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Oxford mathematics at a low ebb? An 1855 dispute over examination results

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ABSTRACT

Between December 1855 and March 1856, a public dispute raged, in British national newspapers and locally published pamphlets, between two teachers at the University of Oxford: the mathematical lecturer Francis Ashpitel and Bartholomew Price, the professor of natural philosophy. The starting point for these exchanges was the particularly poor results that had come out of the final mathematics examinations in Oxford that December. Ashpitel, as one of the examiners, stood accused of setting questions that were too difficult for the ordinary student, with the consequence that, in Price's view, further mathematical study in Oxford – never as robust as in Cambridge – would be discouraged. We examine this short-lived affair, and use it not only to gain insight into the status of mathematical study in Oxford in the mid-nineteenth century, but also to point towards the increasing importance of competitive examinations in British public life at that time.

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1. Introduction

A useful, if rather idiosyncratic, source concerning Oxford in the nineteenth century is provided by the *Recollections* of the author George Valentine Cox (1786–1875).[1] Compiled in 1868, and drawing heavily upon a diary kept intermittently over several decades, Cox's *Recollections* meander through facts and anecdotes relating to life in the city and the university. In his chapter of 'Recollections from A.D. 1851 to A.D. 1856', Cox recorded the following:

> The beginning of Lent Term [1856] brought with it a long (and rather sharp) printed correspondence between Professor Price and Mr. Ashpitel of B. N. C. [Brasenose

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[1] G. V. Cox, *Recollections of Oxford* (London: Macmillan, 1868). On Cox, see: Alan Bell, 'Cox, George Valentine (1786–1875)', in *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/6524. Like all the other people mentioned in this paper, Cox also has an entry in the published register of Oxford alumni: Joseph Foster, *Alumni Oxonienses: The Members of the University of Oxford, 1715–1886: Their Parentage, Birthplace, and Year of Birth, with a Record of their Degrees: Being the Matriculation Register of the University, Alphabetically Arranged, Revised and Annotated*, 4 vols. (Oxford; London: Parker and Co., 1888), vol. 1, p. 308.

> College] about the total blank in the Mathematical *First Class List* of the preceding Michaelmas Term. Mr. Ashpitel represented the Mathematical Examiners on that occasion, and Mr. Price had been the private tutor of two or three men who (contrary to his expectation or calculation) had dropped into the second class. It is not pretended here to report the particulars of their squabble. If Examiners are fallible, the fact need not be exposed beyond their own body.[2]

In line with his closing comment, Cox said no more about the affair, but we are able to fill in a few more particulars from other sources. The first of the protagonists mentioned by Cox was Bartholomew Price (1818–1898), fellow and tutor at Pembroke College, and recently installed Sedleian Professor of Natural Philosophy, in which role he was responsible for the advanced teaching in applied mathematics that took place within the central university.[3] The other figure, Francis Ashpitel (1827–1897), was a mathematical lecturer at Brasenose College, and a former private pupil of Price's.[4] The point of contention that had arisen between the two was the state of the mathematical class list that had been published following the final mathematics examinations of Michaelmas Term 1855.[5] We reproduce the list here in Table 1, from which we see that of the eight candidates who received honours in mathematics that term, five were placed in the third class, with one in the second and two in the fourth, but none in the first.[6] Ashpitel had served as one of the three mathematical examiners that term, alongside Francis Harrison (1829–1912), fellow and mathematical lecturer at Oriel College, and William Spottiswoode (1825–1883) of Balliol College.[7]

Price's reaction to this poor list of results was one of sympathy for the candidates, but also of dismay at the damage that this might do to the image of mathematics at Oxford and to the encouragement of its study. In contrast to the situation in Cambridge,[8] where mathematics reigned supreme, the subject had traditionally enjoyed a rather lower status in Oxford, always

[2]Cox, *Recollections*, pp. 396–7.

[3]E. I. Carlyle, rev. M. C. Curthoys, 'Price, Bartholomew (1818–1898)', in *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/22741; Christopher D. Hollings, 'Bartholomew Price', in *Oxford's Sedleian Professors of Natural Philosophy: The First 400 Years*, ed. by Christopher D. Hollings and Mark McCartney (Oxford: Oxford University Press, 2023), pp. 111–40.

[4]Biographical sources on Ashpitel are, unfortunately, rather few; see: *Alumni Oxonienses*, and *Brasenose College Register, 1509–1909*, vol. I (Oxford: B. H. Blackwell, 1909), p. 539.

[5]At that time, the Oxford academic year consisted of four terms: Michaelmas, running from 10 October to 14 December; Hilary (or Lent), from 14 January to the day before Palm Sunday; Easter, from the Wednesday following Easter to the Friday before Whit Sunday; Trinity (or Act), from the day before Whit Sunday to the Saturday following the first Tuesday in July.

[6]The university's printed Latin class list may be found in the Bodleian Library as G. A. Oxon c. 71 (Papers relating to the proceedings of the university 1855), f. 296. It was also reproduced in English translation in *Jackson's Oxford Journal*, no. 5355, Saturday 15 December 1855, p. 5a.

[7]'The Rev. Francis Harrison', *The Times* (London), no. 39844, 12 March 1912, p. 11c; W.J. Lewis, 'Francis Harrison', *The Oriel Record*, September 1912, pp. 40–45; *idem*, *Notes on the History of the Parish of North Wraxhall, co. Wilts., with a Life of the Late Rector, Francis Harrison, M.A., at One Time Fellow, Dean, and Tutor of Oriel College, Oxford* (London: SPCK, 1913); A.J. Crilly, 'Spottiswoode, William (1825–1883)', in *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/26171.

[8]Oxford and Cambridge were England's only two long-established universities at this time, though the first half of the nineteenth century had seen the foundation of further institutions in Durham and London. Scotland, in contrast, had four long-standing universities, in St Andrews, Glasgow, Aberdeen, and Edinburgh.

Table 1. The mathematics class list for Michaelmas Term 1855.

Class I

Class II
Capes, William Wolfe, Queen's

Class III
Hicks, John Power, Lincoln
Marsham, Robert Henry Bullock, Merton
Rice, Charles Hobbes, St John's
Short, Ambrose, New College
Smith, Thomas Sharp, Exeter

Class IV
Morice, William Hallen, Jesus
Sandford, John Douglas, Trinity

placed second to classics.[9] Indeed, the latter was viewed by many as the essential centrepiece of a 'proper' liberal university education.[10] The merits of mathematical study had been protested loudly by a small number of prominent figures within the university during the first half of the nineteenth century,[11] but the classical bias was pervasive – so much so that even Price's predecessor as Sedleian Professor, George Leigh Cooke (1779–1853), had argued that students ought not to study 'too much' mathematics, lest it distract them from their classical and theological studies.[12] Mathematics and the sciences were seen as being less important for the rounded education that the university endeavoured to provide, since, it was supposed, they did not help students to develop a capacity for critical thinking.[13] It had been only very recently, with the reforms that the university had been undergoing during the 1850s, linked in large part to the improvement of scientific and mathematical teaching, that the status of mathematics had begun to recover.[14] To Price, an active

[9]On mathematics in nineteenth-century Cambridge, see: Andrew Warwick, *Masters of Theory: Cambridge and the Rise of Mathematical Physics* (Chicago: University of Chicago Press, 2003); Alex D.D. Craik, *Mr Hopkins' Men: Cambridge Reform and British Mathematics in the 19th Century* (London: Springer, 2007). On mathematics in Oxford, see: Keith Hannabuss, 'Mathematics', in *The History of the University of Oxford, vol. VII: Nineteenth-century Oxford, part 2*, ed. by M. G. Brock and M.C. Curthoys (Oxford: Clarendon Press, 2000), pp. 433–55; *idem*, 'The 19th century', in *Oxford figures: Eight Centuries of the Mathematical Sciences*, ed. by John Fauvel, Raymond Flood, and Robin Wilson, 2nd edn (Oxford: Oxford University Press, 2013), pp. 223–38.

[10]On the place of classics within the nineteenth-century Oxford curriculum, see: M. G. Brock, 'The Oxford of Peel and Gladstone', in *The History of the University of Oxford, vol. VI: Nineteenth-century Oxford, part 1*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 1997), pp. 7–71.

[11]Most notably by Baden Powell (1796–1860), Savilian Professor of Geometry, in his *The Present State and Future Prospects of Mathematical and Physical studies in the University of Oxford, Considered in a Lecture* (Oxford: W. Baxter, 1832).

[12]Cooke made this argument, advising that students ought to stop short of calculus in their mathematical learning, in the preface to his textbook: *The First Three Sections and Part of the Seventh Section of Newton's Principia, with a Preface Recommending a Geometrical Course of Mathematical Reading, and an Introduction on the Atomic Constitution of Matter, and the Laws of Motion* (Oxford and London: John Henry Parker, 1850). On Cooke, see: Anon, rev. Anita McConnell, 'Cooke, George Leigh (*bap.* 1779, *d.* 1853), in *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/6165; Christopher D. Hollings, 'George Leigh Cooke', in *Oxford's Sedleian Professors of Natural Philosophy*, pp. 93–110.

[13]Brock, 'Oxford of Peel and Gladstone', pp. 13, 16. The views cited here are summarised in: C. A. Ogilvie, 'On the Union of Classical with Mathematical Studies', *The Oxford English Prize Essays*, 4 vols., 1830, vol. 3, pp. 173–91.

[14]For general overviews of this period of reform, see: W. R. Ward, *Victorian Oxford* (London: Frank Cass & Co., 1965); L. W. B. Brockliss, *The University of Oxford: A History* (Oxford: Oxford University Press, 2016), ch. 9; Christopher Harvie, 'Reform and Expansion, 1854–1871', in *History of the University of Oxford, vol. VI*, pp. 697–730.

and visible participant in those reforms, and an experienced examiner himself, the debacle of the 1855 exam results risked undermining the efforts that he and others had been making in the promotion of mathematics.

It was his perception of the severity of the situation that prompted Price to respond to the class list publicly in the form of a letter to *The Times*, in which he commiserated with a disappointed candidate, and commented more generally on the potential for the discouragement of mathematical study in Oxford.[15] In a direct contrast to the view later expressed by Cox – that the dispute ought to have been carried on privately – Price had strong reasons for placing the matter squarely in the public domain.

Price's letter did not name the examiners involved, nor did it attempt to assign blame for the situation, other than in a generalized manner, and yet Ashpitel appears to have taken the criticism as a personal attack upon himself. He responded swiftly to Price, in a private letter that subsequently also appeared in *The Times*.[16] Ashpitel's tone was decidedly defensive and, as Cox noted, rather sharp; he appears to have felt betrayed by his mentor Price. However, nowhere in his response did Ashpitel address Price's concerns directly, and so the correspondence went through a further two rounds, slipping out of the newspapers and into pamphlet form, and becoming increasingly bitter, at least on Ashpitel's side.[17] Indeed, Price cited Ashpitel's asperity when finally closing down the correspondence at the beginning of March 1856.

The impact of Price and Ashpitel's public discussion of Oxford examinations is difficult to gauge; there are hints of it having prompted a more private parallel conversation within the university, but details are few. What a study of the affair does provide us with, however, is a window onto the status of mathematics within the Oxford curriculum in the mid-nineteenth century during a period of extensive reform, and insight into the discussions then surrounding its encouragement. A subject that had so often been neglected, at least in its advanced study, had been placed on a more secure footing, and yet at least

[15] *The Times* (London), no. 22236, Thursday 13 December 1855, p. 12d. The letter itself is dated 11 December 1855. It was subsequently reproduced in part in *Jackson's Oxford Journal*, no. 5355, Saturday 15 December 1855, p. 5a, and also published as a stand-alone pamphlet: *A Letter from the Sedleian Professor of Natural Philosophy, to a Candidate Disappointed in the Late Mathematical Examination* (Oxford: Baxter, 1855).

[16] Ashpitel's letter is dated 17 December 1855, and appeared in *The Times* (London), no. 22271, Wednesday 23 January 1856, p. 11a. It was reproduced in *Jackson's Oxford Journal*, no. 5361, Saturday 26 January 1856, p. 4e–f, and also in the pamphlet *Correspondence on the Subject of the Late Second Public Examination in the Mathematical Schools* (Oxford: J. H. and J. Parker, 1856).

