

2 A Survey of Physical–Psychical Scientists

In 1912, the British psychiatrist Ivor Tuckett observed that “the interest which physicists in different countries have taken in psychic research is a really striking fact”.¹ Eight years later, a very different observer, the American Episcopal clergyman, spiritual healer and psychical researcher Elwood Worcester, considered it “curious that so many physicists should have interested themselves in Psychical Research”.² Tuckett’s and Worcester’s perplexity reflected a more widely shared view that the phenomena investigated by the relatively young field of enquiry, psychical research, were predominantly psychological and therefore the province of the emergent science of psychology.

Tuckett’s comment was partly a response to *New Light on Immortality* (1908) by the British physicist and popular science writer Edward E. Fournier d’Albe. For Fournier d’Albe it was not “presumptuous of a physicist to venture an opinion” on human immortality, a question “usually associated with psychology and theology”.³ Human immortality concerned the “relations between mind and matter” and this required an “extensive acquaintance with what is actually known about matter and what is *not* known about it”.⁴ Since physicists confronted these “ultimate questions” more often than chemists and physiologists, they could justify their fascination with a subject – psychical research – that studied phenomena of great relevance to the questions of the existence of mind independent of matter and of the postmortem existence of the human soul.⁵

Fournier d’Albe, Tuckett and Worcester were probably aware that the most striking evidence for this fascination came from the membership of the Society for Psychical Research. This chapter uses the SPR as one of

¹ Ivor Tuckett, ‘Psychical Investigators and “The Will to Believe”’, *Bedrock*, vol. 1 (1912–13), pp. 180–204, p. 192.

² Elwood Worcester, ‘The Intrepid Pioneer’, *Journal of the American Society for Psychical Research*, vol. 14 (1920), pp. 501–10, p. 504.

³ E. E. Fournier d’Albe, *New Light on Immortality* (London: Longmans, Green, and Co., 1908), p. vii.

⁴ Fournier d’Albe, *New Light on Immortality*, p. vii.

⁵ Fournier d’Albe, *New Light on Immortality*, pp. vii–viii.

the main ways of critically examining the trend that so surprised Tuckett and Worcester. After exploring the SPR's foundation and early development, it examines the identities of the physicists and practitioners of other physical sciences who joined the organisation, as well as the nature of their commitment to psychical research. This picture of what, for the purposes of brevity, we call 'physical-psychical scientists', cannot be comprehensive because many of them pursued psychical interests independently of the SPR or died before it was founded. For this reason, much of the following analysis depends on source materials beyond the SPR's publications.

The mainly British connections that we will establish between late-nineteenth- and early-twentieth-century 'physics and psychics' are both stronger and more complex than historians have suggested. Not only were more professional physicists interested in psychical phenomena than previously assumed, but they were joined by a host of practitioners of other physical sciences, and the personal, professional and other links between many of these individuals were far closer than hitherto supposed. Furthermore, the phrase 'physics and psychics' smooths over the different kinds of connection that physical scientists had with psychical investigation, whether this related to what motivated their inquiries, the kinds of phenomena that primarily interested them or the strength and duration of their interest.

Inventing Psychical Research

In December 1881, several Victorians received an invitation from the British physicist William Fletcher Barrett to attend a conference in London for "friends interested in Spiritualism and Psychological Research", whose aims included discussing the "present condition of affairs, suggesting lines of work, and discussing the advisability of having a select Central Society, organised under some such name as the London Psychical Society".⁶ Barrett's invitation was the outcome of several discussions he had had over the previous few years with Edmund Dawson Rogers and William Stainton Moses, two leading spiritualists, and Frederic William Henry Myers, a well-known classicist, essayist and government schools' inspector who had spent much of the 1870s investigating spiritualism. These discussions persuaded Barrett that some spiritualists, academics and scientists would be willing to collaborate on more scientific approaches to spiritualism and related subjects.

⁶ William F. Barrett, 'The Early Years of Psychical Research', *Light*, vol. 44 (1924), p. 395.

Barrett was on familiar territory. Only eight years earlier he had helped launch a ‘Society of Physical Research’ that would exhibit and publish original researches in the physical sciences in which existing scientific societies did not appear to be interested. Eventually founded in 1874 as the Physical Society of London, the organisation recruited a host of Victorian natural philosophers, electrical engineers and physical chemists and it symbolised the disciplinary boundaries of physics that Barrett and other early members were negotiating.⁷ Barrett had good reason to think that existing scientific societies were even more blinkered about the spiritualistic and psychological researches he had been pursuing for over a decade. He had provoked the ire of many fellow scientists for presenting, at the 1876 meeting of the British Association, his positive evidence for thought-reading and spirit-rapping.⁸ His subsequent request that the British Association form a committee for studying mesmerism and spiritualism more scientifically than previously done was refused, and this merely compounded the fears of Barrett and others that the scientific authorities typically associated with these subjects (notably medical practitioners, physiologists and psychiatrists) were either misleading the public with unsatisfactory psycho-physiological explanations or failing in their duty to conduct satisfactory investigations.

Barrett’s struggles to raise the scientific profile of psychical investigation took place in the context of what Graham Richards has identified as a transitional period in British psychology.⁹ Unlike the situations in Germany, the United States and France, British psychology lacked an academic institutional base, and those medical practitioners, physiologists and psychiatrists spearheading efforts to provide one did so by trying to shift psychology’s subject matter away from questions of the will, soul and spirit towards the application of evolutionary theories to the human mind and body. The questions sidestepped by the emerging elite of British psychology were precisely those that many Victorian spiritualists explored in their numerous ‘psychological’ societies and which formed the focus of the short-lived but largely non-spiritualist Psychological Society of Great Britain (1875–9). Most of the members of these organisations shared the belief that Christian theology, ‘metaphysical’ philosophy and what they often perceived to be materialistic science were failing to deliver satisfactory answers to questions about human nature, morality and cosmic purpose, and some would pursue their questions in the

⁷ Gooday, ‘Periodical Physics’; John L. Lewis (ed.), *Promoting Physics and Supporting Physicists: The Physical Society of London and the Institute of Physics, 1874–2002* (Bristol: Institute of Physics Publishing, 2003), chapter 1.

⁸ See Noakes, ‘The Bridge Which Is Between Physical and Psychical Research’, pp. 438–41.

⁹ Richards, ‘Edward Cox’.

Metaphysical Society, an exclusive British forum of intellectual debate that ran from 1869 to 1880, and later in the SPR.¹⁰

Among those individuals who link the Metaphysical Society and SPR is the eminent British moral philosopher Henry Sidgwick. As several historians have shown, Sidgwick was at the centre of a group of intellectuals who were colleagues, students or associates of his at Cambridge University, and who would dominate the SPR's activities in its first decades.¹¹ They included Myers and the psychological writer Edmund Gurney, and in the 1870s they joined Sidgwick and thousands of other Victorians in visits to spiritualistic seances, which promised to yield more satisfactory answers to questions about the human soul and its future state than those given by 'materialistic' science and the orthodox Christianity on which most seance attendees had been raised. Although its investigations of spiritualism (and especially of the physical phenomena of seances) proved disappointing, the Sidgwick group's hopes for an alternative science of psychology were raised by Barrett's controversial paper of 1876, his collection of testimony to various psychical phenomena, and his intervention in the 'thought-reading' craze that swept across Britain and the United States in the 1880s. Indeed, in 1881, they joined the physicist in tests suggesting that several young female performers of the extraordinary psychological feat were genuinely able to read words and images in the minds of others, independently of sensory clues and to a degree that ruled out simple chance coincidence (Figure 2.1).

The support that Barrett enjoyed from Myers, Gurney and Sidgwick extended to his London conference on spiritualistic and psychological research which, when held in January 1882, resolved to found the SPR. The principal objective of the new society was to make an "organised and systematic attempt to investigate that large group of debatable phenomena designated by such terms as mesmeric, psychical and Spiritualistic", phenomena for which there seemed to be plenty of credible testimony but which were "*prima facie* inexplicable on any generally recognised

¹⁰ On the Metaphysical Society see Alan Willard Brown, *The Metaphysical Society: Victorian Minds in Crisis* (New York: Columbia University Press, 1947). Metaphysical Society members who joined the SPR included Arthur Balfour, William Ewart Gladstone, Richard Holt Hutton, John Ruskin, Henry Sidgwick and Alfred Lord Tennyson.

¹¹ Gauld, *Founders of Psychical Research*; Oppenheim, *Other World*, chapter 4; Turner, *Between Science and Religion*, chapters 3 and 5; John Peregrine Williams, 'The Making of Victorian Psychical Research: An Intellectual Elite's Approach to the Spirit World', unpublished doctoral thesis, University of Cambridge, 1984. More focussed studies are Gordon Epperson, *The Mind of Edmund Gurney* (Madison, NJ: Fairleigh Dickinson University Press, 1997); Trevor Hamilton, *Immortal Longings: F. W. H. Myers and the Search for Life After Death* (Exeter: Imprint Academic, 2009); Bart Schultz, *Henry Sidgwick: Eye of the Universe. An Intellectual Biography* (Cambridge University Press, 2004), esp. chapter 5.



2.1 The thought-reading craze in late-Victorian Britain. This popular pastime appeared to show the ability of some people to correctly ‘read’ words and images in the minds of others, even though blindfolds and silence seemed to deprive them of obvious sensory clues. From [Anon.], ‘Amateur Thought-Reading’, *Illustrated London News*, 19 October 1889. Reproduced by permission of Hulton Archive/Getty Images.

hypothesis”.¹² The SPR founders’ preoccupation with projecting an image of a credible scientific organisation informed many aspects of its operation. They strategically chose ‘psychical’ for the title to prevent misconceptions that they were just another pro-spiritualist or ‘occult’ organisation, and elected as their first president Sidgwick, whose reputation for open-minded but cautious enquiry helped symbolise the organisation’s approach to controversial questions. The SPR’s structure imitated many of the scientific societies to which many of its professional scientific and medical members already belonged.¹³ In the first few years, its research was organised into committees – on thought-reading, mesmerism, Reichenbach’s od, apparitions, the physical phenomena of

¹² [Anon.], ‘Society for Psychical Research’, p. 3.

¹³ [Eleanor] Sidgwick, ‘The Society for Psychical Research. A Short Account of Its History and Work on the Occasion of the Society’s Jubilee, 1932’, *PSPR*, vol. 41 (1932–3), pp. 1–26, pp. 4–5.

spiritualism, and literary testimony of psychical effects – and submitted papers were refereed by the SPR's governing Council before being published in the organisation's publicly circulated *Proceedings*.

A conspicuous difference between the SPR and earlier Victorian psychological societies was the social status of its members. Most hailed from the middle and upper classes of British society and included eminent figures in the sciences, medicine, politics, philosophy, religion and literature. Its vice-presidents and Council members included the Tory statesmen Arthur and Gerald Balfour, the Anglican bishop William Boyd Carpenter, the logician John Venn, the journalist Richard Holt Hutton, the surgeon Charles Lockhart Robertson, the American psychologist and philosopher William James, the astronomers John Couch Adams, Lord Lindsay (the 26th Earl of Crawford and 9th Earl of Balcarres) and Samuel P. Langley, the naturalist Alfred Russel Wallace, and the physicists Lodge, Stewart, the Third Baron Rayleigh and J. J. Thomson.¹⁴ Many senior members also had close family ties to the Sidgwick group: Eleanor Balfour, who became one of the most powerful figures in the SPR after 1900, was Arthur and Gerald's sister, the Third Baron Rayleigh's sister-in-law, and in 1876 she married Henry Sidgwick.¹⁵

Even the lower-ranking positions of honorary, corresponding and ordinary member boasted such significant draws from British, American and European intellectual, literary and scientific life as Crookes, the Liberal prime minister William Ewart Gladstone, the psychologists Hippolyte Bernheim, Granville Stanley Hall, Ambroise-Auguste Liébeault and Pierre Janet, the physiologist Charles Richet, the literary critic John Ruskin, the poet Lord Tennyson and the painter George Frederic Watts. The intellectual lustre that such members conferred on the SPR partly explains why the size of its membership grew steadily from 286 in 1883 to 925 in 1901 and why the American Society for Psychical Research launched in Boston in 1885 attracted so many scientific members, including the psychologists Stanley Hall and William James and the astronomers Simon Newcomb and Edward C. Pickering.¹⁶

¹⁴ For simplicity 'Rayleigh' will subsequently be used to refer to the Third Baron Rayleigh (John William Strutt) but, where necessary, full aristocratic titles will be used to distinguish him from his son, the Fourth Baron Rayleigh (Robert John Strutt).

¹⁵ On Eleanor Sidgwick see Ethel Sidgwick, *Mrs. Henry Sidgwick: A Memoir by Her Niece* (London: Sidgwick and Jackson, 1938).

¹⁶ Figures established from membership lists in the SPR's *Proceedings* for volumes 1 (1882–3) and 15 (1900–1). The American Society for Psychical Research had a chequered early history. Leading members' frustration with inconclusive enquiries and financial difficulties forced it to be taken over by the British SPR in 1889 and it was not until 1907 that an independent American Society for Psychical Research was relaunched. See Seymour H. Mauskopf and Michael R. McVaugh, *The Elusive Science: Origins of Experimental Psychical Research* (Baltimore, MD: Johns Hopkins University Press, 1980), p. 16.

For many Britons, Americans and Europeans who joined the British or American branches, the main source of the SPR's appeal lay in the results of its painstaking investigations into psychical effects that they had long believed required further study. A large proportion of these investigations was undertaken by those with the financial independence and time to do so – notably the Sidgwick group. Although the SPR's administrative headquarters was in London, it was this largely Cambridge-based faction that was responsible for the society's important early achievements. This included the production, collection and critical analysis of a vast amount of evidence for 'telepathy'.¹⁷ Coined by Myers in 1882 to describe the communication of ideas, images and other impressions between minds, independently of the recognised sensory channels, this term was partly intended to avoid the assumptions involved in such ancestral terms as 'mind-reading', 'thought-reading' and 'thought-transference', although all four terms were used interchangeably well into the early 1900s. The evidence for telepathy was put together from experimental tests of thought-reading and from unsolicited or 'spontaneous' cases of individuals who appeared to perceive apparitions of distant relatives and friends who were dying or critically close to death. With this evidence, ghosts and, much to the annoyance of spiritualists, disembodied spirits were brought down from their supernatural and spiritual planes respectively by being interpreted as telepathically projected images of embodied minds. In opposition to those who maintained fluid theories of mesmerism, telepathy was also invoked as an explanation of recent evidence, closely analysed by Myers, that individuals had been hypnotised at a distance.

Myers, Gurney and the London Post Office clerk Frank Podmore consolidated the evidence for telepathy in *Phantasms of the Living* (1886), a monumental work that helped raise the SPR's cultural profile but which certainly did not achieve the scientific and medical impact for which its authors hoped. Many scientific critics attacked the SPR's methods, which, in experimental telepathy, did not appear to safeguard against observational error, fraud and the use of sensory clues, and which, in spontaneous cases, showed poor understanding of statistical analysis and relied too heavily on the potentially flawed judgement of those excited or distressed by seeing ghosts of loved ones.¹⁸ One of the most prominent critics was G. Stanley Hall, whose misgivings about the SPR were shared by several other academic psychologists and other scientists who, like Hall, had resigned from the American SPR by the early 1890s on the

¹⁷ On telepathy and its impact see Luckhurst, *Invention of Telepathy*.

¹⁸ Shane McCorristine, *Spectres of the Self: Thinking About Ghosts and Ghost-Seeing in England, 1750–1920* (Cambridge University Press, 2010), chapter 4.

grounds that psychical research was ostensibly failing to adopt the methods that they were vigorously upholding as critical to their idea of the true academic science of psychology.¹⁹

By the mid-1890s, the SPR leadership had responded to the attacks of Hall and others by applying more robust methods of investigation to a large-scale study of hallucinations, a proportion of which they claimed as evidence for the reality of telepathically projected apparitions. This ‘Census of Hallucinations’ certainly helped give the SPR leadership the professional scientific profile it desired, since members were invited to present papers on it at the International Congresses of Experimental Psychology in 1889 and 1892.²⁰ The emphasis that the Census placed on large-scale, analytical and dispassionate approaches to psychical phenomena diverged from the emphasis that most spiritualists placed on a more emotionally engaged approach to a smaller number of powerful seance ‘facts’. Indeed, as Perry Williams has argued, profound methodological and epistemological differences underpinned the bitter conflict between the SPR’s academic leadership and spiritualist members in the mid-1880s.²¹

The conflict came to a head in 1886 when Eleanor Sidgwick, who exemplified the more academic approach to psychical research, accused the British ‘slate writing’ medium William Eglinton of fraud. Drawing heavily on the testimony of the amateur magician and SPR member S. J. Davey, Sidgwick concluded that Eglinton had employed “clever conjuring” in producing writing between enclosed slates that the medium and his spiritualist supporters attributed to the agency of disembodied spirits.²² For many spiritualists inside and outside the SPR, this was not only a slur on a valued medium but another example of an overly cautious and hostile approach to spiritualism that they had resented for years. Disgusted by the SPR’s refusal to distance its corporate position from Sidgwick, many spiritualists members resigned.

The SPR’s leadership was hardly dismayed by this exodus, but their confidence in spiritualism as a fruitful area of enquiry, already lower than that in other areas of psychical enquiry, was not completely shattered: the late 1880s and 1890s would see the SPR undertake its most elaborate studies of trance mediumship and the physical phenomena of spiritualism. Much of this work informed one of the SPR’s most elaborate theoretical achievements: Myers’s theory of the ‘subliminal self’. Welcomed

¹⁹ Coon, ‘Testing the Limits’. ²⁰ McCorristine, *Spectres*, chapter 5.

²¹ Williams, ‘Making of Victorian Psychical Research’, chapter 8. See also John J. Cerullo, *The Secularization of the Soul: Psychical Research in Modern Britain* (Philadelphia, PA: Institute for the Study of Human Issues, 1982), chapter 4.

²² Eleanor Sidgwick, ‘Mr. Eglinton’, *JSPR*, vol. 2 (1886), pp. 282–334, p. 332.

by many fellow psychical researchers as a stimulating if tentative hypothesis, but rejected by many academic psychologists as overly speculative, it proposed that the human self comprised multiple layers of consciousness, including many whose activities fell below the “ordinary threshold (*limen*)” of consciousness.²³ Some psychological phenomena, however, including telepathy, clairvoyance and spiritualist mediumship, seemed to evidence the capacity of these activities to emerge into normal conscious experiences.

