6 Modernising Physics and Psychics

When, in 1900, Lodge accepted an invitation to become the first Principal of the University of Birmingham, he did so partly on condition that he was given a laboratory and assistants for maintaining his profile as an original physical researcher and that he be allowed to continue his work in psychical research, a field of inquiry whose results and legitimacy continued to divide the scientific and intellectual world.[1] For the SPR, Lodge's prestigious new role, in addition to a knighthood in 1902 and a successful scientific career at Liverpool behind him, made him an obvious choice of president following the deaths of Sidgwick and Myers, and a failed attempt to persuade the scientifically more eminent Rayleigh to assume the helm.[2]

The presidential address that Lodge gave to the SPR in 1903 revealed the extent to which he saw similarities between his SPR and Birmingham roles. The solution to the SPR's ongoing problem of becoming a scientific organisation with a "sound and permanent basis" converged with the solution to the problem of establishing a modern university.[3] Both problems required financial investment, albeit on vastly different scales. As SPR president, Lodge announced the initial contributions to the SPR's endowment fund and sketched out his ideas for its possible uses. When it reached £8,000, it could support a "Research Scholarship in Psychical Science" and thus give "young people of genius" a monetary incentive to contribute to the subject; and if it grew significantly larger, the fund could support a "much-needed laboratory" for staging experimental inquiries into phenomena that were "improperly accepted or improperly rejected".[4] Similarly, in a manifesto published only a month earlier, the

[1] Lodge, *Past Years*, pp. 315–16.
[2] Arthur J. Balfour et al., 'The Memorial, of Which a Copy Is Printed Below, Was Forwarded to Lord Rayleigh on 18th February', *JSPR*, vol. 10 (1901–2), pp. 58–60.
[3] Lodge, 'Presidential Address', p. 6.
[4] Lodge, 'Presidential Address', pp. 8–9. By the time Lodge spoke, the fund had already reached £2,000: [Anon.], 'Endowment Fund for Psychical Research, *JSPR*, vol. 11 (1903–4), pp. 44–5.

Birmingham principal argued that an investment of at least £5 million in university buildings (including laboratories), equipment, salaries and other items would help alleviate a tendency of the world to be "wasteful of genius" and to allow such talented individuals to push back the frontiers of existing departments of knowledge.[5]

To attract investment, however, the practical benefits of the Midlands varsity and the SPR needed to be more strongly impressed upon the public. Echoing decades of arguments for technical and scientific instruction, Lodge emphasised that investment in Birmingham's areas of academic study would have significant cultural, economic, moral and other benefits and an altogether "extraordinary influence on the progress of the country".[6] Investing in the SPR promised to lead to such important "practical results" as new understandings of the "obscure" workings and treatment of the criminal mind and steps towards the scientific basis of religious beliefs.[7]

Lodge's strategy for the SPR was mainly driven by a genuine fear that the organisation faced a "long period of danger and difficulty".[8] His fears were partly justified. Although its membership had grown five times since 1882 and was in its strongest-ever financial position, the SPR had lost its two greatest intellectual champions in close succession, the scientific lustre of its highest ranks had diminished with the deaths of such individuals as Adams, Stewart and Stone, and of the prestigious scientific members still living, Crookes, Ramsay, Rayleigh and Thomson no longer had the time or enthusiasm for new investigations with which to bolster the organisation's profile.[9]

One of SPR's greatest difficulties, however, remained confronting a world of "official science" that was ambivalent at best about the fruitfulness of psychical research per se, let alone the arguments for the existence of specific types of psychical phenomenon.[10] Much critical opinion held that the SPR had produced strong but not convincing evidence for the existence of telepathy but that its biggest weaknesses lay in its claims regarding survival and theories of the unconscious.[11] Lodge encountered

[5] Oliver Lodge, 'The University in the Modern State', *Nature*, vol. 67 (1902–3), pp. 193–6, p. 196.
[6] Lodge, 'University in the Modern State', p. 193.
[7] Lodge, 'Presidential Address', p. 15.
[8] Lodge, 'Presidential Address', p. 7.
[9] Between 1882 and 1902 the SPR's balance rose from over £200 to nearly £3,000. See [Anon.], 'Anniversary Meeting', *PSPR*, vol. 1 (1882–3), pp. 158–60; [Anon.], 'Report of the Council to Members and Associates of the Society for Psychical Research for the Year 1902', *JSPR*, vol. 11 (1903–4), pp. 38–43.
[10] This is well captured in [Anon.], 'La Métapsychique', *Lancet*, 18 February 1905, pp. 449–50.
[11] [Anon.], 'Modern Spiritualism', *Edinburgh Review*, vol. 198 (1903), pp. 304–29; W. H. Mallock, 'The Gospel of Mr. F. W. H. Myers', *Nineteenth Century and After*, vol. 53 (1903), pp. 628–44.

an especially stark reminder of psychical research's troubles in 1909 when he read the declaration of Simon Newcomb, the veteran American astronomer and one-time president of the American Society for Psychical Research, that the outcome of 25 years of painstaking investigation into telepathy had been "[s]cientifically, nothing at all".[12] The evidence for this alleged mental faculty only comprised isolated facts that could not be reduced to laws, and the conditions under which it could be reproduced remained unknown. Branding psychical research a form of "modern occultism", a pejorative label that the SPR had spent decades trying unsuccessfully to eschew, Newcomb sided with many critics in warning of the extent to which the evidence of psychical effects was gravely weakened by observational error, lapses in memory and fraudulence.[13]

Lodge's response to Newcomb was a now-familiar critique of authority, insofar as the astronomer's judgements seemed to be based on a woefully limited understanding of what psychical research had achieved – notably the amassing of evidence for telepathy – and the robust methods it had employed to do so. What particularly surprised Lodge was that Newcomb had relied on poor sources of information, including a recent popular book by someone Lodge excoriated as a "not specially competent and quite irresponsible journalistic writer".[14] Given the difficult situation in which the SPR found itself, such ill-informed popular works were particularly unwelcome. An obvious solution to this problem was for those who did consider themselves competent to offer their own articles, books and lectures, for similar audiences, that would rebut and displace such misrepresentations.

Leading physical–psychical scientists were, of course, no strangers to these popularisation strategies, especially when they felt the need to defend their authority in psychical research. In this chapter we shall see that from the early 1900s onwards, physical–psychical scientists were more likely to contribute to psychical research by these literary means than by experimental investigation. Their texts gave them liberties that they were not permitted in other works. In official SPR publications, they were obliged to avoid theological controversy to safeguard the claimed objectivity of the

[12] Newcomb, 'Modern Occultism', p. 131. Cf. Newcomb's compatriot, the Harvard physicist John Trowbridge, who, in 1903, argued that "there is no science in the subject of telepathy" because the evidence was weak and the phenomena could neither be repeated nor measured: John Trowbridge, 'Telepathy', *Nation*, vol. 76 (1903), pp. 308–9, p. 308.

[13] Long into the twentieth century, psychical research was deemed to be a form of occultism by both sympathisers and critics. See, for example, the contents of the generally sympathetic *Occult Review* and Edward Clodd's critical perspective in his 'Occultism', *Fortnightly Review*, vol. 107 (1920), pp. 757–68.

[14] Lodge, 'Attitude of Science to the Unusual', p. 207. The book was Beckles Willson, *Occultism and Common Sense* (London: T. Werner Laurie, 1908).

organisation; but in popular scientific, philosophical and religious books and journals, they could debate the religious and moral uses of psychical research that they believed might ultimately attract financial support for the SPR.[15] These were the very publications where, as Peter Bowler has shown, scientists, liberal theologians, philosophers and others discussed ways of reconciling scientific or naturalistic and religious interpretations of the cosmos, and where scientists could explore ideas that were increasingly inappropriate in the secularised discourses of professional scientific research and teaching.[16] As Fournier d'Albe perceptively explained in his book on a physical theory of the soul, the tome did "not work under the limitations of a college text-book" or just "give only that which is generally accepted", but took controversial "facts" as the basis for illuminating the "obscure" psychical problems sidestepped by "official science".[17] Like so many of the texts explored in this chapter, Fournier d'Albe's book cut across the distinctions between the physical and what were increasingly upheld as psychical 'sciences', and between scientific and religious ways of doing and knowing – distinctions that were reinforced in such modern scientific institutions as Birmingham University, where Fournier d'Albe had taught for several years.

One of the reasons why writing on psychical research and spiritualism became attractive to Fournier d'Albe and other physical–psychical scientists was because the market for books, articles and other texts on these subjects boomed in the early twentieth century, and especially during and after the First World War, when many of the millions who had lost loved ones in conflict sought solace in evidence of life after death and mind independent of matter.[18] By creating and taking advantage of opportunities to raise the profile of psychical research, physical–psychical scientists were, of course, opening themselves up to scrutiny from a large readership, among whom were many who felt that they had pushed the connections between physics and psychics too far or not far enough.

Busy Men

"Our officers are able men, self-sacrificing men, but they are also busy men, in some cases extremely busy men."[19] Thus, in May 1901, Ferdinand

[15] The SPR's policy was expressed by Eleanor Sidgwick in [Eleanor Sidgwick], 'Correspondence', *JSPR*, vol. 6 (1893–4), p. 214.
[16] Bowler, *Reconciling Science and Religion*.
[17] Fournier d'Albe, *New Light on Immortality*, pp. 204–5.
[18] This trend is strikingly illustrated by an analysis of the titles of books and other texts listed in *JISC Library Hub Discover* and the titles and contents of articles in the ProQuest digital library, *British Periodicals Collections I–III*, and the *British Newspaper Archive*.
[19] Schiller, 'Future of the S.P.R.', p. 76.

C. S. Schiller doubted whether the SPR's leading figures had the "time and energy" to compensate for the deaths of the organisation's most industrious founders, and whether it was "rank and file" or new members who would continue where Gurney, Sidgwick and Myers had left off.[20] Schiller's description would not have been inappropriate for the SPR's leading scientific officers who survived into the twentieth century.

The oldest was Crookes. Now in his 70s and boasting a knighthood (in 1897) for his scientific work, this elder statesman of British chemistry and physics no longer had as much energy for the kinds of work he had pursued in earlier decades. Much of the energy he did have was channelled into new researches on radioactivity and spectroscopy, as well as government consultancy and business ventures.[21] His interest in psychical phenomena was unabated: he continued discussing such matters in private, he religiously attended the SPR's London meetings, he had occasional sittings with spiritualist mediums and, above all, he joined the London-based private dining society, the Ghost Club, where he regaled fellow 'ghosts' with recollections of his old investigations of Home, Cook and other mediums, and more recent forays into spirit photography.[22] Yet Crookes was left with little time and energy for anything more in the psychical direction and did not even have time to write a book that was to amplify his old articles on the subject.[23] Inevitably, his reticence prompted much speculation on his attitude towards spiritualism, and particularly his ambiguous views on the existence of disembodied spirits.[24]

Lack of time was no less of a problem for Crookes's younger and more energetic colleagues. Rayleigh's heavy commitments to government advisory and other official scientific duties, as well as ongoing private researches into acoustics, optics and hydrodynamics, were evidently the main reasons why he declined the offer of the SPR presidency in 1901. But as a close relative of Eleanor Sidgwick, Arthur and Gerald Balfour, he could hardly have been unaware of the organisation's activities, and it was doubtless their encouragement that persuaded him to deliver a presidential address in 1919, only six weeks before he died. The address suggested that Rayleigh had had few psychical experiences since the Palladino investigations of 1895 and was as undecided as ever about telepathy, survival and the physical phenomena of spiritualism. Yet

[20] Schiller, 'Future of the S.P.R.', p. 76.
[21] On Crookes's later career see Brock, *William Crookes*, chapters 21–4.
[22] See, for example, W. W. Baggally, 'Some Sittings with Carancini', *JSPR*, vol. 14 (1909–10), pp. 193–211; Crookes's letters to Lodge in SPR.MS 3/344–67, OJL-SPR; Minute Books vols. 4–8, Add. MS 52261–52265, GC-BL.
[23] William Crookes to Oliver Lodge, 15 March 1913, SPR.MS 35/359, OJL-SPR.
[24] See, for example, 'Perplexed', 'Is Sir William Crookes a Spiritualist?', *Light*, vol. 25 (1905), p. 35.

there was no doubt in Rayleigh's mind that the need to build convincing evidence for telepathy remained strong and that scientists still needed to be warned of their unscientific habit of dismissing psychical effects simply because they conflicted with "ordinary experience".[25]

The institutional burden of Rayleigh's successor at Cambridge's Cavendish Laboratory, J. J. Thomson, and his leadership of research into positive rays and other aspects of the electrical discharge through gases meant that he, like Rayleigh, could only sustain armchair interests in psychical research. With Eleanor Sidgwick on campus, there was no need for Thomson to worry that psychical research lacked powerful local advocates who could encourage students and staff to get involved.[26] But Thomson was not too busy to inspire students of physics to at least contemplate the possible relevance of physics to psychical research. In the early decades of the twentieth century, many physics undergraduates read the multi-volume *Textbook of Physics* that he co-authored with Lodge's Birmingham colleague, John Henry Poynting. Significantly, in explaining the "universal rule" that the disappearance of one form of physical energy was always followed by the appearance of another, one volume of the work tantalisingly suggested that if telepathy were "placed beyond question" then the energy associated with it was probably converted into another, unknown form as it transited from one person to another.[27]

The most committed of all SPR physical scientists, Barrett and Lodge, were no less busy than Rayleigh and Thomson in the early twentieth century. Barrett was greatly preoccupied by the relocation and expansion of the Royal College of Science for Ireland, but still managed a modest output of physical research in the areas of metal alloys and physiological optics, a demanding schedule of public lecturing activities, and the local charitable work that he had pursued in Dublin for decades.[28] Lodge's administrative duties as Birmingham principal, and especially the task of expanding an institution in a parlous financial state, proved so onerous that he was forced to delegate much of his new physical research in wireless and cable telegraphy to assistants such as Benjamin Davies.[29]

[25] Rayleigh, 'Presidential Address', p. 285.

[26] Distinguished Newnham College members who were involved with the SPR during Sidgwick's time there as college principal included the geologist Gertrude Elles, the ornithologist Agnes Elliot, the plant geneticist Edith Saunders, the zoologist Alice Johnson, and the classicists Jane Harrison, Margaret de Gaudrion Verrall (née Merrifield), Helen Woolgar de Gaudrion Salter (née Verrall), and Florence Stawell.

[27] J. H. Poynting and J. J. Thomson, *A Textbook of Physics. Heat* (London: Charles Griffin, 1904), p. 115.

[28] On the transformation of the college see *Royal College of Science for Ireland: Its Origin and Development* (Dublin University Press, 1923).

[29] On Davies's work see Clow, 'Laboratory of Victorian Culture', chapters 4–5; Richard Noakes, 'Industrial Research at the Eastern Telegraph Company, 1872–1929',

Lodge's research publications certainly declined after 1900, and this is consistent with his later private complaint that the principalship hampered his ability to keep abreast of modern developments in physics.[30]

Barrett and Lodge were genuinely busy, but this had more of an effect on *what* they chose to contribute to psychical research than *how much* they contributed. Barrett's investigative work tended to focus on that which could be done from Ireland, including local cases of poltergeists and mediumship, and his renowned large-scale study of water-divining, which combined experimental tests of dowsers in the Irish countryside and critical analyses of historical and modern testimony.[31] Much of this latter research, which Barret believed yielded strong evidence of an obscure sensory capacity (akin to clairvoyance) by which dowsers perceived hidden springs and metallic ores, was presented to the Dublin branch of the SPR, which Barrett had founded in 1908 and which successfully catered to local interest in psychical research.[32] The Dublin branch gave Barrett a more accessible forum for psychical research, but it also symbolised his increasing misgivings about the main organisation, whose leadership's "autocratic treatment" of some members' investigations and overly cautious approach to the physical phenomena of spiritualism exasperated him almost to the point of resignation.[33] To express what he believed psychical research had been invented to accomplish, Barrett also turned increasingly to publications and venues outside the SPR's direct control.

