

Silvanus Phillips Thompson (1851–1916): An introduction to the spotlight section

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SPOTLIGHT SECTION

Silvanus P. Thompson: Quaker polymath and
public scientist-engineer

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Abstract

The extraordinary career of the British Quaker polymath, Silvanus Phillips Thompson (1851–1916), encompassed fame in physics, electrical engineering, mathematics, history of science, educational method, painting, music, textbooks, X-rays, popular lectures, the promotion of women's rights, book-collecting, and not least his leadership in encouraging fellow Quakers to embrace the challenging results of research in the natural sciences. His public-facing career, with a reputation that ranged across Western Europe at least, centred on the sincere yet critical communication of new technical and historical knowledge, in a mastery of four languages. Yet his kaleidoscopic work has not received any sustained historical examination since the *Life and Letters* produced by his widow Jane and daughter Helen in 1920. The centenary of his death was marked by an interdisciplinary workshop at the Westminster (Quaker) Meeting-House, “A Many-sided Crystal’: The Quaker Physicist and Electrical Engineer Silvanus Phillips Thompson” on September 16, 2016. This spotlight section of *Centaurus* captures four of the revised contributions to that event, and these cover Thompson's contributions to historical theory, biographical practice, and commercial technology, as just a few elements of the rich and complex legacy that emerged posthumously from his multifarious, polymathic talents. These collectively point us to a revised view of Thompson as a pre-First World

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War European figure who gained his authority not from specialization in a single area of esoteric research, but from a life of public service that integrated the literary arts and historical writing with sciences and engineering, all incorporated within an active Quaker practice. The papers in this collection thus show how Thompson came to be an historian of science with an unprecedented mastery of contemporaneous techno-scientific arts and sophisticated skills in historical-biographical writing, working harmoniously in a secular world with a rigorous yet non-dogmatic faith.

KEYWORDS

biography, centenary, electrical engineer, physicist, Quaker, Silvanus Thompson

What should the 21st century make of Silvanus Phillips Thompson? “SPT,” as this polyglot Quaker Yorkshireman was fondly known among his large international network of friends and correspondents, in fact set an example of pre-First World War scientific practice that is surely of interest today far beyond the British Isles. Born to a Quaker family in York, Northern England in 1851, he initially followed his father, Silvanus Thompson, into school teaching. But Thompson soon had independent ideas: pursuing music and especially painting to a very high level for an “amateur;” he took up the study of chemistry and latterly physics while a student in London in the early 1870s. After educational travels around Europe, he was elected a Lecturer in Physics at University College, Bristol in 1876, but found his way back to the capital in 1885 just as the great innovations of electrical engineering were prompting new interest in the applications of physics. Familiarizing himself with electro-technical works in French, German, Italian, and English, Thompson soon found how to use his polyglot expertise in physics to enhance both the education of young electrical engineers and the design of commercial power-generating machinery. But while he became a clear master of the textbook on that particular subject, and thus highly respected in the engineering world, it should be emphasized that Thompson also experimented widely with telephony, acoustics, optics, and radiography—even exploring on the effects of electricity on brain physiology. In all this he did not generally pursue a self-indulgent agenda of research for its own sake, but acted largely in response to current research trends in the techno-scientific world that he saw as potentially applicable to solving essentially human problems.¹

Shunning thus the late-Victorian and early-Edwardian move to specialization and self-advancement in his personal career, Thompson was more fundamentally a public servant of science. Committed to communicating the potential utility of others' recent discoveries and inventions in the physical sciences (especially electricity and optics) to the widest possible audience—far more than his own innovations—he equally encouraged both women and men to join the endeavour of creating and sharing useful technological knowledge. Dedicated, moreover, to challenging the hypocrisy and corruption of those in positions of power, not least those who would use their knowledge for the pursuit of warfare, Thompson's Quakerism was the deepest driving force in his life. While some believed that science and religion were engaged in inevitable conflicts of authority and epistemology, Thompson instead showed how their symbiosis could benefit all: not only did he show Quakers how and why they should embrace the secular authority