[17] There are two responses by Price to Ashpitel's letter of 17 December: a long one, dated 1 January 1856, that appeared as part of the pamphlet *Correspondence on the Subject of the Late Second Public Examination*, as well as being printed in *Jackson's Oxford Journal* (no. 5362, Saturday 2 February 1856, pp. 4f–5a), and a much shorter one, dated 23 January 1856, that appeared in *The Times* two days after the publication of Ashpitel's letter (no. 22273, Friday 25 January 1856, p. 10c). Ashpitel issued a further letter to Price, dated 28 February 1856, in *A Reply to the Second Letter of the Sedleian Professor on the Subject of the Recent Examination in the Final Mathematical Schools* (Oxford: J. Vincent, 1856), after which Price closed down the correspondence with his *A Rejoinder to the Reply of the Rev. F. Ashpitel, M.A. Brasenose College: One of the Examiners, on the Subject of the Recent Examination in the Final Mathematical Schools* (Oxford: John Henry and James Parker, 1856), dated 5 March 1856.

one of its prominent advocates still deemed it sufficiently precarious to engage in such a conspicuous public defence as we describe here.

We begin the paper with an outline of the place of mathematics in Oxford during the first half of the nineteenth century, with a particular focus on the format of examinations, before turning to a biographical sketch of Price. The main part of the paper consists of an account of the dispute of 1855–1856. Insofar as is possible, we study the aftermath of the affair by looking to the subsequent careers of those involved, both examiners and candidates. We conclude with some comments on the state of mathematics in Oxford, and (with a view to future work) on the place of competitive examinations within wider Victorian public life.

2. Mathematics and Oxford examinations in the early nineteenth century

The expansion and reorganization of examinations at Oxford University during the first part of the nineteenth century is a rather convoluted tale, which we do not attempt to address in full here.[18] Rather, we confine our attention to the main developments pertaining to the examination of mathematics, and the ways in which these reflect the position of mathematics within the university.[19]

By the 1790s, the examination arrangements for the Oxford BA were, in the words of an anonymous commentator writing 70 years later, 'little better than a mockery'.[20] Ritualized oral examinations saw candidates present pre-prepared answers to standard questions, a process that came to be known as a 'wall-lecture', since the examiners generally remained only for the first part of the presentation, leaving the candidate to lecture to the walls.[21] This situation led to external criticism of the Oxford system.[22] In a bid to restore the university's academic reputation, a new examination statute was introduced in 1800, whereby candidates would be tested rigorously on aspects of a descendant of the traditional mediaeval liberal arts curriculum: grammar, rhetoric, logic, moral philosophy, mathematics, and the articles of the Church of England. Mathematics, at least to a certain level, was thus a part of the studies of every undergraduate student. In 1807, however, the first of many modifications to that 1800 statute mostly removed mathematics as a compulsory subject of study. At a distance of two centuries, the reasons for this change in statute are rather obscure, but this may have been part of an effort to thin out a

[18]See instead: M. C. Curthoys, 'The Examination System', in *History of the University of Oxford, vol. VI*, pp. 339–74.
[19]See also: Hannabuss, 'Mathematics'.
[20]*The Oxford Ten-Year Book, Made Up to the End of the Year 1860* (Oxford and London: John Henry and James Parker, 1863), p. 143.
[21]Arthur Engel, 'Emerging Concepts of the Academic Profession at Oxford 1800–1854', in *The University in Society, vol. I: Oxford and Cambridge from the 14th to the Early 19th Century*, ed. by Lawrence Stone (Princeton University Press, 1974), pp. 305–51 (p. 307).
[22]Asa Briggs, 'Oxford and its Critics, 1800–1835', in *History of the University of Oxford, vol. VI*, pp. 134–45.

crowded curriculum (which had been found to be time-consuming to examine rigorously, the examinations being conducted orally) in such a way that the all-important classics was preserved. The statute's re-emphasis of the works of classical authors and its wholesale rejection of more recent scholarship led contemporary critics to view the changes as an Aristotelian doubling down.[23] For the next several decades, candidates aspiring to an Oxford BA were required to sit final examinations in the classics (*literae humaniores*) honour school, which continued to include some elementary arithmetic and geometry on its curriculum. More advanced mathematical topics were transferred to the optional mathematics and physical sciences honour school, in which candidates might elect to sit final examinations for the additional accolade.[24] In practice, however, very few candidates sat mathematics finals: one estimate suggests that between 1807 and 1853 (the year of a further substantial change to the examination requirements), only 10–15% of undergraduates sat for mathematical honours.[25]

Even those candidates with sufficient interest and motivation to prepare for the mathematics examinations were not required to study to a particularly high level, as is illustrated by a story from the mid-1820s. The clergyman and Oxford graduate William Tuckwell (1829–1919) recorded in his *Reminiscences of Oxford* the experience of the moral philosopher Francis William Newman (1805–1897) in a mathematics examination of 1826. Newman had solved a problem by means of the analytical methods that were then making preliminary inroads from the continent into British mathematics,[26] but had been pulled up on this by one of the examiners, the Sedleian Professor, Cooke:

> Cooke […] pronounced that they could not […] pass beyond the Geometry of Newton; but [Robert] Walker, Experimental [Natural] Philosophy Professor, who probably of the three examiners alone knew the subject, persuaded his colleagues to let him examine Newman in the work he offered […][27]

Not only did Newman go on to gain a first in mathematics (alongside his first in classics), but he also impressed the mathematics examiners sufficiently that they

[23]The Rector of Lincoln College, Edward Tatham (1749–1834), was a particularly outspoken critic of the changes, arguing against it in a series of pamphlets, the first of which was *An Address to the Members of Convocation at Large, on the Proposed Statute on Examination* (Oxford, 1807); Bodleian Library: G. A. Oxon 4° 23 (1). In Tatham's view, the Oxford authorities had rejected mathematics because they were jealous of the heights to which it had been taken in Cambridge.

[24]One response to Tatham's pamphlets (see note 23) argued that the new examination arrangements were a good thing for those who wanted to demonstrate their mathematical ability: questions on mathematics would no longer be given short shrift at the end of a more general examination (Philalethes, *A Letter to the Rector of Lincoln College* (Oxford, 1807); Bodleian Library: G. A. Oxon b. 19 Box 2 ff. 379–82).

[25]Curthoys, 'Examination System', p. 352. It is difficult to be more precise than this because of the way in which the recording of information and the assignment of degrees changed over these decades.

[26]J. M. Dubbey, 'The Introduction of the Differential Notation to Great Britain', *Annals of Science*, 19 (1963), 37–48; Philip C. Enros, 'The Analytical Society (1812–1813): Precursor of the Renewal of Cambridge Mathematics', *Historia Mathematica*, 10(1) (1983), 24–47; Brigitte Stenhouse, 'Mary Somerville's Early Contributions to the Circulation of Differential Calculus', *Historia Mathematica*, 51 (2020), 1–25.

[27]W. Tuckwell, *Reminiscences of Oxford*, 2nd edn (London: Smith, Elder & Co., 1907), p. 204.

presented him with 'finely bound copies' of some continental mathematical texts by way of an additional prize.

Such conservative examination contributed to a mismatch between the mathematics that was taught and that which was examined. Students were first and foremost members of their individual colleges, where most of their teaching took place. In particular, they received the more rudimentary aspects of their mathematical education from their college tutors, with more advanced topics, such as calculus, being taught centrally by university-appointed professors. On the whole, however, it was only the topics taught within the colleges that appeared on the examination papers, leaving students with little impetus to attend the professorial lectures. Thus, we find figures such as Baden Powell (1796–1860), the Savilian Professor of Geometry, bemoaning the difficulties of mustering an audience for his mathematical lectures.[28]

As we see from Newman's case, however, there were at least some candidates whose interest in mathematics led them to study topics, either on their own or with a private tutor, that went beyond what they were expected to know. Moreover, the presence of Powell, Walker, and others indicates that there was a small subset of academics who were interested in promoting, and perhaps even raising the level of, mathematical study in Oxford. Indeed, it is from this group that subscriptions were raised at the end of the 1820s in order to found university mathematical scholarships whose purpose, in the first instance, was to promote further mathematical study among candidates who had recently completed their BA.[29]

By the beginning of the 1850s, however, matters were coming to a head with regard not only to the state of mathematics teaching in Oxford, but also that of scientific teaching more generally. The sciences, broadly speaking, formed little part of college teaching, and were mostly handled instead in centrally-organized professorial lectures. As such, the sciences were disproportionately affected by the problems then assailing the university's professoriate and its associated teaching. We have already noted the mismatch between teaching and examination. In addition, the eighteenth-century habits of absenteeism and pluralism persisted within the professoriate: it was not unusual for professors, all of them clergymen, to absent themselves from Oxford upon being presented to a comfortable parish, often in the gift of their college, elsewhere in the country; professors rarely gave up their chairs at this point, and only a few were conscientious enough to appoint a deputy to deliver their teaching.[30] The life of a parish priest could be relatively lucrative, at least compared with the

[28]Powell, *The Present State and Future Prospects*.
[29]Hannabuss, 'Mathematics', p. 446.
[30]The appointment of 'sublecturers' had been a more common practice during the previous century; see, for example, Allan Chapman and Christopher D. Hollings, 'A Century of Astronomers: From Halley to Rigaud', in *Oxford's Savilian Professors of Geometry: The First 400 Years*, ed. by Robin Wilson (Oxford: Oxford University Press, 2022), pp. 55–91.

increasingly inadequate professorial stipends provided by centuries-old endowments. There is little evidence, for instance, of Cooke having delivered any professorial lectures after his move in the 1820s to the parish of Cubbington near Leamington Spa, where he served as an active parish priest until the end of his life in 1853.[31]

The problem of scientific teaching at England's two ancient universities was placed into the hands of a Royal Commission, appointed by Lord John Russell's Whig government at the beginning of the 1850s.[32] Tasked with investigating the teaching and finances of the universities and their constituent colleges, the Commissioners' enquiries were not well received in Oxford. In many instances, the university and college authorities declined to answer the Commission's questions, and so when its report appeared in 1852, the evidence it contained had largely come from individuals with an axe to grind: junior fellows and college lecturers who usually had little voice in the running of the university.[33] This being said, there were some well-established Oxford figures among the Commissioners: Powell, for one.

To modern eyes, the changes recommended by the Commissioners don't seem so unreasonable.[34] At the heart of their suggestions lay the clear specification of the duties of each professor, the introduction of processes to ensure that the professors were indeed carrying out their statutory teaching, and preliminary suggestions as to how the finances unpinning the various chairs might be improved. With regard to mathematics, a significant point was the revitalization of the Sedleian Chair as a post devoted to the teaching of applied mathematics; Cooke's long neglect of his Oxford teaching duties had led one witness to the Commission, the geologist Nevil Story Maskelyne (1823–1911), to describe the Sedleian Professorship as 'practically obsolete'.[35] Change, however, was not immediate: the Act of Parliament that followed the Commission merely made recommendations, rather than compelling reform, and so it was largely ignored within the university.[36] Nevertheless, the grounds for reform had been prepared, and significant changes would slowly unfold over the following decades as further Commissions reported their findings and more effective bills passed through Parliament.[37]

[31]Hollings, 'George Leigh Cooke'.
[32]For a fuller account of this Royal Commission and its successors, as well as the reforms that eventually resulted, see: Ward, *Victorian Oxford*; Brockliss, *University of Oxford*, ch. 9.
[33]*Report of Her Majesty's Commissioners appointed to inquire into the State, Discipline, Studies, and Revenues of the University and Colleges of Oxford: together with the Evidence, and an Appendix* (London: W. Clowes and Sons for Her Majesty's Stationery Office, 1852).
[34]A brief summary of the Commission's recommendations may be found in: 'Oxford University Commission', *The Literary Gazette: A Weekly Journal of Literature, Science, and the Fine Arts*, 29 May 1852, pp. 449–51.
[35]Ibid., Evidence, p. 189. On the history of the Sedleian Chair and its place within the nineteenth-century reforms, see: Christopher D. Hollings, 'Four Centuries of Sedleian Professors', in *Oxford's Sedleian Professors of Natural Philosophy*, pp. 1–27.
[36]Engel, 'Emerging Concepts of the Academic Profession at Oxford', p. 333. For the Act itself, see: Oxford University Act 1854 (17 & 18 Vict. c. 81), <https://www.legislation.gov.uk/ukpga/Vict/17-18/81/contents>.
[37]Ward, *Victorian Oxford*; Christopher Harvie, 'Reform and Expansion'.