The strengths and weaknesses of Myers’s theory proved to be one of many sources of conflict within the SPR, and the organisation’s leading physical scientists found themselves torn by such conflicts. They were generally not as wealthy or as well connected as the Sidgwick group and their bourgeois status put them closer than this socially elevated circle to most spiritualists. This may have been one reason why they were more tolerant of spiritualists whom the Sidgwick group typically regarded as their social inferiors as well as unscientific in their approaches to seances. There was also a good pragmatic reason for this greater tolerance: physical scientists within the SPR needed the cooperation of spiritualists to gain access to the kinds of phenomena that they believed would best exploit their expertise: the physical manifestations in seances.²⁴ However, most of the SPR’s physical scientists shared some of the Sidgwick group’s misgivings about spiritualists’ methods and believed that the physical sciences could be drawn upon to forge approaches that fulfilled the requirements of robust scientific enquiry and the conditions of seances. This was also part of their attempt to limit what they perceived to be the drift of the SPR towards telepathy and purely ‘psychological’ subjects and to return it to the broader range of research topics that they felt lacked satisfactory scientific investigation and that the organisation had partly been established to probe.²⁵

Identifying Physical–Psychical Scientists

Who were the practitioners of physical sciences in the SPR? The organisation’s membership lists, regularly published in its *Proceedings*, are the obvious source here. Besides easily recognisable individuals such as

²³ Frederic W. H. Myers, *Human Personality and its Survival of Bodily Death*, 2 vols. (London: Longmans, Green, and Co., 1903), vol. 1, p. xxi. On the subliminal self and its reception see Gauld, *Founders of Psychical Research*, chapter 12.

²⁴ William F. Barrett, ‘The Society for Psychical Research and Spiritualism’, *Light*, vol. 6 (1886), pp. 51–2.

²⁵ See, for example, William F. Barrett to Oliver Lodge, 21 October 1912, SPR.MS 35/73, OJL-SPR; Oliver Lodge, ‘On the Scientific Attitude to Marvels’, *Fortnightly Review*, vol. 79 (1906), pp. 460–74, esp. p. 471.

Crookes, Rayleigh and J. J. Thomson, others can be identified from the academic titles, professional affiliations and other information provided alongside names. Over seventy astronomers, chemists, electrical and civil engineers, and physicists can be identified in the period between 1882 and about 1940, and they are shown in Table 2.1, which also gives years of birth and death, membership dates, positions reached within the SPR, primary fields of expertise and nationality. It does not constitute an exhaustive list, since there are undoubtedly some physical scientists whose identities are not obvious from the membership information provided. Nevertheless, this table serves to both strengthen and complicate contemporary observers' perceptions of the unusual presence of physicists in psychical research. In addition to the number of physicists, it shows that in the SPR's first thirty years, five of its twenty-nine presidents were professional physicists (Barrett, Lodge, the Third and Fourth Barons Rayleigh and Stewart), four of whom also fulfilled roles as Council members and as vice-presidents.

Senior ranks were filled by plenty of practitioners of other physical sciences too. Crookes, the astronomers Camille Flammarion and Frederick J. M. Stratton served as president, while Council members included John Couch Adams, the chemists William R. Bousfield and William Ramsay, the electricians Walter H. Coffin and Desmond G. Fitzgerald, and the medical electrician William H. Stone. Some additional patterns regarding physical sciences as a whole can be gleaned from Table 2.1. More joined as ordinary rather than associate members and roughly equal numbers of members hailed from astronomy, chemistry, electrical and civil engineering and physics.²⁶ As we might expect in an organisation based in Britain and whose founders were all Britons, most were British. We can also see that they held onto their membership for widely different lengths of time. Some, such as Barrett, Lodge, Rayleigh and J. J. Thomson, clung on for more than three decades, but others, such as Cuthbert B. Horwood and Joseph P. Hall, lasted only a year. The number of women among physical scientist members was tiny (only Marie Curie and Eleanor Sidgwick), which was proportionately smaller than the number of women in the SPR as a whole, and a reflection of the widespread gender inequality in nineteenth- and twentieth-century professional sciences and engineering.

²⁶ In the 1880s, ordinary members paid two guineas per annum, received the SPR's publications, and were eligible to occupy an official position within the organisation, vote in its Council elections and borrow books from the organisation's library and reading rooms in London. Associate members paid one guinea per annum but did not have voting or book-borrowing rights. See [Anon.], 'Constitution and Rules', *PSPR*, vol. 1 (1882–3), pp. 331–6, p. 332.

2.1 *Physical-psychical scientists in the SPR, 1882–C. 1940*

Name	Dates	In SPR	SPR position	Primary field(s) of expertise	Nationality
John Couch Adams ^a	1819–92	1891–2	H, Cl	Astronomy	British
William Fletcher Barrett ^b	1844–1925	1882–1925	M, Cl, VP, P	Experimental physics	British
George Thomas Beilby ^c	1850–1924	1915–24	M, Cl	Industrial chemistry	British
Henry Percy Boulois ^d	1846–1927	1894–1901	A	Civil engineering	British
William Robert Bousfield ^e	1854–1943	1924–43	M, Cl	Physical chemistry and physics	British
Guy Burniston Brown ^f	1902–89	1929–31	A	Physics	British
Walter Rayleigh Browne ^g	1842–84	1882	M, Cl	Civil engineering and mathematical physics	British
Alexander Mikhaylovich Butlerov ^h	1828–86	1885	Cor	Chemistry	Russian
William Lant Carpenter ⁱ	1841–90	1886–7	M	Electrical engineering and medical electricity	British
Arthur Prince Chattock ^j	1860–1934	1890–1934	Life A	Experimental physics	British
Walter Harris Coffin ^k	1853–1916	1882–1903	M, Cl	Electrical engineering and medical electricity	Anglo-American
Daniel Frost Comstock ^l	1883–1970	1907–9	A	Electrical engineering and physics	American
Sherard Osborn Cowper-Coles ^m	1866–1936	1902–15	M	Electrometallurgy	British
John Cox ⁿ	1851–1923	1884–92	A	Experimental physics	British
James Mason Crafts ^o	1839–1917	1891–8	A	Chemistry	American
Quentin Charles Alexander Craufurd ^p	1875–1957	1912–29	M	Wireless telegraphy	British

William Crookes ^e	1832–1919	1882–1919	H, Cl, VP, P	Analytical chemistry and experimental physics	British
Charles Robert Cross ^f	1848–1921	1890	A	Electrical engineering	American
Marie Curie ^g	1867–1934	1913–33	Cor	Chemistry and experimental physics	Polish-French
Benjamin Davies ^f	1863–1957	1894–1939	M	Electrical engineering and physics	British
Alfred Wilks Drayson ^h	1827–1901	1882–7	M	Astronomy	British
George William Fisk ^v	1882–1972	1913–73	M	Wireless telegraphy	British
Desmond Gerald Fitzgerald ^w	1834–1904	1882–1904	M, Cl	Electrical engineering	British
Camille Flammarion ^x	1842–1925	1923	P	Astronomy	French
Edmund Edward Fournier d'Albe ^y	1868–1933	1908–10	A	Electrical engineering and physics	British
Emile Oscar Garcke ^z	1856–1930	1901–4	A	Electrical engineering	German-British
Robert M. Gordon ^{aa}	fl. 1880s	1884–5	A	Civil engineering	British
Christopher Clive Langron Gregory ^{ab}	1892–1964	1935–64	M	Astronomy	British
Joseph Platt Hall ^{ac}	1864–1934	1908	M	Electrical engineering	British
John Baboneau Nickterlien Hennessey ^{ad}	1829–1910	1905–9	M	Astronomy and surveying	British
Christian Victor Charles Herbert (6th Earl of Powis) ^{ae}	1904–88	1932–74	M	Astronomy	British
John Herschel ^{af}	1837–1921	1898–1915	A	Civil engineering and astronomy	British
Heinrich Rudolf Hertz ^{ag}	1857–94	1892–4	Cor	Experimental and mathematical physics	German
Harold Edward Sherwin Holt ^{ah}	1862–1932	1883–94	M	Civil engineering	British
Cuthbert Baring Horwood ^{ai}	b. 1877	1925	M	Mining engineering	British
William Benjamin Hutchinson ^{aj}	1863–98	1896–8	A	Civil engineering and astronomy	British
Benjamin Jordan-Smith ^{ak}	fl. 1900	1899–1933	M	Chemistry	British

2.1 (cont.)

Name	Dates	In SPR	SPR position	Primary field(s) of expertise	Nationality
Samuel Joyce ^{al}	1829–1906	1884–9	M	Electrical engineering	British
Charles George Lamb ^{am}	1867–1941	1909–39	A	Electrical engineering	British
St George Lane Fox-Pitt ^{an}	1856–1932	1899–1921	M, Cl	Electrical engineering	British
Samuel Pierpont Langley ^{ao}	1834–1906	1890–1906	M, Cl, VP	Astrophysics	American
Léon George Harold Lec ^{ap}	1883–1954	1910	A	Meteorology	British
James Ludovic Lindsay (26th Earl of Crawford and 9th Earl of Balcarres) ^{aq}	1847–1913	1890–1913	M, Cl	Astronomy	British
Oliver Joseph Lodge ^{ar}	1851–1940	1884–1940	M, Cl, VP, P	Experimental and mathematical physics	British
Hiram Stevens Maxim ^{as}	1840–1916	1910–15	A	Engineering	Anglo-American
Francis Henry Neville ^{at}	1847–1915	1884–95	A	Physical chemistry and metallurgy	British
Simon Newcomb ^{au}	1835–1909	1890–1909	M	Astronomy	American
Ernest Payne ^{av}	1859–1936	1899–1915	M	Electrical engineering	British
Edward Charles Pickering ^{aw}	1846–1919	1884–1915	Cor	Astronomy	American
James R. Pickering ^{ax}	b. 1857	1892–1901	A	Electrical engineering	British
William Ramsay ^{ay}	1852–1916	1891–1901	M, Cl	Physical chemistry	British
Alec Harley Reeves ^{az}	1902–71	1939–71	M	Electrical engineering	British
Arthur Richardson ^{ba}	1858–1912	1895	A	Physical chemistry	British
Frederic William Richardson ^{bb}	1860–1950	1893–1933	A	Analytical chemistry	British
Edward Robinson ^{bc}	fl. 1900	1898–1901	A	Astronomy	British
Arthur Rücker ^{bd}	1848–1915	1891–1913	M	Experimental physics	British
Walter Raymond Schoeller ^{be}	d. 1947	1909–10	A	Analytical chemistry	British

Arthur Schuster ^{bf}	1851–1934	1884–8	M	Experimental physics	British
Alfred Richard Sennett ^{bg}	1860–1932	1885–7	M	Civil and electrical engineering	British
Alfred John Shilton ^{bh}	1860–92	1884–90	A	Chemistry	British
Eleanor Mildred Sidgwick ^{bi}	1845–1936	1884–1936	M, Cl, P, HS	Experimental physics	British
Balfour Stewart ^{bj}	1828–87	1882–7	M, Cl, VP, P	Experimental physics	British
William Henry Stone ^{bk}	1830–91	1882–5	M, Cl	Medical electricity	British
John William Strutt (3rd Baron Rayleigh) ^{bl}	1842–1919	1884–1919	M, Cl, VP, P	Experimental and mathematical physics	British
Robert John Strutt (4th Baron Rayleigh) ^{bmi}	1875–1947	1925–47	M, P	Experimental physics	British
Joseph Wilson Swan ^{bn}	1828–1914	1884–93	M	Electrical engineering	British
Harold Dennis Taylor ^{bo}	1862–1943	1908–25	A	Astronomy and instrument-making	British
Joseph William Thomas ^{bp}	1846–1914	1892–1909	M	Analytical chemistry	British
Joseph John Thomson ^{bq}	1856–1940	1883–1940	M, Cl, VP	Experimental and mathematical physics	British
William Mundell Thornton ^{br}	1870–1944	1899–1913	A	Electrical engineering	British
George Richard Tweedie ^{bs}	1857–1937	1891–2	M	Analytical chemistry	British
Arthur Mannering Tyndall ^{bt}	1881–1961	1904–7	A	Experimental physics	British
George Nugent Merle Tyrrell ^{bu}	1879–1952	1908–52	M, P	Wireless telegraphy	British
Henry Addenbrook Wassell ^{bv}	1838–1918	1883–1910	A	Astronomy	British
Walter Weldon ^{bw}	1832–85	1882–5	M	Industrial chemistry	British
William Cecil Dampier Whetham ^{bx}	1867–1952	1904–15	M	Experimental physics	British
D. L. Leedham White ^{bv}	1838–1905	1897–1904	M	Industrial chemistry	British
Charles John Young ^{bz}	fl. 1890	1888–94	A	Astronomy	British

Key to columns

A = Associate Member; Cl = Council Member; Cor = Corresponding Member; H = Honorary Member; HS = Honorary Secretary; M = Ordinary Member; P = President; VP = Vice-President

Abbreviations in references

- DSB: *Dictionary of Scientific Biography*
 JCS: *Journal of the Chemical Society*
 JIEE: *Journal of the Institution of Electrical Engineers*
 MNRAS: *Monthly Notices of the Royal Astronomical Society*
 ODNB: *Oxford Dictionary of National Biography*
 Venn: *J. A. Venn, Alumni Cantabrigienses: A Biographical List of all Known Students, Graduates and Holders of Office at the University of Cambridge from the Earliest Times to 1900, Part II from 1752–1900*, vols. 1–6 (Cambridge University Press, 1944–54).

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^b ODNB.

^c ODNB.

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^f www.ancestry.com

^g Obituary Notice, *Minutes of Proceedings of the Institution of Civil Engineers*, vol. 29 (1884–5), pp. 362–6.

^h DSB.

ⁱ Obituary Notice, *Nature*, vol. 43 (1891), p. 230.

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^q ODNB.

^r H. M. Goodwin, D. H. Dewey and H. W. Tyler, 'Charles Robert Cross', *Technology Review*, vol. 14 (1922), pp. 22–4.

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^t [Anon.], 'Benjamin Davies, Birmingham', *Czars y Byd*, vol. 17 (1902), pp. 49–52; R. G. Roberts, 'The Training of an Industrial Physicist: Oliver Lodge and Benjamin Davies', unpublished doctoral thesis, University of Manchester, 1984.

- ^u Obituary Notice, *MNRAS*, vol. 62 (1902), pp. 241–2.
- ^v Donald J. West, 'Obituary. G. W. Fisk', *JSPR*, vol. 47 (1973–4), pp. 21–3.
- ^w [Anon.], 'Obituary. Desmond G. Fitzgerald', *Electrician*, vol. 54 (1904), p. 21; www.ancestry.com.
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- ^y 'G. A. S.', 'Dr. E. E. Fournier D'Albe', *Nature*, vol. 132 (1933), p. 125; H. H. Stephenson (ed.), *Who's Who in Science International* (London: J. & A. Churchill, 1914).
- ^z *ODNB*.
- ^{aa} *Report of the Seventieth Meeting of the British Association for the Advancement of Science, Held at Bradford in September 1900* (London: John Murray, 1901).
- ^{ab} E. Margaret Burbidge, 'Christopher Clive Langton Gregory', *Quarterly Journal of the Royal Astronomical Society*, vol. 7 (1966), pp. 81–2.
- ^{ac} Obituary Notice, *JIEE*, vol. 75 (1934), p. 836.
- ^{ad} *ODNB*.
- ^{ae} Charles Mosley (ed.), *Burke's Peerage, Baronetage and Knightage* 3 vols (Wilmington, Delaware: Genealogical Books, 107th ed., 2003).
- ^{af} Obituary Notice, *MNRAS*, vol. 82 (1922), pp. 250–1.
- ^{ag} *DSB*.
- ^{ah} *Who's Who 2008*.
- ^{ai} www.ancestry.com; *Who's Who in Engineering* (London: Compendium Publishing Company, 1939).
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- ^{ak} 'University Intelligence', *Times*, 16 August 1902, p. 5.
- ^{al} [Anon.], 'Professor Samuel Joyce', *JIEE*, vol. 39 (1907), p. 789.
- ^{am} [Anon.], 'C. G. Lamb', *Electrical Review*, 128 (1941), p. 656.
- ^{an} [Anon.], 'Mr. Fox Pitt. Inventor and Psychic Student', *Times*, 7 April 1932, p. 14.
- ^{ao} *DSB*.
- ^{ap} www.ancestry.com; *Quarterly Journal of the Meteorological Society*, vol. 30 (1904), p. 343.
- ^{aq} *ODNB*.
- ^{ar} *ODNB*.
- ^{as} *ODNB*.
- ^{at} Venn.
- ^{au} *DSB*.
- ^{av} Venn.
- ^{aw} *DSB*.
- ^{ax} www.ancestry.com.
- ^{ay} *ODNB*.

^{az} ODNB.

^{ba} J. N. Collie, 'Arthur Richardson', *JCS, Transactions*, vol. 103 (1913), pp. 766–7.

^{bb} C. H. Manley, 'Frederic William Richardson', *Analyst*, vol. 76 (1951), p. 190.

^{bc} *Royal Astronomical Society. List of Fellows and Associates. June 1895* (London: Spottiswoode and Co., 1895).

^{bd} ODNB.

^{be} www.ancestry.com.

^{bf} ODNB.

^{bg} www.ancestry.com.

^{bh} [Anon.], 'Death of Mr. Shilton', *Reading Mercury, Oxford Gazette, Newbury Herald and Berks County Paper*, 6 February 1892, p. 5; [Anon], 'Proceedings at Annual General Meeting', *Proceedings of the Chemical Society*, vol. 8 (1892), pp. 59–66, p. 60.

^{bi} ODNB.

^{bj} ODNB.

^{bk} 'W. M. O.', 'William Henry Stone', *Saint Thomas's Hospital Reports*, vol. 20 (1892), pp. xxvii–xxxii.

^{bl} ODNB.

^{bm} ODNB.

^{bn} ODNB.

^{bo} T. Smith, 'Harold Dennis Taylor', *Proceedings of the Physical Society of London*, vol. 55 (1943), pp. 508–11.

^{bp} John Greenaway, 'Joseph William Thomas', *JCS, Transactions*, vol. 107 (1915), pp. 588–9.

^{bq} ODNB.

^{br} 'G. W. O. H.', 'Professor William Mundell Thornton', *JIEE*, vol. 91 (1944), pp. 475–6.

^{bs} M. G. Tweedie, 'George Richard Tweedie', *JCS, Part I*, 1938, pp. 164–5.

^{bt} ODNB.

^{bu} ODNB.

^{bv} Obituary Notice, *MNRAS*, vol. 79 (1919), pp. 233–4.

^{bw} ODNB.

^{bx} ODNB.

^{by} Obituary Notice, *Minutes of Proceedings of the Institution of Civil Engineers*, vol. 160 (1905), pp. 403–4.

^{bz} *MNRAS*, vol. 47 (1887), p. 443.