¹J. S. Thompson & H. G. Thompson (1920, pp. 62–123, 185–203, 253–277).

of natural science, but he showed how pursuing that natural science with practical Quaker values of unflinching sincerity and communal beneficence could bring unity and trustworthiness to a contested domain. It is no wonder that Thompson was honoured in his lifetime by learned societies from as far afield as Amsterdam, Bologna, Frankfurt-am-Main, Königsberg, New York, Paris, and Stockholm.²

Yet more than a century after his passing, Thompson's name and reputation across the world seem limited to—indeed inextricably entangled with—that of his friend, near namesake, and famous biographical subject, as a result of SPT's monumental two-volume *The Life of William Thomson, Baron Kelvin of Largs* of 1910.³ In that work, Thompson presented Kelvin as having a clearly identifiable and formidable legacy in thermodynamics, telegraphy, and electrical theory, a reputation sustained and cherished with little controversy for over a century since then. Yet the same could not quite be said of SPT's own, more elusive, posthumous reputation. Much more than just a Quaker biographer, Thompson was in fact much more diverse in his technical and creative accomplishments than Kelvin—a diversity, however, that made it harder to identify a simple clear legacy in a scientific world rapidly moving away from the values that Thompson's life epitomized.

Undeniably, Thompson was cherished in his own lifetime as an innovator in technical education, textbook-writing, and consultancies that brought his advanced knowledge of the physics of electromagnetism to the practical benefit of electrical engineers. Thompson is now mostly remembered (if at all) not as a scientist or engineer, but either as the mischievous author of *Calculus Made Easy*—a key example of his innovation in pedagogy—or as a rigorous historian and biographer of science.⁴ The few scholars since then who have looked deeply into Thompson's multifarious roles and initiatives in science, engineering, and the Society of Friends have turned to the richly documented *Life and Letters* published 4 years after his death by his widow and former journalist, Jane, and their daughter, Helen, herself university-educated in the natural sciences.⁵ One hundred years since that comprehensive publication, fresh approaches are surely overdue in trying to understand Thompson's often perplexing multi-stranded legacy.

While no full scholarly monograph has appeared on Thompson in the intervening years, two detailed studies have insightfully addressed Thompson's technical and educational works. Both have located Thompson as a figure whose achievements served his 19th-century audiences well, with a high degree of public authority as a Quaker scientist. Yet they also did this in a way that cast his achievements as an unusual phenomenon specific to the turn of the 20th century. Geoffrey Cantor noted that Thompson was rare among Quakers involved in natural sciences in taking an interest in the physical sciences, rather than in the botanical and medical knowledge that learned Friends most often directed to human welfare. As a well-informed mediator between the Society of Friends and the secular worlds of techno-science, Thompson was uniquely responsible for leading fellow Quakers to embrace new secular results emanating from the natural sciences at the turn of the 20th century.⁶

Noting Thompson's deep Quaker commitments, Anne Barrett and Hannah Gay also observed his unusual embeddedness—for a late 19th century Quaker—in the increasingly secular world of Victorian technological commerce.⁷ They showed how Thompson charmed his way through that world as one of the very last among Victorian polymathic gentlemen of science, equally at ease in both artistic and technical domains. He was a liberal generalist rather than an expert specialist; so we can surmise from Gay and Barrett's account that, had Thompson survived the Great War that he opposed so vigorously, he would not easily have found a place in the world of expert specialist technocracy that followed it.⁸

²J. S. Thompson & H. G. Thompson (1920, pp. 356–357).

³S. P. Thompson (1910). Thompson's name as biographer is still sometimes transposed with his subject: for example, Reville (2002).

⁴"F.R.S." [Thompson] (1912), which is still in print, many editions later. For biographies, see S. P. Thompson (1898, 1910).

⁵J. S. Thompson & H. G. Thompson (1920).

⁶Cantor (2005).

⁷While Quakers, as non-conformists, were barred from taking University degrees until the 1870s, Quakers importantly had long held major roles in British business: for example, the commercial manufacture of iron (the Darbys of Coalbrookdale) and latterly in chocolate (Cadbury in Birmingham and Rowntree in York). Walvin (1998).

