the World is equated with the physical concept of \textit{energy}, described as ‘the immanent and creative essence in things’:

\begin{flushright}
\textsuperscript{172} Ibid., 43.
\textsuperscript{173} Cf. Stanley Goldberg, ‘In Defense of Ether’.
\textsuperscript{174} Abdul-Ali, ’An interpretation of alchemy in relation to modern scientific thought’, 44.
\textsuperscript{175} See Besant and Leadbeater, \textit{Occult Chemistry}. For an analysis of this programme, and its relation to physical science, see chapter eleven below.
\textsuperscript{176} Abdul-Ali, ’An interpretation of alchemy in relation to modern scientific thought’, 44.
\end{flushright}
"The Soul of the World" is the ubiquitous, immanent and creative essence in things. Evidently the phrase describes something very much like energy ... The principal difference is that to us the term “energy” denotes a concept which has a definite mathematical expression, although, of course, we do not know the nature of energy considered as "substance"; while to the alchemists such names as "The Soul of the World" had a quite general and undefined meaning. 177

Continuing his translation efforts, Abdul-Ali proceeds to equate the *quinta essentia*, or Spirit of the World, with ether:

Then "The Spirit of the World" or "Fifth Essence", considered as the medium by which the Soul held intercourse with its Body (*i.e.*, matter) is analogous to the ether, the medium of energy transmission, as already explained.178

The four elements proved much harder to make sense of from a modern scientific perspective. Abdul-Ali insinuated that they may be given a modern meaning in terms of the *states* of matter, rather than in terms of "elements" in the modern sense.179 Following this approach, he considered the liquid, solid, and gaseous states to correspond with water, earth, and air, while fire could be understood in terms of ‘what may be called the incandescent-gaseous’ state – probably referring to plasma. However this may be, the translation attempt now starts to look more than a little forced.

Finally, Abdul-Ali hinted to what one would otherwise have thought was the most obvious point of connection between alchemical and contemporary scientific discourse, namely the vindication of transmutation by radioactivity. Somewhat surprisingly, Abdul–Ali does not appear too enthusiastic about radioactivity’s relevance for alchemy: ‘I may remark ... that modern methods in this branch of experimental research [i.e., transmutation] are entirely different from those of the alchemists, and do not, in my opinion support alchemical doctrines.’180 On this he was undoubtedly correct from a historical perspective, but one is left wondering why the same objection is ignored in the rest of Abdul-Ali’s paper. Indeed, it is quite unclear what is really

177 Ibid.
178 Ibid.
179 Ibid., 44-45.
180 Ibid., 45.
achieved by Abdul-Ali’s attempt at building the foundations of a new philosophy of nature on a metaphorical relation to alchemy. Its grasp of contemporary science was not the main problem, but the struggle to give new meaning by forcing alchemical terms on scientific ones does, in the end, appear quite superficial and without any real consequence.

Despite this disappointment, Abdul-Ali’s is the most complete and sincere discussion of alchemy with regards to modern science to appear in the limited corpus of the Alchemical Society. Other speakers at the Society’s meetings also touched on the subject in various ways, but mostly in a more taken-for-granted and not very systematic fashion. Thus, for example, the occultist and author of Templar and Masonic myth, Gaston De Mengel, spoke about the historical evidence for authentic transmutation, by focusing on the example of the Dutch physician and alchemist Johann Friedrich Schweitzer (a.k.a. Helvetius; 1625 – 1709). Although largely a report on the historical evidence, De Gaston freely made reference to recent scientific evidence to make transmutation seem more plausible:

I need not remind you that the opinions of these scientists are greatly emphasized by the discoveries of the past ten years: the study of kathodic rays and of radio-activity has given an entirely new aspect to the scientific view of the nature of matter and the constitution of the so-called elements. You will find these views developed nowhere better than in Dr. Gustave Le Bon’s Evolution and Matter ... Assuming therefore that we have no valid ground for denying a priori, for scientific reasons, the possibility of transmutation, I will pass to the positive historical evidence.

After this vaccination against a priori objections, De Mengel goes through the case of Helvetius’ alleged transmutation, finding that it has been well authenticated and should be taken seriously. In fact, De Mengel’s main point becomes that the only reason it has not been accepted as authentic has been scientific chemistry’s inability to explain such occurrences. De Mengel then sets out to provide an explanatory framework, or, in the occultist’s own words, ‘a line of thought along which may be discerned, more or less

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181 De Mengel, ‘Evidence for Authentic Transmutation’.
182 Ibid., 51.
183 Ibid., 56.
dimly, some explanation of the *magnum opus*.\textsuperscript{184} This, curiously, brings De Mengel into “ether metaphysics”, as he seeks to find such a line of thought in ‘a hypothesis as to the genesis of matter from Aether, and the modifications of Aether, and consecutively of matter, by spiritual activity’.\textsuperscript{185} A long and complex cosmological vision follows, intending to show how a “primordial” ether gets differentiated into the ether known to physics, and how this, again following Kelvin’s vortex model, gave rise to matter. In the end De Mengel adds a rather vague statement on how certain psychological traits, and particularly ‘awareness’ – conceived of as a ‘spiritual’ faculty – can play a role in the process of ‘differentiating’ the ether.\textsuperscript{186} How all this is thought to work, and what supports it, is all very obscure, but it is clear that the notion serves to build a connection between the mental and the physical, active through the ether, and which would make alchemy seem more plausible. In the discussion following his paper, Abdul-Ali showed particular interest, calling it a paper of ‘ingenious originality’.\textsuperscript{187} It is also to be noted that he picked up on De Mengel’s use of the ether, giving certain suggestions to expand that line of theorising, mentioning Oliver Lodge’s *The Ether of Space* (1909) as a valuable reference for further work.\textsuperscript{188} Whatever the actual theology or philosophy of nature coming out of modern alchemy really was, it seemed unable (or unwilling) to get rid of the ether.

The final author who made a concentrated effort at saying something about alchemy and worldview in the context of the Alchemical Society was yet another occultist, namely Isabelle de Steiger (1836–1927).\textsuperscript{189} De Steiger is an important, yet somewhat overlooked figure in the history of late Victorian occultism. She was a close friend of Mary Anne Atwood, whose *Suggestive Inquiry into the Hermetic Mystery* (1850) cemented a notion of alchemy as having been a purely spiritual pursuit. Furthermore, de Steiger was involved with most of the major esoteric societies and movements that mushroomed from the 1870s onwards, including the Theosophical Society, the Hermetic Society (she was close friends with its founder, Anna Kingsford), the Hermetic

\textsuperscript{184} Ibid.
\textsuperscript{185} Ibid.
\textsuperscript{186} Ibid., 59-60.
\textsuperscript{187} Ibid., 60 (discussion section).
\textsuperscript{188} Ibid.
\textsuperscript{189} De Steiger, ‘The Hermetic Mystery’.
Order of the Golden Dawn, and, following the latter's schism at the turn of the century, of Arthur Edward Waite's Holy Order of the Golden Dawn. She was even an early member of Rudolf Steiner's Anthroposophical Society, after it split from Theosophy around 1909. De Steiger supported a version of Atwood’s “spiritual alchemy” thesis. In her address, de Steiger emphasised her notion of “superhumanity” (which had previously been commented on briefly by Redgrove in the Review section of the Journal), in order to speak of the “internal” quest of the ‘Hermetic mystery’. Because of her generally mental orientation, stemming from the peculiar theories on mind and magic developed in 19th century occultism largely under the historical influence of Mesmerism, de Steiger focuses less on contemporary scientific issues. She talks at some length about Mesmerism, and calls it ‘the key to all magic, known to every race and time’, finding in it the spiritual key to alchemy as well.190 This is entirely in the line of Atwood’s spiritual alchemy.191 The closest one gets to an engagement with science is, once again, some references to the ether. While Abdul-Ali had correlated the ether with spiritus, however, de Steiger equated it with the alchemical prima materia – which Abdul-Ali had interpreted as the protoyle.192 This fundamental semantic confusion illustrates the utter arbitrariness characterising the metaphorical play with scientific and alchemical concepts in the Alchemical Society.

De Steiger’s understanding of the ether appears largely influenced by, and probably mediated through, Theosophy. Largely in agreement with Theosophical doctrine, she presents a classification of three different “degrees” of ether. Only the lowest or crudest of these is the one known to physics, the three higher ones being more subtle and “spiritual” forms of substance.193 A similar idea was expressed in Besant and Leadbeater’s project of occult chemistry, although differing somewhat in details such as the number of subtle “planes” beyond matter and ordinary ether. De Steiger is generally a little ambivalent towards Theosophy, dismissing the programme of occult chemistry as completely irrelevant for true alchemy: ‘the “occult chemistry” of Mr. Leadbeater and Mrs. Besant has, I think, no resemblance at all to the Arch-Chemistry of the

190 Ibid., 22-23.
191 See especially Atwood, Suggestive Inquiry, 181-201
192 Ibid., 18-19.
193 Ibid., 19-20.
alchemists’. That ‘Arch-Chemistry’, in her opinion, was a spiritual alchemy, and would therefore look nothing like the Theosophical attempt to clairvoyantly perceive the elements, or for that matter the “modern alchemy” of contemporary radioactivity research.