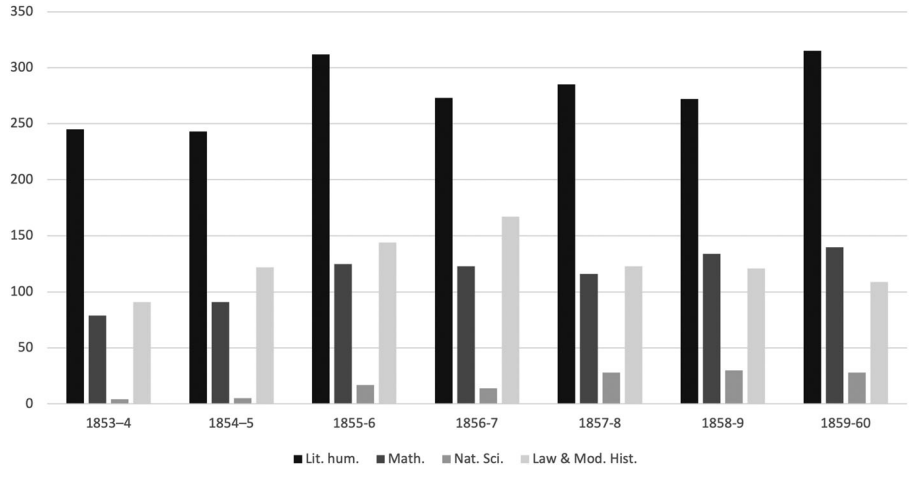

Figure 1. Numbers of Candidates Sitting Finals in the Four Oxford Honour Schools, 1853–1860.

Although not yet forced into reform, senior figures within the university recognized the political expediency of introducing changes of their own before less favourable measures could be forced upon them. Thus it was that the early 1850s saw the university more firmly acknowledge the existence of other fields of study beyond its narrow traditional remit: in 1853, two new honour schools were introduced, one in natural sciences, and the other in law and modern history. The examination requirements were also changed at this time: the final classics examinations remained compulsory (and continued to be so until 1864), but it now also became mandatory for candidates to sit finals in one other honour school of their choice. During the early years of these new arrangements, mathematics was a popular option for the second honour school, although the school of law and modern history quickly gained favour (Figure 1). In its first few examinations, the school of natural sciences suffered from issues of calibration in the level of difficulty of the papers set, but candidates could trust in the fairness of the school of mathematics – or so they thought.[38]

3. Bartholomew Price

One well-established Oxford figure who gave evidence to the Commission of the early 1850s was Price, who indeed was a life-long advocate of mathematical education and university reform. In his replies to the Commission, Price had proposed a careful demarcation of the duties associated with the various mathematical teaching posts within the central university.[39] In particular, he had

[38]Robert Fox, 'The University Museum and Oxford Science, 1850–1880, in *History of the University of Oxford, vol. VII*, pp. 641–91 (p. 669).
[39]*Report of Her Majesty's Commissioners*, Evidence, pp. 59–67.

placed the teaching of applied mathematics into the hands of the Sedleian Professor. He could not have known that within just a couple of years, Cooke would be dead, and Price himself would succeed to a Sedleian Chair that was being reformed in precisely the manner he had recommended. Elected to the chair in mid-April 1853, just a few weeks later Price was advertising his first lecture course (on analytical mechanics), to begin that October.[40] He would lecture, year in, year out, on a broad range of topics in applied mathematics until his retirement at the age of 80 in 1898.

By 1853, Price had been teaching mathematics at Pembroke College since the mid-1840s. Having entered the college as a student in 1837, he had graduated with a BA three years later. In doing so, he marked himself out as a candidate whose main interests lay in mathematics: he was placed in the third class in the classics examinations, but obtained a first in mathematics. During the early 1840s, he was a recipient of one of the university mathematical scholarships mentioned above, which helped him to remain in Oxford until he obtained his MA in 1843. A fellowship at Pembroke followed soon afterwards; indeed, Price would remain at Pembroke in various capacities until his death in 1898; for the last seven years of his life, he would be Master of the college. More generally, Price looms large as a prominent figure in university politics throughout the second half of the nineteenth century – in particular, he served on the university's governing council for over 40 years. Indeed, his influence in Oxford and beyond was such that his career has been summarized in the following terms:

> In life span he was close to Queen Victoria, comparable with her too in the way his personality quietly suffused the society in which he lived. He achieved nothing spectacular, but his dogged ubiquity is recorded in countless footnotes to the histories of nineteenth-century Oxford.[41]

Given the nature of his evidence to the University Commission, it is no surprise that Price went on to use his stature within the university to promote mathematical study. Unlike his Sedleian predecessor, Price produced a small number of original works in mathematics, but the greater part of his mathematical energies were devoted to its teaching. Already by the end of the 1840s, he had produced a textbook on calculus which would eventually be the first of four volumes covering differential and integral calculus and its applications to mechanical and other problems.[42] Reminiscences by Price's earliest students, even

[40]'University Intelligence', *The Times* (London), no. 21434, Saturday 21 May 1853, p. 6f.
[41]Peter H. Sutcliffe, *The Oxford University Press: An Informal History* (Oxford: Clarendon Press, 1978), p. 28.
[42]*A Treatise on the Differential Calculus, and its Application to Geometry: Founded Chiefly on the Method of Infinitesimals* (London: George Bell, 1848). The title page of the second edition (Oxford University Press, 1852) identified this as vol. I of *A Treatise on Infinitesimal Calculus: Containing Differential and Integral Calculus, Calculus of Variations, Applications to Algebra and Geometry, and Analytical Mechanics*. The subsequent volumes, all published by OUP, were: II – *Integral Calculus, and Calculus of Variations* (1854; 2nd edn, 1865), III – *Statics, and Dynamics of Material Particles* (1856; 2nd edn, 1868); IV – *The Dynamics of Material Systems* (1861; 2nd edn, 1889).

those whose enthusiasm for mathematics was minimal, paint a positive picture. For instance, one student, Philip Hedgeland (1826–1911), who entered Pembroke in 1846, asserted that '[t]he only lectures in my time worth a straw, were Price's', while Hedgeland's contemporary, Edward Redman Orger (1826–1917), recalled that 'Mr Price was conspicuous for his energy, and his constant efforts to induce men to read for Mathematical honours'.[43]

Price's influence on mathematical study in Oxford extended even beyond his rudimentary teaching in Pembroke and his more advanced lectures as Sedleian Professor, for he also acted as a private mathematical coach. Though considerably less widespread than in Cambridge, where the need was driven by the competitive nature of the Tripos examinations, the practice of mathematical coaching was nevertheless present in Oxford as well,[44] and Price became a well-known figure in this capacity. According to Orger, Price's Pembroke students were 'astonished at the numbers of out-College men [i.e. students of other colleges] who came to read with him privately'.[45] By thus extending his influence into the fundamental mathematical education of students of colleges other than his own, Price arguably became the central mathematical figure for the whole university. It was mainly as a private tutor that he was acquainted with several of the students (not to mention the examiners) who were caught up in the dispute of 1855–1856.

It remains to note one further aspect of Price's mathematical activities that is perhaps the most relevant for our present purposes, namely his duties as an examiner. On several occasions, starting in the late 1840s, Price served both as a 'moderator', with oversight of the 'moderations' examinations that took place early in a candidate's degree course as a qualifying hurdle on the path towards finals, and also as an 'examiner', a term that was reserved for the assessors of the final honour school examinations.[46] He also served at times as an examiner for the university's mathematical scholarships.[47] Given Price's wider concern for mathematical study in Oxford, it seems reasonable to speculate that his experiences as an examiner would have reinforced his desire to raise the standard of mathematical attainment, and to ensure that the examinations were a fair measure of candidates' abilities.

[43]Pembroke College, Oxford: Douglas Macleane Papers, PMB/T/5/5 (1/10), P. Hedgeland to D. Macleane, 17 July 1893; ibid., PMB/T/5/5 (1/24), 'Orger Recollections', f. iii.

[44]Indeed, the sense of the word 'coach' as a mathematical tutor had originated in Oxford (Warwick, *Masters of Theory*, pp. 89–90).

[45]Pembroke College, Oxford: Douglas Macleane Papers, PMB/T/5/5 (1/24), 'Orger Recollections', f. iii.

[46]Cf. the slightly different Cambridge terminology; see, for example, Christopher Stray, 'From Oral to Written Examinations: Cambridge, Oxford and Dublin 1700–1914', in *History of Universities: Volume XX/2*, ed. by Mordechai Feingold (Oxford: Oxford University Press, 2005), pp. 76–130. Over the course of his career, Price served as a mathematical moderator on four occasions (1852, 1856, 1868–9), and as an examiner thirteen times (1847–8, 1853–4, 1857, 1859–60, 1862–4, 1866–7, 1871); see: *The Historical Register of the University of Oxford, being a Supplement to the Oxford University Calendar, with an Alphabetical Record of University Honours and Distinctions, Completed to the End of Trinity Term, 1900* (Oxford: Clarendon Press, 1900), p. 814.

[47]The names of scholarship examiners are not recorded as systematically as those of moderators or finals examiners, but we find Price listed in that role in a university notice of 1850, for example (Bodleian Library, Oxford: G. A. Oxon c. 66 (Papers relating to the proceedings of the university 1850), no. 35).

4. The dispute

At the end of Michaelmas Term 1854, Price completed his fourth stint as a finals examiner.[48] His co-examiners that term were the Savilian Professor of Astronomy, William Fishburn Donkin (1814–1869), and Henry Pritchard (1820–1857) of Corpus Christi College.[49] Of the three, Donkin was by far the most experienced, this being his sixth stint as a mathematical examiner; Pritchard, in contrast, had taken on the role for the first time that year, although he had served as a moderator on one prior occasion.[50] At the end of 1854, however, both Donkin and Price stood down and were replaced by Ashpitel and Spottiswoode. Neither of these latter two had served as a finals examiner, or even as a moderator, before,[51] although they had both served alongside Price as examiners for the mathematical scholarships on at least one occasion each.[52] As Price would later observe, this experience fitted Ashpitel and Spottiswoode well for identifying top candidates, but not so well for fairly assessing the less accomplished students. Thus, at the beginning of 1855, the university found itself with a relatively inexperienced set of mathematical examiners. Their first mathematical honours class list, for Easter Term 1855, shows a spread of results, although it is skewed towards the lower end (two firsts, one second, one third, and six fourths), a fact that fed into Price's concerns later that year. If any one examiner dominated over the others at these examinations, it seems reasonable to suggest that it would have been Pritchard, as the relatively experienced member of the trio, and also as the most senior: he had obtained his MA in 1844, in contrast to Spottiswoode's 1848 and Ashpitel's 1852. Those Easter Term exams, however, were Pritchard's last, and he was replaced in turn by Harrison, another untried finals examiner, again with experience only of examining for the mathematical scholarships.[53] Going into the examinations of the following Michaelmas Term, the mathematical examiners had only one shared term of finals examining experience between them. The result was the poor class list that appears in our Table 1.

Although not directly involved in the examinations on this occasion, Price would surely have taken an interest in the results, not least because of his personal knowledge of at least some of the candidates. His response to the class list

[48]The word 'stint' is being used here rather loosely to refer to any calendar year in which an individual served as an examiner (the way in which this information is recorded in the university's *Historical Register*). In some cases, the examiner served in both of the terms in which finals examinations were sat (Michaelmas and Easter), but in others just one.

[49]W. J. Harrison, rev. I. Grattan-Guinness, 'Donkin, William Fishburn (1814–1869)', in *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/7813; *Alumni Oxonienses*, vol. 3, p. 1155 (Pritchard).

[50]*Historical Register*, pp. 663, 815.

[51]Ibid., pp. 588, 853.

[52]Spottiswoode examined for the scholarships alongside Price and Powell in 1850 (Bodleian Library, Oxford: G. A. Oxon c. 66 (Papers relating to the proceedings of the university 1850), no. 35), while Ashpitel filled the role in 1854 (ibid.: G. A. Oxon c. 70 (Papers relating to the proceedings of the university 1854), no. 70).

[53]*Historical Register*, p. 710. Harrison examined for the scholarships alongside Price and Ashpitel in 1854 (see note 52).

was, as we have seen, the letter to *The Times* that sparked his further exchanges with Ashpitel.