Lodge did not share Barrett's misgivings about the SPR leadership's cautious approach to phenomena (especially for 'public' purposes), but was increasingly disappointed that it had not pursued physical phenomena with the seriousness of European scientific practitioners with psychical interests.[34] These were the individuals who seemed to be trying harder

British Journal for the History of Science, vol. 47 (2014), pp. 119–46; Roberts, 'Training of an Industrial Physicist'. On the University of Birmingham's financial difficulties see Ives, Drummond and Schwarz, *First Civic University*, chapter 8.

[30] Oliver Lodge to Andrew C. Bradley, 30 April 1923, typescript copy, OJL/1/55/6, Oliver Lodge Papers, Cadbury Research Library, University of Birmingham. See also Theodore Besterman, *A Bibliography of Sir Oliver Lodge F.R.S.* (Oxford University Press, 1935) and the declining number of entries in Lodge's research notebooks: Lodge research notebook no. 9, MS.3.18, Oliver Lodge Papers, University of Liverpool Library.

[31] William F. Barrett, 'Poltergeists: Old and New', *PSPR*, vol. 25 (1911), pp. 377–412; William F. Barrett, 'On the So-Called Divining Rod or *Virgula Divina*', *PSPR*, vol. 13 (1897–8), pp. 2–282; William F. Barrett, 'On the So-Called Divining Rod', *PSPR*, vol. 15 (1900–1), pp. 130–383.

[32] [Anon.], 'Society for Psychical Research: Dublin Section', *JSPR*, vol. 14 (1909–10), pp. 63–4.

[33] William F. Barrett to Oliver Lodge, 21 October 1912, SPR.MS 35/73, OJL-SPR.

[34] Oliver Lodge, 'Introduction to the Earl of Dunraven's Record of Experiences with D. D. Home', *PSPR*, vol. 35 (1925), pp. 1–20, esp. pp. 4–5.

than anybody else to build on the examples of Crookes, Varley and others in employing the resources of experimental physics in psychical research. Given his 1894 vision of a 'psychical laboratory', Lodge must have envied the foundation, in the early 1900s, of laboratories at the Institut Général Psychologique in Paris and at Baron Albert von Schrenck-Notzing's palatial residence in Munich, both of which were stocked with instruments for detecting, measuring and controlling the physical phenomena associated with mediumship.[35] It was at the Insitut that such fellow scientists as Éduoard Branly, Marie and Pierre Curie and Paul Langevin participated in physiological, mechanical and electrical tests of Palladino, which effectively supported Lodge's, Richet's and Myers's conclusion that, in the midst of fraudulent activity, there were some genuinely novel phenomena. Of particular interest to Lodge would have been the evidence that Palladino could discharge electroscopes without touching them, thus suggesting that the strange vital prolongations from her body had ionising properties.[36]

In many ways, however, Lodge's decisions about how he was going to contribute to psychical research may have been partly responsible for the SPR's failure to follow the European examples. He was certainly not too busy for fresh investigative work, as demonstrated by further seances with Leonora Piper, whom he brought over from Boston in 1906, and the more notorious sittings (in 1915–16) with the British medium Gladys Osborne Leonard, through whom he claimed to have gained proof of the survival of his son Raymond, who had been killed in the First World War.

Participating in investigations of physical mediumship where the resources of experimental physics were most likely to matter, however, seems to have caused Lodge more difficulties. Part of the problem was that most of the mediums who offered the best opportunities for this resided overseas, and Lodge's academic commitments would have made such trips difficult to schedule. He even found it difficult to personally investigate cases of physical phenomena much closer to home. In late 1910, he had to ask Davies to visit the London clinic of the medical electrician Walter J. Kilner, who, inspired by the Reichenbach investigations of his former mentor William H. Stone, claimed to have constructed a glass screen filled with a special dye through which the human 'aura' could be

[35] On the Institut see Lachapelle, *Investigating the Supernatural*, pp. 75–85. On Schrenck-Notzing's laboratory see Wolffram, *Stepchildren of Science*, chapter 3.

[36] Jules Courtier, *Documents sur Eusapia Palladino. Rapport sur les séances d'Eusapia Palladino à l'Institut général psychologique en 1905, 1906, 1907, 1908* (Paris: Institut général psychologique, 1908), pp. 508–11.

seen.[37] Davies found himself acting as Lodge's psychical deputy again in 1916, when he witnessed the mechanical tests devised by the Belfast academic engineer William J. Crawford that appeared to yield powerful new evidence of mediumistic levitation.[38] Equally telling was Lodge's response to Harry Price's request, in 1925, for support in the foundation of Britain's first psychical laboratory, an organisation designed specifically to implement some of the investigations into the physical phenomena of spiritualism that Lodge cherished. The physicist disappointed this rising star of British psychical research on the grounds that he had too many other commitments in "writing and calculating", which he now regarded as his "special function".[39]

Lodge's later view of himself as primarily a writer and calculator highlights the extent to which the sharp decline in his output of original psychical investigations owed more to a conscious career choice than dwindling opportunities. After accepting the Birmingham position, he saw himself as much more of a public figure than ever before, and as someone who needed to engage with a variety of audiences on a far wider range of topics than he had previously published or lectured on.[40] The marked increase in his literary output and the frequency of his public lectures testifies to the seriousness with which he took this goal after 1900.[41] There were intellectual and moral motivations for this. Lodge clearly felt passionate about many topics – notably ether physics, psychical research, the liberalisation of Christian theology, and social reform – and

[37] Davies concluded from his visit that it was hard to tell whether the aura he saw surrounding his hands was not a "fancy": copy of a letter from Benjamin Davies to Oliver Lodge, 20 February 1911, letter 564, File 5, Box 3, BD-NLW. His conclusion supported Lodge's earlier expectation that the effect was as dubious as N-rays: Oliver Lodge to Benjamin Davies, 15 December 1910, letter 560, File 5, Box 3, BD-NLW. See also Kilner, *Human Atmosphere*.

[38] Oliver Lodge to Benjamin Davies, 23 February 1916, letter 618, File 5, Box 3, BD-NLW. Davies was reasonably impressed with Crawford's experiments, but Lodge's interest owed more to Barrett, whose attendance at seances with Crawford and his medium (Kathleen Goligher) in 1915 had persuaded Barrett that table movements could not be due to physical contact with participants: William F. Barrett, 'Report of Physical Phenomena Taking Place at Belfast with Dr. Crawford's Medium [1916]', *PSPR*, vol. 30 (1918–19), pp. 334–7. Lodge also emphasised the importance of Barrett's testimony to Fournier d'Albe, who, in 1921, concluded from tests of Goligher that her telekinetic and ectoplasmic effects were fraudulently produced. See Oliver Lodge to E. E. Fournier d'Albe, 17 August 1921, E. E. Fournier d'Albe Papers, Private Collection, Christine Fournier d'Albe; E. E. Fournier d'Albe, *The Goligher Circle, May to August 1921* (London: John M. Watkins, 1922). For Crawford see Allan Barham, 'Dr. W. J. Crawford, His Work and Legacy in Psychokinesis', *JSPR*, vol. 55 (1988), pp. 113–38.

[39] Oliver Lodge to Harry Price, 9 May 1925, HPC/4B/150, Harry Price Collection, Senate House Library, University of London.

[40] Peter J. Bowler, *Science for All: The Popularisation of Science in Early Twentieth-Century Britain* (Chicago University Press, 2009), pp. 219–20.

[41] Besterman, *Bibliography of Sir Oliver Lodge*.

sought to exploit his academic authority in shaping public understanding of them. But there were financial motivations too. Like Crookes, Lodge saw scientific work as a diverse source of income and by plying skills in teaching, public lecturing, writing, commercial consultancy, patenting and other activities he could ensure that his large family had a respectable quality of life.[42] Lodge had long experience negotiating financially advantageous agreements with publishers and journal editors and by 1900, now boasting scientific and intellectual credentials that made him a valuable commodity in the literary marketplace, he could make writing even more profitable.[43] Many of Lodge's books largely comprised reprints or revised versions of published articles for which he had already been remunerated, and from which he clearly believed more monetary value could be extracted.

Even before he arrived at Birmingham, Lodge was aware that he could make a bigger difference to the profile of psychical research by writing and lecturing than by any other means. In 1897, his former Liverpool colleague Arthur Chattock had opined that it was mainly because of his writings that "centres of interest" in psychical research had emerged in various colleges, including those represented by Chattock's and Lodge's own students.[44] But neither Lodge nor any other physical–psychical scientist seems to have been able to turn such "centres of interest" into anything institutionally more concrete. Lodge, who wielded more power within his academic institution than most other physical–psychical scientists, had contemplated something along these lines in 1905 – a professorship or a permanent endowment – but seems to have been persuaded against taking it any further.[45] He clearly believed that a more effective way of bringing psychical research within the University of Birmingham's walls was via lectures to students.[46]

[42] On Lodge's consultancy and commercial ventures see Anna Guagnini, 'Ivory Towers? The Commercial Activity of British Professors of Engineering and Physics, 1880–1914', *History and Technology*, vol. 33 (2017), pp. 70–108, esp. pp. 78–93. On his patenting see Stathis Arapostathis and Graeme Gooday, *Patently Contestable: Electrical Technologies and Inventor Identities on Trial in Britain* (Cambridge, MA: MIT Press, 2013), esp. chapter 6.

[43] See Lodge's correspondence with Macmillan's regarding various editions of such volumes as *Modern Views of Electricity* (1889) and *Pioneers of Science* (1893): ff. 49–173, Add. 55220, Macmillan and Company Ltd Archive, British Library.

[44] Arthur P. Chattock to Oliver Lodge, 11 April 1897, MS ADD 89/23, OJL-UCL.

[45] Arthur Rücker to Oliver Lodge, 31 December 1905, MS Add. 89/91, OJL-UCL. Rücker, a physicist, university administrator and SPR member, questioned Lodge's proposals on the grounds that psychical "facts" were not yet sufficiently reproducible or testable to constitute the "solid" basis on which an academic chair or endowment fund could be justified. There is no mention of Lodge's proposal in the University Council's Minute Index Books from 1903 to 1906: UB/COU/3/3–4, University of Birmingham Special Collections.

[46] See, for example, Oliver Lodge, 'University of Birmingham. Lectures to Medical Practitioners on Physics Applied to Medicine', Summary of Lectures V and VI in Lodge, *University of Birmingham. Lectures to Medical Practitioners on Physics Applied to*

Anyone who missed Lodge's lectures could easily have apprehended his views on psychical research via the astonishing number of publications he managed to produce from the early 1900s. Lodge's literary output on psychical and other subjects certainly helped him become one of the best-known scientific personalities of the day, and the sheer volume of his writings on what he often described as "physics and psychics" means that he necessarily dominates this chapter.[47] Lodge's output certainly dwarfs that of most other physical–psychical scientists who survived into the twentieth century and who contributed very little to the literature on psychical research, or what, from the early twentieth century onwards, was increasingly referred to as 'psychic research', 'psychic science' or simply 'psychics'. However, Lodge's work draws attention away from some physical–psychical scientists, both inside and outside the SPR, who contributed important other perspectives on 'physics and psychics'. As we shall see, what they managed to contribute repays close attention and demonstrates that Lodge's views did not represent a consensus.

Applied Psychical Research

In *Survival of Man* (1909), his first and commercially most successful book on psychical research, Lodge explained that while religion encroached too closely on the "region of emotion to be altogether suitable for consideration" by such a "scientific Society" as the SPR, it was one of the "practical applications" of psychical research by which the value of the fledgling science to humanity would be judged.[48] Lodge thus captured an important place that religious questions occupied in the literary activities of physical–psychical scientists in the early twentieth century. The religious significances that he and others gave to psychical research would also give value to a welter of new proposals regarding the possible connections between 'physics and psychics'. Yet as a book primarily focussed on analysing the SPR's evidence for telepathy and survival (including his own studies of Piper's mediumship), *Survival of Man* was typical of many early popular and semi-popular books on psychical research in sidestepping detailed discussion of religious applications. In concluding his volume on the subject for a new series of popular science books, Barrett

Medicine (University of Birmingham, 1904), pp. 11–13. Copy at OJL3/3/103, Oliver Lodge Papers, Cadbury Research Library, University of Birmingham.

[47] See, for example, Lodge, *Beyond Physics*, p. 7; Oliver Lodge, *Phantom Walls* (London: Hodder and Stoughton, 1929), p. 99.

[48] Lodge, *Survival of Man*, p. 36. By 1926, this book had reached its 10th and final edition, and French, German and Italian editions were published.

warned that psychical research, "though it may strengthen the foundations, cannot take the place of religion" because it only concerned itself with the "*external*, though it be in an unseen world" and at best provided a "stepping stone in the ascent of the soul to its own self-apprehension".[49]

In texts that were *not* primarily designed to persuade readers of the scientific credibility of psychical research's evidence, Barrett and Lodge were far less restrained in their religious discussion, and on many fundamental questions agreed with other writers on the religious significances of psychical research and spiritualism.[50] Moreover, as Peter Bowler has shown, their writings were among the intellectually weightier contributions to the vigorous early-twentieth-century debate in Britain on the relationships between the sciences and religions.[51] They joined company and entered dialogues with a host of professional scientists, science popularisers, philosophers and representatives of liberalising and modernising trends in Christian theology, who devised new reconciliation strategies based largely on relatively recent idealistic, vitalistic and otherwise non-mechanistic trends in physical, biological and psychological thought.

Barrett's and Lodge's output of religious writing was far greater than that of most other physical–psychical scientists of the early twentieth century, who, even in forms of publication where there was ample room for religious discussion, tended to repeat the common trope that psychical research led to a more satisfactory understanding of the future state than either Christian dogma or materialistic science. For example, in the early 1920s, the leading British forum of religious and philosophical debate, the *Hibbert Journal*, published articles on telepathy and survival by the physical chemist and barrister William R. Bousfield. He criticised those whose early religious education made them blind to new evidence of "miraculous" phenomena indicating the operation of "higher" natural laws and whose scientific education nurtured a "materialistic complex" that made them abandon all ideas about God and the future life and reject the religious implications of psychical research.[52] Despite its brevity, Bousfield's religious application of the results of psychical research was still more extensive than that of most other physical–psychical scientists,

[49] Barrett, *Psychical Research*, p. 246. The series was the Home University Library. On this and similar book series see Bowler, *Science for All*, chapter 7.

[50] Examples of such writers include Arthur Conan Doyle, *The New Revelation* (London: Hodder and Stoughton, 1918) and James Hervey Hyslop, *Psychical Research and the Resurrection* (Boston: Small, Maynard and Company, 1908).

[51] Bowler, *Reconciling Science and Religion*.