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The motivation for forming the Alchemical Society was not only to re-evaluate historical alchemy, but also to investigate its relevance for contemporary science, as a more profound philosophy of nature with prospects of bringing the domains of religion and science together. It is difficult to avoid the conclusion that the Society ultimately failed in this aspiration. Several reasons may be given for this, the most prosaic one being its very short lifespan and unfortunate discontinuation after the outbreak of war. However, its real failure is that no consistent alchemy-based philosophy of nature ever emerged, that there was no hint of any consensus in the group, or even any clarity about what lines such a philosophy should be developed along in the first place. The three examples given above illustrate this lack of agreement. Despite a low level of conflict in the meetings and a tendency to applaud all contributions, these three authors disagreed on almost every single point: the place and nature of “transmutation”, the physical or spiritual character of alchemy, and the exact correlations with modern science, to take but the three most central ones.

In a recent book on the alchemical revival of the early 20th century, Mark Morrisson has presented a somewhat more charitable interpretation of the Alchemical Society than the one given here. Morrisson argues that the Alchemical Society displayed a hybrid character stemming from its curious position in between various occult and academic milieus. Morrisson furthermore holds that this situation in fact gave the Society a strategic advantage: it provided an arena where very different viewpoints could meet and interact, giving the possibility of sharing ideas that could not have been shared otherwise. I would like to problematise this evaluation: When we look at the philosophical and natural theological outcome, its lack of consistency is no doubt due to too much openness and an absence of paradigmatic restrictions. Thus,

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194 Ibid., 31.
195 Morrisson, Modern Alchemy.
196 Ibid., 55-59.
there is no real *dialogue* on these issues in the Alchemical Society, merely a conglomeration of different and opposing monologues, each following their own agenda without taking serious notice of each other. The outcome in terms of an alchemical philosophy of science was thus very minimal and superficial. It may remain true that the society had a strategic potential for dialogue, and for making it possible to put the particular agenda on the table. We must however conclude that the agenda appears not to have been realised.

If no satisfactory natural theology arose from the socially hybridic meetings of the Alchemical Society, we should, however, grant it more success in its aspirations to renew the *historical* study of alchemy. Although it is not my major concern here, the meeting of the influential “spiritual alchemy” thesis with the views stressing actual physical work in laboratories did lead to better understandings of the subject. It was, for example, in this context that Arthur Edward Waite first presented his mature view on alchemy, moving away from the purely spiritual interpretation so fashionable among occultists.\(^{197}\) Here, the meeting between occultists, historians, amateur historians, and chemists was certainly a more fruitful one, as seen, for example, in the discussions between Waite and Redgrove.\(^{198}\)

Despite its ultimate failure as a natural theology, the story of modern alchemy, particularly through the effort of the Alchemical Society, is of historical importance. It represents a unique attempt to theologize a certain part of physical science in a period characterised by scientific instability and change. The alchemy trope had been reintroduced by enthusiastic scientists who realised that a conceptual revolution was needed in chemistry if their observations were correct. The observations, as we saw in

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197 Waite, 'The Canon of Criticism in Respect of Alchemical Literature'. For Waite's place in the historiography of alchemy, see the evaluation in Principe and Newman, 'Some Problems with the Historiography of Alchemy', 393-395. Principe and Newman note Waite's change of perspective on alchemy in late life, but are not able to find a clear reason for this change: 'The occultist has marvelously transmuted himself into a positivist; whether his mind was changed by further studies or by a convenient abandonment of Victorian occultism for 1920s positivism is unclear'. The answer is neither: Waite's transformation was already in place in 1913, and it happened in the post-radioactivity milieu of modern alchemy in which Waite's ideas were challenged by scientifically more literate people such as Redgrove, in the shared environment of the Alchemical Society. For the relation between Waite's historiography and his esoteric and religious leanings, see Hanegraaff, *Esotericism and the Academy*, 247-252.

198 Cf. Redgrove, 'The Origin of Alchemy'.
chapter four, were established already in 1902. It would, however, be more than two decades until a sufficient set of theories emerged to explain what was going on, and finally replace the earlier models of the 19th century. The Alchemical Society emerged in the middle of this theoretical vacuum. Another reason for what today looks as a confused mix of “backward” ether physics and “progressive” radioactivity research was simply that clarity on these matters was still lacking. However, when this gap was eventually filled at the end of the 1920s, with the establishment and popularisation of the relativity theories and quantum mechanics, the plausibility of modern alchemy gradually withered away. In 1945, the spiritual enthusiasm surrounding radioactivity was quite literally blown away in Hiroshima and Nagasaki. For natural theology, any paradigm will ultimately do, it seems, and a new school quickly emerged to take the place of the ether metaphysics and modern alchemies of the past: quantum mysticism.

(V) Quantum Mysticism

References to quantum mechanics and the “new physics” became a standard ingredient of the New Age and “alternative spiritual” visions of the post-War era. A number of spiritual and theological claims have been argued with reference to basic concepts, experiments, and theories belonging to this field. A brief list of examples would include works such as Lawrence LeShan’s, *The Medium, the Mystic, and the Physicist* (1966), Fritjof Capra’s *Tao of Physics* (1975) and *The Turning Point* (1982), Gary Zukav’s *The Dancing Wu Li Masters* (1979) and *The Seat of the Soul* (1989), Michael Talbot’s *Mysticism and the New Physics* (1980), Deepak Chopra’s *Quantum Healing* (1989), Amit Goswami’s *The Self-Aware Universe* (1993), and a host of other books, articles, TV-shows, documentaries, and films. Although it is not within the scope of the present work to review this vast and still growing literature in its dimensions of breadth, width or depth, it is worth pointing out that a number of themes show up in this later literature that may be traced back to the interpretation and popularisation of new scientific concepts by working scientists of the pre-War period. We may, for example, broadly distinguish between two quantum mechanical focus areas that have been particularly popular, namely the stress on acausality, and the re-evaluation of the role of the observer in

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199 For a general exposition of “New Age science”, see Hanegraaff, *New Age Religion*, 62-76. The best scholarly treatment of quantum mysticism as a specific theme (under the heading ‘Quantum Metaphysics’) is found in Hammer, *Claiming Knowledge*, 271-303.
experiments. In various combinations, these have been used to argue positions such as absolute idealism (e.g. Goswami), that the ordinary physical world is illusion (e.g. Talbot), that consciousness creates reality (e.g. Zukav, Talbot, Chopra), or that there is a general convergence between modern physics and “mysticism” (e.g. LeShan, Capra). In addition come various forms of holistic and vitalistic perspectives, emphasising the ostensible capability of quantum mechanics to counter mechanism, determinism, and/or reductionism.

In the present section I build on the discussion presented at the end of chapter four, and proceed to argue that all the themes mentioned above can be seen as part of a natural theological school of “quantum mysticism” that has its origin with the generation of scientists who developed and conceptualised quantum mechanics. It was born out of a number of intersecting agendas: a struggle to define a new and philosophically more profound identity separating the “new” physics from the “old” one was a central concern of the first wave of fanciful interpretations, largely born in continental Europe; secondly, a wave of popularisation took place in the late 1920s and 1930s, in which the most exotic aspects of physics were emphasised, and possible wider implications of a philosophical and religious character were fed to an enthusiastic public. Together these two aspects led to and sanctioned a field of speculation around the new physics, which imprinted on the general culture and laid the foundation for later speculative uses of physics along the same lines.

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As we saw in chapter five, early quantum physicists were generally not reluctant to speculate on the radical philosophical implications of their science. This, I argued, could be seen as an explicit rejection of disenchantment, in the interest of distancing oneself from a cultural stigma attached to the natural sciences after the Great War. The strategy of the revolutionary physicists was, in short, to portray disenchanted science as something of the past – the naive and erroneous ways of 19th-century “classical”

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200 In addition to these come an interest in the concepts of the uncertainty principle, wave/particle duality, and complementarity – all three related in various ways to the two first.

201 Here we could mention David Bohm, who may be described as a holist, anti-reductionist, and anti-mechanist, but at the same time seems to border on a radical determinism. A vitalistic dimension appears to be present in Gary Zukav’s “Wu Li” project. Cf. Hammer, Claiming Knowledge, 292-295.
mechanists. I argued that these wider cultural and identity-political concerns motivated individual scientists to make certain choices concerning the interpretation of their data, choices that were not strictly speaking necessitated by them. Examples of this include the stress on fundamental acausality, as expressed paradigmatically by Heisenberg as part of his uncertainty principle of 1927, and Bohr's insistence on the principle of complementarity, barring the search for a unified description of quantum phenomena.