Dated 11 December 1855, Price's letter appeared in *The Times* two days later, and was introduced as being 'to a candidate disappointed in the late mathematical examination'.[54] The candidate was addressed simply as 'My dear H–', but this was presumably John Power Hicks (1833–1895), about whom we will say more below. In the letter, Price expressed his 'surprise and sorrow' upon having seen the class list the evening before, and also indicated immediately that his sorrow was not confined solely to a spirit of commiseration with the candidates, but also 'on account of the discouragement which [the class list] gives to mathematical studies at Oxford'. He went on:

> It has been with difficulty, as you know, that mathematical science has been able to maintain its position here; it has required much fostering care, and all the inducements which could be afforded to it by bare honours […]

Price was concerned that the receipt of 'such small fruit in the University award' after years of study could only serve to discourage the pursuit of mathematics in Oxford, and that 'with one or two more such trials', it might be 'well nigh extinguished'. Thus, Price sought publicly to stress that examinations ought to be, and ought to be *seen* to be, a fair test of candidates' abilities. The skewing of the results from the preceding Easter Term may already have had an effect, for we learn from Price's letter that one of the Michaelmas Term candidates had in fact withdrawn from the honours examinations, apparently in anticipation of a poor outcome. The candidate in question must have been John Douglas Sandford (1832–1892), whose fourth in mathematics was in fact an 'honorary fourth', a classification that could be bestowed at the examiners' discretion upon candidates who were deemed worthy, even if they had only sat for a pass degree. Overall, at least three of the candidates (including Sandford) were known to Price from his Sedleian lectures and his private coaching, and he asserted that 'they were […] not below the average of candidates for honours in this school', having all previously attained firsts in mathematics moderations.

In making his comments on the examinations, however, Price carefully walked a fine line. As a former examiner himself, and a newly-elected member of university council, he did not want to criticize the Oxford examinations system as a whole, nor perhaps to undermine the new arrangements that were the result of hard-won reforms. While commiserating with his addressee, Price was clear that there could be no form of redress for the candidates – the decisions of the examiners had to stand.[55] Nor did Price seek to impugn the *character* of the examiners, asserting instead that all of them were 'gentlemen of principle and the highest intellectual attainment'. All of them were Price's

[54] *The Times* (London), issue 22236, Thursday 13 December 1855, p. 12d.

[55] Unlike in the corresponding examinations today, there was no rescaling to take account of particularly easy or difficult papers – the examiners' marks were absolute.

former pupils, so he was 'able personally to bear witness to their mathematical attainments', and their suitability therefore as examiners. In his view, the error that had been made was one of judgement: the examiners had simply set the difficulty level too high, and had not tailored the examinations sufficiently to the teaching, and in particular to the standard textbooks, that they were supposed to assess. They had failed to take into account the needs and abilities of 'a student of ordinary calibre', with papers that contained many unseen problems and little bookwork.[56] Price concluded his letter by once again addressing the disappointed candidate directly, noting that although nothing could be done, he hoped that a public recognition of the affair might offer 'some slight consolation'.

Any reply from the disappointed candidate has gone unrecorded. Nor do we have any idea how either Spottiswoode or Harrison reacted to Price's letter. Ashpitel's response, however, is abundantly clear, for he appears to have taken the letter as an attack on himself, and was particularly upset – perhaps not unreasonably – that Price had chosen to raise his concerns in so public a manner. Ashpitel first replied to Price privately in a letter dated 17 December 1855, and this was subsequently printed in *The Times*, as well as in a pamphlet published by Price, containing Ashpitel's letter (with permission) and his own further response thereto.[57]

The tone of Ashpitel's reply is set by its first paragraph, in which he complains that Price's original letter had been 'ungenerous, and full of misrepresentations'. There is also a sense of betrayal in Ashpitel's words: we learn from his letter that it had been Price who had recommended Ashpitel as an examiner in the first place, in light of their shared experience of examining for the mathematical scholarships, but now Ashpitel felt that his fitness as an examiner was being questioned. With regard to the level of the examination papers, Ashpitel held that he had simply applied the standards that he had learnt from studying with Price. Considering Ashpitel's choice of words throughout, and the extent to which he took Price's letter as a personal affront, one could be forgiven for concluding that he had been the sole examiner. Other than a clarification at the beginning of the letter that he was writing for himself alone, there is no mention of the others.

Writing in general terms, Ashpitel answered Price's criticisms, focusing in particular on the supposed lack of bookwork in the examination papers, something that he refuted outright. He also denied that high achievement at moderations was an accurate marker of success in finals, and, perhaps forgetting Price's examination experience, disputed that tutors could have any firm idea of how their pupils would perform in examinations: the tutor judges

[56]It is unfortunate for our present purposes that the examination papers (of which there were ten in total) do not appear to have survived.

[57]*The Times* (London), no. 22271, Wednesday 23 January 1856, p. 11a; *Correspondence on the Subject of the Late Second Public Examination*.

capabilities, while the examiner judges achievements. Perhaps blinded by a need to defend himself, Ashpitel appears to have entirely missed the point of Price's original letter: nowhere did he address the potential discouragement of mathematical study. In conclusion, he did at least acknowledge the need for faith in the examination system, but at the same time he appears to have misconstrued Price's purpose, complaining about private tutors who try to 'interfere and decide for themselves the Classes of their Pupils'.

Perhaps because Ashpitel had failed entirely to address the central issue of Price's original critique, the latter felt compelled to respond, and to do so in such a way as to keep the matter within the public sphere. Thus, Price published the pamphlet mentioned above, containing Ashpitel's letter of 17 December, and his own reply, dated 1 January 1856. In the first place, Price was at pains to justify and reiterate his reasons for publishing the original letter, even though one of the examiners involved was a 'highly valued friend' (namely Spottiswoode).[58] Price noted, however, that it was 'with reluctance' that he had 'laid aside private feeling' in the interests of '[j]ustice to the disappointed Candidates'.[59] He confirmed that, with the possible exception of Sandford, all of the affected candidates had attended his Sedleian lectures, and also addressed the wider issue of encouraging mathematics:

> I, in common with very many others, take interest in the promotion of Mathematical studies at Oxford; and I knew that a strong sense existed with many of the Mathematical teachers, that such discouragement would be caused by the late Examination Papers, and by the award of the Examiners consequent upon them.[60]

Moreover, Price was already aware that, in light of what had happened in December, 'some students immediately proposed to discontinue their Mathematical studies'.[61] Taking a firm stand on the fairness of the class list was therefore imperative.

Again trying carefully to attack neither individuals nor the institution, Price stressed that the examiners had done nothing wrong as far as the examination statute was concerned, but suggested that the problem had arisen because of their inexperience not only as examiners, but also as teachers: Ashpitel and Harrison had each only been teaching at their respective colleges since about 1853, while Spottiswoode appears to have done little teaching at all.[62] The upshot of this collective lack of experience was, in Price's view, that none of them had any 'practical knowledge of the capacities and attainments of ordinary students'.[63] At the same time, in a bid to counter Ashpitel's perception that

[58] *Correspondence on the Subject of the Late Second Public Examination*, p. 7.
[59] Ibid., p. 8.
[60] Ibid.
[61] Ibid.
[62] Obituaries of Spottiswoode credit him with only a little teaching: 'he gave lectures for a term or two at Balliol' (*The Times* (London), no. 30858, Thursday 28 June 1883, p. 6c–d).
[63] *Correspondence on the Subject of the Late Second Public Examination*, p. 10.

he was being defamed, Price offered praise for the former's mathematical abilities, and acknowledged that he had indeed recommended him as an examiner, in light of his breadth of knowledge of the syllabus, on the basis of which he had obtained a first in mathematics in 1849. As his co-examiner for the mathematical scholarships, Price had found Ashpitel a 'diligent and careful' colleague, who set questions that were 'original, although hard'. It appears that Ashpitel had himself been a very mathematically-focused undergraduate, if we may judge by the fact that he did not receive honours in classics. Price recalled, moreover, that Ashiptel's undergraduate reading had 'greatly exceeded the limits which Candidates for Honours in the Public Examination usually attain to'. But it was precisely in Ashpitel's mathematical abilities that Price found the heart of the problem with the examination papers:

> You must not make your reading the measure of the extent of that which Candidates for Honours usually reach; any more than it is fair for you to make your ability the standard of theirs.[64]

A substantial part of Price's reply to Ashpitel consists of his correcting a great many statements that had been made by the latter in which he had either misquoted or misrepresented Price's words. By this point, Price had also looked again at the examination papers. He reasserted his original judgement of their level and lack of bookwork, but now also found a number of errors within the questions, which he described in detail. These ranged from careless inaccuracies such as the omission of details necessary for the set-up of a given problem, to misprints that rendered questions either nonsensical or unsolvable. Nevertheless, in Price's view, '[m]any of the questions [were] extremely good, and […] much to the credit of the Examiners' – they just didn't cater for the full range of abilities among the students.[65] In once again stressing that the examiners' decisions must be taken as final, Price was keen to point out to Ashpitel that he had 'not impugned the correctness of your Class List, as consequent upon the answers which you received to your questions'.[66] In the future, however, the value of the class lists would be 'impaired, if the students themselves do not generally recognize them as fair criteria of their merits'.[67]

The letter printed in Price's pamphlet was not his only reply to Ashpitel's communication of 17 December. As we have noted, the latter was printed in *The Times* on 23 January; a one-paragraph response from Price appeared in the same forum two days later.[68] The pamphlet was probably in preparation at this time, and so perhaps Price sought to keep his side of the argument alive in the public arena until it could be published. This suggestion is supported by the fact that, although Price's short note added nothing substantially

[64]Ibid.
[65]Ibid., p. 21.
[66]Ibid., p. 22.
[67]Ibid., p. 21.
[68]*The Times* (London), no. 22273, Friday 25 January 1856, p. 10c.

new to the discussion, he did use the opportunity to stress the magnitude of the issue at hand:

> The question is one now of great public importance; for when examinations, both competitive, and as tests of qualification are being introduced into all branches of public service, it is necessary that the result of them should merit public confidence.

The context for Price's comment here is probably the introduction of competitive examinations for entry into the civil service, a point to which we shall return below.

The final instalments in the Price-Ashpitel exchange were printed only in pamphlet form, perhaps because their increasing length made them unsuitable for newspaper publication. In a pamphlet dated February 1856, Ashpitel attempted a detailed rebuttal of Price's criticisms of the examination papers.[69] The result, however, was more of a personal attack on Price than a rational discussion of the content of the papers. Ashpitel played semantic games, trying to catch Price out in self-contradiction, and he still did not acknowledge Price's main point concerning the discouragement of mathematical studies in Oxford. When Price responded with his own further pamphlet in March 1856, it was clear that there was little new to say, and that the tone of the correspondence was deteriorating on both sides.[70] Each had accused the other of 'asperity' in their writings, and it seems that the letters were no longer being exchanged privately ahead of publication, as they had been since Ashpitel's first response.[71] At this late stage, Price could do little but add a few further details to his criticism of the examination papers, condemning more directly than previously the 'carelessness' of the examiners.[72] In bringing the correspondence firmly to a close, Price gave a glimpse of a parallel discussion that must have been going on, much less publicly, within the university:

> The time for another Examination is drawing near; and it is desirable that the confidence of all […] should be restored. The Authorities have thought right to nominate into the Board of Mathematical Examiners, in the place of one whose term of office has expired, a Gentleman of mature years, great experience, and sound judgment, and the University may place confidence in that judgment.[73]

The new examiner alluded to here was the university's Reader in Experimental Philosophy, Robert Walker (1801–1865), whom we encountered briefly earlier in the paper. Walker's examination of Newman in the 1820s had occurred within the first of his sixteen stints as a finals examiner in mathematics, spanning thirty years.[74] Although he never held any of the major university teaching

[69] *A Reply to the Second Letter of the Sedleian Professor*.
[70] *A Rejoinder to the Reply of the Rev. F. Ashpitel*.
[71] *A Reply to the Second Letter of the Sedleian Professor*, p. 10; *A Rejoinder to the Reply of the Rev. F. Ashpitel*, pp. 3, 5.
[72] *A Rejoinder to the Reply of the Rev. F. Ashpitel*, p. 8.
[73] Ibid., pp. 17–8.
[74] *Historical Register*, p. 881.

posts relating to mathematics, he had served as a mathematical tutor at Wadham College between 1828 and 1853, and had exerted a quiet influence on the conduct of Oxford mathematics teaching – and indeed its examining, as we saw from the Newman episode.[75] Walker stepped in as examiner in 1856 in place of Harrison under circumstances that are rather murky, as we shall describe below. Whether it was because of Walker's influence or Price's intervention, the mathematical class list for the next set of final examinations, in Easter Term 1856, was a little more promising than either of the previous two: there were six fourths, three thirds, two seconds, and two firsts.