[52] Bousfield, 'Telepathy', pp. 498–9. See also William R. Bousfield, 'Human Survival', *Hibbert Journal*, vol. 22 (1923–44), pp. 501–14.

who, like an increasing number of professional scientists, do not seem to have been willing or able to engage publicly in religious debates at all.[53]

From its launch in 1902 until the 1910s, the *Hibbert Journal* was strongly associated with some of Lodge's most provocative interventions on religious and philosophical questions of the day, although much of what he wrote had been rehearsed since the late 1890s in discussions at the Synthetic Society, whose surviving members would also contribute to the periodical. Lodge's earliest contribution – a 1902 essay on the "outstanding controversy" between science and Christian faith – marked a significant change from his earlier reticence on the religious applications of psychical research.[54] Nine years earlier, he had hinted that he was aware of such applications but was clearly unable or unwilling to go further: he merely suggested that studies of both psychical phenomena and the ether would eventually provide a "glimpse into a region of the universe which Science has never entered yet" but which had been "perhaps blindly apprehended, by painter or poet, by philosopher or saint".[55]

The confidence that Lodge showed in his later arguments for connections between psychical research, ether physics and religion owed much to the "tuition" that he received from the person he would later venerate as "among the chief influences in my life": Myers.[56] From the 1880s, the two men corresponded at least once a week and frequently met at each other's homes or at meetings of the SPR and other learned societies.[57] Among the major consequences of such encounters were Lodge's abandonment of his belief, encouraged by such early teachers as Tyndall and Huxley, that mind and body were inseparably connected, and his appreciation of Myers's interpretations of the evidence amassed by psychical research. One of the most important of these interpretations was Myers's idea of a "metetherial" environment.[58] This environment, which Myers believed was continuous with but ultimately distinct from the ether of

[53] Bowler, *Reconciling Science and Religion*, p. 20.
[54] Lodge, 'Outstanding Controversy'. Complementing the analysis here are John D. Root, 'Science, Religion and Psychical Research: The Monistic Thought of Sir Oliver Lodge', *Harvard Theological Review*, vol. 71 (1978), pp. 245–63; David B. Wilson, 'On the Importance of Eliminating *Science* and *Religion* from the History of Science and Religion: The Cases of Oliver Lodge, J. H. Jeans and A. S. Eddington', in Jitse M. van der Meer (ed.), *Facets of Faith and Science Volume 1* (Lanham, MA: University Press of America, 1996), pp. 27–47.
[55] Lodge, 'Interstellar Ether', p. 862.
[56] Lodge, *Past Years*, p. 220. See also Lodge, 'The Life Work of My Friend F. W. H. Myers', *Nature*, vol. 144 (1939), pp. 1027–8.
[57] Their friendship is evident from the correspondence at SPR.MS 35/1298–1572, OJL-SPR.
[58] Myers, *Human Personality*, vol. 1, p. 216.

space, was the permanent location of our "spiritual life", which psychical research had "proved by actual evidence" did not depend on the "material world" or our bodily existence.[59]

Lodge's debt to Myers is particularly apparent in an incestuous review that he wrote of the book from which the above quotes have been taken: Myers's posthumous magnum opus *Human Personality and its Survival of Bodily Death* (1903). He explained that his late friend's "admission of telepathy as the *vera causae* in psychical science" opened the "flood-gates to a torrent of new ideas", including the possibility of a "channel of communication" between humans and between both incarnate and discarnate "intelligences in the universe".[60] The communication channel probably extended to the divine, which would provide the much-sought-after "rational interpretation" of the efficacy of prayer and the Christian doctrine of the communion of saints.[61] Myers's book had also rendered the afterlife less abstract and altogether less terrifying a prospect. According to Lodge, Myers had suggested that the conditions in the future life were not "revolutionarily different": our personalities were, for a long time after death at least, essentially the same, even though they were constantly being enlarged by the "etherial" environment in which they now resided.[62] This environment may not have been "material" but, reassuringly, it still gave us a "kind of semi-bodily existence", which Christian writers called the "spiritual body" but which could also be regarded as a "sort of etherial" one.[63]

Lodge's debt to Myers is also obvious from his earliest *Hibbert Journal* articles, the most substantial of which he adapted for re-publication in his first and commercially most successful theological book, *Man and the Universe* (1908).[64] Here, Lodge invoked the well-established metaphor of the conflict between science and religion. The kernel of the "controversy" was that "orthodox modern science" regarded the universe as "self-contained and self-sufficient" and denied that any supposed "transcendent beings" could influence it, while religion (by which he meant Christianity) required humanity to be in close contact with "a power, a mind, a being or beings, entirely out of our sphere, entirely beyond our

[59] Myers, *Human Personality*, vol. 1, p. 215.
[60] Oliver Lodge, 'The Survival of Personality', *Quarterly Review*, vol. 198 (1903), pp. 211–29, p. 220. On *Human Personality* see Carlos Alvarado, 'On the Centenary of Frederic W. H. Myers's *Human Personality and Its Survival of Bodily Death*', *Journal of Parapsychology*, vol. 68 (2003), pp. 3–43; Gauld, *Founders of Psychical Research*, chapters 12 and 13; Hamilton, *Immortal Longings*, chapters 5 and 9.
[61] Lodge, 'Survival of Personality', p. 220.
[62] Lodge, 'Survival of Personality', p. 226.
[63] Lodge, 'Survival of Personality', p. 226.
[64] Lodge, *Man and the Universe*. By 1928, the book had reached its 21st and final edition, and Czech and Danish editions were also published.

scientific ken", agencies on which the origin, maintenance and progress of the universe depended.[65] The reconciliation between these extreme positions hinged critically on one question – the efficacy of prayer – because this represented the most obvious example of external guidance of the apparently self-contained universe. Telepathy provided the most important step towards answering this question because if

> we are open to influence from each other by non-corporeal methods, may we not be open to influence from beings in another region or of another order? And if so, may we not be aided, inspired, guided, by a cloud of witnesses – not witnesses only, but helpers, agents like ourselves of the immanent God?[66]

The evidence for telepathy, which Lodge and many others now believed to be conclusive, suggested that prayer was an aspect of a cosmic law "hitherto unimagined by science" and through which transcendent beings lovingly guided humanity on a path of moral and spiritual progress.[67] By the 1920s, Lodge would turn evidence of immaterial guidance into contributions to a growing literature attempting to reconcile biological evolution with the idea of a beneficent creative power.[68]

Myers's "tuition" featured especially strongly in Lodge's critical approach to Christian theology and his particular argument that the Christian teachings on the soul were strengthened by the evidence of telepathy and post-mortem communications, which suggested that mind existed independently of the material body and that the essential constituent of human personality was "permanent".[69] This argument was one of many ways in which Lodge ultimately hoped to free "official" Christianity from outdated and unintelligible doctrines and to tackle what he perceived to be the corresponding popular indifference to the "outward and visible" forms of the church.[70] Christianity would be less depressing if Christ's Resurrection was seen as the "pattern" for the resurrection of all Christian souls and, moreover, as a form of survival, or continuity in the existence of an immaterial 'body' or soul carrying the "undying essence or spirit" rather than the "infantile" and unproven idea

[65] Lodge, 'Outstanding Controversy', p. 49.
[66] Lodge, 'Reconciliation Between Science and Faith', p. 223.
[67] Lodge, 'Outstanding Controversy', p. 60. See also Oliver Lodge, 'Religion, Science and Miracle', *Contemporary Review*, vol. 86 (1904), pp. 798–807.
[68] See, for example, Oliver Lodge, *Evolution and Creation* (London: Hodder and Stoughton, 1926). For Lodge's evolutionary writings see Bernard Lightman, 'Lodge and the New Physics, 1919–1933', in Graeme Gooday and James Mussell (eds.), *Oliver Lodge: Continuity and Communication, 1875–1940* (Pittsburgh, PA: University of Pittsburgh Press, in press).
[69] Oliver Lodge, 'The Immortality of the Soul. Part II. The Permanence of Personality', *Hibbert Journal*, vol. 6 (1907–8), pp. 563–85, p. 563.
[70] Oliver Lodge, 'The Alleged Indifference of Laymen to Religion', *Hibbert Journal*, vol. 2 (1903–4), pp. 235–41, pp. 84 and 90.

of the particles of the material body being resuscitated.[71] Both Christian doctrines of the resurrection of the 'body' and the immortality of the soul would be more appealing if the soul was regarded as the immaterial yet still physical vehicle of spirit, rather than something closely tied to the material body that dissolved at death. For Lodge, the pursuit of the ether problem promised to illuminate these and other profound theological questions: its apparently perfectly continuous, robust, immaterial but physical nature made it a possible candidate for the substance of the soul or spiritual body and the means by which divine spirit interacted with the material world.

Lodge's ideas about the ways that Christian doctrine could be reinterpreted in light of psychical research changed very little from the early 1900s to his death in 1940. His high intellectual profile ensured that they provoked much debate. His ideas appealed to many fellow Christian-minded scientists and to proponents of liberalising and modernising trends in Christianity, but alarmed plenty of agnostics and Christian traditionalists alike.[72] Critics saw his attacks on such doctrines as the Atonement, the Resurrection and the Virgin Birth as hopelessly amateur, his claims for divine immanence as essentially pantheistic, his appeal to the evidence for survival as morally and theologically perilous, and his preoccupation with the etherial or other physical vehicles of spirit as too materialistic.[73] By the 1930s, the important role that Lodge claimed for the ether in his modernising efforts regarding the soul was also proving to be a major weakness for many Christian thinkers. For these individuals, the ether's existence had been cast into doubt by the theory of relativity, which, as interpreted by Arthur Stanley Eddington, James Jeans and other popularisers of the new physics, represented a more promising scientific vindication of the Christian idea that the physical universe was an expression of the Divine Mind.[74]

[71] Lodge, *Man and the Universe*, pp. 284–5, 292.

[72] Sympathisers included the Scottish biologist Patrick Geddes, the German physicist Phillip Lenard and the major British exponent of 'new' and 'liberal' Christian theology Reginald Campbell: Geddes cited in A. H. Tabrum, *Religious Beliefs of Scientists* (London: North London Christian Evidence League, 2nd ed., 1913), pp. 70–2; Phillip Lenard to Oliver Lodge, undated letter, MS Add. 89/66, OJL-UCL; Reginald J. Campbell, *A Spiritual Pilgrimage* (London: Williams and Norgate, 1917), esp. p. 258.

[73] Examples of criticism include: [Anon.], 'Professor Lodge's Theology', *Church Times*, vol. 50 (1908), p. 767; [Anon.], 'Science', *Athenaeum*, 28 November 1908, pp. 686–9; Charles Gore, *The New Theology and the Old Religion* (London: John Murray, 1907); Joseph McCabe, *The Religion of Sir Oliver Lodge* (London: Watts and Co., 1914); E. S. Talbot, 'Sir Oliver Lodge on "The Re-interpretation of Christian Doctrine"', *Hibbert Journal*, vol. 2 (1903–4), pp. 649–61.

[74] See, for example, E. O. James, 'The Return of Materialism', *Church Times*, vol. 104 (1930), pp. 161–2. On Eddington, Jeans and religion see Bowler, *Reconciling Science and Religion*, pp. 101–21; Matthew Stanley, *Practical Mystic: Religion, Science and*

Barrett had been writing about the relationship between one of the focal points of psychical research – spiritualism – and religion long before Lodge. Many of the fundamental hopes and fears that he had for the religious uses of spiritualism were unchanged by his later experiences in psychical research. His first book on spiritualism, *On the Threshold of a New World of Thought* (1908), reiterated old arguments that it showed the "immanence of the spiritual world" that could undermine a "paralysing materialistic philosophy" and provide a welcome "handmaid" to Christian faith.[75] It also repeated his oft-expressed warnings to those who treated spiritualism as a religion in its own right, and failed to distinguish between the often gross and deceptive phenomena of the seance and the true spirituality to which they faintly pointed.

Barrett's hopes for the Christian uses of spiritualism were strengthened and complemented by the religious interpretations that he and others made of telepathy. Like Lodge, he believed it gave credence to Christian ideas of prayer, divine inspiration, and of a Divine Mind that transcended, unified and gave meaning to the material cosmos, and he later claimed for such an immaterial influence a role in biological evolution.[76] Yet this Congregationalist minister's son proved he was more orthodox than Lodge in eschewing radical reinterpretations of fundamental Christian doctrines, notably the immortality of the soul. While Lodge believed that we were born with a "permanent human element" and that psychical research could point to this, Barrett insisted that there was no Christian warrant for the natural immortality of the soul and that this was accordingly beyond the scope of psychical research.[77]

Lodge's deviation from Christian orthodoxy was, however, moderate compared to that of William Kingsland. By the early 1900s, he had largely turned from electrical engineering to scientific and philosophical writing, and was using the results of psychical research and the new understandings of the nature of matter and ether to develop what he upheld as a "truly *Scientific Idealism*".[78] While Kingsland was rare among British writers on idealism in his engagement with the sciences, his appeal to psychical research and physics was hardly original given that at least one

A. S. Eddington (Chicago University Press, 2007); Wilson, 'On the Importance of Eliminating *Science* and *Religion*'.

[75] Barrett, *Threshold of a New World of Thought*, pp. 5 and 100.

[76] Barrett, 'Psychic Factor'; William F. Barrett, 'The Spiritual Significance of Nature', *Contemporary Review*, vol. 105 (1914), pp. 791–9.

[77] Oliver Lodge, *Why I Believe in Personal Immortality* (London: Cassell and Company, 1928), p. 148; Barrett, *Threshold of a New World of Thought*, p. 78.

[78] Kingsland, *Scientific Idealism*, p. vii. For Kingsland's strong allegiance to Blavatsky and his attack on the SPR's exposure of her see William Kingsland, *The Real H. P. Blavatsky. A Study in Theosophy, and the Memoir of a Great Soul* (London: John M. Watkins, 1928).

of the scientific authorities on whom he drew for his understanding of the ether – Lodge – had already been discussing the congruent tendencies of physics to "elevate matter and all existence to the level of mind and spirit" and of psychical research to elevate mind over body.[79] But Kingsland's idealism differed markedly from Lodge's in being far less indebted to psychical research and concerned with the religious benefits of this enterprise. Its principal debt was to modern Theosophy, a form of occultism with which Kingsland had been strongly associated since the 1880s, but which Lodge seems to have disliked and which certainly divided opinion among physical–psychical scientists.[80]

Kingsland essentially updated modern Theosophy's approach of challenging what was perceived to be materialistic science and Christian theological dogma with a synthesis of 'secret' knowledge in world religions and philosophies (including esoteric forms of Christianity, Buddhism and Hinduism), and modern scientific revelations about the hidden aspects of human psychology and matter. Psychical research and physical science, he insisted, confronted the same problem of tracing things to the same higher plane of existence. Just as psychical research showed that our normal consciousness, personality and memory were fragments of a far larger self operating on an "astral" or "etheric" plane, so physical science was resolving matter into the "substance" of that same, higher plane.[81]

Scientific evidence of this higher plane lent support to the idea of still higher and subtler planes of consciousness and reality that modern Theosophy had been teaching for decades. Indeed, the key to the reconciliation between materialism and idealism lay in the fact that the highest of the seven macrocosmic planes taught in modern Theosophy was the infinite, eternal "Absolute Primordial Substance" or "Noumenon".[82] As the ultimate embodiment of cosmic unity, the Absolute sustained "inherent" motions that gave rise on the one hand to consciousness and subjectivity, and on the other to matter and objectivity.[83] On this basis the entire universe, including matter, was conscious and spiritual, and distinctions between material and spiritual, and natural and supernatural were illegitimate. The claimed unity between the inner self and what Kingsland called

[79] Lodge, 'Scope and Tendencies of Physics', p. 355. On British idealism and the sciences see W. J. Mander, *British Idealism: A History* (Oxford University Press, 2011), esp. 547–51.