While these are already steps in the direction indicated, they are still far from constituting theologies or any positive statements about the structure of reality at all. After all, logical empiricism of the Vienna circle fashion was an important part of the identity of quantum mechanics. Thus complementarity, acausality, and indeterminism were pessimistic assertions about the poverty of experience in supporting grand mechanistic models of reality, and not a basis for constructing any new metaphysical system. While it is thus correct to say that the philosophical emphasis of this generation of physicists was on epistemology, there seems to have been a kind of slippery slope from the epistemological to the metaphysical. Thus, for example, while Bohr was careful to strategically distance himself from ‘mysticism, antirational vitalism, and acausality construed in favor of spiritualism’, at the right occasions and in front of the right audiences (the quotation is from his address to a Vienna circle meeting in Copenhagen in 1936), he was flexible enough to also speculate on the implications of complementarity for human values and experience, or using it in the defence of free will, when addressing other kinds of audiences. Thus, for example, in front of a crowd of anthropologists in the late 1930s, Bohr appealed to complementarity to suggest the plausibility of a cultural relativism that would undermine chauvinistic ethnocentrism and nationalism.

In addition to debunking determinism and defending free will, we also find some of the more extravagant themes of the later quantum mysticism expressed among the earliest quantum physicists, including support of vitalism, organicism, and holism, even of the radically idealistic thesis that consciousness is somehow directly involved with, or responsible for, the production of the physical world. Both vitalism and subjective

204 Bohr, ‘Natural Philosophy and Human Cultures’. 
idealism were in fact expressed by Pascual Jordan, one of the originators of quantum mechanics in the research group of Max Born and Werner Heisenberg in Göttingen. Jordan was cut off from much of his scientific network when he joined the NSDAP in the 1930s, while many of his colleagues emigrated. During this period, Jordan started to take his interpretations of quantum mechanics in new directions. In a paper published in 1935 he stated that the observer of a quantum mechanical experiment does not so much pick out pre-existing realities, as actually create those realities through the act of observation.205 This amounted to what Max Jammer, in his standard work on the philosophy of quantum mechanics, called a ‘maximum formulation’ of the problem with indeterminacy.206 The implication of this interpretation was, to begin with, that philosophical realism fails: there can be no knowledge of an independent physical world, only of a world that is constructed by the observer. Jordan’s point remained an epistemological one, albeit a step more extreme than the main line of the Copenhagen school. The understanding that the implications of the new role of the observer were philosophically revolutionary, and moreover tending in a religious direction, were sufficiently widespread for the Vienna circle philosopher Philipp Frank to address it explicitly on the pages of Erkenntnis.207 Unsurprisingly, his conclusion was that ‘the new role of the “observer” in physics cannot be exploited in support of a turn of physics towards a more spiritualistic conception.’208

Another radical approach was Jordan’s attempt to link quantum mechanics to vitalistic notions in biology. According to Jordan, the radical indeterminacy of quantum events made the “new physics” much more hospitable to non-mechanistic interpretations of life and organisms than the “old physics” had been. In stating the relation this way, it is notable that Jordan went a step further than Bohr in this regard as well; Bohr too had voiced his ideas on what quantum mechanics meant for the life sciences, but to him the question was restricted to his usual epistemological points concerning complementarity. The ‘proper biological regularities’ could be envisioned as laws of nature that were complementary to the laws governing inorganic matter, Bohr

207 Frank, ‘Zeigt sich in der modernen Physik ein Zug zu einer spiritualistischen Auffassung?’
claimed, and held to be able on this basis to resist both mechanistic reductionism and the invocation of special vitalistic forces.\textsuperscript{209} Jordan likewise presented his view as in compliance with a purely epistemological position that did not end up in metaphysics, but he had a much less convincing case. This became clear when Jordan courageously presented his views in the journal of the Vienna circle, \textit{Erkenntnis}. Jordan’s article sparked a large philosophical debate in 1934 and 1935, involving some of the foremost contemporary philosophers of science, including Hans Reichenbach, Otto Neurath, and Moritz Schlick.\textsuperscript{210} Rather unimpressed by the nexus linking quantum mechanics, philosophy of biology, and the question of free will, Neurath concluded: ‘\textsc{[T]}he method practiced by Jordan, to link good, new physics with outdated metaphysics, does not serve the clarification that we seek.’\textsuperscript{211} Despite his failure to convince the logical empiricists, Jordan continued his line of speculation in the years that followed, even publishing a short monograph entitled \textit{Die Physik und das Geheimnis des organischen Lebens} in 1941. Here, the thesis had been expanded to a chapter on ‘Quanten-Biologie’, followed by chapters on psychology, the problem of freedom, and even physics and religion.

While there was thus some tendencies within scientific debates not only towards disputing the strictly disenchanted world picture, but also towards suggesting new metaphysical possibilities, we have to look to the popularisation of physics to find these perspectives applied more explicitly to the field of natural theology. In what follows, I will review two particularly important examples, both taken from the British context. The astrophysicist and pioneer cosmologist Arthur Eddington (1882–1944) developed his views on the new physics and religion in the context of the Gifford Lectures in 1927, published as \textit{The Nature of the Physical World} in 1928. James Jeans (1877–1946) articulated his views on the matter in his bestselling popular science book, \textit{The Mysterious Universe}, published in 1930.


Eddington belonged to the first generation of British physicists who embraced relativity and quantum physics. He even played a role in the vindication of general relativity when, in 1919, he led an expedition to Sobral in Brazil, photographing the solar eclipse and providing evidence that the light of stars were bent around the sun, as Einstein had predicted. This event pretty much launched Eddington's career as a public physicist. The following year, his *Space, Time and Gravitation* (1920) became the first popular exposition of general relativity in the English language. His *Stars and Atoms* (1927) was another popular success, and included expositions of his own scientific contributions in astrophysics, particularly concerning the composition of stars. The same year, Eddington gave his series of Gifford Lectures in Edinburgh, published as *The Nature of the Physical World*.

Although we discuss this book under the heading of “quantum mysticism”, *The Nature of the Physical World* is about much more than quantum mechanics. Its scope is the whole of the physical sciences, presented in a broad cosmological framework. The first eleven chapters of the book expound on the recent developments in physics in general, especially relativity theory and quantum physics, but also the gradual development of thermodynamics. In a popularising manner, Eddington explained how these fields are thought to bear on cosmological questions such as the ultimate fate of the universe (ch. IV), and man’s place in it (ch.VIII). He also made contributions to the “plurality of worlds” debate by speculating about possible life on Venus and Mars. For example, he thought it entirely possible that Venus is covered by vast oceans hidden under its fog, and is a planet ‘where fishes are supreme’. As for Mars, Eddington found that there is ‘a rather strong case for the existence of vegetation’ on the planet, but held that the evidence was insufficient to conclude anything about animal life. However, as he was inclined to reject the nebular hypothesis of formation of planetary systems – a scientific tradition stretching back to Swedenborg, through Laplace, by which the formation of planetary systems would be expected to have happened

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214 Ibid., 174.
frequently in the universe – he held our solar system to be ‘a freak’ among the stars.\textsuperscript{215} Our sun was the only known star with planets, he stressed, while there were ‘thousands of double stars in the sky’, stars that were thought unlikely to produce planets.\textsuperscript{216}

Such cosmological speculations are obviously of a certain relevance to worldview questions, as they say something about the place of human beings in the universe at large. Historically, natural theology has often focused on precisely such questions, whether related to the age of the earth, its place in the solar system, its uniqueness in the universe, or the question of whether we are alone or not. Contemplating the place of humanity in the cosmos, Eddington remarks that life seems not to be a central ingredient in our universe, and humanity itself is certainly not in any essentially privileged position. Despite an initial pessimism, however, Eddington does seem to suggest that there is a “purpose” to the universe after all, and that this purpose is connected with what he conspicuously calls ‘the mystery of consciousness’:

Assuming that the stage of highly developed life is a very small fraction of the inorganic history of the star, the rival earths are in general places where conscious life has already vanished or is yet to come. I do not think that the whole purpose of the Creation has been staked on the one planet where we live; and in the long run we cannot deem ourselves the only race that has been or will be gifted with the mystery of consciousness. But I feel inclined to claim that at the present time our race is supreme; and not one of the profusion of stars in their myriad clusters looks down on scenes comparable to those which are passing beneath the rays of the sun.\textsuperscript{217}

Eddington is thus able to argue that humanity is most likely in a special position \textit{for the time being}, in the capacity of having attained this mystery of consciousness. It is interesting to note that the basic assumption here is not so far removed from that of Alexander and the emergentists: the ability of the universe to produce conscious beings becomes the mystifying central point. Humanity’s role is solely as a specific step in this process, at a more or less random place within spacetime.