5. Aftermath

Before we explore the consequences of the Price/Ashpitel affair for the examiners, and for Oxford mathematics more widely, we pause to consider its impact on the candidates involved. This, in fact, appears to have been minimal. If we look to the later careers of these candidates, we mostly find a sequence of successful barristers and academic churchmen, whose paths through life do not appear to have been blighted by unfair results in a single set of examinations. This is hardly surprising: although figures such as Price may not have wanted to hear it, Oxford mathematics examinations simply were not that important. This was true both within the university and also in the country at large.[76] Despite the more secure position accorded to mathematics by the reforms of the 1850s, it was still in the shadow of classics. Moreover, the traditionally lower status of mathematics in Oxford, coupled with its largely non-competitive nature, meant that those obtaining even high honours in mathematics in Oxford did not enjoy the same stature as the highly-ranked Cambridge Wranglers (the top-performing candidates in the Mathematics Tripos) whose examination results effectively guaranteed them entry into the career of their choice.[77] Indeed, an Oxford education was so inextricably linked to the classics that high attainment in mathematics was often seen as being at the expense of classical studies – this was precisely the reason for

[75] A. V. Simcock, 'Walker, Robert (1801–1865)', in *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/38098

[76] The 'University Intelligence' columns of the major newspapers were much more exercised in December 1855 by an alleged heresy contained in a text published by Benjamin Jowett, Oxford's newly-appointed Regius Professor of Greek; see, for example, 'University Intelligence', *Morning Chronicle* (London), issue 27752, Thursday 6 December 1855, p. 3c.

[77] Although the Cambridge system was much criticised for the fact that it merely encouraged cramming, rather than true learning, those Oxford figures who sought to promote mathematical study in the early nineteenth century often looked to Cambridge for inspiration, arguing that a more overtly competitive examination system might encourage mathematical attainment. For instance, the Oxford class lists were ordered alphabetically within each class, and one suggestion (never implemented) was to adopt the Cambridge method of ranking all candidates by attainment in order to promote competition; see, for example: Augustus P. Saunders, *Observations on the Different Opinions Held as to the Changes Proposed in the Examination Statute, with the View Principally to Encourage the Study of Mathematics in the University, and a Plan of Examination Respectfully Submitted to the Committee Now Appointed to Frame the New Statute, as well as to the Members of Convocation Generally* (Oxford: Henry Cooke, 1830). Alphabetical ranking was also used briefly in Cambridge later on, but was soon abandoned (Stray, 'From Oral to Written Examinations', p. 100).

Table 2. Summary of the wider examination results of the candidates listed in Table 1; a blank indicates a pass without honours.

	Classics moderations	Mathematics moderations	Classics finals	Mathematics finals
Capes	I, MT 1853	I, MT 1853	I, MT 1855	II, MT 1855
Hicks	I, MT 1853	I, MT 1853	III, MT 1855	III, MT 1855
Marsham	–	II, ET 1854	–	III, MT 1855
Morice	II, ET 1854	II, ET 1854	–	IV, MT 1855
Rice	–	I, ET 1854	IV, ET 1855	III, MT 1855
Sandford	I, MT 1853	I, MT 1853	I, ET 1855	IV, MT 1855
Short	–	II, MT 1853	–	III, MT 1855
Smith	–	–	–	III, MT 1855

Cooke's warning about 'too much mathematics'. Thus, it appears that the candidates at those finals examinations in December 1855 were carried forward by their wider academic attainments (some of which we summarize in Table 2) and perhaps in some cases by their family connections.

The only one of the candidates who does not appear to have built a professional career for himself is William Hallan Morice (1832–1905), of whom little trace remains beyond his appearances in the censuses of the later nineteenth century, which indicate that he was independently wealthy.[78] Looking to the others, we see that William Wolfe Capes (1834–1914), the candidate with perhaps the least grievance, having been awarded the only second class in mathematics that term, went on to a fellowship first of his *alma mater* The Queen's College, and then of Hertford College.[79] An affirmed classicist, Capes lectured on that subject at the college level, and also during his seventeen years as the university's Reader in Ancient History, after which he moved on to the rectorship of the parish of Bramshott in Hampshire. Biographies of Capes are very matter-of-fact in noting his second class in mathematics alongside his other first-class results, but don't seem to view it as being particularly important.[80]

Among the remaining six names from the class list, we find three further churchmen and three barristers. Already a precocious fellow of New College at the time of his mathematics finals, Ambrose Short (1833–1923) remained there until the mid-1860s when he took up the headmastership of Oswestry Grammar School in Shropshire.[81] In 1856, both Thomas Sharp Smith (1832–1926) and Charles Hobbes Rice (1832–1904) took up positions as mathematical tutors at St Columba's College in Dublin.[82] Within a few years, however, Smith

[78]The 1901 Wales census, for instance, lists him as 'Living on own means' with two servants in Aberystwyth (National Archives, Kew: Census Returns of England and Wales, 1901; class RG13, piece 5153, folio 64, page 14). An earlier census, moreover, gives his status as 'Invalid' (National Archives, Kew: Census Returns of England and Wales, 1871; class RG10, piece 5562, folio 9, page 12).

[79]J. R. Magrath, rev. Elizabeth Baigent, 'Capes, William Wolfe (1834–1914)', in *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/32284

[80]'Canon W. W. Capes', *The Times* (London), no. 40684, Monday 2 November 1914, p. 5d; John Percival, *A Memoir of Canon Capes, Canon Residentiary of Hereford Cathedral* (Hereford: Wilson and Phillips, 1916).

[81]*Alumni Oxonienses*, vol. 4, p. 1291.

[82]For Rice, a family connection may have been involved: his brother Robert (1838–1919) was also a tutor at St Columba's, and went on to become its Warden: G. K. White, *A History of St. Columba's College, 1843–1974* (Dublin: Old Columbian Society, 1980).

was back in England, where he spent thirty years as curate-in-charge of the parish of Mablethorpe in Lincolnshire.[83] Rice eventually returned to England as rector of Cheam in Surrey, a parish in the gift of St John's College, Oxford, of which he was a fellow.[84] It is worth singling Rice out for special attention among the examination candidates, for within his personal papers, held at the Shakespeare Birthplace Trust in his native Stratford-upon-Avon, we find another letter of commiseration concerning that December 1855 class list, addressed to Rice by John Alfred Lumb Airey (1823–1909), his former mathematics master at the Merchant Taylors' School.[85] In the letter, dated 15 December 1855, Airey certainly did not mince his words:

> Allow me to add my own words of sympathy with you to that of Price, (whose letter I yesterday read in the "Times",) upon being made one of the victims of silly, priggish conceit. We all know where your place should have been in the Mathematical Class List, and give you all due honour for your labours. The List itself is a most emphatic condemnation of the "judgement", (as Price moderately calls it) of those who made it.[86]

Airey probably felt quite secure in his assessment of Rice's abilities, since the latter had been the recipient of a mathematical prize under his tutelage, before winning a scholarship to Oxford, and then attaining a first in mathematics moderations.[87] In Airey's view, this incident in Oxford was part of a wider trend afflicting examinations more generally:

> This absurd and mischievous trick, whether it be from ignorance and inexperience in examining, or from sheer conceit,–of young Examiners in setting 'posers', not fair honest questions,–in trying to shew others how clever (or cunning) they can be, and not to inform themselves of the attainments of the examined,–is becoming a very serious nuisance, and must be abated.

Without giving any specifics, he asserted that '[t]he same foolish conceit' had occurred in connection with examinations for the Indian Civil Service a few months earlier, in which, Airey claimed, a paper had been set that 'would have made any young man of 22 wince, even if he had been fit for a Senior Wrangler's place'. Thus, like Price, Airey sought to defend the fairness of

[83]'Nonogenarian Clergyman: Death of Former Curate-in-charge at Mablethorpe', *Nottingham Evening Post*, no. 14832, Monday 18 January 1926, p. 7f.

[84]'The Late Rev. Charles Rice', *Stratford-upon-Avon Herald*, 27 May 1904. Other newspaper obituaries of Rice are preserved at the Shakespeare Birthplace Trust (DR724/6/1/18). All of them record his examination results without further comment. An adjacent file (DR724/6/1/17) contains some unsigned manuscript notes on Rice (not obviously corresponding to any of the published biographies) which say a very little more about the 1855 affair in passing: 'the Examiners placed not a single candidate in Class 1, a decision for which they received castigation in the "Times"'.

[85]Airey was a Cambridge man who had graduated Second Wrangler in 1846: 'The Rev. J. A. L. Airey', *The Times* (London), no. 39004, Tuesday 6 July 1909, p. 13c.

[86]Shakespeare Birthplace Trust, Stratford-upon-Avon: Personal papers of Reverend Charles Hobbes Rice, DR724/6/1/4, J. A. L. Airey to C. H. Rice, 15 December 1855. A clipping of Price's first letter is also preserved in the archive (DR724/6/1/3).

[87]'Merchant Taylors' School', *The Times* (London), no. 20513, Wednesday 12 June 1850, p. 8c; 'University Intelligence', *The Standard* (London), no. 8389, Tuesday 1 July 1851, p. 1d.

examinations at large. Corroborating evidence for Airey's last claim has yet to come to light, however.

As we have noted, all of the remaining honours candidates from those 1855 examinations subsequently built careers as barristers. Robert Henry Bullock Marsham (1833–1913) was called to the bar in 1860, and spent much of his career as a metropolitan police magistrate.[88] The route taken into the legal profession by Sandford, on the other hand, was via the Indian Civil Service. He ended his career as Judicial Commissioner of Mysore, having been one of the first candidates to face the competitive examinations for entry into the service, just a few months before his rather less successful finals in Oxford.[89]

The only candidate left to consider is Hicks, the addressee of Price's original letter. Hicks was also, in some sense, the 'most mathematical' of the candidates at the exams in question, and perhaps therefore the one who would have been most stung by the results. Unlike the other candidates, Hicks had not proceeded straight to Oxford from school, but had instead gone via University College London, where for a time he had held a scholarship, and where he had received a mathematical prize.[90] While at UCL, Hicks studied with the professor of mathematics, Augustus De Morgan (1806–1871), with whom he seems to have forged a connection. Hicks's mathematical claim to fame is that while a student with De Morgan, he had calculated the roots of a particular polynomial to 152 decimal places.[91] Hicks's handwritten copies of De Morgan's mathematical tracts remain in the UCL archives, and a single surviving letter from Hicks to De Morgan indicates that the former was still engaged in mathematical study (or at least calculation) in 1860.[92] Thus, Hicks emerges as the candidate for whom we have the clearest evidence of a genuine interest in mathematics – an interest, moreover, that does not appear to have been dampened by the events of December 1855. He had begun his Oxford career by matriculating at Pembroke College in 1851, before migrating to Lincoln College to take up a scholarship the following year.[93] Thus, in the earliest part of his Oxford education, Hicks had attended Price's mathematical lectures in Pembroke. Price would later note the 'high opinion' that he had formed of Hicks's attainments. In addition, Price had found Hicks 'industrious', and was certainly of the view that his place in the 1855 mathematical class list was 'below his deserts'.[94] As with the other candidates, however, this result does not appear to have done

[88]'Mr. R. H. B. Marsham', *The Times* (London), no. 40180, Tuesday 8 April 1913, p. 11c.
[89]'Obituary: Mr. John Douglas Sandford', *The Times* (London), no. 33657, Monday 6 June 1892, p. 10c.
[90]'University College, London–Andrews' Scholarships', *The Standard* (London), no. 8185, Tuesday 5 November 1850, p. 1f.
[91]See, for example, A. De Morgan, 'On the Syllogism (IV) and on the Logic of Relations', *Transactions of the Cambridge Philosophical Society*, 10 (1864), 331–58 (p. 337). See also: A. Thomas Fuller, 'Horner versus Holdred: An Episode in the History of Root Computation', *Historia Mathematica*, 26 (1999), 29–51 (p. 42).
[92]University College London Special Collections: MS ADD 6, De Morgan Tracts; Senate House Library, London: De Morgan Family Papers, MS913I/71/1, J. P. Hicks to A. De Morgan, 1 March 1860.
[93]Joseph Foster, *Men-at-the-bar: A Biographical Hand-list of the Members of the Various Inns of Court, including Her Majesty's Judges, etc.*, 2nd edn (London and Aylesbury: Hazell, Watson, and Viney, 1885), p. 217.
[94]*Correspondence on the Subject of the Late Second Public Examination*, p. 9.

him any great harm. Hicks went on to a career as a barrister, and retained a link to UCL, eventually becoming a Life Governor.[95]

Hicks's role as a governor at UCL highlights a common feature of the subsequent careers of many of those 1855 candidates: almost all of them went on to have some involvement with education or examination. In the cases of the churchmen, this is less surprising, but it is worth emphasizing their educational connections, both within the university setting and without. We have seen, for example, that Capes taught in Oxford, but in addition to this, not only did he act as a classics examiner on several occasions, but he also served as university proctor in 1865, a role that would have given him wider oversight of the examination process, together with responsibility for appointing examiners.[96] During his later clerical career, he was a governor at St Paul's School.[97] As headmaster of Oswestry Grammar School, Short's immediate connection to education is clear, but we note that he was also active in trying to establish scholarships that would take pupils from his school to university – Short had previously benefitted from a similar such a scholarship himself.[98] We have seen that Rice and Smith had taught for a time at St Columba's College, and, based on a testimonial that survives in Rice's personal papers, he had tried (apparently unsuccessfully) to sustain a teaching career.[99] After his leaving St Columba's, there is no direct evidence of any further teaching activities by Smith, but we do find him appealing to the Royal Society for funds to support Mablethorpe School.[100] And to return finally to Hicks, we note that he too served for a time as a scholarship examiner at UCL, not very long after his Oxford finals.[101] Looking collectively at the candidates in this way creates an impression of the centrality of various kinds of examinations to parts of British society during the second half of the nineteenth century.