[80] Oliver Lodge, untitled paper dated 26 January 1904, in *Papers Read Before the Synthetic Society 1896–1908*, pp. 460–2, p. 460. Barrett, however, was interested in the modern Theosophical interpretations of karma and reincarnation: Barrett, *On the Threshold of a New World of Thought*, pp. 42– 3n. For Crookes's Theosophical interests see Brock, *William Crookes*, pp. 337–43.

[81] Kingsland, *Scientific Idealism*, p. 361.

[82] Kingsland, *Scientific Idealism*, p. 286.

[83] Kingsland, *Scientific Idealism*, p. 163.

the "Self of the Universe" reflected modern Theosophy's teaching of the divinity of all humans, their capacity to apprehend the higher planes of reality, and their evolutionary development towards truly divine beings, of whom Christ was an exemplar.[84]

There were some overlaps between Kingsland's form of scientific idealism and Lodge's writings on Christian theology and new conceptions of matter and ether. Both sought to use modern science to rid Christian doctrine of superstitious accretions; both challenged the distinctions that orthodox Christianity made between God and humanity; both appealed to the ether of space as the connecting link between material and spiritual domains; and both saw the moral and spiritual evolution of humanity as part of the upward progress of the whole universe. But for all its unorthodoxy, Lodge's theology remained Christian because it accepted the "unique degree" to which God had revealed himself to humanity via the Incarnation of Jesus Christ, a teaching whose "hold" upon the "race" would strengthen if incarnation was seen as something happening to "ordinary humanity".[85] Kingsland's idealism and, *a fortiori*, the Theosophical teachings on which it built, however, had no interest in privileging Christianity. On the contrary, by replacing the God of Christian theology with an abstract Absolute Principle and by denying that Jesus Christ was more heavily endowed with the divine spirit than Gautama Buddha and other "higher types of men", Kingsland ought not have been surprised to report that Christians were modern Theosophy's "bitterest opponents".[86]

Lodge's Etherial Body

In 1909, after reading Lodge's first popular book on the ether, Crookes praised his friend for "giving this elusive substance a solid place in our thoughts" but confessed that the "apparent contradictions are more appalling than ever!"[87] Crookes merely echoed the frustrations that so many physicists of the early twentieth century had with the hypothetical space-filling medium. The astonishing developments in wireless or 'etherial' telegraphy since the 1890s certainly seemed to provide indirect experimental evidence of the reality of an electromagnetic ether that could be manipulated for long-distance communication purposes. Yet even the ether's staunchest advocates agreed that the entity's constitution

[84] Kingsland, *Scientific Idealism*, p. 217. [85] Lodge, *Man and the Universe*, p. 293.
[86] Kingsland, *Scientific Idealism*, p. 322; William Kingsland, 'Theosophy and Christianity', *Lucifer*, vol. 14 (1894), pp. 335–40, p. 336.
[87] William Crookes to Oliver Lodge, 22 May 1909, SPR.MS 35/356, OJL-SPR. Crookes was referring to Oliver Lodge, *The Ether of Space* (London: Harper & Brothers, 1909). The following section develops my 'Making Space for the Soul'.

remained a problem.[88] Attempts to produce direct experimental evidence of the ether's existence had failed and there remained numerous conceptual and theoretical problems. It was still not clear how a medium fluid enough to allow matter to pass through it without any resistance could be rigid enough to transmit the transverse vibrations constituting light; how a medium filling all space transmitted the cohesive electrical, magnetic and gravitational forces between material bodies as well as electromagnetic radiation; and how a medium that was supposed to be perfectly uniform developed the localised singularities that Larmor, Lodge and other physicists regarded as the origins of the electrical or 'electronic' constituents of matter. This latter theory led Lodge to one of the contradictions that probably appalled Crookes: if electrons arose from etherial singularities then the ether's density needed to be about 10^{12} times denser than water, which challenged a long-held assumption that it was supremely rarefied.[89]

Physicists' lack of success in devising satisfactory mechanical explanations of the ether's puzzling physical properties fuelled existing arguments that it could no longer be described in terms of the properties of gross matter and prompted suggestions that it necessitated a new form of mechanics that was more fundamental than Newtonian. While Lodge, Larmor, J. J. Thomson and other British ether theorists had, by 1900, abandoned the old mechanical ethers of William Thomson and Stokes with which they had grown up, they never regarded the ongoing ether problem as a good reason to give up hope for some kind of mechanical explanation or of abandoning the medium per se. This latter path was taken by a younger generation of physicists who admired the conceptual simplicity and mathematical power of Albert Einstein's Special Theory of Relativity, which notoriously rendered the ether superfluous to the analysis of moving electrical and magnetic bodies.

Several years after the publication, in 1905, of Einstein's Special Theory of Relativity, Larmor, Lodge and other elder statesmen of British physics upheld numerous physical and philosophical arguments against abandoning the ether.[90] In his entry on the entity for the 11th edition of the *Encyclopaedia Britannica*, Larmor noted the narrow "modern" trend of

[88] This was expressed in Joseph Larmor, 'Aether', *Encyclopaedia Britannica*, 29 vols. (Cambridge University Press, 11th ed., 1910–11), vol. 1, pp. 292–7, esp. p. 294; Lodge, *Ether of Space*, p. xv; Thomas Preston, *The Theory of Light* (London: Macmillan and Co., 4th ed., 1912), p. 33.

[89] Lodge, *Ether of Space*, p. 82.

[90] See Stanley Goldberg, 'In Defense of the Ether: The British Response to the Special Theory of Relativity, 1905–1911', *Historical Studies in the Physical Sciences*, vol. 2 (1970), pp. 89–125. *Contra* Goldberg, however, Warwick has argued that the lukewarm reaction of Cambridge mathematical physicists to relativity owed less to an adherence to the ether

merely resting "content" with mathematical laws describing mechanical interactions between bodies at a distance before turning to what he clearly preferred as the "wider view", which filled space with a "dynamical process" or a continuous "aethereal transmitting medium".[91] This "view" was a "predilection" nurtured partly by the successes of continuum mechanics and by a fundamental human sense of exerting mechanical effects on outside bodies via "limbs and sinews".[92] As someone who had upheld the continuous ether as the "foundation" of the human conviction of an "orderly" cosmos, he was bound to declare that the problem of the entity's constitution could be "attacked and continually approximated to" and possibly "definitely resolved".[93]

Lodge's numerous defences of the ether strongly echoed Larmor's arguments. In his widely discussed presidential address to the British Association meeting of 1913, he urged a "conservative attitude" towards new scientific theories that seemed to be undermining the foundations of long-cherished views of the physical world, notably the idea of the "*ultimate* Continuity" of the cosmos.[94] Unable to imagine the "exertion of mechanical force across empty space", he saw the ether as "at least" the

> great engine of continuity. It may be much more, for without it there could hardly be a material universe at all. Certainly, however, it is essential to continuity; it is the one all-permeating substance that binds the whole of the particles of matter together. It is the uniting and binding medium without which, if matter could exist at all, it could exist only as chaotic and isolated fragments.[95]

The prime threats to continuity were relativity's assault on the ether and the new quantum theory's revolutionary proposal that energy, including that associated with light, was not continuous but concentrated in discontinuous packets or 'quanta', and that this applied to energy in its absorption and emission by the discrete constituents of matter and in its transit through the allegedly continuous ether. As someone who strongly believed that direct experimental evidence of the engine of continuity

than to Einstein's theoretical techniques, which were alien to those practised in the ancient English varsity: Warwick, *Masters of Theory*, chapter 8.

[91] Larmor, 'Aether', p. 293. [92] Larmor, 'Aether', p. 293.

[93] Joseph Larmor, 'Physical Aspects of the Atomic Theory [1908]', in Joseph Larmor, *Mathematical and Physical Papers*, 2 vols. (Cambridge University Press, 1929), vol. 2, pp. 344–72, p. 372; Larmor, 'Aether', p. 294. For analysis of British physicists' defences of the 'continuity' of the ether and of the traditions of dynamical physics see Imogen Clarke, 'Ether at the Crossroads of Classical and Modern Physics', in Navarro, *Ether and Modernity*, pp. 14–29.

[94] Oliver Lodge, 'Continuity', in *Report of the Eighty-Third Meeting of the British Association for the Advancement of Science. Birmingham: 1913* (London: John Murray, 1914), pp. 3–42, pp. 15 and 19.

[95] Lodge, 'Continuity', pp. 19 and 27.

would one day be found, Lodge was clearly delighted to help himself to J. J. Thomson's plea of 1909 that, as an ether was required to explain how the earth's inhabitants benefited from the sun's "gifts", its study represented "the most fascinating and important duty of the physicist".[96] The ongoing search for ether's drift relative to the Earth and the continued debate on the ether's existence well into the 1930s suggests that Lodge's and Thomson's views were much more widely shared.[97]

Thomson's reference to the "gifts" conferred by the ether suggests a providentialist interpretation of the ether that was congruent with Lodge's belief in the possibility of the ether's "mental and spiritual functions" and harked back to the religious significances of the ether upheld by Thomson's teachers Stewart and Stokes.[98] Yet Thomson and Lodge were far from being the only physicists of their generation for whom the ether had a religious significance, and that this was relevant to questions about its reality. In 1908, George F. C. Searle, a devout Christian and one of the leading teachers of experimental physics in Thomson's Cavendish, told fellow Anglicans that the ether constituted "evidence of the unity of the universe" and that this evidence led to the "conviction that the whole universe, the ether included, is the work of a single Creator".[99] Searle's interpretation would have compounded the scientific reasons that he had at this time for being indifferent to and baffled by Einstein's Special Theory of Relativity.[100] Religious considerations weighed equally heavily with one of Lodge's old Liverpool colleagues, the electrical engineer William Thornton. As late as 1930, he warned fellow Christians that while relativity was useful "as far as the equations go", the existence of an ether that could potentially store vastly more energy than just the "material universe" rendered more intelligible the idea that the whole universe was the physical immanence of an infinitely energetic God.[101]

Thornton's balancing of the ether's wider significance against relativity's technical power owed much to Lodge. When, in 1919, sensational astronomical evidence was produced in support of Einstein's General Theory of Relativity, Lodge's resolve to broadcast the philosophical virtues of the

[96] Lodge, 'Continuity', p. 27. Lodge was quoting from Thomson's presidential address to the British Association: J. J. Thomson, 'Address', in *Report of the Seventy-Ninth Meeting of the British Association for the Advancement of Science Winnipeg, 1909* (London: John Murray, 1910), pp. 3–29, p. 15.

[97] Swenson, *Ethereal Aether*, chapters 9–12.

[98] Lodge, 'Continuity', p. 27.

[99] George F. C. Searle, 'The Modern Conception of the Universe', in *Pan-Anglican Papers. Being Problems for Consideration at the Pan-Anglican Congress, 1908. Religion and Science* (London: Society for the Promotion of Christian Knowledge, 1908), pp. 1–8, p. 4.

[100] Warwick, *Masters of Theory*, pp. 399–404.

[101] William M. Thornton, *The Scientific Background of the Christian Creeds* (Newcastle-on-Tyne: Andrew Reid and Company, 1930), p. 17.

ether only strengthened. As he insisted in a popular article of 1921, the Special and General Theories of Relativity represented an impressive but ultimately "blindfold mathematical method of arriving at results" relating to constant and accelerated motion, because the method sidestepped the question of physical cause, which an ether, embodying the "solid ground of inductive dynamical physics" and the fundamental human conception of force, answered.[102]

Yet Lodge's response to General Relativity was more equivocal than we might expect from this self-confessed "fervent believer in the Ether of Space".[103] Einstein's "real achievement", he contended, was in extending the work of Faraday, Maxwell and others in raising the importance of 'empty' space and in bringing the elusive force of gravity within the ether's remit. Lodge's argument ignored the fact that the 'ether' that Einstein had recently accepted as the necessary physical basis for the spacetime continuum of General Relativity differed significantly from even the abstract dynamical ether of Larmor and Lodge in being entirely devoid of mechanical qualities.[104] But for Lodge, such differences over the ether's nature were outweighed by the usefulness of Einstein's work in illustrating a welcome tendency in physics towards multiplying the ether's functions. Writing in the same periodical where he had first hinted at the ether's possible psychical significance, he explained that relativity encouraged the idea that the ether's functions might one day include "other forms of existence which for simplicity Science feels it convenient at present to ignore".[105]

Some of Lodge's readers may have known that a few years earlier, in 1919, he had published his first detailed but tentative hypothesis about the ether's relationship to one such form of "existence".[106] This concerned the nature of the "etherial body", which was essentially Lodge's most elaborate attempt to render the Christian idea of the soul or spiritual body more intelligible and appealing than either the vulgar materialistic view that the soul was merely a rarefied form of matter that disappeared at death, or the equally discomforting idealistic view that it was completely disembodied, outside space and time and otherwise beyond human apprehension.[107] Over the remaining decades of his life, it came to

[102] Oliver Lodge, 'Einstein's Real Achievement', *Fortnightly Review*, vol. 110 (1921), pp. 353–73, pp. 358 and 366.
[103] Lodge, 'Continuity', p. 15.
[104] Albert Einstein, 'Ether and the Theory of Relativity [1920]', in *Sidelights on Relativity* (New York: E. P. Dutton, 1922), pp. 3–24.
[105] Lodge, 'Einstein's Real Achievement', p. 372.
[106] Oliver Lodge, 'Ether, Matter and the Soul', *Hibbert Journal*, vol. 17 (1918–19), pp. 252–60.
[107] Lodge, *Raymond*, p. 391; Lodge, *My Philosophy*, p. 256.

represent the core of a 'philosophy' dominated by the known and anticipated properties of the ether and provided the key to two related problems he had pondered for decades: how mind or spirit interacted with matter, and how 'physics and psychics' were linked.

In Chapter 3 we saw that in 1902 Lodge had briefly discussed the idea of an etherial body as a possible means by which disembodied spirits materialised themselves to the living.[108] At this stage, Lodge's hypothesis was no more sophisticated than the ethereal, etherial or 'astral' body that spiritualist, Theosophical and occult writers had envisioned as the subtler physical vehicle of the spirit or instrument by which spirits manifested themselves on the material plane.[109] It owed something to Myers's notion of a 'metetherial' world and to the *Unseen Universe*, which had, like many texts explored in this study, sidestepped questions about the ultimate nature of spirit but turned to physics (and particularly ether physics) to illuminate the nature of the spiritual body.[110]

By 1919, Lodge had at least two reasons for believing that a new argument for the etherial body was both necessary and possible, and both related to the First World War. First, the etherial body symbolised the values that he and others ascribed to the ether and which he believed were being threatened by modern German culture. In his fiercely anti-German *War and After* (1915), he interpreted German physicists' apparent denial of an ether as an "allegory" of the "larger scheme" in which the focus of Britain's chief enemy on the material side of things and the military power of the German state had destroyed its "spiritual sense".[111] His revulsion towards German barbarism turned to anger months later, in 1915, when his son Raymond was killed in action near Ypres. Raymond's death also informed the second reason why the idea of an etherial body needed articulating. Lodge channelled much of his grief into a campaign to reassure those who had lost loved ones in the conflict, and who may already have turned to spiritualism for consolation, that death was not final.[112]

[108] Lodge, 'Address by the President', p. 47.