These cosmological considerations already address issues connected with natural theology. In the last four chapters of the book, however, Eddington deals

\textsuperscript{215} Ibid., 176.
\textsuperscript{216} Ibid.
\textsuperscript{217} Ibid., 178.
explicitly with the ‘position which this scientific view should occupy in relation to the wider aspects of human experience, including religion’. He made clear that the first eleven chapters could easily be enjoyed and appreciated on their own terms, seen apart from the applications in the latter part of the book; however, Eddington also stated that his ‘principal aim has been to show that these scientific developments provide new material for the philosopher. I have, however, gone beyond this and indicated how I myself think the material might be used.’ It is these four last chapters that interest us the most, as they contribute significantly to the developing discourse on science and religion. As I will show, Eddington’s approach to this discourse bears certain clear signs of his Quaker upbringing and beliefs. Furthermore, I concur with Peter Bowler’s verdict that it amounts to a theology of nature, rather than a natural theology in the strictly defined sense.

Eddington develops an essentially idealistic metaphysic to account for reality, which harkens back to 19th century theories. For example, Eddington borrows the concept of “mind-stuff” from the Victorian mathematician and philosopher William Kingdon Clifford (1845–1879):

the stuff of the world is mind-stuff. ... The mind-stuff of the world is, of course, something more general than our individual conscious minds; but we may think of its nature as not altogether foreign to the feelings in our consciousness.

Admitting that this idealist foundation may be hard to swallow for many of his colleagues, Eddington appealed to an old sceptical argument:

It is difficult for the matter-of-fact physicist to accept the view that the substratum of everything is of mental character. But no one can deny that mind is the first and most direct thing in our experience, and all else is remote inference – inference either intuitive or deliberate.

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218 Ibid., vii.
219 Ibid., viii.
220 Bowler, Reconciling Science and Religion, 110.
Similar to how epistemological scepticism has so often been used in support of idealism in the past, the point of the argument is that “mind” or “consciousness” is the only thing of which one has some more or less certain knowledge, and that hence it should be more parsimonious to assume other, less certain types of entities to be in some way of the same “stuff”, rather than inferring something of a radically different nature.

While this fundamental epistemological scepticism may not seem too convincing as a support for idealism as it once did, it is still connected to a distinction that is absolutely central to Eddington’s philosophy of nature. Eddington distinguishes between two types of knowledge, one “symbolic” and the other “intimate”. Scientific knowledge is of the symbolic kind: it is a set of abstractions and reconstructions of a supposed world “out there”. The symbols are capable of being processed, calculated, schematized, communicated and criticized. Intimate knowledge, on the other hand, is the kind of knowledge which is spontaneous, direct, and happens in immediate experience. This type of knowledge is not really capable of being faithfully translated into symbolic knowledge; when translated, it is essentially lost, or transmuted into something essentially different.

An example of symbolic versus intimate knowledge is provided at the very beginning of Eddington’s chapter on ‘Science and Mysticism’. Here he cites and compares two passages that are both meant to describe waves created on a surface of water by a soft breeze: one is from a textbook on hydrodynamics, and filled with equations; the other is taken from a sonnet by the poet Rupert Brooke (1887–1915). The joy, laughter, and emotion triggered by the view of waters blown by changing winds in Brooke’s sonnet are, from the scientific perspective, mere illusion and self-deception,

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223 Eddington’s category seems to correspond to the contemporary notion of “embodied” knowledge; that is, the focus on perception, cognition, and mental activity in the context of our bodily situatedness. Some classics in this burgeoning field on the intersection between phenomenology, philosophy, psychology, and neuroscience include Maurice Merleau-Ponty, *Phénoménologie de la perception*; Francisco Varela, Evan Thompson, and Eleanor Rosch, *The Embodied Mind*; Shaun Gallagher, *How the Body Shapes the Mind*; Lawrence Shapiro, *Embodied Cognition*. It should be noted that this contemporary stream of thought has also been used on several occasions to justify new views on “spirituality”, this time particularly through an embrace of various forms of meditation, and through secularised Buddhism. See especially the final chapter of Varela, Thompson, and Rosch, *The Embodied Mind*.

224 Ibid., 321-323.
Eddington explains. Yet, most people would agree that there is something valuable and authentic about the experience of nature, conveyed here in poetry. This immediate experience of nature is, in fact, what moves Eddington to approach the concept of “mysticism”. Intimate knowledge is involved in a ‘mystical feeling for Nature’, but also in the ‘mystical experience of God’. However, since this intimate knowledge is lost to symbolic knowledge – including science and theology – these two types of knowledge seem on the surface to exclude one another. One is thus left with a choice:

It seems to me that the only alternatives are either to count all such surrender to the mystical contact with Nature as mischievous and ethically wrong, or to admit that in these moods we catch something of the true relation of the world to ourselves – a relation not hinted at in a purely scientific analysis of its content. I think the most ardent materialist does not advocate, or at any rate does not practice, the first alternative; therefore I assume the second alternative, that there is some kind of truth at the base of the illusion.

Having thus vouched for the validity of “mystical” intimate knowledge – vis-à-vis, and partially opposing scientific knowledge – Eddington goes on to characterise what the truth of mysticism might be:

If I were to try to put into words the essential truth revealed in the mystic experience, it would be that our minds are not apart from the world; and the feelings that we have of gladness and melancholy and our yet deeper feelings are not of ourselves alone, but are glimpses of a reality transcending the narrow limits of our particular consciousness – that the harmony and beauty of the face of Nature is at root one with the gladness that transfigures the face of man.

Mysticism, then, appears as a route to real and important knowledge, of a kind quite different from scientific knowledge. Substantially, the knowledge is one of monism, or at least of an integration of individual consciousness with the totality of the world.

There is, however, a fundamental pessimism here about the very project of natural theology, even of theology as such. As Eddington reminds his readers, ‘theology

\[\text{\textsuperscript{225}}\text{Ibid., 317-320.}\]
\[\text{\textsuperscript{226}}\text{Ibid., 320.}\]
\[\text{\textsuperscript{227}}\text{Ibid., 321.}\]
is symbolic knowledge whereas the experience [i.e. mystical experience of God or nature] is intimate knowledge’ – the latter, he had already claimed, can never be translated faithfully into the other.\(^{228}\) Hence, a “scientific” search for God in Nature is fundamentally misguided. This criticism is expanded when Eddington writes that

... if the scientist were to repent and admit that it was necessary to include among the agents controlling the stars and the electrons an omnipresent spirit to whom we trace the sacred things of consciousness, would there not be even graver apprehension? We should suspect an intention to reduce God to a system of differential equations, like the other agents which at various times have been introduced to restore order in the physical scheme.\(^{229}\)

A search for divine agency in nature might, in fact, lead not to a re-enchantment of science, but rather to a *trivialization* and *reduction* of the divine to a system of arbitrary and symbolic differential equations. In place of the strictly natural theological project, Eddington thus defends a “mystical religion”, built on intimate experience:

I repudiate the idea of providing the distinctive beliefs of religion either from the data of physical science or by the methods of physical science. Presupposing a mystical religion based not on science but (rightly or wrongly) on a self-known experience accepted as fundamental, we can proceed to discuss the various criticisms which science might bring against it or the possible conflict with scientific views of the nature of experience equally originating from self-known data.\(^{230}\)

The real problem remains to build something lasting, a worldview or a religion, which must essentially imply a symbolic kind of knowledge. Doing so, Eddington argued, is necessary: 'If not, it can only be left ungraspable – an environment dimly felt in moments of exaltation but lost to us in the sordid routine of life'. The way of formalising a worldview in symbolic language had, however, to be deeply personal and individual: 'We have to build the spiritual world out of symbols taken from our own personality'.\(^{231}\)

Intriguingly, Eddington thus comes in support of a strengthening of the faculty of

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\(^{228}\) Ibid., 322.
\(^{229}\) Ibid., 281-282.
\(^{230}\) Ibid., 333.
\(^{231}\) Ibid., 337-338.
imagination, a faculty which, he reminds his readers, is always present for us when we interact with the world around us, a world which science has taught is largely “illusion”:

... so it seems to me that the first step in a broader revelation to man must be the awakening of image-building in connection with the higher faculties of his nature, so that these are no longer blind alleys but open out into a spiritual world – a world partly of illusion no doubt, but in which he lives no less than in the world, also of illusion, revealed by the senses.232

Eddington’s pessimism about natural theology, and defence for an individualised mysticism which at best supplements science, and perhaps finds certain analogies to support its case in the difference between scientific and everyday conceptions of reality, seems to be in harmony with his Quaker background. Quakerism, it is to be remembered, is a pietistic Christian movement with a strong emphasis on internal “mystical” practices by which one is said to enjoy direct contact with God in one’s soul – even though these practices are typically managed in collective gatherings. By emphasising the direct mystical experience over the symbolic and doctrinally mediated knowledge of sciences and theologies, Eddington’s philosophy of nature is in compliance with the Quaker understanding of religion.