It is instructive to compare the presence of physical scientists with those from other scientific fields. In 1882, physical scientists comprised roughly 10 per cent of members, but there was the same percentage in the early 1900s when the size of the membership had more than doubled.²⁷ Members whose reputations, professional titles and qualifications suggest connections with physiology, zoology, botany and natural history constitute roughly 3 per cent of all members in 1882 and this had fallen to about 1 per cent in the early 1900s. Members coming from psychology, psychiatry, physiology and medicine also constituted about 10 per cent of the total membership in 1882, but this had swelled to about 30 per cent in the early 1900s. While this upward trend confirms what we might expect about the professional scientific composition of enquiries into phenomena with a strong psychological component, there remains the intriguing question of why, in its early decades, the SPR's scientific members were drawn from 'physical' and 'psychological' fields in roughly equal proportion.

Valuable as the SPR's membership is as a step towards a more comprehensive understanding of the relationship between psychical investigation and the physical sciences, it needs to be handled with as much caution as any other official membership. Length of membership is not necessarily a reliable indicator of the degree of commitment (or lack of commitment) to the subject represented by the organisation. Although Fournier d'Albe was only a member from 1908 to 1910, we know from many other sources that he sustained his interest in psychical research long after this. Conversely, in their comparatively long stints Ernest Payne, Benjamin J. Smith, Arthur Rücker, Charles J. Young and even Council member Lord Lindsay contributed practically nothing to the SPR's activities. They are among a significant number of individuals in Table 2.1, and, for that matter, in the SPR's membership as a whole, who were relatively inert and whose reasons for joining are typically unknown.²⁸

J. J. Thomson contributed more to the SPR's activities than the likes of Lindsay and Rücker, but this was still dwarfed by what Barrett, Crookes, Lodge and Stewart managed. Thomson's case well illustrates the extent to which the SPR's management could tolerate members' relative inactivity if their reputations conferred much-needed intellectual lustre on the organisation. In 1921, he considered resigning from the SPR Council because he had been unable to attend its meetings. The organisation's Honorary Secretary, Eleanor Sidgwick, wanted him to stay on as a vice-president

²⁷ The percentages in this discussion are based on analysis of the membership lists published in the *PSPR* for volumes 1 (1882–3) and 15 (1900–1).

²⁸ This inertness is noted in Mauskopf and McVaugh, *Elusive Science*, p. 13.

instead because this was a “purely honorary” position that did not involve attending meetings.²⁹ After reminding him that her scientifically distinguished brother-in-law Rayleigh was kept on as vice-president although he “practically never attended meetings”, she explained that having Thomson’s “name on our papers [...] implying a general approval of our objects and methods” would be of “very great value to our Society”.³⁰ Thomson was evidently persuaded, since he continued to be the largely symbolic member that he had been since the 1880s.³¹

Thomson’s case is illuminating in two other respects. First, he illustrates the need to understand the different levels of interest that SPR members had in different *kinds* of psychical phenomena. There were some members, notably Barrett, Crookes and Lodge, who were reasonably catholic in their psychical tastes, but Thomson was more selective: he expressed particular views about telepathy and water-divining, and helped investigate the physical phenomena of spiritualism, but seems to have had little or no interest in apparitions, haunted houses, mesmerism and Reichenbach’s od.³² Second, he illustrates the need to understand the extent to which different SPR members became convinced by the evidence for different psychical phenomena. By 1900, Barrett, Crookes and Lodge had become convinced of telepathy and ‘telekinesis’, Myers’s term for the movement of untouched objects by the power of thought or some unknown force. In his 1933 autobiography, Thomson expressed continued reservations about both types of psychical effect, despite declaring them eminently worthy of further investigation.³³

The most obvious limitation of the SPR’s membership is that there were many practitioners of the physical sciences who showed an interest in psychical phenomena but had either (a) died before the SPR was founded, (b) largely abandoned this interest before 1882, or (c) did not join. We have already met three individuals who fall into these categories: Reichenbach (a), Tyndall (b) and Varley (c). Between the 1850s and the 1930s it is possible to identify 75 such individuals from unpublished and published source materials, including the correspondence of SPR physical scientists. They are listed in Table 2.2, which, like Table 2.1, provides

²⁹ Eleanor Sidgwick to J. J. Thomson, 6 January 1921, JJT H.22/1, J. J. Thomson Papers, Trinity College Library, Cambridge.

³⁰ Sidgwick to Thomson, 6 January 1921.

³¹ Heinrich Hertz also fulfilled a symbolic function. Despite having only an armchair interest in psychical research, he was still elected as a foreign member of the SPR and earned an obituary notice in the organisation’s *Journal*: Oliver Lodge, ‘Professor Heinrich Hertz’, *JSPR*, vol. 6 (1893–4), pp. 197–9.

³² J. J. Thomson, *Recollections and Reflections* (London: G. Bell, 1936), pp. 147–63 and 379–83.

³³ Thomson, *Recollections and Reflections*, pp. 147–58.

2.2 *Physical-psychical scientists outside the SPR, C.1850–1940*

Name	Dates	When interested in psychical effects	Primary field(s) of scientific expertise	Nationality
Dominique François Jean Arago ^a	1786–1853	1850s	Natural philosophy	French
Jacques-Arsène d'Arsonval ^b	1851–1940	1900s	Physics and physiology	French
Francis William Aston ^c	1877–1945	1910s	Chemistry and experimental physics	British
Jacques Babinet ^d	1794–1872	1840s–50s	Natural philosophy	French
John Logie Baird ^e	1888–1946	1910s–30s	Electrical engineering	British
Kristian Olaf Bernhard Birkeland ^f	1867–1917	1910s	Experimental physics	Danish
Éduoard Eugène Désiré Branly ^g	1844–1940	1900s	Electrical engineering	French
David Brewster ^h	1781–1868	1810s–60s	Natural philosophy	British
Frank Playfair Burt ⁱ	1879–1938	1900s	Physical chemistry	British
James Rand Caproni ^j	1829–88	1870s	Astronomy and photography	British
Richard Chenevix ^k	1774–1830	1820s	Chemistry and mineralogy	Irish
Josiah Latimer Clark ^l	1822–98	1850s–60s	Electrical engineering	British
Reginald Charles Clinker ^m	1876–1931	1890s	Electrical engineering	British
William Walter Coblenz ⁿ	1873–1962	1880s–1910s	Experimental physics	American
William Roy Cecil Coode-Adams ^o	1895–1961	1920s	Chemistry and electrical engineering	British
William Jackson Crawford ^p	1881–1920	1910s	Civil engineering	Irish
Pierre Curie ^q	1859–1906	1890s	Experimental physics and chemistry	French
George Howard Darwin ^r	1845–1912	1870s	Mathematics and geophysics	British
Amos Emerson Dolbear ^s	1837–1910	1880s–1900s	Experimental physics	American

2.2 (cont.)

Name	Dates	When interested in psychical effects	Primary field(s) of scientific expertise	Nationality
Thomas Alva Edison ^t	1847–1931	1870s–1920s	Electrical engineering	American
Norman Edwards ^u	fl. 1920s	1920s	Wireless telegraphy	British
Giovanni Battista Ermacora ^v	1858–98	1890s	Experimental and mathematical physics	Italian
Michael Faraday ^{wo}	1791–1867	1850s	Chemistry and natural philosophy	British
George Francis FitzGerald ^x	1851–1901	1880s–90s	Experimental and mathematical physics	Irish
Cyril Charles James Frost ^y	1894–1960	1920s–30s	Wireless telegraphy	British
Reginald Gibbs ^z	1898–1997	1930s	Experimental physics	British
Charles Henry Gimingham ^{aa}	1853–90	1870s	Experimental physics	British
William Gregory ^{ab}	1803–58	1840s–50s	Chemistry and medicine	British
Fritz Grunewald ^{ac}	fl. 1900s	1900s	Electrical engineering	German
Edwin Herbert Hall ^{ad}	1855–1938	1880s	Experimental physics	American
William Hallock ^{ae}	1857–1913	1900s	Experimental physics	American
Herbert Anthony Hankey ^{af}	1884–1961	1930s	Electrical engineering	British
Robert Hare ^{ag}	1781–1858	1850s	Chemistry	American
William Henry Harrison ^{ah}	1841–97	1860s–90s	Photography and telegraphic engineering	British
Eduard Haschek ^{ai}	1875–1947	1910s	Experimental physics	Austrian
John Heringer ^{aj}	1880–1956	1930s	Wireless telegraphy	Romanian
Bernard Joseph Hopper ^{ak}	1876–1947	1930s	Experimental physics	British
Edwin James Houston ^{al}	1847–1914	1880s–1930s	Electrical engineering	American
William Huggins ^{am}	1824–1910	1870s	Astronomy	British

Walter John Kilner ^{an}	1847–1920	1890s–1910s	Medical electricity	British
William Kingsland ^{ao}	1855–1936	1880s–1930s	Electrical engineering	British
Paul Langevin ^{ap}	1872–1946	1990s	Experimental and mathematical physics	French
Edwin John Godfrey Lewis ^{aq}	1903–77	1920s	Wireless telegraphy	French
William Lynd ^{ar}	1845–1911	1890s–1900s	Telegraphic engineering	British
Dmitrii Ivanovich Mendeleev ^{as}	1834–1907	1870s	Chemistry	Russian
Stefan Meyer ^{at}	1872–1949	1920s	Experimental physics	Austrian
A. E. Mundy ^{au}	fl. 1920s	1920s	Chemistry and electrical engineering	British
Hans Christian Oersted ^{av}	1777–1851	1810s	Natural philosophy	Danish
Jean Baptiste Perrin ^{aw}	1870–1942	1900s	Experimental physics	French
William Henry Pickering ^{ax}	1858–1938	1880s	Astronomy	American
Francesco Porro de' Somenzi ^{ay}	1861–1937	1900s	Astronomy	Italian
Samuel Tolver Preston ^{az}	1844–1917	1890s	Civil engineering and physics	British
Richard Anthony Proctor ^{ba}	1837–88	1880s	Astronomy	British
Karl Przibram ^{bb}	1878–1973	1920s	Experimental physics	Austrian
Alexander Oliver Rankine ^{bc}	1881–1956	1930s	Experimental physics	British
Karl Freiherr von Reichenbach ^{bd}	1788–1869	1830s–60s	Industrial chemistry	German
Herbert Stanley Redgrove ^{be}	1887–1943	1880s–1940s	Chemistry	British
James Emerson Reynolds ^{bf}	1844–1920	1870s	Chemistry	Irish
Philip James Risdon ^{bg}	1879–1947	1920s	Wireless telegraphy	British
John Obadiah Newell Rutter ^{bh}	1799–1888	1850s	Civil engineering	British
Giovanni Virginio Schiaparelli ^{bi}	1835–1910	1890s	Astronomy	Italian
John Hawkins Simpson ^{bj}	fl. 1860	1860s	Telegraphic engineering	British

2.2 (cont.)

Name	Dates	When interested in psychical effects	Primary field(s) of scientific expertise	Nationality
John Toby Sprague ^{bk}	1824–1906	1840s–1900s	Electrical engineering	British
John Traill Taylor ^{bl}	1827–95	1890s	Photography	British
Silvanus Phillips Thompson ^{bm}	1851–1916	1870s–1910s	Electrical engineering and experimental physics	British
Hans Thirring ^{bn}	1888–1976	1920s	Experimental physics	Austrian
Augustus Trowbridge ^{bo}	1870–1934	1900s	Experimental physics	American
George William De Tunzelmann ^{bp}	b. 1856	1910s	Electrical engineering and experimental physics	British
John Tyndall ^{bq}	1820–93	1860s	Experimental physics	Irish
Francis Lawry Usher ^{br}	1885–1969	1900s	Physical chemistry	British
Cromwell Fleetwood Varley ^{bs}	1828–83	1850s–80s	Telegraph engineering	British
René Warcollier ^{br}	1881–1962	1920s–60s	Physical chemistry	French
R. A. Watters ^{bu}	fl. 1930s	1930s	Experimental physics	American
Wilhelm Eduard Weber ^{bv}	1804–91	1870s	Experimental and mathematical physics	German
Edmund Basil Wedmore ^{bw}	1876–1956	1890s	Electrical engineering	British
Adolf Ferdinand Weinhold ^{bx}	1841–1917	1870s–80s	Experimental physics	German
Robert William Wood ^{by}	1868–1955	1900s	Experimental physics	American
Harry Edward Yerbury ^{bz}	1871–1955	1930s	Electrical engineering	British
Johann Karl Friedrich Zöllner ^{ca}	1834–82	1870s	Astronomy	German

Abbreviations in references

- ANB: *American National Biography*
 Courtier: Jules Courtier, *Documents sur Eusapia Palladino. Rapport sur les séances d'Eusapia Palladino: à l'Institut général psychologique en 1905, 1906, 1907 et 1908* (Paris: Institut général psychologique, 1908).
 DSB: *Dictionary of Scientific Biography*
 JCS: *Journal of the Chemical Society*
 JIEE: *Journal of the Institution of Electrical Engineers*
 JSPP: *Journal of the Society for Psychological Research*
 MNRAS: *Monthly Notices of the Royal Astronomical Society*
 ODNB: *Oxford Dictionary of National Biography*
 Venn: J. A. Venn, *Alumni Cantabrigienses: A Biographical List of All Known Students, Graduates and Holders of Office at the University of Cambridge from the Earliest Times to 1900*, Part II, vols. 1–6 (Cambridge University Press, 1944–54).
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- ^p Allan Barham, 'Dr. W. J. Crawford, His Work and Legacy in Psychokinesis', *JSPR*, vol. 55 (1988), pp. 113–38; W. J. Crawford, *The Reality of Psychic Phenomena* (London: John M. Watkins, 1919).
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- ^{ar} Obituary notice, *Electrical Review*, vol. 68 (1911), p. 929; William Lynd, 'Thought Transference and Wireless Telegraphy', *Surrey Magazine*, vol. 1 (1900), pp. 24–7.
- ^{as} DSB; Dmitri I. Mendeleev, *Materialy dlia sushdeniia o spiritisme* (St Petersburg: Obshchestvennaia Pol'za, 1876).
- ^{at} Helmut Rechenburg, 'Meyer, Stefan', in *Deutsche Biographie*, www.deutsche-biographie.de/sfz62835.html; Rudi Schneider: *The Vienna Experiments of Professors Meyer and Przibram*, Bulletin 5 of the National Laboratory of Psychical Research (London: National Laboratory of Psychical Research, 1933).
- ^{au} A. E. Mundy, 'Vibrations in the Air and Ether', *British Journal of Psychical Research*, vol. 2 (1928), pp. 8–12.
- ^{av} DSB; Erik Bjelfvenstam, 'Hypnotism in Scandinavia 1800–1900', in Eric J. Dingwall (ed.), *Abnormal Hypnotic Phenomena: A Survey of Nineteenth Century Cases*, vol. 2 (London: J. and A. Churchill, 1967), pp. 203–46.
- ^{aw} DSB; Courtier.
- ^{ax} DSB; H. P. Bowditch et al., 'Report of the Committee on Thought-Transference', *Proceedings of the American Society for Psychical Research*, vol. 1 (1885–9), pp. 6–49.
- ^{ay} Sandra Ciccone, 'Francesco Porro de' Somenzi', in T. Hockey et al. (eds.), *Biographical Encyclopaedia of Astronomers*, 2 vols. (New York: Springer, 2012), vol. 2, pp. 1750–1; Hereward Carrington, *Eusapia Palladino and Her Phenomena* (London: T. Werner Laurie, 1910).

- ^{az} Obituary Notice, *Nature*, vol. 99 (1917), p. 190; www.ancestry.com; S. Tolver Preston, 'On the Physics of Thought-Reading [1893]', Add. MS. 7654, P45a, J. J. Thomson Papers, Cambridge University Library.
- ^{ba} ODNB; Richard A. Proctor, 'Thought-Reading', *Knowledge*, vol. 2 (1882), pp. 51, 68–9, 106–7, 128, 161–2.
- ^{bb} Helmut Reichenburg, 'Przibram, Karl', in *Deutsche Biographie*, www.deutsche-biographie.de/sfz97580.html; Rudi Schneider: *The Vienna Experiments of Professors Meyer and Przibram*, Bulletin 5 of the National Laboratory of Psychical Research (London: National Laboratory of Psychical Research, 1933).
- ^{bc} George P. Thomson, 'Alexander Oliver Rankine', *Biographical Memoirs of the Fellows of the Royal Society*, vol. 2 (1956), pp. 248–55; Harry Price, *Rudi Schneider: A Scientific Examination of His Mediumship* (London: Methuen and Co., 1930), p. 38.
- ^{bd} Michael Engel, 'Reichenbach, Karl Freiherr von', in *Deutsche Biographie*, www.deutsche-biographie.de/gnd107050978.html#ndbcontent; Karl von Reichenbach, *Researches on Magnetism, Electricity, Heat, Light, Crystallization, and Chemical Attraction, in Their Relation to the Vital Force*, translated by William Gregory (London: Taylor, Walton and Moberly, 1850).
- ^{be} www.ancestry.com; Herbert S. Redgrove and I. M. L. Redgrove, *Joseph Glanvill and Psychical Research in the Seventeenth Century* (London: W. Rider and Son, 1921).
- ^{bf} ODNB; E. Fournier d'Albe, *The Life of Sir William Crookes* (London: T. Fisher Unwin, 1923), p. 185.
- ^{bg} www.ancestry.com; P. J. Risdon, 'Psychic Phenomena and Wireless', *Popular Wireless Weekly*, 29 August 1922, pp. 237–8.
- ^{bh} Obituary Notice, *MNRAS*, vol. 49 (1889), pp. 168–9; J. O. N. Rutter, *Human Electricity: The Means of Its Development, Illustrated by Experiments* (London: John W. Parker, 1854).
- ^{bi} DSB; Camille Flammarion, *Mysterious Psychic Forces: An Account of the Author's Investigations in Psychical Research, Together with Those of other European Savants* (Boston: Small, Maynard and Company, 1907).
- ^{bj} [Anon.], 'Single-Wire Typo-Telegraph by J. Hawkins Simpson', *Engineer*, 15 November 1867, pp. 421–2; [Anon.], 'Lyon v. Home', *Spiritual Magazine*, vol. 3 (1868), pp. 241–54.
- ^{bk} [Anon.], 'The Late Mr. J. T. Sprague', *English Mechanic and World of Science*, 9 February 1906, pp. 3–4; John T. Sprague, 'Psychology', *English Mechanic and World of Science*, vol. 56 (1892), pp. 171–2, 219–20, 263–4, 307–8, 351–2, 393–4, 487–8, 532–4, 579–80; vol. 57 (1893), 23–4.
- ^{bl} [Anon.], 'In Memoriam: The Late J. Traill Taylor', *British Journal of Photography*, vol. 42 (1895), p. 725; John Traill Taylor, 'Spirit Photography', with Remarks on Fluorescence', *British Journal of Photography*, 17 March 1893, pp. 167–9.
- ^{bm} ODNB; Silvanus P. Thompson, 'A Physiological Effect of an Alternating Magnetic Field', *Philosophical Transactions of the Royal Society of London*, Series B, vol. 82 (1909–10), pp. 396–8.
- ^{bn} [Anon.], 'Thirring, Hans', *Deutsche Biographie*, www.deutsche-biographie.de/sfz132004.html#indexcontent; Hans Thirring, 'The Position of Science in Relation to Psychical Science', *British Journal of Psychical Research*, vol. 1 (1927), pp. 164–81.
- ^{bo} ANB; Charles L. Dana et al., 'Report of an Investigation of the Phenomena Connected with Eusapia Palladino', *Science*, vol. 31 (1910), pp. 776–80.