[109] See, for example, Helena Petrovna Blavatsky, *Isis Unveiled: A Master Key to the Mysteries of Ancient and Modern Science and Theology*, 2 vols. (New York: J. W. Bouton, 1877), vol. 1, pp. 280–1; Sargent, *Scientific Basis of Spiritualism*, pp. 54–6 and 196–213.

[110] Lodge was aware of the *Unseen Universe* by at least the 1890s: William F. Barrett to Oliver Lodge, 18 October 1890, SPR.MS 35/60, OJL-SPR. Oliver Lodge, 'The Ether of Space', *Contemporary Review*, vol. 93 (1908), pp. 536–46, p. 540.

[111] Oliver Lodge, *The War and After: Short Chapters on Subjects of Serious Practical Import for the Average Citizen in A.D. 1915 Onwards* (London: Methuen and Co., 1915), p. 18.

[112] George M. Johnson, *Mourning and Mysticism in First World War Literature and Beyond* (Basingstoke: Palgrave, 2015), chapter 2; Jay Winter, *Sites of Memory, Sites of Mourning: The Great War in European Cultural History* (Cambridge University Press, 1995), chapter 3.

It is no coincidence that it was in his account of how he had coped with Raymond's death – via establishing evidence for his post-mortem manifestation in seances – that Lodge sought to lend his scientific authority to the comforting ideas that death was "not a word to fear" and that those whose material bodies had been blown apart in battle continued to live, whole in an etherial continuum.[113] Death probably involved the complete transit of our spirit to the ether, which, though immaterial, intangible and elusive, was nonetheless physical and "substantial enough" to give spirit some kind of a body that could, under certain circumstances, manifest itself to the living.[114]

The idea of an etherial body was mentioned by the 'disembodied' spirit 'Feda' who controlled Gladys Leonard's voice during the seances she gave to Lodge, and which was the primary source of information about Raymond.[115] Lodge was gratified that the denizens of the other world gave their "general approval" to the idea that they had some kind of body, but for public purposes the argument for the etherial body's possibility needed a more this-worldly basis.[116] A stronger argument for the etherial body was possible because, as far as Lodge was concerned, the ether had become a more significant physical entity than it had been in the late nineteenth century. The extraordinary physical properties it seemed to possess – notably its enormous elasticity and inertia, its apparently flawless continuity and transparency, and freedom from friction and disintegration – underpinned Lodge's frequent references to it as the most "substantial" and "perfect" entity in the universe, and his argument that it was especially promising as an abode of life and mind.[117] Since life and mind were associated with gross matter, then it was not unlikely that they were also associated with a physical entity (the ether) whose elasticity and inertia made it vastly better than gross matter in carrying other immaterial phenomena such as light, electricity and magnetism. Since ether was also believed by many (notably older British physicists) to be intimately related to gross matter – whether as the medium out of which the constituents of matter were formed or as the agent of cohesion and other forms of physical influence between all material bodies – then it promised to be the perfect "intermediary third" class of entity that could explain how immaterial mind, whether human or divine, interacted with the material world.[118]

[113] Lodge, *Raymond*, p. 298.
[114] Lodge, *Raymond*, p. 319.
[115] Lodge, *Raymond*, p. 195.
[116] Lodge, *Beyond Physics*, p. 7.
[117] Oliver Lodge, *Ether and Reality: A Series of Discourses on the Many Functions of the Ether of Space* (London: Hodder and Stoughton, 1925), pp. 154–5.
[118] Lodge, *Beyond Physics*, p. 22.

The significance of the ether in constituting and welding together matter was critical to Lodge's stronger argument for the etherial body. It led him to propose that it was probable that all sensible objects had material and etherial aspects, even though the latter aspect was invisible and intangible.[119] The psychical significance of *animate* objects arguably applied to both their material and etherial aspects and this had a major implication for human beings. Our etherial aspect or body was bereft of the "temporal disabilities" blighting gross matter, such as "fatigue, imperfect elasticity, friction, dissolution", and when freed from such matter it could lead a "less abstracted and livelier existence".[120] The possibility that our etherial body had a psychical significance, and that this survived the dissolution of the material body, was, Lodge conceded, a question to be settled by evidence from psychical research rather than by "dogmatism".[121] Difficult as this task had been and would continue to be, it was worth pursuing because it promised to render "vaguely explicable" and physically more intelligible Christian conceptions of the soul or spiritual body and how incorporeal intelligences appeared to interact with terrestrial matter as manifested in the communications and movements of spiritualist seances.[122]

Lodge's preoccupation with the ether's possible properties only intensified after his retirement, in 1919, from the University of Birmingham. This transition gave him more time for writing, lecturing and, later, radio broadcasting, and permitted him more freedom in contemplating the controversial physical, psychical, religious and philosophical topics that had interested him for decades. Much of this material combined surveys of established knowledge of the ether's known physical properties with articulations of the vaguer grounds he had for believing in the medium's wider significances. In *Ether and Reality* (1925), his most commercially successful book on the ether, he moved from a popular exposition of the ether's "ascertainable physical properties" to the "instinct" he had for the idea that since we were "more in direct touch with the ether than with matter", then this made the physical medium "our real primary and permanent instrument".[123] "Instinct" led him to push the religious significance of etherial contact further than he had done before. In one of the most audacious of all his books' conclusions, this volume declared that

[119] Lodge, 'Ether, Matter and the Soul', p. 258. For a complementary analysis of Lodge's hypothesis see Wilson, 'The Thought of Late-Victorian Physicists'.
[120] Lodge, 'Ether, Matter and the Soul', p. 258.
[121] Lodge, 'Ether, Matter and the Soul', p. 259.
[122] Lodge, 'Ether, Matter and the Soul', p. 259.
[123] Lodge, *Ether and Reality*, pp. viii, 173 and 176–7. The book was still being reprinted in 1930. An incisive study of the volume is Whitworth, 'Transformations of Knowledge'.

the ether was the "primary instrument of Mind, the vehicle of Soul, the habitation of Spirit. Truly it may be called the living garment of God".[124]

Like all of Lodge's later writings on the ether, *Ether and Reality* balanced a sense of the significant uncertainties about the ether (notably the precise means by which matter and spirit interacted with it) with a sincere belief that these uncertainties were among the greatest scientific problems for the future. In the 1920s and '30s, Lodge often spoke of the ether as one of the ways he felt that "physics and psychics" were "interlocked", and this reflected his hopes for fruitful convergences of physical, psychical and theological forms of enquiry as well as his belief in the capacity of the ether to illuminate the interactions between phenomena of the physical and psychical domains.[125] As he explained in his last book:

> The bringing in of the ether into the scheme of psychics, as it has already been partially brought into the scheme of physics, is the work which I feel sure is lying ahead for generations of men. Then – when a serious beginning in this direction has been made – the term "soul" will acquire a definite and clear connotation; no longer will the idea of a spiritual body seem vague and indefinite and difficult of apprehension – there is nothing indefinite about future existence – soul will no longer be regarded as a term to be avoided, but will become as real and recognisable, as concrete and tractable, as are the corpuscles of electricity.[126]

Like Larmor and Thomson, Lodge could not forget the tradition of ether-based physics that had been most successful in the late nineteenth century, and this was clearest in his hopes for the discovery of a hydrodynamical or other "perfect mechanism" for the medium.[127] But, unlike those other physicists, he believed that the success of rendering the problems of physics more intelligible via the ether could be repeated in the domains of psychical research and Christian theology. What strengthened the "hold" that he admitted the quasi-mechanical ether had on him was not just its potential psychical and theological significances, but the way that it fitted into his fundamental belief that everything in the cosmos – matter, life, mind and spirit included – were ultimately parts of a cosmic "chain of causation", many parts of which were beyond human grasp.[128] So closely tied was the etherial mechanism and cosmic orderliness in his mind that he judged "preposterous" the argument, associated closely with such younger rivals in popular physics as Arthur Stanley Eddington and James Jeans, that the interdeterminacy

[124] Lodge, *Ether and Reality*, p. 179. [125] Lodge, *Beyond Physics*, p. 114.
[126] Lodge, *My Philosophy*, p. 238. Chapter 21 of this book expands Lodge, 'Ether, Matter and Soul'.
[127] Oliver Lodge, 'The Ether and Relativity', *Nature*, vol. 126 (1930), pp. 804–5, p. 804.
[128] Lodge, 'Ether and Relativity', p. 805; Oliver Lodge, *Modern Problems* (London: Methuen and Co., 1912), p. 4.

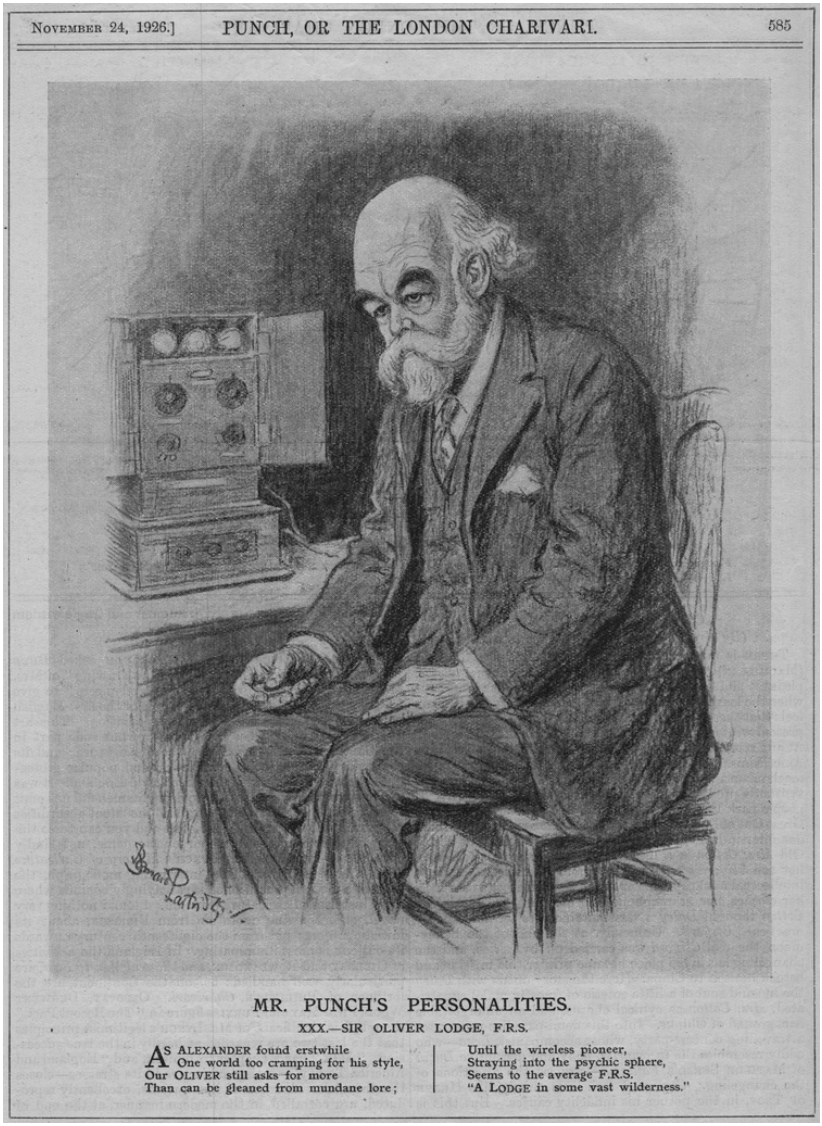
implied by quantum mechanics made the idea of a Divine Mind scientifically more acceptable.[129] It also meant that he could be confident that while in the 1930s it was profoundly difficult to conceive of the interaction between mind and ether – an interaction between something so unphysical and immaterial with something with ascertainable physical and mechanical properties – it was a problem that would eventually be solved by the ceaseless human quest for intelligibility.

Interpreting Lodge's Physics and Psychics

In late 1926, the British comic periodical *Punch* featured Lodge in its long-running series of cartoons of leading personalities of the day (Figure 6.1). Showing the ageing wireless pioneer sitting near a radio receiver, the image was accompanied by a short poem parodying verses from William Cowper's anti-slavery poem of 1784, 'The Task'. Claiming that Lodge had found the "mundane" world too "cramping for his style", it described how he had strayed into the "psychic sphere", which seemed to the "average F.R.S. / A Lodge in some vast wilderness".[130] Lodge would not have been surprised, and may have been amused, to find his apparent scientific marginality portrayed in this way. He had long perceived, with some justification, that his "psychic utterances" had done "harm" to his scientific reputation, and the numerous attacks on *Raymond* and similar works would have reminded him that doubts about his capabilities as a psychical researcher, as well as the scientific credibility of psychical research per se, were as severe as ever.[131] His forays into theology compounded perceptions of his professional marginality: most scientists remained in some sense religious but were increasingly reluctant to speak out on matters lying beyond their scientific expertise, thus undermining the efforts of the older generation of scientists, liberal Christians and others to find common ground between science and religion.[132]

Yet the *Punch* cartoon alluded to one reason why Lodge had grounds for believing that perceptions of his scientific marginality were not necessarily shared beyond circles of elite scientists. As a prominent figure in

[129] Lodge, *Beyond Physics*, p. 73.
[130] Bernard Partridge, 'Mr. Punch's Personalities. XXX – Sir Oliver Lodge, F.R.S.', *Punch*, 24 November 1926, p. 585.
[131] Oliver Lodge to J. Arthur. Hill, 23 December 1914, in Hill, *Letters from Sir Oliver Lodge*, p. 49. Examples of hostile responses to Lodge's psychical works include Viscount Halifax, 'Raymond; Or, Life and Death', *Church Times*, vol. 72 (1917), pp. 181–2; J. W. A. Hickson, 'Sir Oliver Lodge and the Beclouding of Reason', *University Magazine*, vol. 16 (1917), pp. 379–97; Charles Mercier, *Spiritualism and Sir Oliver Lodge* (London: Watts and Co., 1919); Tuckett, 'Psychical Researchers'.
[132] Bowler, *Reconciling Science and Religion*, pp. 20–4.



6.1 Bernard Partridge, 'Mr. Punch's Personalities. XXX – Sir Oliver Lodge, F.R.S.', *Punch*, 24 November 1926, p. 585.

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early radio broadcasting, Lodge reinforced his profile as one of the most familiar figures in British science who was often called upon to interpret the ideas of 'modern' physics and a host of other subjects to a wide range of scientific and non-scientific audiences.[133]

Few of these ideas divided Lodge's different audiences more than those relating to the ether. In a lecture to fellow electrical engineers in 1926, Alexander Pelham Trotter opined that "most of those of us" who knew Lodge's broadcasts and writings agreed with him that relativity's champions could not dismiss the ether "by a summary negation".[134] The British physicist Edward Andrade was more equivocal. Reviewing *Ether and Reality* in *Nature*, he echoed the praise that Lodge frequently received for his literary "charm and simplicity" but deemed the author's ideas about the ether confusing and antiquated.[135] He was puzzled by Lodge's insistence on an ether that was not composed of gross matter but had mechanical properties (for example, inertia and elasticity) commonly associated with such matter, and by his appeal to Einstein – a physicist who, unlike Lodge, had rejected the idea of the ether as mechanical and as embodying the absolute reference frame for space and time. It was for these reasons, and Lodge's apparent appeal to "mystic inspiration and psychic experiences" for some of his etherial arguments, that Andrade believed that the book was better suited to those seeking a "wider outlook" than to professional physicists such as himself.[136] In his review of the same book, the leading British science journalist J. W. N. Sullivan denied that many physicists adhered to Lodge's "modified form of the old ether theory" but, unlike Andrade, questioned whether he had also served those seeking a wider outlook.[137] The fundamental problem of understanding the interaction of mind and matter was not simplified by appealing to something as substantial as Lodge's ether.