⁸Gay & Barrett (2002).

The participants in this spotlight section “Silvanus P. Thompson: Quaker Polymath and Public Scientist-Engineer” gathered a century after Thompson's death (in the middle of the First World War) to re-consider his legacy. Certainly, among discussions at the Westminster Quaker Meeting-House in September 2016, there was no doubt that in his lifetime Thompson had been both a leading member in the “Society of Friends” and a major authority figure in many aspects of British *fin-de-siècle* techno-science and late-Victorian and Edwardian culture. Yet it was also clear that, as a Quaker, he would have had little time for the vanity project of autobiography, let alone countenancing the somewhat idolatrous and uncritical hagiographies that so often accompany a centenary commemoration. In that spirit, this collection of essays also shuns hagiography, while aiming to complement rather than displace Jane and Helen Thompson's *Life and Letters* as the canonical treatise. The contributors in fact show how deeply Thompson was immersed in the worlds of both historical-biographical writing and electrical technology—so intensely and effectively that, to the untutored eye, Thompson's work might easily be mistaken as that of a narrow specialist in just one of those fields.

Geoffrey Cantor's article “Thompson, Biographer” asks, whence came Thompson's skills in the intensely time-consuming art of biography skills?⁹ Cantor observes that Thompson's writing of biographies of Michael Faraday, Lord Kelvin, Phillip Reiss, and William Sturgeon showed (what still look to be) remarkable skill and sensitivity. Rather than treating the writing of the history of science as an inevitable corollary of scientific practice, Cantor points to some characteristic Quaker traits that informed the quality of Thompson's writings. These included both sincerity in pronouncement (a judicious proxy for the less attainable pursuit of absolute “truth”), and scrupulousness in critical attention to the details of narratives of technical innovation in order to do justice to all participants, not just the lucky winner of patent disputes. As Cantor explains, Thompson's trenchant source-critical methods made him a historian who is still worth reading today. Cantor also points us to the way in which Thompson highlighted the Quaker-like virtues of all four of his character studies, without ever turning the biographical narrative into hagiography. Characteristically, Thompson was much more interested in writing the lives of others, not his own. Whereas Thompson had no interest in self-aggrandizement, by contrast the autobiographies of the much longer-lived Oliver Lodge and Ambrose Fleming were more clearly written for personal vindication in seeking to ensure that the historical record might in future be written with a fair representation of their individual labours.¹⁰

In a related vein, Matt Stanley's article “No Slaves to Words: S. P. Thompson's Theory of History” explores how Thompson's practice of sincerity and boldness in his writing was much in keeping with such fellow Quaker intellectuals as J. Rendell Harris and Rufus Jones.¹¹ This practice informed his historical sensibility, in a period of difficult Quaker adjustment. This, in turn, enabled Thompson to articulate with considerable sophistication the complexities of the historical relationship between his science and his Quaker religion. Shunning dogmatic adherence to cherished interpretations of texts in either domain was, for Thompson, a route to respectfully ensuring no conflict between them: careful reflection on one's faith to adjust core commitments could be used to develop an accommodation with new science. Such was Thompson's nuanced approach that Stanley suggests it instanced what John Hedley Brooke later formalized as the “complexity thesis” in science–religion relations.

Looking beyond Thompson's faith as a Quaker, Stathis Arapostathis and Anna Guagnini write—in “Living in Between”—of Thompson's secular concerns with managing techno-scientific innovations across multiple domains.¹² Although on a narrow view of the prerogatives of the Quaker Society of Friends this might appear to be an incongruity, as a liberal Quaker, Thompson accepted the technology-related changes of modern life, especially in the electrical engineering of dynamo machinery, and did his utmost both to improve power-supply systems and to educate his students to do likewise. Yet where others were often stoical pragmatists, Thompson consistently rejected the corporate monopolism that bedevilled the capitalist foundation of the ever-expanding markets in electro-technics and telecommunications. In

⁹Cantor (2021).