Let us now return to the events of late 1855 and early 1856. An early indication that Price was justified in his worries about the impact of the class list on the image of Oxford mathematics came just two days after the appearance of his initial letter. The *Berkshire Chronicle*, published in nearby Reading, reproduced the mathematics class list with the comment that 'it will be naturally inferred that the knowledge of mathematics is at a very low ebb at

[95]Gillian Furlong, *Treasures from UCL* (London: UCL Press, 2015), p. 139.
[96]*Historical Register*, p. 628.
[97]'University Intelligence', *The Times* (London), no. 34889, Wednesday 13 May 1896, p. 10c.
[98]*Wrexham Weekly Advertiser*, vol. 14, no. 733, Saturday 4 May 1867, p. 4d; 'University Intelligence', *The Standard* (London), no. 8524, Friday 5 December 1851, p. 2c. Of the names on the December 1855 mathematics class list, it is only for Marsham and Smith that we have no explicit evidence of their having held a scholarship of some form during their university career.
[99]Shakespeare Birthplace Trust, Stratford-upon-Avon: Personal papers of Reverend Charles Hobbes Rice, DR724/6/1/5, testimonial for C. H. Rice by J. R. Crawford, Master of Berkhamsted Grammar School, 22 August 1861.
[100]Royal Society, London: Miscellaneous correspondence received by the Royal Society on official business, MC/9/291, T. S. Smith to W. White, Assistant Secretary of the Royal Society, 30 November 1871; MC/10/26, T. S. Smith to W. White, 17 October 1873.
[101]'University College, London', *The Times* (London), no. 23146, Tuesday 9 November 1858, p. 7e.

Oxford'.[102] The anonymous writer noted that there had not been such a 'meagre' class list since 1841, when there had been no firsts, one second, five thirds, and five fourths;[103] it was noted also that there had been no firsts in 1825. In the latter instance, this was a reference to the final examinations of Michaelmas Term 1825 when only four candidates received honours in mathematics, and all of them were placed in the second class by a panel of examiners that included Cooke.[104] The journalist's reference to 1841 must have been to the examinations of Michaelmas Term that year, when the examiners had been Walker, Donkin, and John Ashworth Ashworth [*sic*] (1811–1890) of Brasenose College.[105] The latter two were each then only in their second year as mathematical examiners, but this was Walker's ninth time in the role. The quite different circumstances of 1841 explain why that year's class list does not appear to have provoked a reaction similar to that of 1855. To begin with, the 1841 list was produced by a panel of examiners with collectively much more experience than that of 1855, and so it was harder to call their judgement into question. The class list immediately prior to that of Michaelmas Term 1841, namely of Easter Term 1841, had been a very strong one (six firsts, two seconds, seven thirds, no fourths), and so there was no reason to fear a trend towards difficult examinations, as perhaps there was in 1855.[106] And there is also the matter of the stature of mathematics: in 1855, Price sought to defend the recent reform-driven improvements in mathematical study in Oxford, but in 1841, mathematics endured stably with its comparatively lowly status. In 1841, there were no gains to defend, but in 1855, this piece in the *Berkshire Chronicle* seemed to justify Price's pre-emptive strike against those who might deem Oxford mathematics to be at a 'low ebb'.

We have seen how this issue was resolved within the university by Walker's return to examining duties in 1856, when he replaced Harrison. The circumstances surrounding this change of personnel are, however, rather opaque.[107] Price had noted that Harrison's time as an examiner had expired, which in itself is slightly mysterious, since the usual term of office was two years, and Harrison had only served for one. There may not have been anything sinister going on here, however, for if we browse the lists of examiners during this decade, we find that many of them only served for one year, regardless of

[102]'Oxford', *Berkshire Chronicle*, vol. 32, no. 1570, Saturday 15 December 1855, p. 5d.

[103]Coincidentally, 1841 was also the year of the so-called 'Cambridge Slaughter' in which the Cambridge Mathematical Tripos saw an unprecedentedly high failure rate; see: Christopher Stray, 'The Slaughter of 1841: Mathematics and Classics in Early Victorian Cambridge', in *History of Universities: Volume XXXV/2*, ed. by Mordechai Feingold (Oxford: Oxford University Press, 2022), pp. 143–78.

[104]*Historical Register*, pp. 214–5.

[105]Ibid., p. 237.

[106]Ibid., p. 236. The same is true of the examinations preceding those of Michaelmas Term 1825: in Easter Term 1825, the mathematics class list comprised six firsts, three seconds, and no thirds; the fourth class had not yet been introduced (*Historical Register*, p. 213).

[107]As far as the author has been able to determine, there is no trace of the affair in the university archives. It is not mentioned, for instance, in the minutes of the university council (Oxford University Archives: HC1/2/1, Hebdomadal Council, signed council minutes, 1854–66).

what the official guidelines said.[108] In the years that followed, Harrison remained very active within the university, serving as a moderator on several occasions, the first being in 1856, alongside Price.[109] He was proctor in 1864, but it was not until 1867 that he again took on the duties of a finals examiner. A later biographer of Harrison, W. J. Lewis (who had first arrived in Oxford in 1865), noted the events of 1855–1856 with the remark that '[h]ow it came about that Mr. Harrison resigned but not his colleagues is unknown', before going on:

> Mr. Harrison never mentioned the subject, and my information is derived from the Proctor who, in 1867, offered him the examinership for the first time after the mishap of 1855. My friend said that he had always felt that Mr. Harrison had been harshly treated; and as far as I can learn from other friends who were resident in Oxford at the time, this feeling was very general.[110]

Sadly, however, we know nothing more than these vague remarks. Interestingly, Lewis did not entirely absolve Harrison of responsibility for the examination papers that year, citing a possible youthful 'zeal' in the setting of questions.[111] This claim appears alongside other remarks asserting Harrison's advocacy of mathematics: 'Mr. Harrison was an enthusiast in mathematics, delighting to teach and to examine in the subject'.[112] Indeed, his academic record makes his interest in mathematics clear: he obtained a first in the still-optional mathematical honour school in 1850, and held a university mathematical scholarship in 1852, the year in which he became a fellow and mathematical lecturer at Oriel College. His biographer, again quoting from an unnamed source, gave Harrison non-specific credit for 'the active part' that he had taken 'in the revival of mathematical studies during the years 1855–1867'.[113] Moreover, the value of examinations cannot have been lost on Harrison, for he had faced a competitive examination in order to win his fellowship at Oriel.[114] Even decades after his 1867 departure from Oxford for the parish of North Wraxhall in Wiltshire, he was still taking an interest in the level of uptake of mathematics in Oxford.[115] And upon his death in 1908, he left £3000 to Oriel for the foundation of a scholarship;

[108]See, for example, *The Oxford University Calendar 1856* (Oxford: John Henry and James Parker, 1856), p. 126.
[109]*Historical Register*, p. 710.
[110]Lewis, *Notes on the History of the Parish of North Wraxhall*, p. 4. The proctors in 1867 were Thomas Vere Bayne (1829–1908) of Christ Church, and Charles Edward Hammond (1837–1914) of Exeter College. Bayne's disciplinary biases (if any) are unknown (he obtained a second class in classics finals in 1852), but Hammond had obtained a double first in classics and mathematics moderations in 1857, followed in finals by a third in classics and a first in mathematics the next year. From 1859, he was a mathematical lecturer at Exeter College (*Historical Register*, p. 707; Foster, *Alumni Oxonienses*, vol. 2, p. 596).
[111]Lewis, *Notes on the History of the Parish of North Wraxhall*, p. 4.
[112]Ibid., p. 3.
[113]Ibid., p. 4.
[114]The questions faced by Harrison in April 1852, including several mathematical problems, are preserved in the Oriel College Archives: MEM 1 A2/3 (Fellowship examination papers). On the Oriel fellowship examinations, see: K. C. Turpin, 'The Ascendancy of Oriel', in *History of the University of Oxford, vol. VI*, pp. 183–192.
[115]Oriel College, Oxford: MPP H5/1/8 (Letters), F. Harrison to W. J. Lewis, 22 June 1905.

an award was subsequently established in his name 'for merit or promise of distinction in mathematics'.[116]

If Harrison's mathematical credentials are clear, then Spottiswoode's are clearer still. He had also obtained a first in mathematics (in 1845), and had held mathematical scholarships (in 1846 and 1847). Indeed, of the three examiners, he is the only one whom we know to have been active in mathematical research, making him a rare creature in mid-nineteenth-century Oxford: a researcher who rarely taught. By the mid-1850s, he had published a treatise on determinants, and a series of pamphlets on assorted topics, containing both original results and digested versions of ideas from continental mathematical texts.[117] Spottiswoode left behind the chance of a formal academic post to help run the family publishing form, Eyre & Spottiswoode, but remained active in the British scientific sphere by serving at various times as president of the London Mathematical Society (1870–1872), the British Association for the Advancement of Science (1878), and the Royal Society (1878–1883). After he had stood down as an Oxford examiner at the end of 1856, however, he never again assumed any official role within the university. It is clear that Spottiswoode maintained cordial relations with Price to the end of his life.[118] Indeed, when Price married in August 1857, Spottiswoode was one of the witnesses.[119] Following the latter's early death in 1883, Price penned a glowing assessment of his mathematical talents.[120]

It remains for us to return to the examiner who was the most vocal in this affair. We have already seen from Price's remarks that Ashpitel was a mathematical high-flyer. He had received a first in mathematics, and had also held a mathematical scholarship (in 1850).[121] A little later, he went on to publish a pamphlet of biblical commentary with a distinctly mathematical flavour.[122] Alongside Spottiswoode, Ashpitel served out his two years as examiner, stepping down at the end of 1856. Apart from a two-year stint as a moderator in the mid-1860s, he never again acted as an examiner within the university.[123] If, as Lewis asserts, there was general sympathy in Oxford for Harrison, then there might equally have been suspicion of Ashpitel, at least as a possible examiner – but there is no direct evidence to support this speculation. The later part of Ashpitel's career was spent largely in the traditional ecclesiastical setting, first

[116]Oriel College, Oxford: MPP H5/2 (Wills and codicils); BT 1 R/1 (Rules of Harrison exhibition).
[117]William Spottiswoode, *Elementary Theorems Relating to Determinants* (London: Longman, Brown, Green, and Longman, 1851); idem, *Meditationes Analyticae*, 4 parts (London, 1847).
[118]Spottiswoode was one of the few correspondents of Price to address him 'Dear Bat': see the several letters that survive in the Price papers at Pembroke (PMB/S/14).
[119]General Register Office, London: England and Wales Civil Registration Indices, Q3 1857, vol. 5b, p. 79 (St Thomas, Devon).
[120]'Scientific Worthies: XXI.–William Spottiswoode', *Nature*, vol. 27, no. 704, 26 April 1883, 597–601 (p. 597).
[121]Neither Ashpitel nor Spottiswoode obtained honours in classics; Harrison was awarded a third.
[122]Francis Ashpitel, *The Increase of the Israelites in Egypt Shewn to be Probable from the Statistics of Modern Populations, with an Examination of Bishop Colenso's Calculations on this Subject* (Oxford and London: John Henry and James Parker, 1863).
[123]*Historical Register*, p. 588.

as rector of Great Hampden in Buckinghamshire (from 1860), and then as vicar of Flitwick in Bedfordshire (from 1880). Nevertheless, his examination experience was not wasted in his life as a parish priest: during the next couple of decades, we find him serving on-and-off as an examiner both at Aylesbury Free School and at the Royal Grammar School in High Wycombe.[124] Indeed, we know that his examining duties at the latter school began as early as 1857, for some documentation, including his examiner's report that year for the school's trustees, survives in the Buckinghamshire Archives.[125] Here, Ashpitel examined all subjects, not just mathematics, and the surviving letters give an impression of his having been much less harsh in this setting than he had been in Oxford – though whether this was because he naturally recognized the appropriate level at which to examine, or because he had been chastened by his Oxford experience, we have no way to tell.