- ^{bp} *Electrical Trades' Directory and Handbook for 1894* (London: 'The Electrician', 1894); George W. De Tunzelmann, *A Treatise on Electrical Theory and the Problem of the Universe* (London: Charles Griffin and Co., 1910), pp. 626–32.
- ^{bq} ODNB; [John Tyndall], 'Science and the Spirits', *Reader*, vol. 4 (1864), pp. 725–6.
- ^{br} E. G. Cox, 'Dr. F. L. Usher', *The University of Leeds Review*, vol. 2 (1950), pp. 167–8; www.ancestry.com; F. L. Usher and F. P. Burt, 'Thought Transference (some Experiments in Long Distance Thought-Transference)', *Annals of Psychological Science*, vol. 8 (1909), pp. 561–600.
- ^{bs} ODNB; Cromwell F. Varley, 'Evidence of Mr. Varley', in *Report on Spiritualism of the Committee of the London Dialectical Society* (London: Longmans, Green, Reader and Dyer, 1871), pp. 157–72.
- ^{bt} Helene Pleasants (ed.), *Biographical Dictionary of Parapsychology with Directory and Glossary, 1964–66* (New York: Garrett Publications, 1964); René Warcollier, *La télépathie recherches expérimentales* (Paris: Félix Alean, 1921).
- ^{bu} R. A. Watters, *The Intra-atomic Quantity* (Reno, NV: Dr. William Bernard Johnson Foundation for Physiological Research, 1933).
- ^{bv} DSB; Johann K. F. Zöllner, *Transcendental Physics. An Account of Experimental Investigations. From the Scientific Treatises*, tr. C. C. Massey (London: W. H. Harrison, 1880).
- ^{bw} J. Greig, 'Mr. E. B. Wedmore, C. B. E.', *Nature*, vol. 178 (1956), pp. 238–9; Arthur P. Chattock, 'Experiments in Thought-Transference', *JSPR*, vol. 8 (1897–8), pp. 302–5.
- ^{bx} Dagmar Szöllösi, 'Adolf Ferdinand Weinhold', *Sächsische Biografie*, [http://saebi.isgv.de/biografie/Adolf_Ferdinand_Weinhold_\(1841-1917\)](http://saebi.isgv.de/biografie/Adolf_Ferdinand_Weinhold_(1841-1917)); Adolf F. Weinhold, *Hypnotische Versuche. Experimentale Beiträge zur Kenntniss des sogenannten thierschen Magnetismus* (Chemnitz: Martin Bühlz, 1879).
- ^{by} DSB; Charles L. Dana et al., 'Report of an Investigation of the Phenomena Connected with Eusapia Palladino', *Science*, vol. 31 (1910), pp. 776–80.
- ^{bz} 'J. A. W.', 'Harry Edward Yerbury', *JHEE*, vol. 2 (1956), p. 49; H. E. Yerbury, 'Precis of Lecture Delivered Before the Reading Society for Psychical Investigation', *Psychic Science: Quarterly Transactions of the British College of Psychic Science*, vol. 14 (1935–6), pp. 165–70.
- ^{ca} DSB; Johann K. F. Zöllner, *Transcendental Physics. An Account of Experimental Investigations, From the Scientific Treatises*, translated by C. C. Massey (London: W. H. Harrison, 1880).

years of birth and death, fields of expertise and nationality, but also includes the period during which individuals were known to have shown significant interest in psychical phenomena and references to principal sources of biographical information and of their psychical interest. Again, like Table 2.1, Table 2.2 is not intended as an exhaustive list, and further research will inevitably turn up more names, but, as it stands, it further strengthens and complicates perceptions that a curiously large number of physicists engaged in psychical investigation, the main complication being that physicists were joined by practitioners from a range of other physical sciences. It is because physicists were not the only practitioners of the physical sciences inside or outside the SPR who showed an interest in psychical investigation that, for the sake of brevity, we shall refer to them collectively as ‘physical–psychical scientists’.

Although there are roughly the same number of physical–psychical scientists in Tables 2.1 and 2.2, the latter table covers more nationalities and a wider range of attitudes towards psychical phenomena. This completely male-dominated table includes individuals such as the American physicists Edwin H. Hall and Robert W. Wood, and the Russian chemist Dmitrii Mendeleev who, while being notorious for their scepticism towards psychical effects, qualify for inclusion among physical–psychical scientists because, unlike those who blankly refused to investigate such effects, they devoted at least some time and effort to them.³⁴ In contrast, it also includes individuals whose psychical enquiries led them to a firm conviction in one or more psychical phenomena. The American physicist William W. Coblentz and the British radio engineer Cyril ‘Jack’ Frost, for example, became devout spiritualists, while the British engineers William Coode-Adams and William Kingsland became followers of modern Theosophy, which had been launched in the United States by Helena Petrovna Blavatsky, Henry Steele Olcott and William Quan Judge in the 1870s. It was probably the long-running conflict between the SPR and modern Theosophy that dissuaded Coode-Adams and Kingsland from joining the organisation: the conflict started in 1884–5 when the SPR published damning evidence that Blavatsky had forged letters allegedly written and materialised out of thin air by the invisible bearers of esoteric wisdom with whom this co-founder of modern Theosophy claimed to be in communion.³⁵

³⁴ On Mendeleev and spiritualism see Gordin, *Well-Ordered Thing*, chapter 4. An idiosyncratic study of Wood is William Seabrook, *Doctor Wood: Modern Wizard of the Laboratory* (New York: Harcourt Books, 1941). For Hall’s involvement in psychical research see Edwin H. Hall, ‘Sir Oliver Lodge’s British Association Address’, *Harvard Theological Review*, vol. 8 (1915), pp. 238–51.

³⁵ Oppenheim, *Other World*, pp. 174–8; J. Barton Scott, ‘Miracle Publics: Theosophy, Christianity, and the Coulomb Affair’, *History of Religions*, vol. 49 (2009), pp. 172–96. The debacle does not appear to have affected the allegiances of SPR physical scientists

Physical–psychical scientists in Table 2.2 seem to have been more selective in their psychical interests than those in Table 2.1. Some, such as Frank P. Burt, Reginald C. Clinker, Edwin J. Houston, William Lynd, S. Tolver Preston, Francis L. Usher and Edmund B. Wedmore, appear only to have been interested in telepathy, while Jacques-Arsène d'Arsonval, Kristian Birkeland, Latimer Clark, William J. Crawford, Fritz Grunewald, Augustus Trowbridge and Johann K. F. Zöllner focussed solely on the physical phenomena of spiritualism.

Many of the physical–psychical scientists in Table 2.2 were good deal more open about their psychical interests than others. Harrison edited a newspaper on spiritualism, and the chemist Herbert S. Redgrove published numerous articles and books on alchemy and other occult topics, but Francis Aston was only prepared to make subtle allusions to modern Theosophy and William Huggins kept his spiritualistic interests largely private, the latter prompting a frustrated Crookes to accuse him of being “a coward with his pen” but “bold as lion in talking” about the subject.³⁶ Huggins shared many scientists’ anxiety that public associations with spiritualism could harm one’s professional reputation, and this was probably one of several undisclosed reasons why he declined to attend Barrett’s psychical research conference in 1882.³⁷

Connecting Physical–Psychical Scientists

One of the reasons why we can compile Table 2.2 is because so many physical–psychical scientists within the SPR shared their psychical interests with plenty of physical–psychical scientists inside and outside the organisation. Indeed, physical–psychical scientists constitute several informal networks of individuals who corresponded, had face-to-face conversations about, collaborated on, and otherwise interacted on psychical matters. Many of these networks centred on the most active (and best-known) physical–psychical scientists, such as Barrett, Crookes and Lodge, and were simply the result of pre-existing networks. For example, it is hardly surprising that Lodge, Oliver Heaviside and George F. FitzGerald interacted on psychical matters given that by the 1880s they already defined a network of physicists

with strong Theosophical interests, such as Henry Boulnois, Lindsay, St George Lane Fox Pitt and Arthur Richardson.

³⁶ On Redgrove see Morrisson, *Modern Alchemy*, chapter 1. For Aston see Hughes, ‘Occultism and the Atom’. William Crookes to D. D. Home, 18 July 1871, quoted in [Julie] Dunlas Home, *D. D. Home: His Life and Mission*, ed. by Arthur Conan Doyle (London: Kegan Paul, Trench, Trübner and Co., 1921), p. 201.

³⁷ William Huggins to William F. Barrett, 23 December 1881, SPR.MS 3/A4/40, WFB-SPR.

interpreting Maxwell's electromagnetic theory.³⁸ And Barrett, Stewart and the physicist and electrical engineer Silvanus Thompson were corresponding about their research and teaching in physics long before they started exchanges on psychical subjects.³⁹

The entanglement of physical and psychical matters in these networks was particularly prominent in the 1890s. This was the decade when Crookes, Rayleigh and Ramsay collaborated on experimental evidence for the inert gas argon and often discussed old and new investigations into spiritualism; when Crookes, FitzGerald, Lodge, Heaviside, S. Tolver Preston and J. J. Thomson exchanged speculations on electromagnetic theories of optics and of telepathy; when Lodge and FitzGerald combined discussions of the fundamental laws of mechanics and the baffling mechanical powers of the American stage magician Annie Abbott; and when Lodge helped Crookes with the physical and psychical parts of Crookes's presidential address to the 1898 meeting of the British Association.⁴⁰

A more compelling illustration of this entanglement comes from Lodge's diary for 1892. During one particularly busy week spent in London in April, he lectured on a Friday at the Royal Institution on the ether of space, lunched with fellow physicist and SPR member Arthur Rücker the following Sunday, had lunch dates with Crookes on the Monday and Arthur Balfour (another SPR member) on the Tuesday, lunched with the Rayleighs and dined with Myers on the Thursday, and ended his visit by attending meetings at the Physical Society of London and the SPR.⁴¹ The conversations between Lodge and his dining companions are likely to have ranged across a variety of physical and psychical questions. They probably included the relationship of ether to gross matter and to psychical phenomena (topics that would have interested Crookes, Myers and Rayleigh), Nikola Tesla's recent London lectures on

³⁸ Hunt, *Maxwellians*.

³⁹ William F. Barrett to Silvanus P. Thompson, 10 November 1879, f. 20, SPT-IC; Balfour Stewart to William F. Barrett, 22 December 1871, f. 120, WFB-RS.

⁴⁰ Copy of a letter from Lord Rayleigh to William Ramsay, 4 January 1896, Argon Correspondence Microfilm, Box #24, Series 5, R-USAF; Lord Rayleigh, *John William Strutt, Life of Lord Rayleigh* (London: Edward Arnold and Co., 1924), p. 265; Mrs C. W. Earle, *Memoirs and Memories* (London: Smith, Elder and Co., 1911), pp. 381–2; William Crookes to Oliver Lodge, 19 August 1898, SPR.MS 35/341, OJL-SPR; Oliver Heaviside to Oliver Lodge, 26 August 1896, f. 100, MS Add. 89/50(ii), OJL-UCL; S. Tolver Preston to J. J. Thomson, 18 May 1893, P47, JJT-CUL; S. Tolver Preston to George F. FitzGerald, 3 September 1890, 11/63, George Francis FitzGerald Papers, RDS Library and Archives; George F. FitzGerald to Oliver Lodge, 17 December 1891, MS Add. 89/35, OJL-UCL; William Crookes to Oliver Lodge, 25 June 1898, SPR.MS 35/328, OJL-SPR.

⁴¹ Oliver Lodge, Diary for 1892, OJL/2/3/9, Oliver Lodge Papers, Cadbury Research Library, University of Birmingham.

the mysterious phenomena of electrical discharge (in which Crookes had strong interests), Lodge's recent tests of telepathy (a topic enormously interesting to Balfour and Myers) and Myers's analysis of the evidence for telekinesis (an effect that Crookes and Rayleigh had investigated).⁴²

Lodge's metropolitan movements illustrate the fact that psychical investigation was a topic that physical–psychical scientists tended to share with more than just fellow physical scientists. It was precisely because it was a subject with obvious connections with psychology, philosophy, religion and spirituality that physical–psychical scientists often found it as fruitful to discuss their psychical interests with philosophers and clergymen as fellow physicists, chemists, astronomers and engineers.⁴³

In 1881, after studying, researching and teaching physics in London, Lodge had taken up the post of Professor of Physics at University College Liverpool and this made it more difficult for him to travel to London, where many of the distinguished scientific and other learned societies had their homes, and to Cambridge, where the SPR's dominant Sidgwick group was based. The difficulty that Lodge faced in sharing physical and psychical interests with Crookes, Myers and other like-minded individuals based in London or Cambridge was also felt by Stewart, who from 1870 until his death in 1887 was Professor of Natural Philosophy at Owens College Manchester, and, *a fortiori*, by Barrett, who, from 1873 to 1910, was Professor of Experimental Physics at the Royal College of Science in Dublin. In some ways, the problem of distance explains why some physical–psychical scientists were inclined to cultivate an interest in psychical research locally as well as share it with distant peers. Indeed, in

⁴² The prominence of Tesla as a topic is suggested by Arthur Rücker to Oliver Lodge, 2 February 1892, MS Add. 89/91, OJL-UCL, and William Crookes to Oliver Lodge, 12 March 1892, SPR.MS 35/313, OJL-SPR. Lodge and Rayleigh were corresponding on the question of the motion of the earth relative to a stationary ether in 1891: see Oliver Lodge to Lord Rayleigh, 8 February 1891, Folder 2, Box #19, Series 4, R-USAF. Publications indicating the interests of Lodge and his dining companions include: Arthur J. Balfour, 'Address by the President', *PSPR*, vol. 10 (1894), pp. 2–13; William Crookes, 'Some Possibilities of Electricity', *Fortnightly Review*, vol. 51 (New Series) (1892), pp. 173–81; Oliver Lodge, 'Some Recent Thought-Transference Experiments', *PSPR*, vol. 7 (1891–2), 374–82, Oliver Lodge, 'The Interstellar Ether', *Fortnightly Review*, vol. 53 (New Series) (1893), pp. 856–62; Frederic W. H. Myers, 'On Alleged Movements of Objects, Without Contact, Occurring Not in the Presence of a Paid Medium', *PSPR*, vol. 7 (1891–2), pp. 383–94. Lodge probably conversed with Crookes, Robert Strutt (later the Fourth Baron Rayleigh), Thomson and Rayleigh about psychical topics at dinner parties hosted by Rayleigh in his London home in the 1890s: see Hannah Gay, 'Science, Scientific Careers and Social Exchange: The Diaries of Herbert McLeod, 1885–1900', *History of Science*, vol. 46 (2008), pp. 457–96, p. 466.

⁴³ Lodge's interactions with philosophers and clergymen are touched on in Bowler, *Reconciling Science and Religion*, chapter 7; W. P. Jolly, *Sir Oliver Lodge* (London: Constable, 1974).

1897, the Liverpool physicist Arthur Chattock praised his senior colleague Lodge for producing writings on “psychics” that had inspired “centres of interest” in the topic in “many colleges” and had “affected” Lodge’s as well as Chattock’s own students, a trend that he believed would enormously benefit the subject in the long run.⁴⁴

There is some truth in Chattock’s claims. Many of the physical–psychical scientists in Tables 2.1 and 2.2 had some connection with Lodge. Francis Aston, Chattock, Benjamin Davies, Fournier d’Albe, Stratton and William Thornton were all colleagues or students of Lodge when he was at Liverpool (1881–1900) or was Principal of Birmingham University (1900–19).⁴⁵ Some of them appear to have been inspired by Lodge’s own studies of psychical phenomena or directly encouraged by him.⁴⁶ Davies served as Lodge’s laboratory assistant from 1880 to 1908, while Chattock knew Lodge in the 1870s when the older physicist taught at University College London, and served under him as an assistant lecturer at Liverpool from 1887 to 1889.⁴⁷ Both Davies and Chattock maintained particularly close correspondences with Lodge that blended discussion of electrical physics, telepathy and spiritualism.⁴⁸ Fournier d’Albe’s exposure to the examples of physics mentors with psychical interests was particularly strong because in 1910, when he took up his post as an assistant lecturer at Birmingham, he had just spent four years assisting Barrett in the physics laboratory at the Royal College of Science, Dublin.⁴⁹

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

⁴⁵ On Lodge’s career at Liverpool see Nani N. Clow, ‘The Laboratory of Victorian Culture: Experimental Physics, Industry and Pedagogy in the Liverpool Laboratory of Oliver Lodge, 1881–1900’ (unpublished doctoral dissertation, Harvard University, 1999) and Peter Rowlands, *Oliver Lodge and the Liverpool Physical Society* (Liverpool University Press, 1990). On Lodge at Birmingham see Eric Ives, Diane Drummond and Leonard Schwarz, *The First Civic University: Birmingham 1880–1980. An Introductory History* (University of Birmingham, 2000), chapters 7–10.

⁴⁶ Frederick J. M. Stratton, ‘Psychical Research – A Lifelong Interest’, *PSPR*, vol. 50 (1954), pp. 135–52, p. 136 and James Chadwick, ‘Frederick John Marrian Stratton’, *Biographical Memoirs of Fellows of the Royal Society*, vol. 7 (1961), pp. 280–93, p. 283. Lodge’s increasingly conspicuous psychical investigations and writings probably inspired the foundation of a ‘Students’ Psychical Society’ at the University of Birmingham around 1905. In this year, Lodge lectured to the society on Charles Richet’s evidence of super-normal ‘lucidité’ (Richet’s alternative term for clairvoyance): see ‘C.W.’, ‘Students’ Psychical Society’, *The Mermaid: The Journal of the Guild of Undergraduates of the University of Birmingham*, vol. 3 (1906), pp. 68–72.