[133] On Lodge as a populariser of modern physics see Clarke, 'Ether at the Crossroads'; Lightman, 'Lodge and the New Physics'; Whitworth, 'Transformations of Knowledge'.

[134] Alexander P. Trotter, 'Illumination and Light', *Journal of the Institution of Electrical Engineers*, vol. 64 (1926), pp. 367–71, p. 370.

[135] E[dward] N. [da] C[osta] A[ndrade], 'Ether and Erdgeist', *Nature*, vol. 116 (1925), pp. 305–6, p. 305. Cf. Andrade's review of Lodge's earlier book, *Atoms and Rays* (1924): E[dward] N. [da] C[osta] A[ndrade], 'A Veteran's View of Modern Physics', *Nature*, vol. 114 (1924), pp. 599–601. Some reviews of *Ether and Reality* agreed that its faults were balanced by its capacity to stimulate thought: see, for example, E. E. Free, 'The Ether and the Soul', *Popular Radio*, vol. 8 (1925), p. 280.

[136] Andrade, 'Ether and Erdgeist', p. 305.

[137] [J. W. N. Sullivan], 'Ether and Reality', *Times Literary Supplement*, No. 1217 (14 May 1925), p. 325.

Sullivan was hardly the first to doubt whether Lodge's ether had the appropriate qualities for the psychical and spiritual purposes that the physicist sought for it. In 1906, the English writer W. H. Mallock had demurred to Lodge's claim that the ether made it easier to comprehend a domain where free will and immortality were possible because, despite being different from gross matter, it was still "determined" and had structures that were temporary.[138] When, in 1918, Eleanor Sidgwick replied to Lodge's proposal to have his paper on the etherial body published by the SPR, she warned him that a "good many physicists" would question his ideas about the ether and offered the personal estimate that the entity seemed "too materialistic a conception" to illuminate "psychics", which she, like so many SPR members, had long believed was primarily a psychological question.[139]

The substantial, objective and quasi-mechanical ether cherished by Lodge fared rather better among spiritualists and modern Theosophists. By the 1920s, spiritualists had come to regard Lodge as one of their greatest scientific allies and they typically welcomed the intellectual gravitas that his books, lectures and radio broadcasts brought to questions relating to survival and telepathy. His speculations on the etherial body found plenty of admirers among contributors to the leading spiritualist weekly *Light* and were appropriated in one of the bestselling British spiritualist texts of the interwar period: Arthur Findlay's *On the Edge of the Etheric* (1931).[140]

Lodge's writings directly or indirectly helped modern Theosophists develop their old argument that modern science was catching up with, and helping to support, occult wisdom. Lodge's theory of a super-dense ether was used by Alfred Percy Sinnett in a 1919 edition of *Occult Chemistry* – Annie Besant and Charles Leadbeater's notorious account of their clairvoyant "observations" of the atomic, subatomic and "ultra-physical" constituents of the chemical elements.[141] For Sinnett, Lodge's

[138] W. H. Mallock, 'Sir Oliver Lodge on Life and Matter', *Fortnightly Review*, vol. 80 (1906), pp. 33–47, p. 37.

[139] Eleanor Sidgwick to Oliver Lodge, 4 October 1918, SPR.MS 35/2255, OJL-SPR. In 1930, Lodge speculated that the new wave mechanics, which represented subatomic particles as vibrations, provided a possible etherial mechanism by which mind could interact with matter. But the young British physicist and SPR member Guy Burniston Brown warned that because this mechanism could be described in terms of the Schrödinger wave equation, it could "hardly be said to bristle with spontaneity and free will!": Guy B. Brown, Review of Oliver Lodge's *Beyond Physics, Philosophy*, vol. 5 (1930), pp. 624–6, p. 626.

[140] [Anon.], 'The Ether and Human Survival', *Light*, vol. 45 (1925), p. 198; H. A. Dallas, 'The Etherial Body: Its Nature and Scope', *Light*, vol. 44 (1924), p. 116; Arthur Findlay, *On the Edge of the Etheric* (London: Psychic Press, 1931), chapter 2.

[141] Besant and Leadbeater, *Occult Chemistry*, p. 4.

theory converged with clairvoyant perception that space was filled with an infinitely dense fluid ('koilon') and that structures within the fluid comprised the building blocks of matter. Similarly, in *Rational Mysticism* (1924), William Kingsland revealed his debt to Lodge when he wrote that the "real substantiality, that which is more real in the sense of being more permanent, more enduring, more *inner*, is not physical matter, but something which lies quite beyond the reach of our senses".[142] This "something" was the ether of space, which Kingsland was pleased to insist had not been destroyed by relativity theory. Although this surviving ether remained a purely physical and "*dead* substance", it was a stepping-stone to Theosophical and mystical ideas of higher planes of substance, including the ultimate "Primordial or Root Substance" of the cosmos where mind and matter were unified.[143]

Kingsland's book illustrates the diverse ways in which modern Theosophists and spiritualists tried to cope with the contradictions between that part of 'modern' physics upholding the existence of an ether and the more recent part denying its existence. His approach challenged the latter position by emphasising Einstein's and Eddington's arguments for space possessing physical qualities and by upholding the "deeper", non-empirical evidence of hidden levels of reality, of which the physical ether was one.[144] The British physical chemist and modern Theosophical writer, William Coode-Adams, was altogether more equivocal. Like many Theosophical texts of the period, his *Primer of Occult Physics* (1927) used Lodge's view of cosmic significance of the immaterial ether to support the general occult principle that "reality is always behind the appearances".[145] Elsewhere, it characterised relativity as a powerful scientific endorsement of occult perceptions of a reality transcending ordinary and rigid notions of space, time and matter, and as a theory whose conception of time as a fourth dimension of spacetime lent credence to clairvoyant travels into the past and future.

Quantum theory was no less useful to Coode-Adams. The idea that energy existed in an atomic form provided an analogy for the Theosophical idea that matter was energy on a lower plane of reality, and seemed to be confirmed by clairvoyant observation. Yet Coode-Adams's attempt to show the congruence of modern and occult physics forced him to make a puzzling compromise. Having accepted the challenge that relativity and quantum theories posed to the idea of an objective ether, he had

[142] William Kingsland, *Rational Mysticism: A Development of Scientific Idealism* (London: George Allen and Unwin, 1924), p. 81.
[143] Kingsland, *Rational Mysticism*, p. 83. [144] Kingsland, *Rational Mysticism*, p. 71.
[145] W. R. C. Coode-Adams, A *Primer of Occult Physics* (London: Theosophical Publishing House, 1927), p. 53.

to conclude that this did not affect the status of the three higher "grades" of ether taught in Theosophy or of Lodge's view of the ether as our primary instrument.[146]

Spiritualists were certainly aware of the challenge that relativity theory posed to their cherished idea, partly encouraged by Lodge's writings, of an etherial body surviving the death of the material body. Some followed Findlay in ignoring relativity; some explicitly challenged the philosophical implications of the theory; and some welcomed it as another argument against the concepts of matter, time and space propping up materialism, and for the existence of higher spatial dimensions where spiritualists had long located spirits.[147] Some tried to forge compromises between relativity and ether physics that, owing partly to Lodge, had proven such a useful source of scientific speculation. One compromise involved focussing on how both kinds of physics involved a welcome challenge to nineteenth-century materialism, even though this was reached by the ostensibly divergent routes of abandoning traditional concepts of space, time and matter and embracing Lodge's idea of an immaterial and objective ether.[148]

In their engagements with Lodge's writings, spiritualists and psychical researchers revealed a variety of interpretations of Lodge's attitude towards the connection between the ether and telepathy or other forms of psychical transmission. In 1921, the civil engineer Stanley De Brath alluded to Lodge's warning of 1903 that spiritual and psychical events might occur in realms beyond the physical and so may not involve the ether of physics.[149] Lodge's warning would have seemed appropriate because in the 33 years between the SPR's first major work on telepathy – *Phantasms of the Living* – and De Brath's article, psychical researchers had amassed further evidence for experimental and spontaneous cases of the obscure human faculty, but many were mindful that the evidence was still inadequate to convince the scientific world and to support etherial, wireless or other physical explanations of telepathy.[150] One of the chief contributors to the more recent studies of telepathy, Eleanor Sidgwick, spoke

[146] Coode-Adams, *Primer of Occult Physics*, p. 48. Other popular expositors of relativity were inconsistent in their views on the ether: see Navarro, 'Ether and Wireless: An Old Medium into New Media', in Jaume Navarro, *Ether and Modernity*, pp. 130–54.

[147] Tudor A. Morgan, 'The Ether and Spiritual Science', *Occult Review*, vol. 50 (1929), pp. 83–9; George Lindsay Johnson, *The Great Problem and the Evidence for Its Solution* (London: Hutchinson and Co., 1927), pp. 35–6; Herbert S. Redgrove, 'Mathematics and Psychical Research', *Psychic Research Quarterly*, vol. 1 (1920–1), pp. 220–34.

[148] Frederick Stephens, 'Science and the Unseen World', *Light*, vol. 49 (1929), pp. 338–9, 356–7.

[149] Stanley De Brath, 'Relativity', *Light*, vol. 41 (1921), pp. 520–1.

[150] [Eleanor] Sidgwick, 'Phantasms of the Living', *PSPR*, vol. 33 (1923), pp. 23–429; Rudolf Tischner, *Telepathy and Clairvoyance*, translated by W. D. Hutchinson

for many psychical researchers in the early 1920s when she called for more experiments that would address such questions as why telepathy was so capricious, what were the psychological conditions of success, whether it depended on the energy of the transmitting agent, and what exactly was transmitted from one mind to another.[151] Sidgwick's reservations about the employment of physical analogies in understanding this transmission were moderate compared to those of Barrett and Lodge, who agreed that the development of wireless telegraphy – the iconic technology of transmitting intelligence through 'empty' space – had encouraged many etherial analogies for and theories of telepathy that they still questioned.[152]

Yet Barrett and, *a fortiori*, Lodge were also partly responsible for the very analogising and theorising that they wanted to curb because so many of their writings emphasised the psychical and spiritual significances of the ether.[153] Someone who read Lodge in this way was Cyril 'Jack' Frost, a former British army officer who by the mid-1920s had emerged as an authority on wireless telegraphy and as a writer and lecturer on spiritualism. In 1926, he told one spiritualist audience that Lodge's *Ether and Reality* aroused "deep interest" in the possibility of a connection between the medium of radio transmission and the medium of communication between discarnate and incarnate souls.[154] As a former official at the British Broadcasting Corporation, he had good reason to think that the organisation had, by making it "commonplace" for people to hear voices of distant souls, also made it easier to contemplate the reality and wider, possibly psychic possibilities of the etherial carrier of those voices.[155]

Frost is one of many individuals from the 1920s and '30s who demonstrate that the connections between the cultures of psychical research and of wireless telegraphy are stronger and more complex than we might assume from the obvious, but actually complicated case of Lodge. In Britain and America, the 'psychical' and 'occult' content of magazines

(London: Kegan Paul, Trench, Trübner and Co., 1925); René Warcollier, *La télépathie recherches expérimentales* (Paris: Librairie Félix Alcan, 1921).

[151] Eleanor Sidgwick, 'Experimental Telepathy: The Need of Further Experiments', in *L'état actuel des recherches psychique d'aprés le travaux du II^me Congrés International tenu à Varsovie en 1923* (Paris: Les Presses Universitaires de France, 1924), 174–80.

[152] Barrett, *Psychical Research*, p. 107; Lodge, *Survival of Man*, pp. 125–6. Examples of such analogies are [Anon.], 'Wireless and Telepathy', *Light*, vol. 47 (1927), p. 78; J. C. F Grumbine, *Telepathy: Or, The Science of Thought Transference* (London: L. N. Fowler and Co., 1915), esp. chapters 4–5.

[153] Examples of Barrett's continued psychical uses of the ether are Barrett, 'Spiritual Significance of Nature', pp. 795–6; William F. Barrett, *On the Threshold of the Unseen: An Examination of the Phenomena of Spiritualism and of the Evidence for Survival After Death* (London: Kegan Paul, Trench, Trübner and Co., 1920), p. 118.

[154] Jack Frost, 'Radio and Psychic Science', *Light*, vol. 46 (1926), p. 221.

[155] [Anon.], 'Wireless and the Next World', *Light*, vol. 46 (1926), pp. 544–5, p. 544.

serving the burgeoning professional and amateur interests in wireless, as well as those catering to less specialist scientific readerships, overlapped more with the 'technical' content of spiritualist, psychical and other occult periodicals than we might expect. Like so much popular scientific and technical literature, this material speculated to a degree that would not have been permitted in the publications of those elite scientific organisations that seemed to marginalise Lodge. Susan Douglas has argued that in the United States it was precisely the hunger for "otherworldly contact, for communion with disembodied spirits, for imaginative escapades that affirmed there was still wonder in the world" that helps explain the astonishing growth of professional and amateur interest in wireless.[156] The hunger for such wireless possibilities was present on both sides of the Atlantic. Articles on 'wireless' theories of telepathy, electrical devices that seemed to capture thoughts and discarnate spirits, experimental evidence of brain waves, and reflections on the classic scientific studies of spiritualism were common to popular wireless and occult magazines in Britain and America[157] (Figure 6.2).

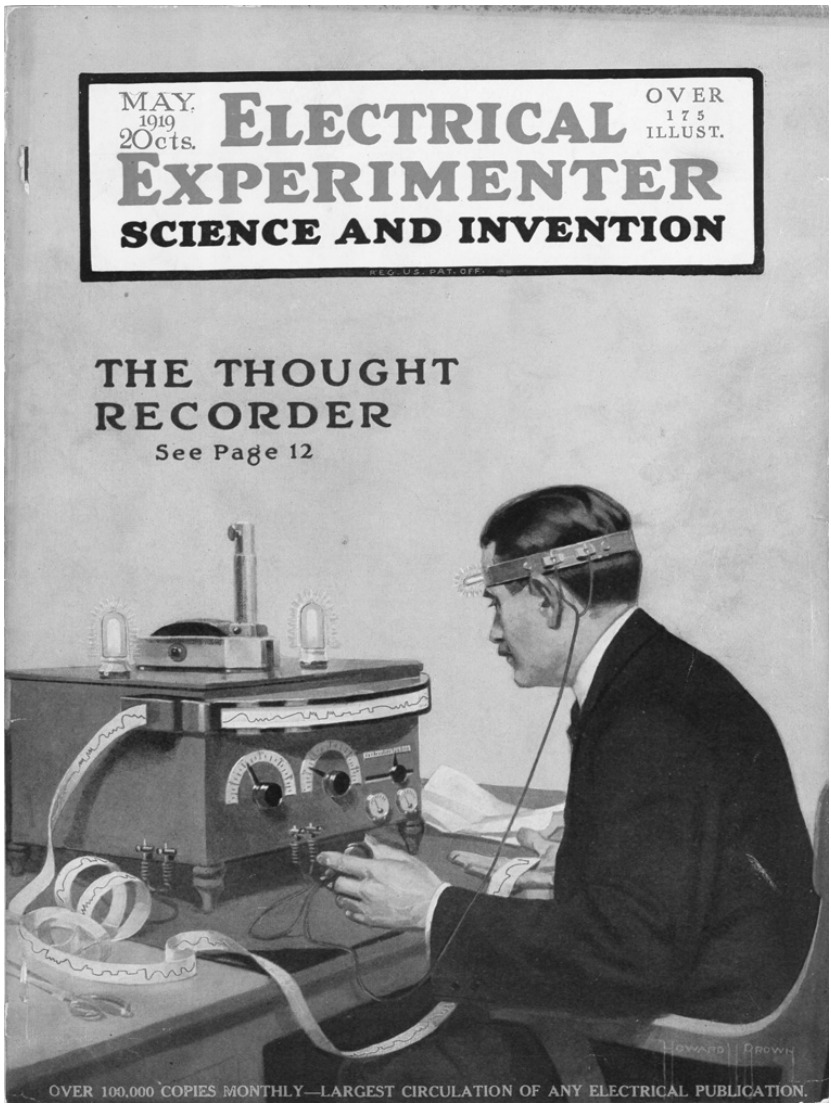
Much of this material demonstrates the fact that the concept of an objective ether was used by professional and amateur wireless practitioners long after it was deemed to have been killed off by relativity theory and become of only marginal interest to professional physicists.[158] For many in these former technical constituencies, the ether's alleged demise was a legitimate topic of debate, not least because the concept still made the quotidian practices of wireless telegraphy intelligible and was indispensable in teaching fundamental principles to novices.[159] Given their acknowledgement of Lodge as a major authority on wireless, it is hardly

[156] Susan J. Douglas, *Listening In: Radio and the American Imagination* (Minneapolis, MN: University of Minnesota Press, 2004), p. 52.