Although sceptical of natural theology’s sufficiency, Eddington did not refrain completely from drawing certain metaphysical conclusions from contemporary physics. Indeed, he held that the ‘idea of a universal Mind or Logos would be ... a fairly plausible inference from the present state of scientific theory; at least it is in harmony with it’.233 His scepticism was rather connected with questions of value. As we saw, the god of natural theology had to be a rather indifferent god:

all that our inquiry justifies us in asserting is a purely colourless pantheism. Science cannot tell whether the world-spirit is good or evil, and its halting argument for the existence of a God might equally well be turned into an argument for the existence of a Devil.234

With this in mind, one might wonder how any more certainty could be gained through mysticism than through science. Eddington treats this question as one of the most

232 Ibid., 324.
233 Ibid., 338.
234 Ibid.
serious objection that a scientist could raise against the mystic: does the mystic have any method of inference by which intuitive self-knowledge may give way to substantial and reasonably secure knowledge? Eddington admitted that there is a historical association between mysticism and ‘extravagances which cannot be approved’, as well as indications of unhealthy psychopathological conditions giving rise to what seems like exalted moments of insight.235 Nevertheless, he decided to shrug off these difficulties with yet another analogy to the imprecision of our senses in general, and the possible dangers this represents for science: ‘the avenue of consciousness into the spiritual world may be beset with pitfalls, but that does not necessarily imply that no advance is possible’.236 Eddington furthermore made clear that his reference to mysticism must not be taken to imply merely exceptional, extravagant experiences and abnormal states of consciousness: ‘to suppose that mystical religion is mainly concerned with these [extravagant experiences] is like supposing that Einstein’s theory is mainly concerned with the perihelion of Mercury and a few other exceptional observations’.237 Similarly, the crucial mystical experience was to apply generally to the interaction with the world, as the spontaneous feeling of being present in and fully integrated with nature. However this may be, Eddington’s defence of certainty in mysticism, and its validity as a basis for worldviews in the end boiled down simply to these analogies and common sense arguments; a “method of inference” is never suggested.

In summing up and concluding, there are two crucial movements in Eddington’s take on natural theology. The first is to provide an argument for idealism, and especially the role of consciousness in the universe, based on recent scientific advances. While this is undoubtedly a metaphysical position, Eddington does not consider it sufficient for a natural theology as such. Instead, and secondly, he defends a mystical religion which is, in fact, opposed to a natural theology, strictly defined as the attempt to find, by scientific means, traces of the sacred in nature. The only authentic way to religion is through an inner mysticism, undoubtedly primed by his Quaker background; ultimately ‘the God within creates the God in Nature’.238 Those searching for God in the equations of physics have gone looking in the wrong place.

235 Ibid., 340.
236 Ibid.
237 Ibid.
238 Ibid., 330.
These two general arguments are expressed in four points summarised by Eddington in his final chapter on mystical religion.\textsuperscript{239} First, the entities of physics are of a symbolic nature, which make it ‘almost self-evident that it is a partial aspect of something wider’. This serves a very general epistemological basis for an idealist interpretation, which gives room for alternative ways of knowing pertaining to whatever is beyond physics. Secondly, following the quantum revolution, strict causality is abandoned, which ‘relieves the former necessity of supposing that mind is subject to deterministic laws or alternatively that it can suspend deterministic law in the material world’. Third, the physical world is completely abstract and lacking “actuality” – ‘apart from its linkage to consciousness’ – an insight which restores consciousness ‘to the fundamental position instead of representing it as an inessential complication occasionally found in the midst of inorganic nature at a late stage of evolutionary history’. Again, this primacy of the conscious subject is taken as a vindication of idealism, and furthermore makes it easier to accept mysticism in the form defined by Eddington. Fourth and finally, the correlation of a “real” physical world to certain conscious feelings is neither more nor less legitimate than ‘correlating a spiritual domain to another side of our personality’. This last point is again a consequence of the epistemology of physics as Eddington conceives it.

Even though Eddington allowed himself to go in a much more metaphysical direction than his continental colleagues, who were more concerned with following the latest philosophical fashions of Vienna and Copenhagen, he too in the end drew more from the epistemology of physics than from its substance. It was by taking the new anti-realism of physics seriously, and embedding it in an idealist framework that mysticism became a viable option. What little could be drawn from the substantial side of physics seemed to Eddington to support idealism further, but without the intimate mystical experience of comfortable unity with the whole of nature, such inferences were useless as natural theologies. The inner illumination of mysticism was the only guarantee that the “world spirit” was divine and not demonic. With this assessment, however, the picture that appears from Eddington’s writing is really that modern science might support religion despite itself. It is in this context that the oft quoted phrase that ‘religion

\textsuperscript{239} The points and the following citation are found in ibid., 331-332.
first became possible for a reasonable scientific man about the year 1927’ should be read. I will close this discussion on Eddington by quoting it in full:

It will perhaps be said that the conclusion to be drawn from these arguments from modern science, is that religion first became possible for a reasonable scientific man about the year 1927. If we must consider that tiresome person, the consistently reasonable man, we may point out that not merely religion but most of the ordinary aspects of life first became possible for him in that year. Certain common activities (e.g. falling in love) are, I fancy, still forbidden him. If our expectation should prove well founded that 1927 has seen the final overthrow of strict causality by Heisenberg, Bohr, Born and others, the year will certainly rank as one of the greatest epochs in the development of scientific philosophy. But seeing that before this enlightened era men managed to persuade themselves that they had to mould their own material future notwithstanding the yoke of strict causality, they might well use the same *modus vivendi* in religion.240

In accordance with his common sense perspective, Eddington here makes it clear that the problems of determinism and free will have always been strictly intellectual, and that hence it is only ‘that tiresome person, the consistently reasonable man’ who has experienced them. It is only for this class of person that 1927 will stand as a year of relief. For everyone else, life remains what it always was. Remembering our previous discussion of disenchantment, it is tempting to conclude that Eddington, writing as a physicist, *for* the common crowd, while remaining true to his Quaker background, presents a view of the problem of disenchantment that is in line with my own: while Weber, as an academic and intellectual, may have seen “the disenchantment of the world” as the only outcome of the sciences, almost as a necessary deduction from its principles, most people, including many scientists and academics, may not have been so ‘consistently reasonable’. For those who were, the revolutions of physics made other options viable once more.

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The other big public name in British physics in the interwar period was James Jeans. Jeans shared many things with Eddington: he too was a deft populariser, and his main

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240 Ibid., 350.
field of expertise was cosmology. Indeed, as a populariser, Jeans was even more successful than Eddington, writing not only books and newspaper columns, but also frequently appearing in the new mass medium of radio.\textsuperscript{241} Also like Eddington, Jeans’ popular science focused on the “big questions”, openly addressing the question of what modern science has to offer religion. While much unites the two men we shall see that the big questions were in the end answered quite differently.

The book that concerns us the most here is \textit{The Mysterious Universe}. Originally published in 1930 the book immediately became an all-time bestseller, breaking all previous records for science books.\textsuperscript{242} Judging from the press reviews upon the book’s publication, it was precisely the wider speculations on the world picture emerging from the new sciences that captured the popular reader’s attention. Jeans’ literary strategy in presenting the implications of science may be summarised in two main movements. First, he described the cosmology that had by the start of the 1930s emerged from the breakthroughs in the physical sciences with relativity, quantum mechanics, and new observations and theories in astrophysics. This was, as we already saw with Eddington, a cosmology in which humanity seemed hopelessly alone, surrendered on all sides by vast reaches of emptiness only interrupted by the most extreme conditions of heat, coldness, and radiation – hardly very hospitable for life in any known form. Jeans emphasised this feeling of alienation, describing the extreme isolation of humanity, our miniscule importance in the grander scheme of the universe’s history, and the utter arbitrariness of our existence in the cosmos. Similar to Eddington, Jeans argued that whatever the purpose of the universe might be, it did not seem very likely to be the production of life; indeed, if one had to pick one phenomenon among others, it could just as well have been magnetism or electricity that the universe was “intended” to produce – at least these played a much more central role in it than did life.

As Bowler writes, Jeans’ vision of ‘a lonely humanity in a vast and empty universe had an austere grandeur’. Ending there would, however, be deeply troubling to anyone hungry for meaning. Again, as with Eddington and so many others, it was the invocation of idealism that would save the day for life and humanity, by reserving a special place for consciousness.

\textsuperscript{241} For a basic discussion of Eddington’s and Jeans’ popularisation campaigns, see Bowler, \textit{Science for All}, 98-103.

\textsuperscript{242} Ibid., 101.
Jeans' idealism has certain similarities with Eddington's, but the two are far from identical. Neither are their views on consciousness the same. Jeans introduced consciousness in the final chapter of *The Mysterious Universe*, entitled 'Into the Deep Waters', where he discussed its relation to the essentially deterministic universe as understood by general relativity. In this connection, he also introduced the concept of “world lines”, used to describe the essentially geometrical aspects of time and duration. A “world line” is, in short, the extension of an object in four-dimensional spacetime. Thus we could imagine our own lives as tubes stretched out and entwined with other objects, with our births in one end, death in another, and all events finding their positions in between. Trying to situate consciousness in the middle of this static view of time proved difficult, but Jeans tried to find a way by going beyond spacetime itself: 'We can most simply interpret consciousness as something residing entirely *outside* the picture [of the physical world], and making contact with it only along the world lines of our bodies'.