⁴⁷ For Chattock see [Anon.], ‘Arthur Prince Chattock 1860–1934’, *Obituary Notices of Fellows of the Royal Society*, vol. 1 (1932–5), pp. 293–8. For Davies see R. G. Roberts, ‘The Training of an Industrial Physicist: Oliver Lodge and Benjamin Davies, 1882–1940’ (unpublished doctoral thesis, University of Manchester, 1984).

⁴⁸ See the letters from Chattock to Lodge from 1888 to 1927 in MS Add. 89/23, OJL-UCL and the letters from Davies to Lodge from 1885 to 1940 in Box 3, BD-NLW.

⁴⁹ Barrett and Fournier d’Albe were also chairman and honorary secretary respectively of the Dublin Section of the SPR established in 1908: [Anon.], ‘Report of the Council for

Chattock's reference to "centres of interest" could well have been one that he was trying to forge himself. He was probably exposed to the psychical interests of scientific colleagues before he went to Liverpool. Between 1885 and 1887 he had been a Demonstrator in the physics department at University College Bristol (1885–7), where he worked under Silvanus Thompson, a close friend and colleague of Barrett, Crookes and Lodge who, despite not joining the SPR, read its publications and believed, like many leading SPR members, that communications from disembodied spirits were probably telepathic impressions from the living (Figure 2.2).⁵⁰

Chattock's Bristol colleagues also included William Ramsay, who, during the mid-1880s, was interested in spirit photography and Zöllner's hyperdimensional theory of how matter appeared to pass through matter in spiritualistic seances.⁵¹ When, in 1889, Chattock left Liverpool for a post as a lecturer in physics at Bristol, he no longer had Ramsay and Thompson as colleagues with whom to ponder physical and psychical questions, but he doubtless inspired his student (and later colleague) Arthur Tyndall to join the SPR. He did not manage to persuade any other students to do so, but in the 1890s he involved his charges Reginald Clinker and Edmund Wedmore in experimental tests of their own telepathic powers. This yielded some evidence of drawings and suits of cards being transmitted between the minds of individuals seated near each other.⁵² Clinker and Wedmore do not appear to have pursued their interest much further, but two other students of Chattock – Frank Burt and Francis Usher – did, and later published what would become frequently cited evidence of telepathy over hundreds of miles⁵³ (Figure 2.3).

Most physical–psychical scientists did not have Lodge's or Chattock's success in creating the "centres of interest" or otherwise encouraging psychical interest among others in their workplaces. By the mid-1870s,

1908', *JSPR*, vol. 14 (1909–10), pp. 36–40. On Fournier d'Albe see Ian B. Stewart, 'E. E. Fournier d'Albe's *Fin de siècle*: Science, Nationalism and Philosophy in Britain and Ireland', *Cultural and Social History*, vol. 14 (2017), pp. 599–620.

⁵⁰ Jane Smeal Thompson and Helen G. Thompson, *Silvanus Philips Thompson: His Life and Letters* (London: T. Fisher Unwin, 1920), pp. 331–2.

⁵¹ William Ramsay to George F. FitzGerald, 21 February 1886, 8/102, George F. FitzGerald Papers, RDS Library and Archives; Arthur P. Chattock to Oliver Lodge, 7 April 1888, MS Add. 89/23, OJL-UCL.

⁵² Arthur P. Chattock, 'Experiments in Thought Transference', *JSPR*, vol. 8 (1897–8), pp. 302–7.

⁵³ F. L. Usher and F. P. Burt, 'Thought Transference (Some Experiments in Long Distance Thought-Transference)', *Annals of Psychical Science*, vol. 8 (1909), pp. 561–600. See also Arthur P. Chattock to Oliver Lodge, 7 June 1907, MS Add. 89/23, OJL-UCL and William Ramsay to E. E. Fournier d'Albe, 13 December 1908, E. E. Fournier d'Albe Papers, Private Collection, Christine Fournier d'Albe.



2.2 The physical laboratory at University College Bristol in the mid-1890s. Arthur Chattock (second from right), Reginald Clinker (second from left) and other students are seen amidst standard apparatus for teaching electricity and magnetism. The image also testifies to the growing number of women admitted to university practical physics courses in the late nineteenth century. Reproduced by permission of University of Bristol Library, Special Collections (DM2765).

Stewart had developed interests in mesmerism, thought-reading, apparitions and psychic force and, in *Unseen Universe* and other works, upheld scientific arguments for the existence of an invisible universe intimately connected with the visible one.⁵⁴ This was the very period when the physicists Arthur Schuster and J. J. Thomson were students of his at Owens College.⁵⁵ Both joined the SPR in 1884, although Schuster terminated his membership after only four years and suspected that Stewart had been duped in his tests of thought-reading.⁵⁶ Far less successful than

⁵⁴ See Balfour Stewart, 'Mr. Crookes on the "Psychic Force"', *Nature*, vol. 4 (1871), p. 237. His interest in spiritualism evidently predated this, as suggested by his correspondence with Harrison in 1868–9: PRO BJ1/25, Records of the Kew Observatory, National Archives.

⁵⁵ On Owens College see Robert H. Kargon, *Science in Victorian Manchester: Enterprise and Expertise* (Manchester University Press, 1977), chapter 5.

⁵⁶ Arthur Schuster, *Biographical Fragments* (London: Macmillan and Co., 1932), p. 215.

Agents: PROF. CHATTOCK and R. C. CLINKER. *Percipient:* E. B. WEDMORE.

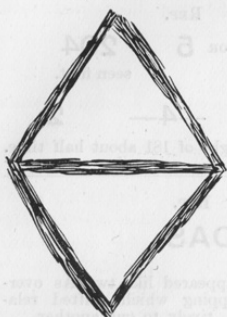
All in same room at Harrow, September, 1897. E. B. W. about 3 yards from agents with lamp and table between.

No. 1.

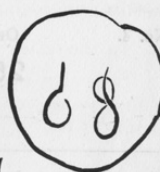
First Sitting.

ORIGINAL.

REPRODUCTIONS.



(a)



(b)

Obtained while the drawing was being made. The middle line was curved to show perspective as the outline suggested a toilet tidy. This and all further outlines and numbers were seen light on a dark background.

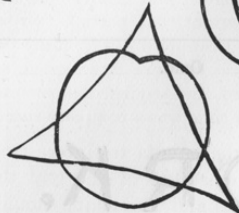
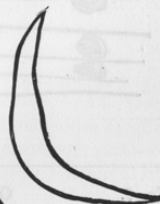
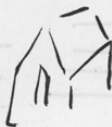
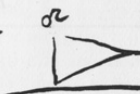
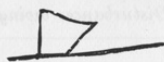
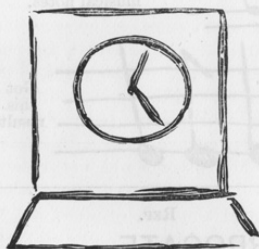
Remarks: "He's got it."
PROF. C.

E. B. W.

No. 2.

REPRODUCTIONS.

ORIGINAL.



2.3 Some of the drawings that Arthur Chattock and his students Reginald Clinker and Edmund Wedmore used in telepathy experiments. The left-hand pictures are those at which Chattock and Clinker (the 'agents') stared. Those on the right are the drawings of the

Stewart was William Thornton, a lecturer in electrical engineering at the Durham College of Science, who in the early 1900s grumbled to fellow Lodge associate Benjamin Davies that “there is a Psychical Research here somewhere not yet found. The people are very level headed & full of engineering as you might expect in the home of the Stevensons [sic]”.⁵⁷

In London there were very few “centres of interest” and this may have owed something to the power that the scientific naturalists wielded over metropolitan science.⁵⁸ The closest it gets is the Electric Telegraph Company, which employed at least three individuals with spiritualistic interests (Clark, Harrison and Varley); the privately run School of Submarine Telegraphy, whose founder, the telegraph engineer and spiritualist Desmond Fitzgerald, probably inspired the occult interests of at least one pupil (Kingsland); and St Thomas’s Hospital, whose Electrical Department brought together William H. Stone and his junior colleague Walter J. Kilner, who later built on Stone’s preoccupation with Reichenbach’s od in his technique of imaging the ‘human aura’.⁵⁹ However, there were plenty of other places in the capital where physical–psychical scientists could have, and were known to have, interacted. It is not unlikely that in the early meetings of the Society of Telegraph Engineers in the 1870s Varley and Clark would have paused to discuss

Caption for 2.3 (cont.)

mental impressions received by Wedmore, a ‘percipient’ sitting some 3 yards from the others. From Arthur Chattock, ‘Experiments in Thought-Transference’, *Journal of the Society for Psychical Research*, vol. 8 (1897–8), pp. 302–5. Reproduced by permission of Andreas Sommer.

⁵⁷ William M. Thornton to Benjamin Davies, n.d. [circa 1900], File 1, Box 2, BD-NLW. Thornton was referring to George and Robert Stephenson.

⁵⁸ See Dawson and Lightman, *Victorian Scientific Naturalism*, chapters 4–5 and 7.

⁵⁹ Latimer Clark to Michael Faraday, 29 April 1857, in Frank A. J. L. James (ed.), *The Correspondence of Michael Faraday Volume 5 November 1855–October 1860* (London: Institution of Engineering and Technology, 2008), pp. 221–3; Latimer Clark to D. D. Home, 11 May 1864, SPR.MS 28/82, Daniel Dunglas Home Papers, Society for Psychical Research Archive, Cambridge University Library; [Anon.], ‘The Presentation of the Harrison Testimonial’, *Spiritualist*, vol. 8 (1876), pp. 53–7; [Anon.], ‘Obituary. Desmond G. Fitzgerald’, *Electrician*, vol. 54 (1904–5), p. 21; William Kingsland, *The Art of Life and How to Conquer Old Age* (London: C. W. Daniel Company, 1934), p. 93; William H. Stone and Walter J. Kilner, ‘On Measurement in the Medical Application of Electricity’, *Journal of the Society of Telegraph Engineers*, vol. 11 (1882), pp. 107–28; Walter J. Kilner, *The Human Atmosphere; Or the Aura Made Visible by Means of Chemical Screens* (London: Rebman, 1911).

spiritualism, and perhaps continued the conversation with such members as Crookes, Walter Coffin, Desmond Fitzgerald, Lord Lindsay and Stone. Later in the decade, Varley, Clark and Stone could have continued the dialogue at the Physical Society of London, at whose meetings they would also have encountered the Society's co-founder Barrett, as well as Crookes, Lodge, Rayleigh, Robert Angus Smith and Stewart.⁶⁰

In London and, indeed, elsewhere, physical–psychical scientists were as likely to share psychical interests in private domestic spaces as in public institutions, not least because the former were the commonest types of space for seances and performances of other psychical phenomena. Crookes, for example, held regular 'at homes' for scientific colleagues at his Regent's Park residence and domestic laboratory, and it was here that Rayleigh, Huggins and others were known to have discussed and collaborated on spiritualistic investigation.⁶¹

The close association of the Sidgwick group with Cambridge University ensured that the institution was one of the most thriving centres of psychical interest, and we can easily place many physical–psychical scientists within it. A measure of Cambridge's importance derives from the fact that in 1884 a local branch of the SPR was established there, and this was graced by many of the university's most distinguished academics.⁶² Equally telling was the presence that psychical research had elsewhere in university life, including specialist magazines, debating societies and dinner parties.⁶³ An insight into the overlap of psychical research and academic sociability comes from the diaries of John Couch Adams, the Cambridge astronomer who joined the SPR in 1884 and who was a regular attendee at the local branch meetings and an avid reader of publications relating to psychical research and modern Theosophy.⁶⁴ Psychical research was undoubtedly a conversation topic at a dinner party that he attended at Henry and Eleanor Sidgwick's Cambridge residence in 1885. He was joined by not only Frederic Myers and his wife Eveleen, but Rayleigh and his wife Evelyn, and

⁶⁰ Rollo Appleyard, *The History of the Institution of Electrical Engineers 1871–1931* (London: The Institution of Electrical Engineers, 1931), pp. 34–7.

⁶¹ Crookes's 'at homes' are mentioned in Thompson and Thompson, *Silvanus Philips Thompson*, p. 153.

⁶² [Anon.], 'Cambridge Branch of the S.P.R.', *JSPR*, vol. 1 (1884–5), pp. 52–3, 180–1.

⁶³ See for example [Anon.], 'Mrs. Verrall on Telepathy', *Cambridge Magazine*, vol. 1 (1912), p. 111; [Anon.], 'Telepathy Again', *Cambridge Magazine*, vol. 7 (1917–18), pp. 97–8. For a recollection of a Cambridge Union debate on spiritualism see Walter Leaf, *Walter Leaf 1852–1897. Some Chapters of Autobiography* (London: John Murray, 1932), p. 93.

⁶⁴ On Adams see H. M. Harrison, *Voyager in Time and Space: The Life of John Couch Adams* (Lewes: The Book Guild, 1994).

another Cambridge astronomy professor, George Howard Darwin, who had attended spiritualist seances in the 1870s.⁶⁵

It was through the Cambridge Branch of the SPR that many of its members gained opportunities to test and debate psychical phenomena. J. J. Thomson recalled that in 1884 he participated in a seance given by Blavatsky in the King's College rooms of Oscar Browning, the Cambridge Branch's secretary. Blavatsky had accepted an invitation to visit Cambridge as part of the SPR's investigation of the psycho-physical phenomena associated with modern Theosophy. Like so many attendees at Victorian seances, Thomson was to be disappointed by his experiences. Having been informed by Blavatsky that an invisible Tibetan 'Mahatma', one of the mysterious sources of esoteric wisdom, would "precipitate a message, a cushion and a bell", he sat for over an hour and nothing happened.⁶⁶ However, as we shall see later in this book, Thomson's attendance at spiritualist seances at Myers's Cambridge residence over ten years later proved much more stimulating and perplexing.

Myers was, of course, one of Henry Sidgwick's many colleagues and students whose interests in psychical research were encouraged by the Fenland varsity's distinguished moral philosopher. There is some evidence to suggest that Rayleigh and Thomson – two of the leading physicists at the university – managed to follow the example of Sidgwick, whose college (Trinity) they both belonged to as undergraduates and fellows, and who became Rayleigh's brother-in-law when he married into the Balfour clan. By 1879, when he was appointed the Cavendish Professor of Experimental Physics and director of Cambridge's Cavendish physics laboratory, Rayleigh was convinced of the power of one mind to influence another by suggestion, and had investigated spiritualism, mainly in collaboration with the Sidgwick group.⁶⁷ Although he judged the results of his spiritualistic investigations of the 1870s to be inferior to Crookes's of the same period, he rejected the commonly held theory that the effects were due to hallucination and trickery. Rayleigh largely gave up active psychical investigation after the 1870s, but it is possible that his example inspired one research student at the Cavendish – Schuster – to take the question seriously. Given that Schuster had studied physics under Stewart and, in the early 1880s, collaborated with Rayleigh and Eleanor

⁶⁵ John Couch Adams, entry for 13 June 1885, Diary No. 18 (1885), Box 21, John Couch Adams Papers, St John's College, Cambridge. On George Darwin's spiritualistic experiences see Adrian Desmond and James Moore, *Darwin* (London; Michael Joseph, 1991), pp. 607–8.

⁶⁶ Thomson, *Recollections and Reflections*, p. 153.

⁶⁷ Lord Rayleigh, 'Presidential Address', *PSPR*, vol. 19 (1919–20), pp. 276–90; Rayleigh, *Third Baron Rayleigh*, pp. 65–8.

Sidgwick on painstaking measurements of the standard of electrical resistance, it would have been difficult for him to have entirely avoided the subject of psychical research.⁶⁸

J. J. Thomson, who shared with Schuster connections with both Rayleigh and Stewart, seems to have been much more successful in setting an example of a physical scientist who at least dabbled in psychical research. In 1884, he succeeded Rayleigh as Cavendish Professor and laboratory director and among the students that undertook research at his laboratory were many who either joined the SPR or developed some kind of psychical interest. These included Francis Aston, a physicist later renowned for his work on isotopes, and whose psychical interests may have already been nurtured by Lodge; William R. Bousfield, who had careers as a barrister and a physical chemist, and who in the 1920s appealed to the evidence of telepathy in an attack on philosophical materialism; William Cecil Dampier Whetham, who in later life was best known as an agriculturalist and historian of science; and Robert John Strutt (later the Fourth Baron Rayleigh), the physicist and future SPR president whose psychical interests probably owed more to his father and Sidgwick and Balfour relatives.⁶⁹

Another of Thomson's students, Daniel Comstock, an American who had careers in theoretical physics and electrical engineering, left a rare insight into the reasons why Thomson's approach to physics was relevant to psychical investigation. In 1965, the ageing Comstock recalled one of several "mental awakenings" that he had had as a Thomson student.⁷⁰ One such awakening was Thomson's insistence on clearly distinguishing fact from theory, and particularly the dangers of privileging theories of

⁶⁸ On the Cavendish and electrical measurement see Schaffer, 'Late Victorian Metrology'; Simon Schaffer, 'Rayleigh and the Establishment of Electrical Standards', *European Journal of Physics*, vol. 15 (1994), pp. 277–85. On Eleanor Sidgwick's scientific collaborations with Rayleigh see John N. Howard, 'Eleanor Mildred Sidgwick and the Rayleighs', *Applied Optics*, vol. 3 (1964), pp. 1120–2.

⁶⁹ The Cavendish work of Aston, Comstock and Whetham is discussed in Dong-Won Kim, *Leadership and Creativity: A History of the Cavendish Laboratory, 1871–1919* (Dordrecht: Kluwer Academic Publishers, 2002), chapter 5. Bousfield's and Rayleigh's major 'psychical' publications included William R. Bousfield, 'Telepathy', *Hibbert Journal*, vol. 20 (1921–2), pp. 497–506 and Lord Rayleigh, 'Presidential Address: The Problem of Physical Phenomena in Connection with Psychical Research', *PSPR*, vol. 45 (1939), pp. 1–18. For Bousfield see W. C. D. Dampier, 'William Robert Bousfield 1854–1943', *Obituary Notices of Fellows of the Royal Society*, vol. 4 (1942–4), pp. 570–6. For the Fourth Baron Rayleigh see Guy R. Strutt, 'Robert John Strutt, Fourth Baron Rayleigh', *Applied Optics*, vol. 3 (1964), pp. 1105–12.

