

Triangulating the Contributions of George Salmon to Victorian Disputes on Mathematics, Evolution, and Liberal Theology

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Given the intellectual potential represented by interdisciplinary investigations, it is disheartening to note the lack of scholarly attention paid to examining a conspicuous intersection of themes: the reception of Darwinism, the promotion of non-Euclidean geometry, and the contentious implications both engendered for religious belief. It would be unusual to find a Victorianist who could not claim some degree of familiarity with Darwinism and its reception; indeed, a wealth of literature attests to the profound nexus of cultural concerns embracing evolution and theology. Yet an essential, if generally acknowledged, dimension of this discourse is typically overlooked: mathematical debates over the necessary truths of geometry have fundamental relationships with better-known disputes between science and religion. Questioning the primacy of Euclidean geometry directly threatened the notion of absolute truth and precipitated a paradigmatic dilemma as unsettling as any attending the dissemination of evolutionary theories. Furthermore, Victorians representing various ideological constituencies adopted diverse strategies in responding to the spiritual challenges emanating from Darwin's terrestrial observations as well as deliberations on the transcendental nature of geometric reasoning. In this essay I emphasize the analytic potential of a framework that integrates mathematical discourses and more familiar post-Darwinian debates by adopting such in order to establish a definite location for the intellectual legacy of George Salmon (1819–1904). Of particular interest is the significant portion of his long academic career devoted to mathematical research and writing, work that garnered wide respect in its day. Equally deserving of consideration, although essentially forgotten, it is Salmon's commentary on evolution offered as a distinguished theologian that makes him an ideal subject for this recuperative undertaking.

Recent research justly reminds us of Salmon's status within the history of Victorian mathematics. In particular, Joan Richards identifies Salmon as a notable contributor to and point of reference for the public, professional, and pedagogical debates over non-Euclidean geometry. Nevertheless, readers of her work may fail to appreciate fully the precarious ideological position he maintained during his career. Salmon can be broadly characterized as one who insisted upon a traditional interpretation of the parameters defining acceptable mathematical investigations, as his resistance to the unconstrained advance of algebraic influences was rooted in a mathematical epistemology that privileged geometric reasoning (52–6). This impression is only reinforced by considering his relationships with others who refused to embrace Bernhard Riemann's approach to the study of geometry (95), which further undermined the discipline's dependence on Platonic idealism in its insistence that distance-measuring functions were integral to defining geometric spaces. Even so, his disquiet at the advance of transformative methodologies and modern axiomatizations must be acknowledged alongside other facts. Salmon (and others) served with Arthur Cayley and William Kingdon Clifford, who both worked at the frontiers of mathematical research, on a special committee of the British Association for the Advancement of Science (BAAS) charged with reevaluating geometric education (170–4; 178–9). This alone suggests that he was prepared to accommodate reforming sympathies on at least some level. Furthermore, one must also consider Salmon's notable sketch of Cayley for *Nature*, in which he praises the latter's algebraic skills (esp. 483). Indeed, passages addressing mathematics' creative relationships to artistic enterprises make it possible to analyze the piece as a worthy precursor to *A Mathematician's Apology*, G. H. Hardy's eloquent, twentieth-century defense of mathematical research (484). This thesis, advanced by John Heard, marks a renewed interest in Salmon by focusing attention on his participation in Victorian discourses that were integral to constructing an identity for a burgeoning group of "pure mathematicians."

In counterpoint to these observations, Rod Gow provides a primarily internalist account of Salmon's considerable influence within the spheres of mathematical education and communication. A preeminent writer of textbooks, Salmon produced a number of works that earned and influenced both domestic and international readerships. Gow's analysis of these, and other research papers, undoubtedly establishes a fitting context for appreciating the many professional accolades bestowed on Salmon, which included the Royal Society's prestigious Copley Medal and a tribute as the most popular mathematician of his day (Joly 355). However, little is made of the fact that he apparently lost interest in promoting the quaternionic system developed by his esteemed colleague William Rowan Hamilton, who eagerly sought his endorsement (Gow 63). That readers are offered no context for Salmon's reluctant engagement with the quaternions, which represent an important step in the development of vectors and computational methods employing them, only adds to the ambiguity surrounding his professional motivations. For example, one can reasonably ask: If the unconstrained production of new analytic tools is essential for the production of mathematical knowledge, as his piece in *Nature* would have its audience accept (484), then what could account for his position on the quaternions? Ultimately the extant scholarly interest in

Salmon, when taken collectively, obscures his precise situation within a radically shifting mathematical landscape. His activities, which can be drawn upon to exemplify both traditional and progressive currents within the discipline, therefore require a detailed exploration if these are to be used to demarcate an ideological domain that is at once professionally and culturally meaningful. I argue it is possible to achieve a coherent resolution to these concerns—one that highlights the consistent privileging of idealism and absolutist convictions through the policing of empirical or relativistic paradigms—by adopting a wider perspective that specifically engages Salmon’s theological writing in response to Darwinism.

Establishing a Context for Salmon’s Contributions

Embracing traditional religious beliefs, Enlightenment principles, and empiricism, natural theology represented the dominant milieu for spiritual discourse in Britain at the beginning of the nineteenth century. In particular, Thomas Malthus and William Paley figure prominently for advancing its constituent themes (Durant 13–18; Moore 307–14). The Malthusian thesis mandated that providential laws govern all aspects of Nature, laws that would overwhelm the impact of any human contrivance or interference. It therefore encouraged an adherence to orthodox Christian values as the only way to negotiate such laws in the pursuit of a fulfilling life. Alongside this dour view of humankind’s place in the universe, Paley focused attention on the benevolent wisdom inherent in its creation by insisting that such could be observed in the numerous though sometimes subtle ways that organisms were adapted to their environments, the well-known argument from design.

The famous Bridgewater Treatises of the 1830s, commissioned to celebrate “the Power, Wisdom, and Goodness of God as manifested in the Creation” (Chalmers xi), have often been adduced to exemplify an important cultural legacy of natural theology: it provided “a context in which scientific, economic, political, and theological discussions could be related” (Topham, “Beyond” 2). Even if an acceptable arena for discourse, natural theology at the time was far from homogeneous in terms of either the content or interpretation of contributions made in its name, and well before Darwin serious challenges had been raised against Paley’s argument from design.¹ By the 1840s British audiences had been exposed to Richard Owen’s version of transcendental morphology, which was influenced by both idealist and romantic naturalist precepts (Rupke, *Owen* 112–6, ch. 4). Stalwart supporters of natural theology didn’t welcome suggestions of morphological unity, as these diverted attention away from Paleyan functionalism and the esteemed tenet of a special creation. Also, Robert Chambers’ *Vestiges of the Natural History of Creation* (1844) helped to breathe new life into the Lamarckian concept of organic evolution, or “transmutation,” that many believed was effectively demolished by Charles Lyell in the 1830s (Secord 177–82). The implications for the fixity of species, another fundamental premise of natural theology, were clear to all. If an initial allure of natural theology was its willingness to enhance the evidential dimensions of religious apologetics, then it required considerable alacrity to maintain this appeal during the first half of the nineteenth century.