6. Concluding remarks

Taking a long view, the public dispute over the December 1855 mathematical class list was something of a storm in a teacup, at least as far as its consequences for the people involved were concerned, and also its impact on the uptake of mathematics in Oxford, which seems to have been minimal (see Figure 2) – perhaps because of Price's swift and public pre-emptive action, in combination with the small-scale remedial action taken by the university. We might even question why the dispute happened at all. Examinations results have their natural ups and downs, often with no readily discernible pattern (see, for example, Figure 2). The journalist for the *Berkshire Chronicle* pointed out some bad years for mathematical honours, and there are many other examples that we might add to these. The mathematics finals results of Easter Term 1844, for instance, were also rather poor (one first, one second, one third, eight fourths).[126] On the other hand, the cohort of Easter Term 1842 was quite strong in mathematics (six firsts, two seconds, two thirds, four fourths).[127] There were even examinations sessions (that of Michaelmas Term 1848, for example) at which the number of mathematics firsts outstripped those in classics (four vs two).[128] In Michaelmas Term 1851, there were no firsts in classics at all (but four in mathematics).[129] And yet, if these latter circumstances were ever discussed at all, one suspects that the blame would have been placed squarely on the candidates, rather than the examiners. No comment was

[124]See, for example: 'Local Intelligence', *Bucks Herald*, no. 1691, Saturday 18 June 1864, p. 5e; 'Local Intelligence', *Bucks Herald*, no. 2054, Saturday 17 June 1871, p. 5e–f.
[125]Buckinghamshire Archives, Aylesbury: CH-1/AP/10/22-30 (Correspondence relating to the holding of examinations at Wycombe Royal Grammar School in accordance with clause 45 of the new scheme, 1857–1858).
[126]*Historical Register*, p. 241.
[127]Ibid., p. 238.
[128]Ibid., p. 247.
[129]Ibid., p. 251.

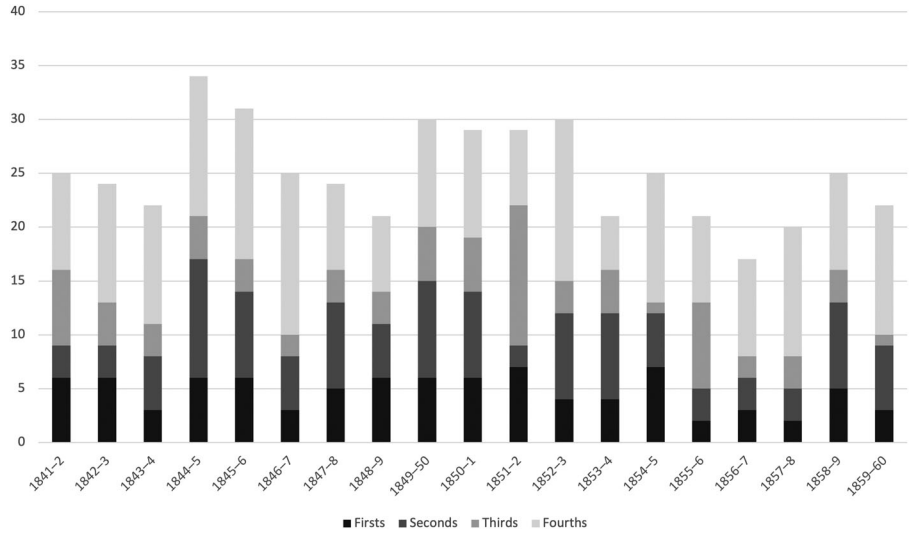

Figure 2. Breakdown of Mathematical Honours Classifications, 1841–60.

made on the poor classics results of some of the 1855 candidates, for example. Faith in the assessment of classics was secure, but in the other honour schools there was room for concern about the distribution of results. Here, the examiners were in some sense still finding their way: although mathematics had a long-established honour school, it had been through a number of changes over the years, including the admission of analytical mathematics, and the broader process of rigorization brought on by the Commissions of the 1850s. Thanks to the various advocates whom we have mentioned here, the position of mathematics within the university had become rather dynamic, and so the mathematical class lists were riper for being questioned than those in classics. And, as we have argued above, a very particular set of circumstances came together at the end of 1855 to ensure that such questions were indeed raised.

We began this paper with Cox's criticism of the public nature of this dispute, but it has become clear that in relating this anecdote, Cox did not appreciate the scope of the issues that were perceived to be at stake. Nor perhaps did Price at first. What began as an attempt to commiserate with a disappointed candidate and to express concern about the impact on Oxford mathematics quickly broadened out into a defence of public trust in competitive examinations more generally. As we have already mentioned, 1855 was the first year in which such examinations were used for entry into the civil service, a circumstance that Price hinted at in his later exchanges with Ashpitel.[130] Price's reference was non-specific, but his readers would surely have picked up on the allusion, for discussions surrounding civil service examinations had filled many newspaper column-inches throughout

[130]On these examinations, see: Richard Willis, *Testing Times: A History of Vocational, Civil Service and Secondary Examinations in England since 1850* (Leiden; Boston: Brill, 2013).

1855, most particularly in *The Times*. Indeed, civil service examinations loom in the background of the Price/Ashpitel dispute, not only because one of the disappointed Oxford candidates, Sandford, was one of the first civil service examinees, but also because of a further circumstance not referenced anywhere else in connection with the affair: Spottiswoode served as one of the first civil service examiners.[131] There is no indication in the easily accessed materials, however, that Spottiswoode had any special responsibility for mathematics. The civil service examinations covered a range of topics, with the particular distribution depending upon the specific department to which a candidate aspired (modern languages were emphasized in examinations for the Colonial Office, for example).[132] Mathematics at varying levels was a part of many of these schemes, and one of the assertions made in the extensive newspaper discussions was that Cambridge candidates might therefore be expected to perform better than those from Oxford.[133] It remains to be investigated whether this was indeed borne out in practice.[134] More generally, the place of mathematics within civil service examinations, and the relationship (if any) of these examinations to those taking place within the universities, would bear further scrutiny, though we do not have space to consider this here.

The responses to the 1855 affair point towards the centrality of examinations in mid-Victorian public life. The Cambridge side of this story, with the doors that opened up naturally for highly-placed Wranglers, has been well studied, but the Oxford angle warrants further attention. The reforms of the 1850s strengthened the position of mathematical study in Oxford, and further modifications to the examination system would be introduced in the following decades – most substantially, the dropping of compulsory classics in 1864, a move that was condemned by many, including mathematicians such as Charles Dodgson, as destroying the well-rounded education that the university had tried historically to provide.[135] But if the nineteenth-century tinkering with Oxford examination statutes showed anything, it was that advanced undergraduate study in any specific subject had become incompatible with the traditional liberal education. And if such a subject was to be taken seriously, then it needed to be examined rigorously. Curiously, while this is a story that reflects the importance of examinations for the wider education system and for general principles, such as the promotion of particular subjects, at the same time it also demonstrates that examinations, though seen as critical in their immediate context, may ultimately have little impact on the lives of those sitting them.

[131]His name appears throughout the *First Report of Her Majesty's Civil Service Commissioners* (London: HMSO, 1859), and not just because it was his family firm that printed it.
[132]*First Report of Her Majesty's Civil Service Commissioners*, p. 5.
[133]'Candidates for the Civil Service of India', *Cambridge Independent Press*, vol. 50, issue 2232, Saturday 18 August 1855, p. 5e.
[134]Figures quoted by John Roach, *Public Examinations in England 1850–1900* (Cambridge: Cambridge University, 1971), p. 199 suggest that Oxford may in fact have had the edge.
[135]Charles L. Dodgson, *The New Examination Statute* (Oxford: Vincent, 1864); Bodleian Library: G. A. Oxon c. 80 (393).

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Bibliography

Archive materials

Bodleian Library, Oxford: Papers relating to the proceedings of the university 1850, 1854, 1855, 1864 (G. A. Oxon c. 66, 70, 71, 80)

Buckinghamshire Archives, Aylesbury: Correspondence relating to the holding of examinations at Wycombe Royal Grammar School in accordance with clause 45 of the new scheme, 1857–1858 (CH-1/AP/10/22-30)

General Register Office, London: England and Wales Civil Registration Indices

National Archives, Kew: Census Returns of England and Wales, 1871, 1901

Oriel College Archives: Fellowship examination papers (MEM 1 A2/3); Harrison Papers (MPP H5); Rules of Harrison exhibition (BT 1 R/1)

Oxford University Archives: Hebdomadal Council, signed council minutes, 1854–66 (HC1/2/1)

Pembroke College, Oxford: Bartholomew Price Papers (PMB/S/14); Douglas Macleane Papers (PMB/T/5)

Royal Society, London: Miscellaneous correspondence received by the Royal Society on official business (MC9, MC10)

Senate House Library, London: De Morgan Family Papers (MS913)

Shakespeare Birthplace Trust, Stratford-upon-Avon: Personal papers of Reverend Charles Hobbes Rice (DR724/6/1)

University College London Special Collections: De Morgan Tracts (MS ADD 6)

Published materials

Anon, 'Candidates for the Civil Service of India', *Cambridge Independent Press*, vol. 50, issue 2232, Saturday 18 August 1855, p. 5e

Anon, 'Canon W. W. Capes', *The Times* (London), no. 40684, Monday 2 November 1914, p. 5d

Anon, 'Local Intelligence', *Bucks Herald*, no. 1691, Saturday 18 June 1864, p. 5e
Anon, 'Local Intelligence', *Bucks Herald*, no. 2054, Saturday 17 June 1871, p. 5e–f
Anon, 'Mathematical Class List', *Jackson's Oxford Journal*, no. 5355, Saturday 15 December 1855, p. 5a
Anon, 'Merchant Taylors' School', *The Times*, no. 20513, Wednesday 12 June 1850, p. 8c
Anon 'Mr. R. H. B. Marsham', *The Times*, no. 40180, Tuesday 8 April 1913, p. 11c
Anon, 'Nonogenarian Clergyman: Death of Former Curate-in-charge at Mablethorpe', *Nottingham Evening Post*, no. 14832, Monday 18 January 1926, p. 7f
Anon, 'Obituary: Mr. John Douglas Sandford', *The Times*, no. 33657, Monday 6 June 1892, p. 10c
Anon, 'On the Late Examination in the Mathematical Schools at Oxford', no. 22273, Friday 25 January 1856, p. 10c
Anon, 'Oxford', *Berkshire Chronicle*, vol. 32, no. 1570, Saturday 15 December 1855, p. 5d
Anon, 'Oxford University Commission', *The Literary Gazette: A Weekly Journal of Literature, Science, and the Fine Arts*, 29 May 1852, pp. 449–51
Anon, 'Scientific Worthies: XXI.–William Spottiswoode', *Nature* 27.704 (26 April 1883), 597–601
Anon, 'The Late Rev. Charles Rice', *Stratford-upon-Avon Herald*, 27 May 1904
Anon, 'The Recent Mathematical Class List', *Jackson's Oxford Journal*, no. 5361, Saturday 26 January 1856, p. 4e–f
Anon, 'The Recent Mathematical Class List', *Jackson's Oxford Journal*, no. 5362, Saturday 2 February 1856, pp. 4f–5a
Anon, 'The Rev. Francis Harrison', *The Times* (London), no. 39844, 12 March 1912, p. 11c
Anon, 'The Rev. J. A. L. Airey', *The Times* (London), no. 39004, Tuesday 6 July 1909, p. 13c
Anon, 'The Town of Oswestry', *Wrexham Weekly Advertiser*, vol. 14, no. 733, Saturday 4 May 1867, p. 4d
Anon, 'University College, London', *The Times*, no. 23146, Tuesday 9 November 1858, p. 7e
Anon, 'University College, London–Andrews' Scholarships', *The Standard* (London), no. 8185, Tuesday 5 November 1850, p. 1f
Anon, 'University Intelligence', *Morning Chronicle* (London), issue 27752, Thursday 6 December 1855, p. 3c
Anon, 'University Intelligence', *The Standard* (London), no. 8524, Friday 5 December 1851, p. 2c
Anon, 'University Intelligence', *The Standard*, no. 8389, Tuesday 1 July 1851, p. 1d
Anon, 'University Intelligence', *The Times* (London), no. 21434, Saturday 21 May 1853, p. 6f
Anon, 'University Intelligence', *The Times* (London), no. 22236, Thursday 13 December 1855, p. 12d
Anon, 'University Intelligence', *The Times* (London), no. 22271, Wednesday 23 January 1856, p. 11a
Anon, 'University Intelligence', *The Times*, no. 34889, Wednesday 13 May 1896, p. 10c
Anon, 'William Spottiswoode', *The Times* (London), no. 30858, Thursday 28 June 1883, p. 6c–d
Anon, rev. Anita McConnell, 'Cooke, George Leigh (*bap.* 1779, *d.* 1853), in *Oxford Dictionary of National Biography*, doi:10.1093/ref:odnb/6165
Ashpitel, Francis, *A Reply to the Second Letter of the Sedleian Professor on the Subject of the Recent Examination in the Final Mathematical Schools* (Oxford: J. Vincent, 1856)
Ashpitel, Francis, *The Increase of the Israelites in Egypt Shewn to be Probable from the Statistics of Modern Populations, with an Examination of Bishop Colenso's Calculations on this Subject* (Oxford and London: John Henry and James Parker, 1863)