⁷⁰ Daniel F. Comstock, 'Autobiography', typescript dated 1963–5, p. 19, MB 2014-1439; 112, Niels Bohr Library and Archives, American Institute of Physics. For Comstock's psychical investigations see Brian Inglis, *Science and Parascience: A History of the Paranormal 1914–1939* (London: Hodder and Stoughton, 1984), pp. 161–9.

puzzling phenomena (in this instance, those connected with the electrical discharge through gases) over strong evidence for such phenomena. For Comstock there was an important lesson in humility here that was immediately applicable to the puzzling but often well-documented phenomena of psychics. It warned against the “prejudice of the human mind which requires an explanation before believing in the phenomena, no matter how well authenticated”.⁷¹

Comstock may well have been present when, at a Christmas dinner at the Cavendish Laboratory in the early 1900s, research students sung a comic song praising the dynamical laws of physics for forcing “Dame Nature” to forsake her mysteries and anticipating Oliver Lodge’s ability to “investigate all spooks and their relations, / Then give them n -coordinates and use / Lagrange equations”.⁷² For many of those joining in, it was hard to avoid the extraordinary ambitions that Lodge, Thomson and other physicists had for the investigation of psychical phenomena, even if they thought such ambitions could be satirised via the far-fetched proposal of applying to such unpredictable effects as “spooks” the sophisticated mathematical techniques deployed by Cambridge-trained physicists to analyse vastly more predictable systems of material particles.⁷³

The satirical approach that many Cambridge physicists adopted towards “spooks” points to one of the problems with the argument that ‘physics and psychics’ was a predominantly Cambridge-based phase in Victorian science.⁷⁴ There were probably at least as many Cambridge physicists who were ambivalent about or hostile towards psychical investigation as interested in it. Neither John Henry Poynting nor Joseph Larmor had much interest in psychical research even though they praised Lodge’s courage in pursuing, and in helping to change scientific attitudes towards, the subject.⁷⁵ More decided in their opinions were two physicists who taught J. J. Thomson: George Gabriel Stokes and James Clerk

⁷¹ Comstock, ‘Autobiography’, p. 20.

⁷² A[lfred] A[rthur] R[obb], ‘A Function of Time’, in *Post-Prandial Proceedings of the Cavendish Society* (Cambridge: Bowes and Bowes, 6th ed., 1926), pp. 17–19, p. 17. Two of Thomson’s students who poked fun at psychical research were J. A. McClelland and J. S. Townsend. In the early 1900s they reputedly “hoaxed” other Cavendish researchers (including Ernest Rutherford) into believing that they had genuine telepathic powers: Lord Rayleigh, *The Life of J. J. Thomson* (Cambridge University Press, 1942), p. 132.

⁷³ On Cambridge mathematical physics see Warwick, *Masters of Theory*.

⁷⁴ This is one of the contentions of Wynne, ‘Physics and Psychics’.

⁷⁵ Joseph Larmor to Oliver Lodge, 7 January 1901, MS Add. 89/65(iii), OJL-UCL; Frederic W. H. Myers to Oliver Lodge, 19 February 1895, SPR.MS 35/1439, OJL-SPR. John Henry Poynting, ‘Biographical Sketch’, in Oliver Lodge, *Mind and Matter: An Address Delivered in the Town Hall, Birmingham* (Birmingham: Birmingham and Midland Institute, 1904), pp. 29–35. Larmor was evidently interested in Lodge’s investigations into the physical phenomena of spiritualism but denied that the SPR’s evidence for

Maxwell. A devout evangelical Anglican who adhered closely to the Bible, Stokes warned in 1893 that there was no foundation “in reason or Scripture” of the spiritualist claim that the future state and immortality of the soul could be established on a natural rather than a supernatural basis.⁷⁶ For this reason, he questioned the moral “lawfulness” of enquiring into “occult manifestations”.⁷⁷

One of Stokes’s most distinguished students, Maxwell, was pouring scorn on spiritualism and animal magnetism as an undergraduate at Cambridge in the 1850s. In an essay written in 1853, around the time that he praised Faraday’s intervention on table-turning, he lambasted phases of “dark science”, all of which involved “speciously sounding laws” that lacked sound “experimental proof”.⁷⁸ Animal magnetism was one of those dark sciences that merely “pretended to be physical sciences” by imitating the language of “popular physics” in its fluid theories, while spirit-rapping, despite offering the intellectually fruitful idea of a “spiritual medium” connecting minds, was no better than older dark sciences owing to the vulgar and absurd practices of “money-making media”.⁷⁹

Beyond Cambridge, there were many other practitioners of the physical sciences who expressed grave doubts about psychical investigation and who further challenge impressions of a generally harmonious relationship between ‘physics and psychics’ suggested in Tables 2.1 and 2.2. In the 1890s, the electrical engineer John Perry attacked Barrett and Wallace for not maintaining a “critical, cautious, unbelieving state” of mind and thereby falling for the “quackery” in psychical phenomena, whose reality Perry did not think was sufficiently probable to justify his attention.⁸⁰ In the same period, William Robert Grove, the chemist James Dewar and mathematician Thomas Archer Hirst reputedly agreed that Crookes was “once more ‘off his head’” for praising Lodge’s recent endorsement of

apparitions of dying persons was conclusive. See also Joseph Larmor to Oliver Lodge, 27 September 1905, Lm 1281, MS/603, Joseph Larmor Papers, Royal Society Archives.

⁷⁶ George G. Stokes, quoted in W. T. Stead, ‘The Response to the Appeal. From Prelates, Pundits and Persons of Distinction’, *Borderland*, vol. 1 (1893), pp. 10–23, p. 18. Stokes made a similar point in a warning to Barrett about disembodied spirits: George G. Stokes to William F. Barrett, 11 September 1880, f. 127, WFB-RS. On Stokes’s religion see Wilson, *Kelvin and Stokes*, pp. 74–99.

⁷⁷ Stokes, quoted in Stead, ‘Response to the Appeal’.

⁷⁸ James Clerk Maxwell, ‘Idiotic Imps’, in Lewis Campbell and William Garnett, *The Life of James Clerk Maxwell* (London: Macmillan and Co., 2nd ed., 1884), pp. 341–3, p. 341. See also James Clerk Maxwell to Charles Benjamin Tayler, 8 July 1853, in P. M. Harman (ed.), *The Scientific Letters and Papers of James Clerk Maxwell*, 3 vols. (Cambridge University Press, 1990–2002), vol. 1, pp. 220–1.

⁷⁹ Maxwell, ‘Idiotic Imps’, pp. 341–2.

⁸⁰ John Perry to Oliver Lodge, 29 August 1891, MS Add. 89/82, OJL-UCL. See also John Perry to Oliver Lodge, 25 June 1894, MS Add. 89/82, OJL-UCL.

psychical research in an address to the 1891 meeting of the British Association.⁸¹

The problem with Lodge's address was that it gave a scientific blessing to subjects that many scientists believed were, as William Thomson curtly expressed it in 1894, mostly "imposture and the rest bad observation".⁸² It was probably with this in mind that Huggins, who was president of the British Association meeting in 1891, warned Lodge against discussing psychical research in his address to Section A (physical sciences) of the Association. While agreeing that the subject was worthwhile, Huggins advised Lodge to drop it for the sake of his "own reputation & peace of mind" because the leading physical scientists would feel that the Association had been compromised.⁸³ Lodge ignored Huggins's advice, and little that he did subsequently in psychical research allayed the astronomer's doubts that he had rendered the subject fit for scientific audiences. By the early 1900s, for example, Huggins could ask Lodge's fellow Maxwellian Joseph Larmor: "are Lodge and Science, in respect of the occult, convertible terms?"⁸⁴

In the long run, psychical matters did seem to harm reputations. In 1895, Rücker told Lodge that Crookes's "relations to spiritualism" had aroused negative "comment" among those considering him for the distinguished position of president of the 1896 meeting of the British Association.⁸⁵ Eight years later, Lodge would have empathised with Crookes when Silvanus Thompson told him that his "dealings" with spiritualism had been a "continual stumbling block" to his nomination for a Nobel Prize.⁸⁶ Neither Crookes nor Lodge secured their respective scientific accolades but their advocacy of psychical research continued. Indeed, despite admitting in 1914 that his "occasional psychic utterances" harmed his scientific reputation, Lodge's interest in and advocacy

⁸¹ The Grove anecdote was recalled by Thomas Archer Hirst, entry for November 1891, Journal XXII, p. 2831, in William H. Brock and Roy M. Macleod (eds.), *Natural Knowledge in Social Context: Journals of Thomas Archer Hirst (1830–1892)* (London: Mansell, 1980).

⁸² William Thomson quoted in Stead, 'Response to the Appeal', p. 17. In recommending Varley to the Royal Society's Fellowship, Thomson (who had collaborated with Varley on patenting and working cable telegraphic inventions) opined that his want of scepticism weakened his scientific judgement but that his interests in mesmerism and spiritualism were not a "fatal objection" to his election: William Thomson to Edward Sabine, 23 March 1871, MC/9 f. 182, Royal Society Archives. Varley was elected later in 1871.

⁸³ William Huggins to Oliver Lodge, 9 August 1891, MS Add. 89/56, OJL-UCL.

⁸⁴ William Huggins to Joseph Larmor, 1 February 1909, in Barbara J. Becker (ed.), *Selected Correspondence of William Huggins*, 2 vols. (London: Routledge, 2014), vol. 2, pp. 474–6, p. 475.

⁸⁵ Arthur Rücker to Oliver Lodge, 3 March 1895, MS Add. 89/91, OJL-UCL.

⁸⁶ Silvanus P. Thompson to Oliver Lodge, 4 January 1913, MS Add. 89/104, OJL-UCL.

of the subject hardly diminished after this date.⁸⁷ Lodge's scientific critics may have underestimated the extent to which his psychical enquiries were driven by a host of scientific, philosophical, religious and other preoccupations and for that reason were more difficult to relinquish. This was hardly rare among physical-psychical scientists.

Gold Mine of Science, Handmaid to Faith

A simplistic interpretation of the informal networks analysed above is that individuals turned to psychical investigation because they were taught or otherwise 'influenced' by the likes of Lodge, Crookes and Barrett. This is obviously inadequate, since many who came within the orbits of these prominent physical-psychical scientists were either uninterested in or positively hostile to psychical subjects. To understand why some were 'influenced' we need to consider their other sources of motivation, which in the case of many physical-psychical scientists in Tables 2.1 and 2.2 are frustratingly difficult to establish.

One of the commonest motivations was the startling experience of a trusted friend, colleague, relative or other individual. In December 1869, for example, Crookes told Tyndall that such an experience prompted him to study spiritualism, having had only a limited, second-hand knowledge of the subject. About six months earlier, a Fellow of the Royal Society standing "in the foremost rank of experimental philosophers" had assured him that he had "witnessed phenomena alleged to be spiritual, which he was unable to explain by any known physical force".⁸⁸ The distinguished scientific colleague, who was probably the sanitation chemist Robert Angus Smith, persuaded Crookes to witness the phenomena for himself.⁸⁹ A few years earlier, Barrett's interest in mesmerism had been stimulated by John Wilson, a respected Irish member of the establishment employing both him and Tyndall, the Royal Institution, and who persuaded the incredulous young laboratory assistant to witness his mesmeric performances near his home in County Westmeath.⁹⁰ In 1881, not long after

⁸⁷ Lodge quoted in J. Arthur Hill, *Letters from Sir Oliver Lodge: Psychical, Religious, Scientific and Personal* (London: Cassell and Company, 1932), p. 49.

⁸⁸ William Crookes to John Tyndall, 22 December 1869, published in R. G. Medhurst (ed.), *Crookes and the Spirit World: A Collection of Writings by or Concerning the Work of Sir William Crookes, O.M., F.R.S. in the Field of Psychical Research* (London: Souvenir Press, 1972), pp. 232–4, p. 232.

⁸⁹ Smith's identity is suggested by a letter Crookes received from him about spiritualism in April 1869: E. E. Fournier d'Albe, *The Life of Sir William Crookes* (London: T. Fisher Unwin, 1923), p. 182.

⁹⁰ William F. Barrett, 'Some Reminiscences of Fifty Years' Psychical Research', *PSPR*, vol. 34 (1923–4), pp. 275–97, p. 282.

taking up his professorship at University College Liverpool, Lodge decided to intervene in the thought-reading craze when Malcolm Guthrie, a partner in a local drapery firm, asked him and other local scientists to witness the psychological power as developed by two of his employees. As a prominent figure in civic life and a “severe student of philosophy” whose own tests demonstrated “care and systematic vigilance”, Guthrie’s invitation was evidently difficult to refuse.⁹¹

George W. De Tunzelmann was rare among physical–psychical scientists because his introduction to psychical phenomena derived partly from his own powers. He seems to have become more interested in telepathy after convincing himself that he had correctly determined, independently of any other sensory channels, suits of cards in the minds of relatives.⁹² In the 1850s, fellow electrical engineer Cromwell Varley claimed to possess mesmeric powers and used them to entrance his wife, Ellen, who in this state answered questions that he had put to her purely mentally and reacted to silent mesmeric passes that he made through solid objects.⁹³ Ellen Varley was rare among the wives of physical–psychical scientists because she, like many mesmerised individuals, developed powers of spiritualist mediumship.⁹⁴ The professed spirits, who spoke through her and rapped out messages, impressed Varley with their ability to correctly predict the timing and nature of critical developments in her state of health. These were decisive in converting Varley from being a “hard-headed unbeliever” in spiritualism.⁹⁵

Varley’s argument for the genuineness of the communicating spirits hinged on his confidence that known explanations of their predictive power (including fraud and self-deception) were simply inadequate. Comparable appeals to the inadequacy of known explanations were expressed by Crookes, Barrett and Lodge in their early experiences of psychical effects. As an unofficial participant in the London Dialectical Society’s enquiry into spiritualism in 1869, Crookes “saw phenomena

⁹¹ Oliver Lodge, ‘An Account of Some Experiments in Thought-Transference’, *PSPR*, vol. 2 (1884), pp. 189–200, p. 189.

⁹² George W. De Tunzelmann, *A Treatise on Electrical Theory and the Problem of the Universe* (London: Charles Griffin and Company, 1910), pp. 626–32.

⁹³ Varley, ‘Evidence of Mr. Varley’, pp. 157–8. Cf. his friend Lord Lindsay, who in “mesmeric experiments” claimed to be able to communicate his will from England to Italy: Lord Lindsay to A. P. Sinnett, [1881], f. 82, Add. 45289B, Mahatma Papers, Volume VII, British Library.

⁹⁴ Desmond Fitzgerald’s wife and daughter were also mediums: ‘E. G.’, ‘A Test Séance with Mr. Williams’, *Medium and Daybreak*, vol. 3 (1872), p. 318. Crookes claimed that his wife once exhibited the power to write under the control of Faraday’s spirit: Crookes quoted in minutes for 5 July 1911, Minute Book Volume 7, Add. MS 52264, GC-BL.

⁹⁵ Cromwell F. Varley, ‘The Reality of Spiritual Phenomena’, *Spiritualist*, vol. 9 (1876), pp. 265–6, p. 256.

that could only be explained on the almost impossible supposition of gross fraud and collusion on the part of many ladies and gentlemen present” but also “occurrences which appear to be beyond the domain of any known physical force”.⁹⁶ The “occurrences” included the movement of untouched tables, intelligent rapping noises that responded to vocalised questions, and nebulous lights that floated in the air. During his mesmeric investigations with Wilson, Barrett observed that one young girl exhibited many of the common phenomena of the mesmeric trance (notably the community of sensation between subject and operator) but what really impressed him was her clairvoyance: she appeared to correctly describe playing cards hidden inside books and the interior of a London scientific instrument maker’s shop unknown to her, even though Barrett was satisfied that he was not giving away clues via unconscious facial or bodily gestures.⁹⁷ Lodge was equally satisfied with the conditions under which he tested the drapery assistants: the girls exhibited astonishing accuracy in their reproduction of simple images in his mind and of other “agents”, despite his “scientific belief” that “no collusion or trickery was possible under the varied circumstances of the experiments”.⁹⁸

Having had their first experiences of psychical phenomena, some physical-psychical scientists identified the parallels with historic evidence of ghost-seeing and supernaturalism.⁹⁹ Many were quick to identify potentially exciting sources of scientific progress. Thus, Crookes enthused to Tyndall in 1869 about glimpsing “something new and worthy of the notice of the man of science”, and these included “a power in some way connected with gravitation” and other unknown forces that, as he put it a few years later, were needed to “do the work of the universe”.¹⁰⁰ Barrett interpreted his mesmeric experiences as evidencing a “wonderful exaltation of the perceptive powers” transcending the widely accepted psycho-physiological explanations offered by Carpenter and others.¹⁰¹ Rayleigh was no less hopeful of ground-breaking results. During his early spiritualistic experiences, he opined to

⁹⁶ Crookes to Tyndall, 22 December 1869, in Medhurst, *Crookes and the Spirit World*, p. 233. As an unofficial participant, Crookes’s name was omitted from the Committee’s published *Report*: see *Report on Spiritualism*, pp. 373–95. See also William Crookes to Frederic W. H. Myers, 16 May 1890, SPR/Research/Crookes/1, Society for Psychical Research Archive, Cambridge University Library.

⁹⁷ William F. Barrett, ‘On Some Phenomena Associated with Abnormal Conditions of Mind’, *Spiritualist*, vol. 9 (1876), pp. 85–8.

⁹⁸ Lodge, ‘Account of Some Experiments’, pp. 192–3.

⁹⁹ William F. Barrett, ‘The Phenomena of Spiritualism’, *Nonconformist*, vol. 36 (1875), pp. 1017–20; William Crookes to ‘J. H. D.’, 10 May 1871 quoted in [Anon.], ‘Mr. William Crookes, F.R.S. on Disembodied Spirits’, *Spiritualist*, vol. 1 (1869–71), p. 161; Cromwell F. Varley, ‘Spiritualism’, *Human Nature*, vol. 3 (1869), pp. 367–71, p. 368.

¹⁰⁰ Crookes to Tyndall, 22 December 1869, p. 233; Crookes, *Psychic Force*, p. 5.

¹⁰¹ Barrett, ‘On Some Phenomena’, p. 86.

Henry Sidgwick that a “decision of the existence of mind independent of ordinary matter must be far more important than any scientific discovery could be, or rather would be the most important scientific discovery” if more people became interested in spiritualism.¹⁰²

Lodge was at least as interested as Crookes in the specific implications for physics. As he suggested in his address to the British Association meeting of 1891, the apparent capacity of untouched material objects to move by some unknown power (telekinesis) was a puzzle that the “orthodox scheme of physics” could not yet explain and was therefore a “line of possible advance” for this “King of the Sciences”.¹⁰³ It was the supposed possibility of extending the boundaries of the physical sciences, in theoretical, conceptual and experimental directions, that would sustain the interest of many other physical–psychical scientists in psychical investigation more than any other single factor.