On this view, the passage of time is merely an illusion which arises from the “contact” between consciousness and the world along our world lines. It would, however, have been more correct to say that events do not really *happen* at all, but that we merely come across them – everything has, in a sense, already happened. This is undoubtedly a Platonic conception, and Jeans appropriately quotes the *Timaeus* in support on his eternalist view of time. What emerges, however, is a completely deterministic worldview, and the place of consciousness seems from the above consideration very different from what Eddington presented. While Eddington asserted the primacy of consciousness and experience and described the physical world picture as merely symbolic, Jeans gives to consciousness a completely passive role, fixed to determined physical structures in a way that comes very close to the dualistic parallelism of Descartes.

Nevertheless, Jeans is at pains to insist that the deterministic aspects of his worldview do not entail materialism and mechanism. Through a slightly different route than Eddington, Jeans insists that his worldview too is in essence idealistic, and furthermore, connected to the old notion of a great ‘Mind of God’ in which all things subsist. Following his Platonic style of reasoning, major stress is laid on the role of

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244 Ibid., 118-120.
245 Ibid., 119.
mathematics in the universe. That nature has turned out to be ‘very conversant with the rules of pure mathematics’, that is, mathematics as thought up by mathematicians ‘out of their own inner consciousness and without drawing to any appreciable extent on their experience of the outer world’, being creations of pure thought, of reason ‘operating solely within her own sphere’, is to Jeans a fact not to be passed over lightly.\textsuperscript{246} It leads him to a variety of the old teleological argument for the existence of God, also known as the “design argument”. By analogy, Jeans considers how a deaf engineer and a deaf musician would study the automatic actions of a pianola.\textsuperscript{247} The engineer might perhaps try to interpret it as a machine, ‘but would be baffled by the continuous reiteration of the intervals 1, 5, 8, 13 in the motions of its trackers’.\textsuperscript{248} The musician, on the other hand, even without being able to hear anything, would immediately recognise this succession of numbers as intervals of the common chord, while other successions of less frequent occurrence would suggest other musical chords. In this way he would recognise a kinship between his own thoughts and the thoughts which had resulted in the making of the pianola; he would say that it had come into existence through the thought of a musician.\textsuperscript{249}

The analogy is clear: the mathematically minded scientist has come to recognise mathematical structures everywhere in nature, and, although Jeans admits it is a crudely and inadequately developed belief, he may state that ‘the universe appears to have been designed by a pure mathematician’.\textsuperscript{250}

Jeans stated this conviction several times over, but we should continue now to have a look at how it is connected to an idealist metaphysic. In addition to Plato and Pythagoras, Jeans’ philosophical favourite on this matter seems to be George Berkeley. After quoting Berkeley on the necessity he saw for an ‘Eternal Spirit’ in whose mind things subsist while they are not being perceived directly by individual minds, Jeans writes that ‘[m]odern science seems to me to lead, by a very different road, to a not

\begin{footnotesize}
\textsuperscript{246} Ibid., 130.
\textsuperscript{247} I.e., a self-playing piano, which had been extremely popular in the 1920s.
\textsuperscript{248} Ibid., 131.
\textsuperscript{249} Ibid., 131-132.
\textsuperscript{250} Ibid., 132.
\end{footnotesize}
altogether dissimilar conclusion. 1251 Behind this statement is Jeans’ conviction that the
old distinction between “realism” and “idealism” has become obsolete, and that what emerges from the modern scientific view of the world is a kind of “idealistic realism”. Again, Jeans connects this position to the role of mathematics: “objective” realities exist in the sense of behaving invariably the same to all observers, and this objectivity is of a mathematical character. 252 Contrary to the materialistic mechanism of physics only a few decades earlier, Jeans contended that there was now almost unanimity that the scientific world picture is going in a non-mechanistic direction hospitable to this form of mathematical idealism:

the universe begins to look more like a great thought than like a great machine. Mind no longer appears as an accidental intruder into the realm of matter; we are beginning to suspect that we ought rather to hail it as the creator and governor of the realm of matter – not of course our individual minds, but the minds in which the atoms out of which our individual minds have grown exist as thoughts. 253

Jeans suggests a view of ‘the universe as a world of pure thought’, an idea which, he believes, throws some light on the historical development in physics as well. 254 If the universe is truly mental and mathematical, then this explains why one physical concept after the other had lost its picturability, being instead replaced by pure mathematical formulae. Furthermore, it means that the mathematical expression that describes a certain phenomenon is the most true and close to reality one can get: ‘as long as there is no imperfection in this [the mathematical description] our knowledge of the phenomenon is complete’. 255 This realism about mathematics is obviously a big step away from Eddington’s view – we are particularly reminded of his criticism of natural theology as resulting in arbitrary and empty equations.

Continuing his defence of mathematics, Jeans intriguingly slips into a metaphor of idolatry and iconoclasm, which I will quote at length:

251 Ibid., 137.
252 Ibid., 137-138.
253 Ibid., 148.
254 Ibid., 140.
255 Ibid., 141.
The making of models and pictures to explain mathematical formulae and the phenomena they describe, is not a step towards, but a step away from, reality; it is like making graven images of a spirit. And it is as unreasonable to expect these various models to be consistent with one another as it would be to expect all the statues of Hermes, representing the god in all his varied activities – as messenger, herald, musician, thief, and so on – to look alike. Some say that Hermes is the wind; if so, all his attributes are wrapped up in his mathematical description, which is neither more nor less than the equation of motion of a compressible fluid. The mathematician will know how to pick out the different aspects of this equation which represent the conveying and announcing of messages, the creation of musical tones, the blowing away of our papers, and so forth. He will hardly need statues of Hermes to remind him of them, although, if he is to rely on statues, nothing less than a whole row, all different, will suffice.\(^{256}\)

Jeans the iconoclast finished this analogy by noting slyly that most physicists were yet busily at work ‘making graven images of the concepts of the wave-mechanics’.\(^{257}\)

Jeans’ scientific worldview, then, is an idealistic one, where the universe is brought forth by the thoughts of a master mathematician. Remembering Eddington’s criticism of natural theology, one might wonder what the comfort of such a worldview is. Jeans was prepared to meet such criticism, and we might end this section by quoting from some of the final passages. Returning to the question of how consciousness is related to our individual world lines on a determined relativistic spacetime continuum, Jeans picks his metaphors well in an attempt to avoid the old connotations of mechanistic determinism. His determinism is rather expressed through analogies that invoke the enjoyment of finite pieces of art: ‘we need find no mystery in the nature of the rolling contact of our consciousness with ... space-time, for it reduces merely to a contact between mind and a creation of mind – like the reading of a book, or listening to music’.\(^{258}\) Nature is more like a book or a symphony than a machine; this sounds perhaps more comforting, but just as the machine had already been built, the symphony had already been recorded, and “consciousness” was pretty much forced to listen. Jeans, however, continued to argue that the idealistic picture that in his opinion was suggested

\(^{256}\) Ibid., 141.  
\(^{257}\) Ibid.  
\(^{258}\) Ibid., 143.
by modern physics should in the end soothe us, even despite of our apparent loneliness in the universe:

It is probably unnecessary to add that, on this view of things, the apparent vastness and emptiness of the universe, and our own insignificant size therein, need cause us neither bewilderment nor concern. We are not terrified by the sizes of the structures which our own thoughts create, nor by those that others imagine and describe to us. ... The immensity of the universe becomes a matter of satisfaction rather than awe; we are citizens of no mean city. Again, we need not puzzle over the finiteness of space; we feel no curiosity as to what lies beyond the four walls which bound our vision in a dream.259

Through the immense commercial success of *The Mysterious Universe*, the idea that physics was uncovering the workings of a mathematical architect God spread quickly among consumers of popular science. The first to criticise this view was the influential Marxist science journalist J. G. Crowther, one of the very first professional science correspondents in Britain, who argued (not entirely implausibly) that ‘the mathematical character of the laws of nature was a human construction’.260 This, as we have seen, is a conclusion that a certain other idealist physics populariser would probably agree to: Jeans’ mathematical architect God is precisely the kind of colourless and arbitrary divinity that Eddington had warned about.

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There seems to be a considerable drive towards idealism among the first generation of scientists working with the “new physics”. This philosophical and natural-theological overlay, I argue, laid the foundations for a “quantum mysticism” to grow up from the middle of the 20th century. Authors such as Eddington and Jeans represent a link between the newer “spiritual” uses of science, and the older, predominantly British, discipline of natural theology. Eddington, on his part, formed his thoughts on the matter in the context of the explicitly natural theological Gifford Lectures, even though he ended up coming out against a traditional conception of natural theology. Jeans, on the other hand, presented a natural theology of the kind which Eddington opposed, and

259 Ibid.

published it as a part of a wider project of science popularisation. Furthermore, for both
these authors, and for continental scientists such as Jordan, Bohr, and later Pauli, the
philosophical and sometimes directly religious implications of their discoveries were
pitted against a caricatured picture of “classical” physics. As explained in chapter four,
the distinctive features attributed to the new physics must be seen in light of the
creation of emic historiographies of science. However, while Jeans was ready to contrast
the idealistic worldview he drew from contemporary physics with the mechanistic one
of the Victorian period, many Victorian ether physicists were, in fact, also idealists, and
made some times quite strikingly similar arguments to the ones advanced by Jeans
himself. Even Jeans’ use of Berkeley found its precursor already in the ether
metaphysics of Stoney and FitzGerald.