¹⁰Fleming (1934); Lodge (1931). Some of Lodge's later historical writing perhaps shows signs of picking up from his friend Thompson the sensibility of detailed historical writing for a general audience. See Lodge (1922).

¹¹Stanley (2021).

¹²Arapostathis & Guagnini (2021).

keeping with others among his techno-scientific contemporaries, Thompson would not let injustice prevail in the attribution of credit in electrical engineering. He just happened to be more articulate and forceful about this in public than his non-Quaker fellow professionals. Thompson's engagement with the profitable world of technology was limited by one Quaker consideration: unlike the non-pacifist Lodge, Thompson would not use his research for any warlike activity.

Finally, Graeme Gooday's piece examines the complexity of Thompson's reputation both during his lifetime and in its posthumous aftermath.¹³ Cast by his contemporary bibliophile friends as a "Many-Sided Crystal," the sheer range and diversity of SPT's activities in art, literature, journalism, physics, engineering, education, and Quaker reformisms requires for us—more than for his contemporaries—some considerable degree of explanation. While Thompson was in many respects one of the very last of the eminent Quaker scientists of the Victorian period, the convictions of his faith lent him a crucially complementary rationale. As a dedicated public servant, Thompson always aimed to make best use of new science and technology for the benefit of the wider public. We must look thus to Thompson's *moral* convictions about the best use of techno-science to understand his multi-stranded life, rather than imposing retrospective presumption of any *epistemic* unity to his activities.

Reading these accounts together, we can thus avoid asking pointless questions about which of Thompson's many roles was his authentic identity: they were all genuine and either interlocked or complementary. Thus we do not need to approach Thompson's entangled set of practices through the anachronistic category of inter-disciplinarity: the valorization of disciplinary divisions and specializations therein is a phenomenon that post-dates Thompson's life. Instead, we can perhaps learn from Thompson's career how a humanitarian vision of physical science and technology could be shared as widely as possible for general benefit without overriding concern for personal wealth or fame. In the enormous collection of both Thompson's books and pamphlets held by the library of the Institution of Engineering and Technology (formerly the Institution of Electrical Engineers so beloved of Thompson), there is clearly still scope for a much deeper understanding of Thompson's evocative life.¹⁴ Such an approach can help the 21st-century history of science break free from the peculiarly 20th-century preconception that scientists or engineers necessarily pursued their own specialist research activities above all other considerations.

More than this, we can relate Thompson's case to some of the wider themes of history of science in our own time, to show why there should be broader interest in his career. First, rather than engaging in melodramas concerning the actual or hypothetical conflicts of epistemological authority between science and religion, Thompson energetically and non-dogmatically *lived* the Quaker life in a secular scientific world. The conflicts and controversies in which Thompson was intermittently embroiled did not concern whether archbishops or professors should have the last word in questions of human origins or destiny; rather, Thompson asked tough—if not always diplomatic—questions about the integrity of educational, engineering, and legal institutions when he saw evidence of unprincipled behaviour. This humanist critique of techno-science long predated the Great War that precipitated his premature death, and suggests that we could look to the ethical ramifications of Thompson's public Quaker career—not sectarian theological squabbling—as the key consequence of his faith-based practice.

Thompson's more immediately visible legacy, as Cantor emphasizes, lies in the rejection of hagiographical writing in history of science, in favour of biographical writing that undertook a critical and non-elitist examination of the character of his subjects. This epitomized a specific variant character of Victorian science evidenced by Thompson's life: knowledge was not and should not be the monopoly of learned institutions or elite academics. In ways that might well have discomfited his continental contemporaries trained in abstruse technical mathematics, Thompson believed that the only legitimate use for physical science was one that could serve the purposes of all. For a world that looks to an uncertain future in which the effects of techno-scientific excess have imperilled the long-term future of humanity, we could do well to refocus our understanding of the trajectory of science much

¹³Gooday (2021).

¹⁴The archive may be found online (<https://ietarchivesblog.org/category/s-p-thompson/>).

more in Thompsonian terms if there is to be any historian of science left to mark the bicentenary of his passing in the year 2116.

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