Many physical–psychical scientists were certainly motivated by a strong sense of the duty of scientific practitioners to intervene on questions of social importance. The period in which the older physical–psychical scientists expressed this most vehemently was, not coincidentally, the same period when, as Frank Turner has shown, champions of the professionalisation of the sciences were making their most forceful arguments for the wider public utility of the sciences, whether intellectual, industrial, social, cultural or moral.¹⁰⁴ Carpenter, Faraday and others had already tried to show that psychical phenomena, and especially the physical phenomena of spiritualism, were among the issues where men of science could demonstrate their public utility, even if many commentators denied that their interventions had been satisfactory. Crookes’s acknowledgement of his public utility is clear from his manifesto for the scientific investigation of spiritualism, published in his own *Quarterly Journal of Science* in 1870. He regarded it as the

duty of scientific men who have learnt exact modes of working, to examine phenomena which attract the attention of the public, in order to confirm their genuineness, or to explain, if possible, the delusions of the honest and to expose the tricks of deceivers.¹⁰⁵

¹⁰² Lord Rayleigh to Henry Sidgwick, 7 June 1874, cited in Rayleigh, *Third Baron Rayleigh*, pp. 66–7, p. 67.

¹⁰³ Oliver Lodge, ‘Address’, in *Report of the Sixty-First Meeting of the British Association for the Advancement of Science Held in Cardiff in August 1891* (London: John Murray, 1892), pp. 547–57, pp. 554–5.

¹⁰⁴ Turner, *Contesting Cultural Authority*, pp. 203–5.

¹⁰⁵ William Crookes, ‘Spiritualism Viewed by the Light of Modern Science’, *Quarterly Journal of Science*, vol. 7 (1870), pp. 316–21, p. 317.

Having spent much of the 1860s championing the need for trained scientific expertise rather than mere “popular science” to solve such pressing problems as the cattle plague and water pollution, Crookes was on familiar territory when he contrasted the caution, exactitude and robust knowledge of “modern scientific men” with the methodological sloppiness and impoverished understanding of the “pseudo-scientific spiritualist”.¹⁰⁶

Crookes was certainly not alone in arguing, however, that even trained scientists, notably physiologists, were failing in their public duty because their interventions had clearly not been effective. In 1877, Barrett believed his intervention on spiritualism was a way of challenging the “flimsy explanations, varnished with half-truths, that pass muster at the hands of those psychologists who arrogate to themselves the sole right of instructing the public mind on this subject”.¹⁰⁷ Barrett’s sense of duty to the “public mind” was strongly rooted in his Christian faith. Like many Victorians, he feared that spiritualism posed a genuine mental and moral threat to the ignorant, credulous and uncultured. As this Congregationalist minister’s son warned in a leading nonconformist periodical in 1875, these were the individuals who suffered “mental derangement” after prying into secrets beyond the grave and had lost their moral compass by turning from Christ to a “new religion” based partly on the “lying and contradictory messages given through mediums” and whose best teachings comprised little more than “maxims about the progress of mankind”.¹⁰⁸

By 1875, Barrett was much more optimistic about spiritualism than he had been a few years earlier because of recent positive experiences of spirit-rapping and levitation taking place through the mediumship of a young Irish girl, and in broad daylight and other conditions that he believed precluded fraud and self-deception.¹⁰⁹ As far as he was concerned, scientific enquirers into spiritualism who were also devout Christians (such as himself) were better able to distinguish the facts upon which religious conclusions might be reliably based and had a

¹⁰⁶ Crookes, ‘Spiritualism Viewed’, pp. 318–19. On Crookes’s earlier campaigns see Brock, *Crookes*, pp. 53–60, 83–103, 267–97.

¹⁰⁷ William F. Barrett, ‘The Demons of Derrygonnelly’, *Dublin University Magazine*, vol. 90 (1877), pp. 692–705, p. 700n.

¹⁰⁸ Barrett, ‘Phenomena of Spiritualism’, p. 1020. Balfour Stewart, who read this article, echoed Barrett’s argument against spiritualism as a religion: Balfour Stewart to William F. Barrett, 2 May 1876, WFB-RS. Barrett later argued that the physical phenomena of spiritualism needed to be studied with great caution given that they were caused by an “intermediate race” of spiritual beings who, unlike higher spiritual agencies, were potentially “troublesome & dangerous”: William F. Barrett to Oliver Lodge, 18 October 1890, SPR.MS 35/60, OJL-SPR.

¹⁰⁹ See Barrett’s more sceptical position in [William F. Barrett], ‘Spiritualism and Science’, *Nonconformist*, vol. 34 (1873), pp. 445–6.

public duty to do so because it would prevent “thousands of people” being “deluded by the matter”.¹¹⁰ By 1875, he also was prepared to proclaim that spiritualism offered “objective proof” of the Pauline doctrine of the spiritual body, which for him constituted a welcome weapon against the “meshes of materialism” and an “entrance to” but not an alternative to Christianity.¹¹¹ By the 1890s, when the “dominant school of scientific thought” appeared to be “essentially, if not *grossly*, materialistic”, psychical phenomena presented a welcome “handmaid to faith” as well as a “perfect gold mine for scientific research”.¹¹² But, useful as spiritualism was in aiding the Christian idea of the soul’s *survival*, Barrett insisted, like most devout Christians, that the soul’s *immortality* was a matter of pure faith rather than of natural enquiry.¹¹³

Barrett recognised a close parallel between the Christian duty that he sought to fulfil by cleaning up spiritualism and the religious objectives of the *Unseen Universe*, a work co-authored by another strongly Christian-minded physicist with whom he often discussed spiritualism: Balfour Stewart. As we shall see in Chapter 3, one of the arguments of the book was that Christian miracles were not incompatible with scientific theories of the physical universe because the latter suggested the possibility of energy flowing from an unseen universe to the visible one with which it was intimately connected. Barrett insisted that the idea of spirit manifestations was only carrying this argument a “step further”, but Stewart and his co-author Tait were not so sure.¹¹⁴ On the one hand, they were convinced that spirit manifestations were subjective impressions of seance-goers in a state of “mental excitement”; on the other hand, they believed that the probable cause of these impressions – the power of one person to exert a direct mental influence upon another at a distance – was a “valuable inquiry”, evidently because this was congruent with the possibility of an invisible realm (in this case mental) acting on a visible one (the brain) at a distance.¹¹⁵ The strong interest that Stewart showed

¹¹⁰ Barrett, ‘On Some Phenomena’, p. 88.

¹¹¹ Barrett, ‘Phenomena of Spiritualism’, p. 1020.

¹¹² William F. Barrett, ‘Science and Spiritualism’, *Light*, vol. 14 (1894), pp. 539–40, 559–61, 571–2, 583–5, 595–7, on pp. 539, 559 and 571.

¹¹³ William F. Barrett, ‘Address by the President’, *PSPR*, vol. 18 (1903–4), pp. 323–50, p. 350.

¹¹⁴ Barrett, ‘Phenomena of Spiritualism’, p. 1020n.

¹¹⁵ [Stewart and Tait], *Unseen Universe*, pp. 42–3. See also Balfour Stewart to William F. Barrett, 26 December 1881, SPR.MS 3/A2/19, WFB-SPR. In 1871, Tait had publicly compared spiritualism to materialism as opposing examples of scientific “ignorance and incapacity”, with spiritualists denying that even the phenomena of “dead matter” were the subject of physical enquiry and materialists reducing everything to “physical manifestations”. Tait’s belief that spiritualism was “harmless folly” but that materialism was “pernicious nonsense” suggests his greater fear of materialism – a fear that would

in evidence for thought-reading, both before and after he joined the SPR, was undoubtedly driven by some of the religious goals underpinning his attempt to render Christian miracles physically intelligible.

By the early 1900s, Lodge was proving to be the heir of Barrett and Stewart in arguing that psychical research and ether physics gave scientific intelligibility to the idea of a realm beyond gross matter and of the capacity of the Divine Mind to guide humanity and the cosmos. Yet Lodge's *initial* interests in psychical research were not necessarily religious. Religion certainly occupied an important place in his youth: both his grandfathers were Anglican clergymen, he owed some of his early education to a devoutly Christian aunt, and he was profoundly impressed by what he later called the "mental and spiritual reality" behind the mundane world as evoked in Tyndall's physics lectures and the Reverend James Moorhouse's sermons, both of which he attended as a science student in London.¹¹⁶ If he did consider his investigations of thought-reading and trance mediumship another way of evincing this "reality" he was only prepared to discuss it publicly from the early 1890s, by which time personal "tuition" from his friend Myers had significantly challenged the materialistic worldview to which he believed leading scientific naturalists had confined him as a student.¹¹⁷

Lodge is not the only physical-psychical scientist whose turn to psychical enquiries is difficult to link directly or exclusively to religious motivations. We know, for example, that Rayleigh was a devout Christian, but can only assume that this contributed to his interests in psychical research. In 1911, he told one correspondent that he had "never thought the materialist view possible" and that his strong Christian faith had encouraged him to look to a "power beyond what we see, and to a life in which we may at least hope to take part".¹¹⁸ Although Rayleigh was never convinced that psychical research had produced conclusive scientific evidence of mind independent of the living brain (via telepathy or survival), the relevance of these areas of psychical investigation to his religious questions is undoubtedly one reason why he never questioned the importance of the enterprise. Other physical-psychical scientists were at least as devout: John Couch Adams was raised as a strict Wesleyan Methodist, Ramsay was a member of the Free Church of Scotland, Stratton was a prominent Unitarian, and J. J. Thomson practised private

prompt him to co-author the *Unseen Universe*. See Peter G. Tait, 'Address', *Report of the Forty-First Meeting of the British Association for the Advancement of Science; Held in Edinburgh in August 1871* (London: John Murray, 1872), pp. 1–8, p. 7.

¹¹⁶ Oliver Lodge, *Past Years: An Autobiography* (London: Hodder and Stoughton, 1931), p. 78.

¹¹⁷ Lodge, *Past Years*, p. 345. ¹¹⁸ Rayleigh, *Third Baron Rayleigh*, p. 361.

prayer and was a “regular communicant” of the Church of England.¹¹⁹ While it is not clear how much and in what way prior religious belief contributed to their psychical interests, they all seemed to have shared a theistic view of the cosmos and would have welcomed any new scientific evidence challenging philosophical materialism.

Crookes never expressed his Christian faith as strongly as Barrett, Lodge and Stewart, but in an early public statement about spiritualism he argued that while spiritualism could be “approached from the sentimental and theological side”, he felt he was better suited to studying its “scientific aspect”.¹²⁰ In many ways Crookes echoed the distinction that Tyndall made in 1867 between religious or emotional and scientific or intellectual approaches to the “credibility of physical facts” associated with miracles: questions about spiritualism that related to its phenomenal or physical aspects – notably the relationship between spirit and matter, the “powers” of spirit when “united” with matter and when free, and the capacity of “intelligent spiritual entities” to communicate with the living – needed to be undertaken by a “man of science” driven by “hard intellect alone” rather than “romantic and superstitious ideas”.¹²¹ When, in 1871, Crookes published these words, this ambitious chemist had a significant personal reason to ensure that “sentimental” motivations for studying spiritualism did not affect the desired image of a “hard” scientific enquirer he wanted to project: this was the tragic death of a younger brother in 1867, which surely contributed to his interest in the subject.¹²²

Crookes would not be the only physical–psychical scientist for whom bereavement played a role in encouraging psychical enquiries: in 1916, Lodge attended spiritualist seances after receiving news that his son Raymond had been killed in action on the Western Front. Raymond Lodge’s death, however, hardly explains Lodge’s ‘turn’ to spiritualism, since it was seances that he attended in 1889 that had privately convinced him of that key spiritualist teaching: the survival of the soul following

¹¹⁹ Chadwick, ‘Stratton’, esp. 290–1; Harrison, *Voyager in Space and Time*, pp. 12–13; Rayleigh, *Life of J. J. Thomson*, p. 285; Morris W. Travers, *The Life of Sir William Ramsay* (London: Edward Arnold, 1956), pp. 295–6.

¹²⁰ Crookes to ‘J. H. D.’, 10 May 1871 in [Anon.], ‘Mr. William Crookes’.

¹²¹ Tyndall, ‘Miracles and Special Providences’, p. 649; Crookes to ‘J. H. D.’.

¹²² In December 1870, some eighteen months after first attending seances, Crookes recorded in his diary the hope that he would “continue to receive spiritual communications” from his brother, Philip: Crookes quoted in Fournier d’Albe, *Life of Sir William Crookes*, p. 171. Fournier d’Albe claims that Philip’s death (aboard a cable-laying ship) brought William “into close touch” with Varley, who persuaded him to contact Philip by “spiritualistic methods” (on p. 133). This is unlikely given that Crookes does not seem to have known Varley particularly well until 1871. This is implied by William Crookes to Cromwell F. Varley, 10 July 1871 in [Anon.], ‘An Experimental Investigation of Spiritual Phenomena’, *Spiritualist*, vol. 1 (1869–71), pp. 180–2, p. 182.

bodily death. These were seances given by the American medium Leonora Piper, who was at this time being investigated by the SPR.¹²³ Piper seemed to be able to commune with the disembodied spirits of some of Lodge's dead relatives whose disclosure of accurate personal family information was, as far as the physicist was concerned, hard to explain by fraudulence, self-deception, telepathy (because the spirits revealed information that he had never known) or any of the "ordinary methods known to Physical Science".¹²⁴ Privately convinced that he had communed with personalities in the post-mortem state, Lodge waited until 1902 (when he was much more professionally established) to publicise his belief.¹²⁵ But for Lodge, as for Crookes, bereavement was only ever one of many sources of appeal of psychical enquiry.

Crookes and Lodge differed from Myers and Sidgwick, as well as from many other physical-psychical scientists, in not experiencing a crisis of religious faith from which psychical investigation promised a way out. For both Cromwell Varley and William Kingsland, psychical investigation far surpassed Christianity in the rationality of its answers to profound spiritual questions. In 1869, Varley explained that he had received an early religious education from the Christian sect, the Sandemanians, but that this had "wholly failed to satisfy [his] anxiety about the future".¹²⁶ Disembodied spirits, however, provided him with a better answer to one such anxiety. Having asked spirits "evidently more advanced" than himself why they had not given humanity "some scientific information in advance of any yet possessed by man", he was told that when they "telegraph to mortals" complex ideas, spirits put thoughts directly in the minds of mediums, but that these thoughts became distorted on being turned into words by the "mechanism of the brain and mouth".¹²⁷ This explanation was evidently "sound and logical" to the Atlantic cable engineer because it was entirely analogous to the difficulties of communicating complex information via encoded words on electric telegraphic mechanisms.¹²⁸

In 1900, Kingsland attacked the Christian faith in which he had been raised for casting the "so-called *spiritual* world as a region of experience

¹²³ On the Piper investigations see Gauld, *Founders of Psychical Research*, 251–68; Hamilton, *Immortal Longings*, pp. 200–12.

¹²⁴ Oliver Lodge, 'Account of Sitzings with Mrs Piper', *PSPR*, vol. 6 (1889–90), pp. 443–557, p. 443.

¹²⁵ Lodge, *Past Years*, p. 279.

¹²⁶ Varley, 'Evidence of Mr. Varley', p. 168. Varley's father, the inventor and landscape painter Cornelius Varley, shared his Sandemanian faith with Faraday. On Sandemanians and Faraday see Cantor, *Michael Faraday*.

¹²⁷ Varley, 'Evidence of Mr. Varley', pp. 168–9.

¹²⁸ Varley, 'Evidence of Mr. Varley', p. 168.

and action utterly unconnected with the facts of the so-called *natural world*” and making it a “region separate, apart, unknown save by special revelation, and unreachable save through the portals of the grave”.¹²⁹ Among the “facts” that he believed evinced this convergence of the spiritual and natural worlds were clairvoyance, mesmerism and other hidden powers of the human self that he believed physical science was unable to explore owing to its exclusive focus on matter and force. What especially appealed to this electrical engineer about modern Theosophy was that it was a “higher science” encouraging individuals to train their minds and bodies to apprehend and have a “practical knowledge” of the spiritual world over which established religions wielded questionable authority.¹³⁰

While some physical–psychical scientists had religious motivations for pursuing psychical enquiry, others had little or no such motivations. They joined those who, as Andreas Sommer has shown, had no doubt that psychical enquiry served purely physical and materialistic goals and who had little time for its potential religious significances.¹³¹ The “physical theory” of spirit manifestations that Fournier d’Albe explained in *New Light on Immortality* seems to have been driven more by a desire to explore the implications of electron theory than a concern with the credibility of Christian theology.¹³² In 1895, Oliver Heaviside, who at other times mocked Anglican clergymen and denied the Christian doctrine of the immortality of the soul, echoed the attitude of French physiologist Charles Richet when he insisted that the “abnormal phenomena” of spiritualism would ultimately be shown to have a “physical basis” and have no religious significance.¹³³ The person to whom Heaviside expressed this opinion was Lodge, who would have disagreed with such a purely physicalist goal, and objected to his fellow Maxwellian’s related

¹²⁹ William Kingsland, ‘Natural Law in the Spiritual World’, *Theosophical Review*, vol. 26 (1900), pp. 441–50, p. 441.

¹³⁰ William Kingsland, *The Higher Science* (London: The Theosophical Publication Society, 1889), p. 2.

¹³¹ Andreas Sommer, ‘Crossing the Boundaries of Mind and Body: Psychical Research and the Origins of Modern Psychology’, unpublished doctoral thesis, University College London, 2013, chapter 2.

¹³² Fournier d’Albe, *New Light on Immortality*.

¹³³ Oliver Heaviside to Oliver Lodge, 11 January 1895, MS Add. 89/50(ii), OJL-UCL. For Heaviside’s religious views see Oliver Heaviside, *Electromagnetic Theory Volume II* (London: The ‘Electrician’ Printing and Publishing Company’, 1899), p. 20 and excerpts of his writings in Rollo Appleyard, *Pioneers of Electrical Communication* (London: Macmillan and Co., 1930), pp. 254–7. See also Paul J. Nahin, *Oliver Heaviside: The Life, Work, and Times of an Electrical Genius of the Victorian Age* (Baltimore, MD: Johns Hopkins University Press, 1988), pp. 108 and 252.

belief that life and the soul were inextricably associated with matter and force.