Despite the rather immense popular appeal of these quantum mystics and
prophets of the new physics, Peter Bowler has passed a somewhat sobering judgment
on Jeans and Eddington by focusing on the reception their works had among
professional scientists and philosophers.261 These were generally ambivalent, when not
outright hostile:

Not everyone agreed with the implications drawn from these theories, of course, and there
were few physicists or philosophers in the later 1930s willing to endorse the idealism of
Jeans and Eddington. Their philosophy was treated with suspicion even by some theologians,
who thought that it provided no real evidence for a true spirituality. But the new science
could at least uphold a challenge to simple materialism, and many religious apologists were
eager to use the ammunition it gave them.262

In the end then, we must endorse as significant the conclusion that, through the early
1930s, ‘the door to a reconciliation between the physical sciences and religion was held
open by at least an articulate minority within the scientific community’.263

261 Notable examples of thorough philosophical criticism of the physicists’ turn to idealism includes L.
Susan Stebbing, Philosophy and the Physicists (1937); Cf. A. D. Ritchie, Reflections on the Philosophy of Sir
262 Bowler, Reconciling Science and Religion, 121.
263 Ibid.
Having now made our way through five schools of new natural theology, represented by a large sample of authors, philosophers, and scientists, advancing a number of diverging views among themselves, it is desirable to close this chapter with some general reflections that may draw this whole field of early 20th century intellectual culture together. In particular, it is justifiable to ask whether we can discern any commonalities between all these approaches to religion and science. I shall argue that we can. Furthermore, I will argue that these commonalities relate the schools we have discussed to a theological and philosophical current that has a long, but problematic, history in Western culture.

From a theological point of view, the foremost problem of natural theology concerns the relationship between nature and divinity. In Christian theology, and the Abrahamic monotheistic theologies more broadly, this relation has typically been described as one of separation, in which God is creator and nature his creation. This assumption has been the foundation for theistic and deistic theologies, which may crudely be construed as the two mainstream positions on the matter. The difference between the two is precisely the extent to which the divine interferes with his creation: regularly in the case of theism; not since the act of creation in the case of deism. A strict ontological distinction between creator and creation is, however, still assumed in both. As soon as this distinction is blurred, we are looking at positions that have typically been labelled “heretical” in Western theology. As Wouter Hanegraaff has recently shown, one of the fathers of the history of philosophy, Jacob Thomasius (1622–1684), formalised this distinction by holding that the “original fallacy” at the root of all heresies was the rejection of *creatio ex nihilo* in favour of a doctrine of the eternity of the world. To Thomasius, the idea that nature was eternal just like God had been at the core of paganism, and all later heresies inspired by, or tending towards, paganism. This doctrine could, however, take a variety of forms:

All heretical beliefs were ultimately grounded in this belief: emanationism (souls or intelligences are not newly created by God but pour forth from his eternal essence), dualism (form and matter, or God and matter, are two co-eternal principles), pantheism (the world is
God), and materialism (God is the world). In their different ways, all these variations amounted to deification of the creation at the expense of its Creator.264

Hanegraaff’s thesis is that Thomasius’ classification and pathology of error, set forth in his influential Schediasma historicum (1665), also and accidentally laid down the conceptual framework that led to the first historical conception of “esotericism”, particularly through its influence on Ehregott Daniel Colberg’s heresiological work, Platonisch-Hermetisches Christentum (1690–1691).265 These works defined the borders between acceptable and heretical doctrine, not only in theology, but in philosophy as well. The latter movement from theology to philosophy was particularly realised by the works of Christian August Heumann (1681–1764) and Johann Jacob Brucker (1696–1770); Heumann defined the characteristics of “pseudo-philosophy” with recourse to Thomasius, even explicitly holding a belief in the world’s co-eternity with God to be one of the fundamental errors (together with the materiality of the soul, and the vitality or agency of matter), and Brucker implemented this general perspective in his widely read and extremely influential work in the history of philosophy, the Historia critica philosophiae (1742–1744).266

The new natural theologies we have encountered in this chapter are all at odds with orthodoxy as it was defined by these Reformation and Enlightenment authors. Although the question of the eternity of the world becomes a difficult one with the modern cosmology of an expanding and relativistic universe, as it appears in Jeans and Eddington, or even an organically evolving one, as in the theologies of emergence, the ontological distinction between creator and created does break down in all of them. They all position themselves in the theological landscape around the two pillars of Platonism and pantheism. Alexander, drawing equally on Spinoza and Plato, was perhaps the most heretical of them all, since his system not only stripped God’s attributes of their eternity, but made divinity absolutely dependent on a constantly changing nature.

264 Hanegraaff, Esotericism and the Academy, 105.
265 See especially Hanegraaff, Esotericism and the Academy, 101-114.
266 For Hanegraaff’s discussion of this development, see ibid., 127-147 (for Heumann’s “pseudo-philosophy”, see pp. 131-132).
What, then, are the general positions open for natural theologies? Atheism and agnosticism are axiomatically ruled out by the very nature of the endeavour, and deism seems insufficient. Theism and pantheism are both viable options in principle, but in practice the theistic orthodoxy (in which an ontological difference between god and the world is presumed) seems to have moved increasingly out of fashion. Pantheism remains, but I will argue that what we see is rather varieties of panentheism or cosmotheism.

Panentheism and cosmotheism may be treated as different scholarly formulations of the same theological idea: one has been developed in the context of the philosophy of religion (panentheism), the other to point out a historically grounded theological development (cosmotheism). Panentheism may be described as a position that attempts to balance the transcendence of theism with the immanence of pantheism, while avoiding both the strict separation of god and nature characteristic of the former, and the identification of nature and god in the latter. Literally, the Greek neologism would suggest that “all is in god”, while some have preferred to add that god is thus also in all. The term was first coined in 1829 by the German philosopher Karl C. F. Krause (1781–1832); it is significant for us to note that Krause was developing a theological system in a romantic-idealist context that he shared with Schelling’s Naturphilosophie. In the 20th century, both the term and its conceptual content have experienced a revival, particularly due to Charles Hartshorne’s work in the philosophy of religion. After Hartshorne and William Rees re-introduced the term in 1953, and used it to identify and systematise a certain line of theological thinking in Western history, panentheism has had a veritable revival in late-20th century theology and philosophy of religion. Interestingly, it seems to have gathered particular attention among those theologians and philosophers who have engaged the question of

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267 For a short and systematic contemporary overview of the philosophical dimensions of panentheism, see John Culp, 'Panentheism'.
269 See especially the introduction and epilogue to Hartshorne & Rees (eds.), Philosophers Speak of God (1953), which gathers together in a systematic way texts written by philosophers, prophets, and intellectuals, from Ikhnaten, Lao-Tse, Plato, and Aristotle, to Hume, Kant, and Schelling, to Freud, Nietzsche, James and Peirce. The introduction is entitled ‘The Standpoint of Panentheism’, and the epilogue ‘The Logic of Panentheism’.

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reconciling religion and modern science.\footnote{For an overview of this current development, see e.g. Philip Clayton & Arthur Peacocke (eds.), \textit{In Whom We Live and Move and Have Our Being} (2004). Philip Clayton was also co-editor (with Zachary Simpson) of the monumental \textit{Oxford Handbook of Religion and Science}, which reads more as a work of theology and philosophy of religion than a work in religious studies. At least two articles in it deal explicitly with panentheism: Michael W. Brierley, ‘The Potential of Panentheism for Dialogue between Science and Religion’; Owen C. Thomas, ‘Problems in Panentheism’.

\footnote{Assmann, \textit{Of God and Gods}, 71.} I suggest that this link has a longer history, and that the tendency away from theism and deism towards panentheism was suggested by early 20\textsuperscript{th} century natural theology.