[157] See, for example, [Anon.], 'Notes of the Month', *Occult Review*, vol. 28 (1918), pp. 187–203; [Anon.], 'Wireless and Telepathy'; Hereward Carrington, 'Sir William Crookes's Psychical Researches', *Electrical Experimenter*, vol. 7 (1919), pp. 407, 440, 442 and 444; C. H. Collings, 'Wireless: Some Facts and Speculations', *Light*, vol. 42 (1922), p. 461; E. E. Free, 'Have "Brain Waves" Been Discovered?', *Popular Radio*, vol. 9 (1926), pp. 366–7; Hugo Gernsback, 'The Thought Recorder', *Electrical Experimenter*, vol. 7 (1919), p. 12, pp. 84–5; Philip J. Risdon, 'Psychic Phenomena and Wireless', *Popular Wireless Weekly*, vol. 1 (1922), pp. 237–8; Cesar de Vesme, 'Human Brain Waves', *Light*, vol. 54 (1934), p. 115. For analysis of this material see Richard Noakes, 'Thoughts and Spirits by Wireless: Imagining and Building Psychic Telegraphs in America and Britain, circa 1900–1930', *History of Technology*, vol. 32 (2016), pp. 137–58.

[158] For a fuller discussion of this point see Navarro, 'Ether and Wireless'.

[159] See, for example, Philip R. Coursey, 'Aether the Substratum of the Universe', *Wireless World*, vol. 8 (1920), pp. 37–40; Philip J. Risdon, 'There Is No Ether?', *Popular Wireless Weekly*, vol. 1 (1922), p. 145; Charles P. Steinmetz, 'There Are No Ether Waves', *Popular Radio*, vol. 1 (1922), pp. 161–6.



6.2 A cover of *Electrical Experimenter*, one of many popular scientific magazines launched by the American inventor and publisher Hugo Gernsback. In this issue, Gernsback discussed a machine that might be able record the etherial waves transmitted by the brain: Hugo Gernsback, 'The Thought Recorder', *Electrical Experimenter*, vol. 7 (1919).

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surprising that wireless practitioners should have helped themselves so readily to the physicist's views on the ether. However, some wireless practitioners were frustrated by Lodge's refusal to extend his etherial speculations in the directions of new theories and experimental investigations connecting psychical and etherial forms of communication.

This is suggested by the comments of Quentin Craufurd, a former Royal Navy wireless officer who, like Frost, started contributing to the spiritualist press in the 1920s. Writing in *Light* in 1927, he deviated from Barrett, Lodge and many other physical–psychical scientists in denying that spiritualists' use of scientific terms was necessarily misguided. Spiritualists' talk of "magnetism" associated with the body or of "invisible light" perceived by clairvoyants was no longer risible given scientific evidence of electrical motion in the body and of wireless waves respectively.[160] For this reason, spiritualists deserved to be respected as individuals who had the potential to make important scientific discoveries, in much the same way that other 'amateurs' were. Indeed, Craufurd insisted that it was the

> free-lance and the amateur who, in the most recent discoveries, have far outstripped the orthodox teachings of science in wireless practice of the present day. The bold experimenter has got ahead of the most cautious professor in many cases, and in nothing is this more obvious than in communication by "magnetism" (if you like to call it by that name) to distant regions".[161]

As we shall see, Craufurd would pursue one such "bold" experimental project with Frost, and this clearly challenged the "cautious" approach of Lodge and others towards magnetic communication with spiritual "regions".

The actions of Craufurd and others with combined interests in wireless telegraphy and psychic communication were at least as telling as their words. In many ways their actions and words represented some of the most creative new attempts of the interwar period to explore connections between physics and psychics. In 1922, the American psychical researcher and science populariser Hereward Carrington fuelled speculation about the occult significances of wireless signals by explaining in the American-based *Popular Radio* magazine that he had recently established a Psychical Institute in New York where he and fellow investigators were exploring, among other questions, the possible enhancement of telepathic impressions by superposing them onto carrier waves generated by a powerful electric field.[162] Although it failed to produce any conclusive

[160] Q. C. A. Craufurd, 'The Unknown Force: An Electrician's View', *Light*, vol. 47 (1927), p. 339.
[161] Craufurd, 'Unknown Force'.
[162] Hereward Carrington, 'Will We Talk to the Dead by Radio?', *Popular Radio*, vol. 1 (1922), pp. 92–7. See also Hereward Carrington, 'New York's Laboratory of the Mysterious', *New York Tribune*, 9 April 1922, p. 3.

results, Carrington's experiment represented a double challenge to Lodge's authority: it not only assumed that thought might create detectable etherial vibrations but drew upon French psychologist Hippolyte Baraduc's claim to have produced 'thought photographs' – images to which Lodge and other leading SPR members paid little attention. Indeed, Carrington's Psychical Institute represented one of many organisations founded in the 1920s partly to explore lines of enquiry (notably into the physical phenomena of spiritualism) that the SPR was reluctant to follow because such enquiries seemed to involve compromising the robustness of the investigative protocols that it had developed over previous decades.[163]

One of the most striking of Carrington's lines of enquiry was the construction of instruments that could detect psychical effects, including the human will and disembodied spirits, without the need for mediums, and which accordingly reduced the risk of fraudulence. Carrington's ideas owed something to the examples of Crookes and, moreover, to Thomas Alva Edison. In 1920, the doyen of American electrical inventors had caused a sensation by proposing to build a machine, based on the principle of the thermionic valve used in wireless detectors, to register the subtle "effort" exerted by spirits of the dead.[164] Unlike Crookes, Carrington believed that the problem of building such an instrument could be solved by amateur scientific and technical practitioners rather than by professional scientists. It was partly owing to the post-war explosion in the availability of thermionic valves that he could invite readers of *Popular Radio* to "undertake experiments of a similar character" to those in his Psychical Institute focussing on the construction of a valve that might pick up "subtle etheric waves" from beyond the grave.[165]

Quentin Craufurd shared more with Carrington than a sense that the most exciting new connections between physics and psychics were being forged by the amateur rather than the professional. He would also have reason to think that the SPR was too blinkered in its approach to psychical research and he too was preoccupied by distinguishing between the "prejudices" that mediums subconsciously contributed to spirit messages

[163] On this point see Inglis, *Science and Parascience*, pp. 214–20. The SPR revealed its position following the dramatic resignation of Arthur Conan Doyle over the organisation's hypercritical attitude towards spiritualism: [Anon.], 'Sir Arthur Conan Doyle's Resignation', *JSPR*, vol. 26 (1930), pp. 45–52.

[164] Austin C. Lescaraboura, 'Edison's Views on Life and Death', *Scientific American*, 30 October 1920, pp. 446, 458–60, p. 446. Carrington also reported on two Dutch inventors, J. L. W. P. Matla and G. J. Zaalberg van Zelst, who had built an electromechanical apparatus reputedly enabling 'spirits' to print words: Hereward Carrington, 'Are the Dead Trying to Reach Us by Radio?', *Popular Radio*, vol. 1 (1922), pp. 188–93.

[165] Carrington, 'Are the Dead Trying to Reach Us by Radio?', p. 191.

and the ostensibly "pure tone" of vibrations from the other world.[166] Like Carrington, Edison and others, he also believed that the most promising solution to this old problem of filtering psychical signal from noise lay in the construction of 'delicate' instruments. By 1928, he and fellow spiritualist–wireless engineer Frost were collaborating on an undisclosed wireless invention that promised to function as a direct spirit communication device.[167] Despite disappointing initial results, Craufurd was by 1933 reputedly enjoying "some" success with the device, although, like the spirit apparatus with which Edison seems to have achieved no results, nothing more was heard of it.[168]

In 1931, Carrington had linked the inconclusive outcomes of attempts to detect spirits by purely instrumental means to the possibility that the only kind of energy connecting the spiritual and physical worlds was that associated with life, thus affirming the need for mediums and other living subjects in psychical research.[169] Craufurd's limited success with his device, however, may well have helped dispel Carrington's doubts. By 1939, Carrington had published an entire book on laboratory- and instrument-based psychical investigations, whose purpose was partly to showcase the "minute fraction" of the "planned and partially completed" instrumental strategies for detecting, independently of mediums, the subtle energies associated with spirits and a host of other psychical effects.[170] The contents of popular technical and occult periodicals from the 1930s suggest that Carrington had not wildly over-estimated the extent of this activity and that some of the most elaborate attempts to make the instruments of physics relevant to the solution of psychical puzzles were continuing to flourish, albeit far from the SPR.[171]

[166] Q. C. A. Craufurd, 'Vibrations', *Light*, vol. 47 (1927), p. 632. See also Q. C. A. Craufurd, 'The Crisis in the SPR', *International Psychic Gazette*, vol. 18 (1930), p. 135.

[167] Q. C. A. Craufurd and Jack Frost, 'Psychic Communication and Wireless: A New Instrument', *Light*, vol. 48 (1928), p. 305.

[168] [Anon.], 'Wireless and Mediumship Problems', *Light*, vol. 53 (1933), p. 150. In 1933, one popular American technical magazine reported the failure of one of Edison's inventions to register spirits: [Anon.], 'Edison's Own Secret Spirit Experiments', *Modern Mechanix and Inventions*, October 1933, pp. 34–6. I owe this reference to Phillipe Baudouin.

[169] Hereward Carrington, *The Story of Psychic Science* (London: Rider and Co., 1930), p. 234.

[170] Hereward Carrington, *Laboratory Investigations into Psychic Phenomena* (London: Rider and Co., 1939), p. 23.

[171] [Anon.], 'Radio Psychometry', *Radio Craft*, vol. 5 (1933), p. 264; [Anon.], 'Model Engineers. Record Number at Exhibition – The Electric Psychometer', *Electrician*, 9 September 1932, p. 324; T. B. Franklin and V. J. Vickers, 'A Radio Divining Rod', *Modern Wireless*, vol. 8 (1933), p. 278; Vesme, 'Human Brain Waves'. See also [Anon.], 'Notes by the Way', *Quarterly Transactions of the British College of Psychic Science*, vol. 15 (1937), pp. 342–3. This article reported on the dispute between the American physicist R. A. Watters and British physicist Bernard Hopper over Watters's claim to have

Interwar Transitions

When, in 1932, the SPR celebrated its 50th anniversary, Lodge and Eleanor Sidgwick accepted invitations to take stock of the organisation's achievements. Both in their 80s, they were now among the SPR's longest-serving members and two of only a handful of individuals listed in Table 2.1 who were still actively contributing to psychical research. Since 1900, many physical scientists in the organisation had either died or resigned, the deaths of Crookes and Barrett in 1919 and 1925 respectively robbing a fast-shrinking network of physical–psychical scientists of two of its most important nodes.

The anniversary addresses that Lodge and Sidgwick gave revealed much agreement between these icons of British psychical research. They both insisted that the SPR's cautious methods and goals were as justified as ever: in one of many quotes from Myers's *Human Personality*, Lodge emphasised the continued need for an organisation to study obscure psycho-physical phenomena with the scientific methods and intellectual virtues that had now become necessary for "salvation".[172] Yet both Lodge and Sidgwick feared for the capacity of the SPR to continue its intellectual mission. Its membership had peaked at 1,305 in 1920, a rise owing much to the obvious wartime and post-war interest in the question of survival that had also fuelled a growth of interest in spiritualism.[173] But by 1932, membership had fallen to 809. The decline was attributed to the global economic depression, which made it difficult for some to maintain their subscriptions, but it also owed something to the emergence of rival British psychical and 'psychic' research organisations offering enquiries into spiritualism, to which many believed the SPR devoted too little attention or was methodologically incapable of testing fairly.[174]

photographed the souls of dying animals in a cloud chamber, a device normally used to show the paths of invisible radioactive emanations via their condensation of droplets in supersaturated water vapour. Watters believed that souls were 'intra-atomic' forms of energy on which the cloud droplets formed. Hopper claimed to have replicated Watters's experiments but not produced any results attributable to non-physical causes.

172 Oliver Lodge, 'The Past and the Future', *PSPR*, vol. 41 (1932–3), pp. 61–74, p. 69.

173 Sidgwick, 'Society for Psychical Research', p. 2.

174 [Anon.], 'Annual Report of the Council for 1932', *JSPR*, vol. 28 (1933–4), pp. 19–29, p. 29. On interwar psychical research see Jenny Hazelgrove, *Spiritualism and British Society Between the Wars* (Manchester University Press, 2000), chapter 7; Inglis, *Science and Parascience*, chapters 6–7; Mauskopf and McVeigh, *Elusive Science*, chapters 2 and 8; Robertson, *Science and the Seance*; Joanna Timms, 'Ghost-Hunters and Psychical Research in Interwar England', *History Workshop Journal*, vol. 74 (2012), pp. 88–104; Valentine, 'Spooks and Spoofs'. Rival organisations included the pro-spiritualist British College of Psychic Science (founded 1920) and Harry Price's National Laboratory of Psychical Research (founded 1925). The fortunes of the American SPR were no better, with its membership halving in size in the 1930s.

The SPR's membership was not only shrinking but increasingly short of those whose professional scientific credentials had always lent much intellectual lustre to the organisation. Lodge believed, with some justification, that the scientific world had become less hostile to psychical research than it had been decades earlier, even though James Jeans would in 1930 provide a reminder of the way professional colleagues continued to attack the subject without having adequate knowledge of it.[175] Marginally less discomforting to him would have been a recent survey of the religious beliefs of Royal Society Fellows, which revealed that slightly more believed in than rejected the idea of the afterlife, but that many considered it a question beyond the scope of the sciences because it concerned personalities lacking the physical form to which scientific methods could be applied.[176] On this question, in other words, psychical research was misguided.