Changing Attitudes to Psychical Investigation

Among the most striking aspects of Tables 2.1 and 2.2 are the different periods for which physical–psychical scientists showed an interest in psychical phenomena. Explaining these trends is limited by the fact that so many physical–psychical scientists left little or no insights into the origins or fate of their interest. Many of those that did provide insights seem to have abandoned psychical research for reasons that were shared by many other enquirers. Some quickly lost interest because of the perceived absurdity of spiritualistic manifestations and rituals, as well as the threat that such enquiries posed to their professional reputation.¹³⁴ Others partially or wholly withdrew after disappointing investigations. Dmitrii Mendeleev abandoned spiritualism after the scientific commission he was leading to investigate the subject in 1875 officially declared that the physical effects were due to mediumistic deception.¹³⁵ Ten years later, the American astronomer Simon Newcomb was already expressing reservations about psychical research that would eventually persuade him that the whole enterprise had been a waste of time. Addressing the American Society for Psychical Research, he warned that telepathy, unlike other rare phenomena in the history of the sciences, did not become easier to reproduce or reveal more information about underlying laws and conditions of appearance as investigations proceeded. Phenomena that defied this standard pattern of “scientific progress” were probably due to “accidental or unknown circumstances” rather than “any new law”.¹³⁶

Mendeleev’s withdrawal from spiritualism was partly driven by serious doubts about the scientific credibility of the methods that spiritualists and some professional colleagues had used when they obtained positive results from tests of mediums. William Ramsay found himself in a similar position. In 1914, he told Fournier d’Albe that he pitied the whole “spiritualistic affair” for being “so overlaid with fraud” and this was undoubtedly one reason why he had long given up pursuing it.¹³⁷

¹³⁴ Hans Thirring, ‘The Position of Science in Relation to Psychical Research’, *British Journal of Psychical Research*, vol. 1 (1927), pp. 165–81.

¹³⁵ Gordin, *Well-Ordered Thing*, pp. 87–96.

¹³⁶ Simon Newcomb, ‘Address of the President’, *Proceedings of the American Society for Psychical Research*, vol. 1 (1889–9), pp. 63–86, p. 78. Newcomb’s damning verdict on psychical research was in Simon Newcomb, ‘Modern Occultism’, *Nineteenth Century*, vol. 65 (1909), pp. 126–39.

¹³⁷ William Ramsay to E. E. Fournier d’Albe, 13 December 1908, E. E. Fournier d’Albe Papers, Private Collection, Christine Fournier d’Albe.

Moreover, the “affair” had put an unwelcome strain on his professional relationships. He recalled that in 1895, when the SPR had invited him to join Myers, Lodge, Richet and others in tests of the Italian medium Eusapia Palladino, he had declined partly because he did not want to be forced into a situation where he would have to “behave” in ways suggesting his distrust of cherished scientific colleagues.¹³⁸ At the time of the tests, however, he doubted his own investigative abilities too. As he explained to Lodge in 1894, he was “so distrustful” of his “own judgement in affairs prestidigital” that he felt it “imperative to be on one’s guard against deception”.¹³⁹

Ramsay was not the only physical–psychical scientist whose interest in psychical investigation appears to have declined or died out completely because of misgivings about their own areas of expertise. George F. FitzGerald, a close colleague of Ramsay and Lodge, had been happy to help Barrett and Lodge with occasional psychical investigations in the 1880s and early 1890s, but thereafter seems to have been content merely to speculate on physical theories of psychical effects rather than to investigate them. It was precisely in this latter period that he echoed Carpenter and so many nineteenth-century physiologists, psychologists and physicians in arguing that since psychical phenomena occupied a “borderland” in “close proximity to hysteria, lunacy &c” then its “proper students” were “physicians, not physicists”.¹⁴⁰ Similarly, in 1921, years after he had participated in investigations of Palladino, the American physicist Augustus Trowbridge declined an invitation to be involved in a new American Psychical Institute on the grounds that his “own interests and training lie so far away from the subject of psychical research”.¹⁴¹

Two of the most distinguished British physicists who participated in the SPR’s investigations of Palladino well illustrate a tendency among some physical–psychical scientists to remain steady in the level of their commitment to and interpretative positions on psychical investigation. Despite their relative inertness as SPR members, Rayleigh and J. J. Thomson remained optimistic about the value of psychical research until their deaths (in 1919 and 1940 respectively), not least in its potential to illuminate questions that they were still not satisfied had been settled. Thus, in the presidential address that he gave to the SPR only weeks before he died, Rayleigh insisted that while he had difficulties accepting

¹³⁸ Ramsay to Fournier d’Albe, 13 December 1908.

¹³⁹ William Ramsay to Oliver Lodge, 27 July 1894, MS Add. 89/88, OJL-UCL.

¹⁴⁰ FitzGerald quoted in Stead, ‘Response to the Appeal’, p. 19.

¹⁴¹ 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 idea of telepathy (because it represented a form of communication that seems to have escaped evolutionary development and was so different from speech and writing), “no pains should be spared” to establish its reality.¹⁴² In his 1936 autobiography, Thomson agreed that telepathy’s “transcendent importance” justified the need for further research and he shared Rayleigh’s humble acceptance that his own negative experience of Palladino’s mediumship was not necessarily the final word on the question of whether objects in seances could be moved by some unknown force.¹⁴³

Among the individuals to whom Thomson deferred on the question of Palladino’s mediumship was Lodge, who, like Barrett and Crookes but unlike Thomson, displayed interests in psychical research that grew stronger and more complex with time. He, Barrett and Crookes had embarked on psychical investigation with interests in specific questions: he and Barrett had started with the genuineness of thought-reading, while Crookes started with the reality of the physical phenomena of spiritualism. By 1900, all three had, through extensive personal experiences of psychical effects and close friendships with fellow psychical investigators inside and outside the SPR, become interested in a much wider range of phenomena: Barrett and Lodge were much keener on spiritualism than they had been when embarking on psychical investigation, and Crookes had developed an interest in telepathy and the purely psychological aspects of psychical research that he did not have when he started attending seances in the late 1860s. By the early 1900s, all three had become convinced by the evidence for telepathy, telekinesis and the survival of the soul following bodily death, and had therefore come to represent what Eleanor Sidgwick called the “forward” section of the SPR, as opposed to “hard-of-belief” section in which she and many other leading members of the organisation located themselves.¹⁴⁴

¹⁴² Rayleigh, ‘Presidential Address’, p. 288.

¹⁴³ Thomson, *Recollections and Reflections*, p. 158.

¹⁴⁴ Eleanor Sidgwick to William F. Barrett, 23 November 1905, SPR.MS 3/A4/115, WFB-SPR. By this time Sidgwick was more convinced of telepathy than of either telekinesis or survival, although she still believed telepathy needed to be replicated under conditions that ruled out chance coincidence, self-deception and fraudulence: [Eleanor] Sidgwick, ‘Presidential Address’, *PSPR*, vol. 22 (1908), pp. 1–18, pp. 16–17. By the early 1930s, however, she was more positive about survival: Sidgwick, ‘Society for Psychical Research’, p. 26. Barrett declared his belief in thought-transference in William F. Barrett, ‘Mind-Reading versus Muscle-Reading’, *Nature*, vol. 24 (1881), p. 212; in the direct action of mind on matter in William F. Barrett, ‘On Some Physical Phenomena, Commonly Called Spiritualistic, Witnessed by the Author’, *PSPR*, vol. 4 (1886–7), pp. 25–42, pp. 39–40; and in survival in Barrett, ‘Address by the President’, p. 350. Crookes had become convinced by telekinesis by the early 1870s: William Crookes, *Researches in the Phenomena of Spiritualism* (London: James Burns, 1874). He declared his belief in survival and telepathy in William Crookes, ‘Address by the President’,

A combination of old and new preoccupations defined their mature psychical interests. By the turn of the century, Barrett was even more strongly convinced than in earlier decades that psychical research presented an “inexhaustible mine for scientific research” which would be of “inestimable value in destroying a materialism” undermining the foundations of Christianity.¹⁴⁵ But Barrett’s interests in psychical research were much broader now. It was something whose results converged with a much wider range of religious and esoteric teachings than he had been prepared to accept before the 1900s (including Swedenborgian and modern Theosophical teachings on the soul).¹⁴⁶ It was also something that lent support to an optimistic view of life on earth, whether by giving credence to new theories that biological evolution was a progressive process partly directed by vital and psychic forces, or by suggesting that telepathy was a genuine faculty that, if allowed to evolve in humans, would accelerate the “sense of sympathy and humanity” in the world and lead to the amelioration of the kind of poverty that he had spent decades tackling in Ireland.¹⁴⁷

By 1900, Crookes was still interested in the physical phenomena of spiritualism but was very discreet about the results of the handful of investigations that he pursued in private.¹⁴⁸ Compared with the 1870s, the period of his most intense spiritualistic enquiries, he was now much more willing to accept that psychical phenomena required the skills of psychologists and conjurors, as well as physical scientists such as himself, because the physical effects they often involved depended so strongly on

PSPR, vol. 12 (1896–7), pp. 338–55, pp. 339 and 349. Lodge declared his belief in telekinesis in Oliver Lodge, ‘Experience of Unusual Phenomena Occurring in the Presence of an Entranced Person (Eusapia Palladino)’, *JSPR*, vol. 6 (1893–4), pp. 306–60, pp. 307–8. He announced his conviction of the reality of thought-transference in Oliver Lodge, ‘Thought Transference: An Application of Modern Thought to Ancient Superstitions’, *Proceedings of the Literary and Philosophical Society of Liverpool*, vol. 46 (1892), pp. 127–45; and in 1902 declared a “personal” conviction of survival, although this could not be justified in a “full and complete manner”: Oliver Lodge, ‘Address by the President’, *PSPR*, vol. 17 (1901–3), pp. 37–57, p. 49.

¹⁴⁵ William F. Barrett, *On the Threshold of a New World of Thought* (London: Kegan Paul, Trench, Trübner and Co., 1908), p. 14.

¹⁴⁶ William F. Barrett, *Swedenborg: The Savant and the Seer* (London: John M. Watkins, 1912); Barrett, *Threshold of a New World of Thought*, pp. 42–3n.

¹⁴⁷ Barrett, *Threshold of a New World of Thought*, p. 99. See also William F. Barrett, ‘The Psychic Factor in Evolution’, *Quest*, vol. 9 (1917–18), pp. 177–202. For Barrett’s charitable and humanitarian work see [Anon.], ‘W. F. Barrett, F.R.S.E., M.R.I.A., &c’, *Light*, vol. 14 (1894), pp. 439–41.

¹⁴⁸ In 1903, he told the SPR that for “many years” he had been trying unsuccessfully to “find some physical method of testing or measuring supernormal susceptibilities or capacities”: William Crookes cited in [Anon.], ‘General Meeting’, *JSPR*, vol. 11 (1903–4), pp. 152–7, p. 156.

the human mind and on possibly fraudulent human subjects. In 1898, he accepted the more widely used identification of psychical research as “Experimental Psychology” and thus signalled his acceptance that the field of inquiry he had helped to stimulate was more relevant to psychology than to physics.¹⁴⁹ A few years later, he reputedly believed that the “laws” governing the “radiations of Thought” underpinned “all occult phenomena”, which made the study of telepathy more important for discerning “psychical truth” than those more physical aspects of psychical research which had interested him for decades.¹⁵⁰ But Crookes, unlike FitzGerald, Trowbridge and others, never lost hope that physics mattered to psychical research, as revealed by his continued interest in physical theories of telepathy and a telegraphic apparatus that allegedly picked up wireless waves from the dead.¹⁵¹

Crookes’s later writings on psychical research included many defences of his earlier positive evidence of psychical phenomena, but also some unpublished and published pieces exploring psychical research’s wider significance.¹⁵² By 1897, he had written (but not published) an ‘Essay on Immortality’, a topic on which he had rarely touched before, and was much more interested in the way that psychical research underpinned the need for humility in the sciences, especially among those individuals whose overly “terrestrial” or materialistic perspective on the cosmos blinded them to the possibility of an “unseen world” transcending the limits of human faculties.¹⁵³ Crookes never seems to have questioned the capacity of spiritualism to provide emotional support, and, following the death of his wife in 1916, the grief-stricken scientist claimed to have gained conclusive evidence of communications from and photographic images of her spirit. Significantly, Crookes was prepared to declare his convictions in spiritualist periodicals and this represented a significant

¹⁴⁹ William Crookes, ‘Address by Sir William Crookes’, in *Report of the Sixty-Eighth Meeting of the British Association for the Advancement of Science Held at Bristol in September 1898* (London: John Murray, 1899), pp. 3–38, p. 32.

¹⁵⁰ Crookes cited in Harold Begbie, *Master Workers* (London: Methuen and Co., 1905), p. 220.

¹⁵¹ Crookes, ‘Address by the President’. In 1915, he tried unsuccessfully to replicate an electrical machine built by a British inventor, David Wilson, for detecting communications from spirits of the dead: Minutes for 6 October 1915, Ghost Club Minutes, Volume 7, Add. 52264, GC-BL.

¹⁵² An example of such defences is Crookes quoted in [Anon.], ‘Sir William Crookes on Psychical Phenomena’, *Light*, vol. 36 (1916), p. 397. He also expressed psychical interests in his brief memberships of the Theosophical Society and the Hermetic Order of the Golden Dawn: Brock, *William Crookes*, pp. 337–43. Crookes was particularly interested in the claim of the theosophists Annie Besant and Charles Leadbeater that they had used clairvoyant means to discern the constituents of atoms.

¹⁵³ Fournier d’Albe, *Life of Sir William Crookes*, p. 357; Crookes, ‘Address by the President’, p. 343.

change in the way he managed his public responses to spiritualism and personal tragedy since the 1870s.¹⁵⁴

One of the reasons why Crookes may have been more comfortable about revealing the way spiritualism had benefited him personally was Lodge's *Raymond or Life and Death* (1916).¹⁵⁵ This bestselling and controversial account of Lodge's positive evidence for the post-mortem existence of his son Raymond offered consolation to the millions who had lost loved ones in the First World War. It also represented the considerable broadening in Lodge's view of psychical research since he had embarked on the subject in the 1880s. In addition to a fearless acknowledgment of the emotional comforts that spiritualism had brought him personally, Lodge had developed a much stronger interest in the ways in which the results of psychical research constituted paths of advance in different sciences as well as in resolving the "outstanding controversy" between science and religious faith.¹⁵⁶ In myriad books, articles, public lectures and radio broadcasts appearing throughout the early decades of the twentieth century, Lodge tied psychical research to ether physics and biological vitalism, as well as to arguments for the scientific reinterpretation and justification of such fundamental Christian beliefs as the survival of the soul, the efficacy of prayer, and the guidance of humanity and the material cosmos by a benevolent God.

This chapter has argued that late-nineteenth- and early-twentieth-century practitioners of the physical sciences, broadly defined, showed an interest in psychical phenomena that was stronger and altogether more complex than historians have claimed. In some ways these physical–psychical scientists did not constitute an especially distinctive portion of the much larger number of individuals who pursued psychical phenomena between the 1850s and 1930s. They echoed more widely shared concerns for decisive verdicts on the reality and provenance of psychical phenomena, and pre-occupations with the potential of such phenomena to serve a host of scientific, religious, philosophical and emotional needs. Given the widespread interest in psychical phenomena, we should expect *some*

¹⁵⁴ Crookes quoted in [Anon.], 'Sir William Crookes' and Crookes quoted in [Anon.], 'Important Interview with Sir William Crookes', *International Psychic Gazette*, vol. 4 (1917), pp. 61–2, p. 62.

¹⁵⁵ Oliver Lodge, *Raymond or Life and Death* (London: Methuen and Co., 1916). For discussion see Rene Kollar, *Searching for Raymond: Anglicanism, Spiritualism and Bereavement Between the Two World Wars* (Lanham, MD: Lexington Books, 2000).

¹⁵⁶ Oliver Lodge, *Man and the Universe: A Study of the Influence of the Advance in Scientific Knowledge upon Our Understanding of Christianity* (London: Methuen and Co., 1908), pp. 1–24.

practitioners of the physical sciences to follow these trends. Yet we are still left with one unusual trend. The proportion of *physical* scientists in the early SPR and otherwise involved in psychical investigation is more than we might expect on the basis that this enterprise was more concerned with psychological than physical phenomena. Part of the explanation of this is that psychical phenomena seemed to represent *enough* of a physical puzzle to stimulate the interests of many practitioners of the physical sciences. Indeed, what chiefly distinguished these individuals from the large number of other psychical enquirers was their belief in the possibility that psychical phenomena represented a possible extension of the knowledges and practices of the physical sciences.

This chapter has had a distinctly British focus and this reflects the broad trends in Tables 2.1 and 2.2. The focus is partly due to the fact that psychical research, as embodied in the work of the SPR, was a largely British invention and British individuals dominated the enterprise well into the early twentieth century, even when varieties of psychical research were flourishing elsewhere (for example, *métapsychique* in France and *psychische studien* in Germany).¹⁵⁷ The achievements of the SPR in telepathy and other questions ensured that interest in psychical research was particularly strong in Britain, irrespective of whether individuals joined the organisation.

The SPR is, however, only part of the reason for the Anglo-centrism of physical–psychical scientists. It built partly on the achievements of earlier enquirers into mesmerism and spiritualism, among whom the most scientifically distinguished (and strategically useful to the organisation) were Barrett, Crookes and Varley. Their achievements and examples made a strong positive impression on a larger number of younger British physical scientists (for example, Lodge, Rayleigh and J. J. Thomson) who already admired the older individuals for their contributions to the physical sciences. The psychical interests of Lodge, Rayleigh, Thomson and others in turn impressed an even larger number of still younger British physical scientists, many of whom were their students or professional colleagues, and who followed their examples well into the 1920s and '30s. There is evidence to suggest that the creation of such favourable impressions on the controversial question of psychical phenomena owed much to face-to-face interactions, and for this reason physical scientists were more likely to be impressed by the psychical investigations of individuals with whom they could personally acquaint themselves (including

¹⁵⁷ On German *psychische studien* see Sommer, 'Normalizing the Supernormal' and Wolfram, *Stepchildren of Science*; on French *métapsychique* see Brower, *Unruly Spirits* and Lachapelle, *Investigating the Supernatural*.

those outside the physical sciences) than those much further afield.¹⁵⁸ This was surely a significant driver of a snowballing effect of psychical interest among late-Victorian British practitioners of the physical sciences, whether or not it was expressed through SPR membership.

What undoubtedly fuelled this effect was the fact that the scientific individuals most revered by British physical–psychical scientists included William Thomson, Stokes and Maxwell, who gave British physics an anti-materialistic and anti-deterministic edge by arguing that a proper scientific understanding of energy, ether and matter left open the possibility of mind, both human and divine, independent of matter. Although these leaders of British physics would not have approved of it, their interpretations created powerful new possibilities for the convergences between the theories of physics and the results of psychical enquiry. In Chapter 3 we study these convergences in detail.

¹⁵⁸ In 1874, Rayleigh told his mother that after an hour and a half's conversation with Crookes he had "no reason to doubt his trustworthiness" regarding the mediumship of Rosina Showers: Lord Rayleigh to Clara Elizabeth Rayleigh, 3 May 1874 in Rayleigh, *Third Baron Rayleigh*, pp. 65–6, p. 66. Even that arch-sceptic of spiritualism Tyndall revealed that after Varley had visited him in 1868, he was more willing to witness spirit manifestations that the telegraph engineer deemed worthy of his attention: John Tyndall to G. W. Bennett, 22 December 1869, in *Report on Spiritualism*, p. 265.