Another historical perspective on panentheistic theologies is found in Jan Assmann’s historical work on monotheism. Although there is a striking resemblance between Hartshorne’s version of panentheism and Assmann’s main thesis on the development of monotheism in \textit{Of God and Gods} there is no reference to Hartshorne’s work in it, and panentheism does not even appear in the index. To Assmann, cosmotheism denotes a certain theological development in between paganism and monotheism, associated with the ‘idea of the world as the embodiment of a soul-like god and of god as a soul animating the world’,\footnote{Ibid., 53-75.} Assmann identifies cosmotheism, and the later development which he calls “hypercosmism”, as the final stages in a process of “evolutionary monotheism”.\footnote{Ibid., 74.} Evolutionary monotheism is an inclusivist development from polytheism, leading to the “all gods are one”-theme of the Hellenistic period, and which continues to stress the co-dependence of god and the world. One of Assmann’s main points is that biblical monotheism did not develop from this evolutionary monotheism, but rather came about by a radical theological break:

It may now have become obvious … how far removed this kind of monotheism is from what the Bible tells us about the god of the Israelites. It may also have become clear that there is no evolutionary line that leads from polytheism to biblical monotheism. Concerning the main difference between biblical and evolutionary monotheism, the Bible does not say “All gods are One” but rather that God is One and “Thou shalt have no other gods. …” It does not establish a connection but rather draws a distinction between God and gods. Ultimately this distinction is one between God and world. Evolutionary monotheism does not draw this distinction. On the contrary, God is the world.\footnote{Ibid., 74."}
What emerges from Assmann’s history of the idea of the one god is that two quite
different monotheistic traditions existed in antiquity: one that had evolved out of
paganism, and emphasised the connection between god and the world; and another that
was founded on a radical break with this tradition, in which god and the world were
separated, and the world furthermore subjugated to this god. The latter, which is the
family of “biblical” monotheism in Assmann’s nomenclature, gave rise to theism and
deism. The “evolutionary” monotheisms, by contrast, gave rise to cosmotheism and
hypercosmism, terms that cover the more familiar concepts related to panentheism and
pantheism. On this branch Assmann places the late-antique theologies of the Corpus
Hermeticum, as well as the philosophies of stoicism and neoplatonism. Considering the
discussion of Reformation and Enlightenment heresiology above, it is hardly surprising
to find that these currents have been particularly influential in Western esoteric thought.
In the eyes of the heresiologist, they were tainted with philosophical “paganism”, failing
to radically separate the divine from the world and give the former the priority it was
thought to deserve.

In the early 20th century, however, when the Christian rhetoric of heresy had lost
much of its credibility, and, above all, lost effective channels of exercising power over
intellectual culture, these panentheistic attitudes resurface within what can only be
understood as an establishment discourse on nature and religion.274 The five schools we
have discerned all seem to be moving in the general direction of panentheistic
theologies, although the degree to which they complete this movement varies. The
clearest examples seem to be the schools of ether metaphysics, theologies of emergence,
and the most developed forms of quantum mysticism. Ether metaphysics may be
described primarily as a form of panentheistic idealism: the ether is a manifestation of
the “mind of god”, or alternatively seen as a garment of god, or god’s body. Matter,
energy, and forces of all kinds are made from, and play out in, this divine mental
substance, and hence the whole world rests in the substance of god. Note, however, the
difference from the creatio ex nihilo doctrine: creation was not a finite and distant

274 By Christianity losing power over academic discourse, I am thinking about very specific developments,
such as the secularisation of the universities, occurring together with the professionalisation and
increasing institutionalisation of the natural sciences. These processes were not fully developed until the
end of the 19th century. See e.g. F. M. Turner, ‘The Victorian Conflict between Science and Religion’.
historical event, in which “something else” (the world) was created by god; rather, every single object in the world takes part in the substance of god through the ether.

The theologies of emergence are slightly more ambiguous, in that not all of nature can be said to be truly part of divinity. Nevertheless, god’s immanent activity is crucial to this school, and thus god is certainly part of the world rather than simply interacting with the world (as in classical theism). In Alexander’s formulation, god is the universe as tending towards deity, and the universe is seen as pregnant with divinity. Thus nature, or at the very least part of nature, is an essential part of the divine.

Quantum mysticism, as we have seen, includes a wide variety of stronger and weaker claims, but in the most overtly theologising form, it is again usually a panentheistic form of idealism. Jeans clearly moves in this direction, by portraying the world as a thought, or set of thoughts, contained in the mind of God, rather than as a separate creation in which humanity dwells in lonely exile. Other elements of quantum mysticism may lack a definite theological position, or be compatible in principle with several positions. For example, the stress on indeterminacy and rejection of strict causality undermines deism, but unless anything else is added, it could be equally combined with theism as with panentheism. Nevertheless, the general direction seems to be towards panentheistic conceptions.

Finally, psychic enchantment and modern alchemy are both more ambiguous than the three above, and we had a hard time finding any consistent and overarching theology springing out of these fields of speculative thought. Nevertheless, there is again a general direction in which they are both tending, and that is a direction which allows more immanent agency in the universe than is allowed in a strictly mechanistic worldview. Vitalism, mental control over matter, spontaneous transmutations, and matter possessing some degree of indeterminate and unpredictable agency all exemplify this direction. We have also seen that when more developed theologies do arise from these fields, they are allied with positions we recognise from the other schools of natural theology. In the case of psychic enchantment, we noticed both a direction towards the idealistic positions in physics, especially in the form of ether metaphysics, and a more original psychological reworking of Platonism, as in the case of Frederic Myers. The same tendency is identified in modern alchemy: when Sijil Abdul-Ali attempted to make a “Hermetic” reading of modern science he did so by interpreting the physical concept of “energy” as anima mundi, and the ether as the “Spirit of the
World”. No matter how unconvincing or superficial we may find these synonymisations, the direction is clearly towards collapsing the distinction between nature and the divine, and localising aspects of god as immanent parts of the world itself.

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I will close this chapter with some reflections on Charles Hartshorne’s later musings on the possibility of natural theology, which seem to illuminate the connections between three major concepts that have structured our discussion so far: disenchantment, natural theology, and panentheism/cosmotheism. Hartshorne opened *A Natural Theology for Our Time* (1967) with an unusual dedication to a diverse band of historical figures, from the theologian Fausto Sozzini (1539–1604), to the physicist and experimental psychologist Gustav Theodor Fechner (1801–1887), to 20th century philosophers such as Muhammad Iqbal (1877–1938), James Ward (1843–1925), and Alfred North Whitehead. All of these, the author said, had defended varieties of a specific theological viewpoint: ‘that the eternity or worshipful perfection of God does not imply his changelessness (or self-sufficiency) in all respects’.275 ‘Their reward for this achievement’, Hartshorne continued, had been only the ‘nearly complete silence or noncomprehension of historians, encyclopedists, and textbook writers’.276

What was the reason for this noncomprension and neglect? Hartshorne does not answer this question directly, but it shines through that it has to do with certain historical processes that have significantly narrowed the scope of intellectual options available in given historical periods. This narrowing down of the possibilities of legitimate thinking had in particular caused the demise of natural theology, according to Hartshorne, and it had happened during the Enlightenment. Pushing his own theological agenda, Hartshorne refused to accept that the intellectual boundaries drawn up two centuries prior should dictate what was legitimate to think in the present:

The possibility of natural theology, or a theory of divinity appealing to ‘natural reason’ – that is, critical consideration of the most general ideas and ideals necessary to interpret life and reality – is often said to have been thoroughly discredited by Hume and Kant. I do not share

275 Hartshorne, *A Natural Theology for Our Time*, vii-viii.
276 Ibid., viii.
Connecting the dots to our previous discussion, the Enlightenment context that Hartshorne refers to was only one of the later steps in a longer history. The problem for the theological positions of those to whom the book was dedicated had started already when the biblical form of monotheism was favoured over the “evolutionary” variety (in Assmann’s sense), and god’s essence withdrawn completely from the natural world. The criticism that followed in the Enlightenment had sprung out of this particular theological tradition; quite literally, as Hanegraaff has shown, since the distinction that emerged in the Enlightenment between “proper philosophy” and “pseudo-philosophy” was constructed precisely on the basis of the heresiological criterion of Thomasius and Colberg. In this sense, the problem had always been philosophical “paganism”. Consequently, the rise of new natural theologies in the wake of the secularisation of the academy in the 19th century signified the return of a pagan science.

All of this may shed some light on disenchantment. Hartshorne’s refusal to follow Hume and Kant’s rejection of natural theology may indeed be seen as an explicit rejection of disenchantment as well. As we saw in chapter one, Max Weber’s conception of a disenchantment of the world was built on an unmistaken Kantian foundation. What is more, the blind spot of disenchantment covers precisely the kind of theological positions we have discussed here. The disenchanted world tolerated positions that kept the world completely autonomous and free of divine or spiritual agency of any kind, that is, positions such as atheism, agnosticism, or deism. Theism was still possible, but only through the pious humiliation of an intellectual sacrifice: *credo quia absurdum*. What was not permitted was the rational pursuit of divine or spiritual agencies in the natural world: the whole domain of natural theology, and the attendant theological positions of panentheism and cosmotheism, was out of bounds. Seen in this light, Weber's disenchantment thesis looks like a post-Enlightenment rephrasing of an older heresiological dictum. In the early decades of the 20th century, the new clothes in which the dictum had been dressed – most notably mechanistic natural philosophy – were being thrown aside by scientists, now working in an environment in which consistency with orthodox theological doctrines were neither required nor encouraged. Scientific professionals but theological amateurs, the new natural theologians of the early 20th
century could freely, and probably often unwittingly, return to heterodox, heretical, or “pagan” conceptions of god and the world.