More regrettable to Lodge was the fact that many of the "younger men" of science felt that their talents were better occupied in more "remunerative" areas of scientific enquiry.[177] Lodge may well have been reflecting on the difficulty that he and other SPR scientists with university careers had in encouraging students to follow their examples: Barrett, Chattock, Lodge, Rayleigh, Stewart and J. J. Thomson had certainly interested some of their charges in psychical research, but these younger individuals did not display a significant commitment to the subject. The younger men who did not come under their direct influence were even less likely to participate and, as the cases of Eddington and Jeans illustrate, were either indifferent or actively hostile towards the subject.[178] For many scientists, psychical research simply did not seem as professionally rewarding as the more established areas of enquiry they had been trained to pursue.

The area of psychical enquiry that Lodge had long hoped would prove most "remunerative" to those with expertise in physical sciences – the

[175] Oliver Lodge to J. A. Hill, 6 March 1930, in Hill (ed.), *Letters from Sir Oliver Lodge*, pp. 234–6. Lodge was reacting to Jeans's comments in a recent BBC radio broadcast. See also note 178.

[176] C. L. Drawbridge (ed.), *The Religion of Scientists: Being Recent Opinions Expressed by Two Hundred Fellows of the Royal Society on the Subject of Religion and Theology* (New York: Macmillan Company, 1932), pp. 94–110. In 1933, *Nature* expressed unusual confidence in psychical research's methods and possible future achievements: [Anon.], 'Science and Psychical Research', *Nature*, vol. 132 (1933), pp. 945–6.

[177] Lodge, 'Past and the Future', p. 71.

[178] Eddington noted his disbelief in spiritualism in Arthur Stanley Eddington, 'The Domain of Physical Science', in Joseph Needham (ed.), *Science, Religion and Reality* (London: Sheldon Press, 1925), pp. 189–218, p. 214. His attitude probably owed something to a rejection of the spiritualist belief in natural law extending to the spiritual domain: Arthur Stanley Eddington, *Science and the Unseen World* (London: George Allen & Unwin, 1929), pp. 32–3. See also James Jeans, untitled essay, in *More Points of View: A Second Series of Broadcast Addresses* (London: George Allen & Unwin, 1930), pp. 55–71. This was the text of a BBC radio broadcast.

physical phenomena of spiritualism – was one where his verdict differed significantly from Sidgwick's. He believed that the physical effects in seances were better evidenced than they had been in the early 1900s and, despite his own lack of experimental work in this area, still promised to enrich scientific knowledge of "semi-physiological phenomena".[179] Sidgwick was much more pessimistic. The SPR's involvement in testing physical mediumship had actually surged during the 1920s, but the encouraging results of its tests of the telekinetic powers of the Austrian mediumistic brothers Rudi and Willi Schneider were outweighed by disappointing outcomes of its investigations into the French ectoplasmic medium 'Eva Carrière' (Marthe Béraud), the British spirit photographer William Hope, and 'Margery' (Mina Crandon), the American medium who produced a range of telekinetic and ectoplasmic effects.[180] Sidgwick's conclusion that the question of physical phenomena was in the "same position" as in 1882 reflected the fact that researches into the question led by the SPR – and, moreover, by Richet, Schrenck-Notzing and others independently of the SPR – had not impressed her as much as it had Lodge.[181] Accordingly, her view of where the SPR's future lay – in enhancing the evidence for the psychological "departments" of telepathy, survival and clairvoyance – had changed little since the 1880s.[182]

The professional scientists who were members of the SPR in the 1920s and '30s seem to have agreed that psychical research was much more accurately regarded as a branch of psychology than of physics or even physiology. Compared with the 1880s, proportionately more hailed from the mental and life sciences than from the physical sciences. There is no doubt that given the investigative priorities of the organisation, even those physicists, chemists and astronomers who were sympathetic to the wider ambitions of psychical research would have echoed George F. FitzGerald and Augustus Trowbridge, who in earlier decades had argued that they lacked the training and interests to contribute to the subject.[183] As far as

[179] Lodge, 'Past and the Future', p. 68.

[180] On the Schneiders see Wolffram, *Stepchildren of Science*, chapter 3. For Hope see Martyn Jolly, *Faces of the Living Dead: The Belief in Spirit Photography* (London: British Library, 2006), chapter 5 and Andreas Schmidt, 'The Most Disrespectful Camera in the World', in Chéroux et al., *Perfect Medium*, pp. 72–91. On Eva Carrière see Lachapelle, *Investigating the Supernatural*, chapter 5. On Crandon see Robertson, *Science and the Seance*, esp. chapter 6.

[181] Sidgwick, 'Society for Psychical Research', p. 22. Barrett shared Lodge's enthusiasm for this work: see William F. Barrett, 'Ectoplasms', *Light*, vol. 41 (1921), p. 347.

[182] Sidgwick, 'Society for Psychical Research', p. 26.

[183] FitzGerald quoted in Stead, 'Response to the Appeal', p. 19; Augustus Trowbridge to Hereward Carrington, 23 June 1921, Folder 50, Box 2, Hereward Carrington Papers (C1159), Manuscripts Division, Department of Rare Books and Special Collections, Princeton University Library.

the SPR was concerned, the connections between physics and psychics were more fruitfully explored in popular and semi-popular scientific writings than in laboratories and other sites of psychical experimentation.

The differences between Lodge and Sidgwick regarding the physical phenomena of spiritualism reflected wider disagreements among psychical researchers over the most fruitful areas of study and the role of "co-workers" in the troubled field of enquiry.[184] When, in her anniversary address, Sidgwick praised Lodge for helping to keep the SPR together over the past few decades, she implicitly accepted that he had been more effective than her in working with spiritualists, who were of course the main sources of the physical phenomena.[185] Under the aegis of Sidgwick and her closest allies, the SPR's relationship with spiritualists had been at least as turbulent as it had been in the 1880s, not least because the SPR remained frustrated by mediums' trickery and spiritualists' credulity, and spiritualists still questioned the legitimacy of the SPR's ultra-cautious and critical approaches.

William Hope's spirit photography dramatised the widening rifts between the SPR and spiritualists inside and outside the organisation. Hope had come to the attention of spiritualists and psychical researchers in the early 1900s, but his claims sparked numerous controversies. An important, though predictably reticent, supporter was Crookes, who in 1916 strengthened his belief in survival on the basis of Hope's images of the spirit of his recently deceased wife.[186] Six years later, Harry Price, the amateur conjuror and relative newcomer to the SPR, tested Hope and concluded that he had employed fraudulent methods to produce images of spirit 'extras' on photographic plates. Among the many spiritualists who defended Hope's credibility was Arthur Conan Doyle. Undoubtedly one of the most energetic and conspicuous champions of spiritualism of the 1920s, the creator of Sherlock Holmes led arguments that Price had himself resorted to underhand methods to expose Hope.[187] For Doyle, the Hope controversy would be one of many episodes highlighting the "essentially unscientific and biased work" of the SPR, which eventually forced him and many other spiritualists to resign their membership.[188] Although Lodge sympathised with the SPR's damning verdict on Hope

[184] Lodge, 'Past and the Future', p. 71. See Mauskopf and McVaugh, *Elusive Science*, chapter 1.
[185] Sidgwick, 'Society for Psychical Research', p. 15.
[186] [Anon.], 'Important Interview with Sir William Crookes'. Crookes had revealed his conviction to Lodge the previous year: William Crookes to Oliver Lodge, 22 December 1916, SPR.MS 35/363, OJL-SPR.
[187] On Doyle see Inglis, *Science and Parascience*, pp. 83–92; Johnson, *Mourning and Mysticism*, chapter 3.
[188] Doyle quoted in [Anon.], 'Sir Arthur Conan Doyle's Resignation', p. 46.

and drew unfavourable comparisons between spiritualists' and the SPR's methods, he had long represented a side of the SPR most sympathetic to spiritualism.[189] He never accepted the spiritualist label, but the views he expressed on survival and mediumship outside formal SPR channels persuaded many spiritualists to share his hopes for a courteous and harmonious relationship between different psychical workers.[190]

Lodge's ability to engage with spiritualists depended partly, as we have seen, on the scientific credibility that his writings lent to the idea of an etherial body that carried the mind and spirit after bodily death. Yet the firm adherence of this most prominent physicist and psychical researcher to the increasingly antiquated idea of an objective ether not only marginalised him from the younger generations of physicists but ultimately hindered his ability to consider other possible theoretical connections between physics and psychics that were being explored elsewhere, typically by non-physicists.

By 1930, Coode-Adams's *Primer of Occult Physics* had been joined by many other texts that turned to both relativity and quantum theory for new ways of rendering psychical effects and powers intelligible. In 1928, for example, J. Malcom Bird, the American mathematician and science journalist who had led the *Scientific American*'s inconclusive investigations of Mina Crandon, insisted that the alleged ability of mediums to experience the future in the present "lined up exactly" with the hyperdimensionality of relativity, while telekinetic powers were easier to comprehend on the "reasonable" basis that the spacetime continuum around a medium was somehow distorted more than that constituting a gravitational field and that this caused untouched objects to defy gravity.[191]

Two years later, the French psychical researcher René Sudre highlighted quantum theory as an example of how "official science" was "clearing the way" for a "rational theory" of psychical effects.[192] The breakdown of strict determinism and causality at the atomic level opened the door to the possibility that mind was an integral part of physical reality. For Eddington, this was a critical part of an idealist worldview; for Sudre, it was much more. It promised a firmer scientific basis for a speculation that FitzGerald, Lodge, Myers and others had started in the

[189] Lodge expressed his scepticism of Hope in Oliver Lodge to William Crookes, 23 December 1916, typescript copy, SPR.MS 35/364, OJL-SPR and Oliver Lodge to Arthur Conan Doyle, 2 January 1925, typescript copy, SPR.MS 35/442, OJL-SPR.

[190] See Lodge's remarks in [Anon], 'A Symposium: Why I Became a Spiritualist', *Quarterly Journal of the British College of Psychic Science*, vol. 14 (1935–6), pp. 48–54, p. 48.

[191] J. Malcom Bird, 'Some Theoretical Aspects of Psychical Research', *British Journal of Psychical Research*, vol. 1 (1928), pp. 331–9, 335–6.

[192] René Sudre, 'Psychical Research and the New Physics', *Psychic Research*, vol. 24 (1930), pp. 117–21, p. 117.

1890s but largely abandoned: that a medium's mind could, by controlling individual molecules, move bodies at a distance, create ectoplasm and materialised spirits, and dissolve objects into thin air. The British psychical researcher Whately Carington agreed with Sudre that Eddington's writings created space for psychical effects. Having earlier regarded relativity as a reason to take seriously his four-dimensional 'mechanism' of survival and clairvoyance, he now linked Eddington's argument for subjectivity and mind in descriptions of physical reality to the idea of universal consciousness mediated by telepathy.[193]

One of the most conspicuous commentators on the possible relationships between what was often called the 'new physics' and psychical research was the leading American science journalist Waldemar Kaempffert. In the late 1930s, he championed the work of Joseph Banks Rhine, the American psychologist whose new approaches to clairvoyance and telepathy yielded powerful evidence for a general psychological faculty, christened 'Extra Sensory Perception' (ESP), that Rhine believed could not be put down to chance coincidence or fraud.[194] In its methodology and setting – notably the statistical analyses of a vast number of laboratory-based trials – Rhine's new science of psychical effects (christened 'parapsychology') sought to position itself far closer to the young but secure academic discipline of experimental psychology than to psychical research. Although the claims of Rhine and his followers were subject to plenty of scientific criticism (especially from psychologists), their methods helped parapsychology gain an academic credibility that psychical research had never enjoyed.

For Kaempffert it was not at all surprising that physicists who formerly scoffed at psychical investigations were now paying attention to Rhine. They had lost their "old cocksureness" about a "mechanistic universe" in favour of new conceptions of space, time, matter and causality that seemed to make psychical effects less implausible.[195] Relativity dissolved the distinction between space and time and made the idea of experiencing the future in the present more intelligible. Quantum theory encouraged a statistical view of physical reality which made Rhine's statistical arguments for the reality of ESP particularly appealing. And both theories represented a radically new way of looking at physical reality – as one

[193] Whately Carington, *The Death of Materialism* (London: George Allen and Unwin, 1933). See also Carington's work published under his original name: W. Whatley Smith, *A Theory of the Mechanism of Survival* (London: Kegan Paul, Trübner, Trench and Co., 1920).

[194] On Rhine see Asprem, *Problem of Disenchantment*, pp. 398–412; Mauskopf and McVaugh, *Elusive Science*.

[195] Waldemar Kaempffert, 'The Duke Experiments in Extra-Sensory Perception', *New York Times*, 10 October 1937, pp. 2 and 21, p. 2.

created by mind – that encouraged a more general change in conceptions of mind, of which ESP was one aspect.[196]

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Lodge never quite lost the "old cocksureness" of nineteenth-century physics. He could not accept that indeterminancy was an ultimate feature of the physical world and that this was a plausible route to explaining psychical effects. In words echoing Einstein's famous quip that God "is not playing at dice", he remarked in 1930 that the "Divine Artificer does not work with the calculus of probability", and insisted that perceptions of indeterminacy at the atomic level merely reflected the limitations of human knowledge.[197] Having rejected ultimate physical indeterminacy, however, Lodge was forced to argue that free will (which he readily accepted) had to relate to the non-physical domain, even though this was interlocked with the physical domain via the ether. So strongly was Lodge attached to traditional ideas of space, time and determinism in the *physical* world that he believed that it was the less "orthodox" facts about a non-physical domain – those relating to clairvoyance, spiritualist mediumship and precognition – rather than relativity and quantum theories that would revolutionise fundamental understanding of the nature of time and space.[198]

By the late 1930s, Lodge, the long-reigning champion of physics and psychics, had little energy for the literary activities that had preoccupied him for decades. Virtually all the books on which his reputation depended were out of print and no longer judged commercially viable publishing strategies, and only a few articles now came from his pen. The handful of publications of his still in circulation embodied some of the profoundest speculations on the connections between physics and psychics, even if they were hampered by an ether hypothesis that only seemed to push back the question of how mind and matter interacted.[199]

For the younger generation of physicists, wireless engineers and other scientific practitioners, the explanatory difficulties of Lodge's ether hypotheses were overshadowed by the notorious problems of directly detecting the entity and investigating psychical effects, and for this reason

[196] Waldemar Kaempffert, 'Searching Out the Mind's Mysteries', *New York Times Magazine*, 17 October 1937, pp. 8 and 24.

[197] Albert Einstein to Max Born, 4 December 1926 in Max Born (ed.), *The Born-Einstein Letters: Correspondence Between Albert Einstein and Max and Hedwig Born from 1916 to 1955, with Commentaries by Max Born*, translated by Irene Born (London: Macmillan, 1971), pp. 90–1, p. 91. Lodge, 'Ether and Relativity', p. 805.

[198] Lodge, 'Past and the Future', p. 73.

[199] See, for example, Oliver Lodge, *Making of Man* (London: Hodder and Stoughton, 12th ed., 1938).

the ageing physicist's ideas were appreciated more as food for thought than as fruitful lines of research. This generation of scientific practitioners had grown up with conceptions of the physical world that were very different from the largely mechanistic ones on which Lodge, Crookes, Rayleigh, Thomson and other physical–psychical scientists were nurtured. But just as the puzzles created by mechanistic conceptions had made psychical phenomena especially alluring for the older scientists, so, suggested Kaempffert six months before Lodge's death, the implications of the newer conceptions of physics seemed to be drawing a younger generation of physical scientists into psychical investigation and to reverse a decline that had begun decades earlier.[200]

[200] Waldemar Kaempffert, 'Science in the News', *New York Times*, 25 February 1940, p. 51.