Bell, Alan, 'Cox, George Valentine (1786–1875)', in *Oxford Dictionary of National Biography*, doi:10.1093/ref:odnb/6524

Brasenose College Register, 1509–1909, vol. I (Oxford: B. H. Blackwell, 1909)

Briggs, Asa, 'Oxford and its Critics, 1800–1835', in *The History of the University of Oxford, vol. VI: Nineteenth-century Oxford, Part 1*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 1997), pp. 134–45

Brock, M. G., 'The Oxford of Peel and Gladstone', in *The History of the University of Oxford, vol. VI: Nineteenth-century Oxford, Part 1*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 1997), pp. 7–71

Brockliss, L. W. B., *The University of Oxford: A History* (Oxford: Oxford University Press, 2016)

Carlyle, E. I., rev. M. C. Curthoys, 'Price, Bartholomew (1818–1898)', in *Oxford Dictionary of National Biography*, doi:10.1093/ref:odnb/22741

Chapman, Allan and Christopher D. Hollings, 'A Century of Astronomers: From Halley to Rigaud', in *Oxford's Savilian Professors of Geometry: The First 400 Years*, ed. by Robin Wilson (Oxford: Oxford University Press, 2022), pp. 55–91

Cooke, G. L., *The First Three Sections and Part of the Seventh Section of Newton's Principia, with a Preface Recommending a Geometrical Course of Mathematical Reading, and an Introduction on the Atomic Constitution of Matter, and the Laws of Motion* (Oxford and London: John Henry Parker, 1850)

Correspondence on the Subject of the Late Second Public Examination in the Mathematical Schools (Oxford: J. H. and J. Parker, 1856)

Cox, G. V., *Recollections of Oxford* (London: Macmillan, 1868)

Craik, Alex D. D., *Mr Hopkins' Men: Cambridge Reform and British Mathematics in the 19th Century* (London: Springer, 2007)

Crilly, A. J., 'Spottiswoode, William (1825–1883)', in *Oxford Dictionary of National Biography*, doi:10.1093/ref:odnb/26171

Curthoys, M. C., 'The Examination System', in *The History of the University of Oxford, vol. VI: Nineteenth-century Oxford, part 1*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 1997), pp. 339–74

De Morgan, A., 'On the Syllogism (IV) and on the Logic of Relations', *Transactions of the Cambridge Philosophical Society* 10 (1864), 331–58

Dodgson, Charles L., *The New Examination Statute* (Oxford: Vincent, 1864); G. A. Oxon c. 80 (393)

Dubbey, J. M., 'The Introduction of the Differential Notation to Great Britain', *Annals of Science* 19 (1963), 37–48, doi:10.1080/00033796300202853

Engel, Arthur, 'Emerging Concepts of the Academic Profession at Oxford 1800–1854', in *The University in Society, vol. I: Oxford and Cambridge from the 14th to the Early 19th Century*, ed. by Lawrence Stone (Princeton, NJ: Princeton University Press, 1974), 305–51

Enros, Philip C., 'The Analytical Society (1812–1813): Precursor of the Renewal of Cambridge Mathematics', *Historia Mathematica* 10.1 (1983), 24–47, doi:10.1016/0315-0860(83)90031-9

First Report of Her Majesty's Civil Service Commissioners (London: HMSO, 1859)

Foster, Joseph, *Men-at-the-bar: A Biographical Hand-list of the Members of the Various Inns of Court, including Her Majesty's Judges, etc.*, 2nd edn (London and Aylesbury: Hazell, Watson, and Viney, 1885)

Foster, Joseph, *Alumni Oxonienses: The Members of the University of Oxford, 1715–1886: Their Parentage, Birthplace, and Year of Birth, with a Record of their Degrees: Being the*

Matriculation Register of the University, Alphabetically Arranged, Revised and Annotated, 4 vols. (Oxford; London: Parker and Co., 1888)

Fox, Robert, 'The University Museum and Oxford Science, 1850–1880, in *The History of the University of Oxford, vol. VII: Nineteenth-century Oxford, part 2*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 2000), pp. 641–91

Fuller, A. Thomas, 'Horner versus Holdred: An Episode in the History of Root Computation', *Historia Mathematica*, 26 (1999), 29–51. doi:10.1006/hmat.1998.2214

Furlong, Gillian, *Treasures from UCL* (London: UCL Press, 2015)

Hannabuss, Keith, 'Mathematics', in *The history of the University of Oxford, vol. VII: Nineteenth-century Oxford, Part 2*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 2000), pp. 433–55

Hannabuss, Keith, 'The 19th Century', in *Oxford Figures: Eight Centuries of the Mathematical Sciences*, ed. by John Fauvel, Raymond Flood, and Robin Wilson, 2nd edn (Oxford: Oxford University Press, 2013), pp. 223–38

Harrison, W. J., rev. I. Grattan-Guinness, 'Donkin, William Fishburn (1814–1869)', in *Oxford Dictionary of National Biography*, doi:10.1093/ref:odnb/7813

Harvie, Christopher, 'Reform and Expansion, 1854–1871', in *The History of the University of Oxford, vol. VI: Nineteenth-century Oxford, Part 1*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 1997), pp. 697–730

The Historical Register of the University of Oxford, being a Supplement to the Oxford University Calendar, with an Alphabetical Record of University Honours and Distinctions, Completed to the End of Trinity Term, 1900 (Oxford: Clarendon Press, 1900)

Hollings, Christopher D., 'Bartholomew Price', in *Oxford's Sedleian Professors of Natural Philosophy: The First 400 Years*, ed. by Christopher D. Hollings and Mark McCartney (Oxford: Oxford University Press, 2023), pp. 111–40

Hollings, Christopher D., 'Four Centuries of Sedleian Professors', in *Oxford's Sedleian Professors of Natural Philosophy: The First 400 Years*, ed. by Christopher D. Hollings and Mark McCartney (Oxford: Oxford University Press, 2023), pp. 1–27

Hollings, Christopher D., 'George Leigh Cooke', in *Oxford's Sedleian Professors of Natural Philosophy: The First 400 Years*, ed. by Christopher D. Hollings and Mark McCartney (Oxford: Oxford University Press, 2023), pp. 93–110

Lewis, W. J. 'Francis Harrison', *The Oriel Record*, September 1912, 40–5

Lewis, W. J., *Notes on the History of the Parish of North Wraxhall, co. Wilts., with a Life of the Late Rector, Francis Harrison, M.A., at One Time Fellow, Dean, and Tutor of Oriel College, Oxford* (London: SPCK, 1913)

Magrath, J. R., rev. Elizabeth Baigent, 'Capes, William Wolfe (1834–1914)', in *Oxford Dictionary of National Biography*, doi:10.1093/ref:odnb/32284

Ogilvie, C. A., 'On the union of classical with mathematical studies', *The Oxford English Prize Essays*, 4 vols, 3 (1830), 173–91.

Oxford University Act 1854 (17 & 18 Vict. c. 81), https://www.legislation.gov.uk/ukpga/Vict/17-18/81/contents

The Oxford Ten-year Book, Made Up to the End of the year 1860 (Oxford and London: John Henry and James Parker, 1863)

The Oxford University Calendar 1856 (Oxford: John Henry and James Parker, 1856)

Percival, John, *A Memoir of Canon Capes, Canon Residentiary of Hereford Cathedral* (Hereford: Wilson and Phillips, 1916)

Philalethes, *A Letter to the Rector of Lincoln College* (Oxford, 1807); Bodleian Library: G. A. Oxon b. 19 Box 2 ff. 379–82

Powell, Baden, *The Present State and Future Prospects of Mathematical and Physical Studies in the University of Oxford, Considered in a Lecture* (Oxford: W. Baxter, 1832)

Price, Bartholomew, *A Letter from the Sedleian Professor of Natural Philosophy, to a Candidate Disappointed in the Late Mathematical Examination* (Oxford: Baxter, 1855)

Price, Bartholomew, *A Rejoinder to the Reply of the Rev. F. Ashpitel, M.A. Brasenose College: One of the Examiners, on the Subject of the Recent Examination in the Final Mathematical Schools* (Oxford: John Henry and James Parker, 1856)

Price, Bartholomew, *A Treatise on Infinitesimal Calculus: Containing Differential and Integral Calculus, Calculus of Variations, Applications to Algebra and Geometry, and Analytical Mechanics*, vol. II (Oxford: Oxford University Press, 1854; 2nd edn, 1865); vol. III (Oxford: Oxford University Press, 1856; 2nd edn, 1868); vol. IV (Oxford: Oxford University Press, 1861; 2nd edn, 1889)

Price, Bartholomew, *A Treatise on the Differential Calculus, and its Application to Geometry: Founded Chiefly on the Method of Infinitesimals* (London: George Bell, 1848); vol. I of *A Treatise on Infinitesimal Calculus: Containing Differential and Integral Calculus, Calculus of Variations, Applications to Algebra and Geometry, and Analytical Mechanics*, 2nd edn (Oxford: Oxford University Press, 1852)

Report of her Majesty's Commissioners Appointed to Inquire into the State, Discipline, Studies, and Revenues of the University and Colleges of Oxford: Together with the Evidence, and an Appendix (London: W. Clowes and Sons for Her Majesty's Stationery Office, 1852)

Roach, John, *Public Examinations in England 1850–1900* (Cambridge: Cambridge University, 1971)

Saunders, Augustus P., *Observations on the Different Opinions Held as to the Changes Proposed in the Examination Statute, with the View Principally to Encourage the Study of Mathematics in the University, and a Plan of Examination Respectfully Submitted to the Committee Now Appointed to Frame the New Statute, as well as to the Members of Convocation Generally* (Oxford: Henry Cooke, 1830)

Simcock, A. V., 'Walker, Robert (1801–1865)', in *Oxford Dictionary of National Biography*, doi:10.1093/ref:odnb/38098

Spottiswoode, William, *Elementary Theorems Relating to Determinants* (London: Longman, Brown, Green, and Longman, 1851)

Spottiswoode, William, *Meditationes Analyticae*, 4 parts (London, 1847)

Stenhouse, Brigitte, 'Mary Somerville's Early Contributions to the Circulation of Differential Calculus', *Historia Mathematica* 51 (2020), 1–25. doi:10.1016/j.hm.2019.12.001

Stray, Christopher, 'From Oral to Written Examinations: Cambridge, Oxford and Dublin 1700–1914', in *History of Universities: Volume XX/2*, ed. by Mordechai Feingold (Oxford: Oxford University Press, 2005), pp. 76–130

Stray, Christopher, 'The Slaughter of 1841: Mathematics and Classics in Early Victorian Cambridge', in *History of Universities: Volume XXXV/2*, ed. by Mordechai Feingold (Oxford: Oxford University Press, 2022), pp. 143–78

Sutcliffe, Peter H., *The Oxford University Press: An Informal History* (Oxford: Clarendon Press, 1978)

Tatham, Edward, *An Address to the Members of Convocation at Large, on the Proposed Statute on Examination* (Oxford, 1807). Bodleian Library: G. A. Oxon 4º 23 (1)

Tuckwell, W., *Reminiscences of Oxford*, 2nd edn (London: Smith, Elder & Co., 1907)

Turpin, K. C., 'The Ascendancy of Oriel', in *The History of the University of Oxford, vol. VI: Nineteenth–century Oxford, Part 1*, ed. by M. G. Brock and M. C. Curthoys (Oxford: Clarendon Press, 1997), pp. 183–92.

Ward, W. R., *Victorian Oxford* (London: Frank Cass & Co., 1965)

Warwick, Andrew, *Masters of Theory: Cambridge and the Rise of Mathematical Physics* (Chicago: University of Chicago Press, 2003)

White, G. K., *A History of St. Columba's College, 1843–1974* (Dublin: Old Columbian Society, 1980)

Willis, Richard, *Testing Times: A History of vocational, Civil Service and Secondary Examinations in England since 1850* (Leiden; Boston: Brill, 2013)