# REFEREES, PUBLISHER'S READERS AND THE IMAGE OF MATHEMATICS IN NINETEENTH CENTURY ENGLAND

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In the realm of publishing history it is well known that many of London's largest nineteenth century publishers hired publisher's readers to advise them about which literary manuscripts they should publish. Moreover, it has been recognized that these readers often acted as tastemakers and had a hand in shaping the development of literature.

Publisher's readers had a similar effect in relation to the genres of science and mathematics. At Macmillan and Company, publisher's readers and close advisors to the publisher influenced decisions about which books were published on scientific and mathematical topics. In 1880, Macmillan and Company hired a publisher's reader to specifically handle the science genre. The chosen reader, Donald MacAlister, also reviewed manuscripts in mathematics, and between 1880 and 1896 MacAlister wrote more than sixty reviews about prospective mathematical books that were being considered for publication. During this time he also wrote reviews evaluating manuscripts in other areas of science. While some observations about his work as a science reader are included, the purpose here is to focus specifically on MacAlister's influence on Macmillan's mathematical publishing program.

The current article demonstrates that, when publishing on mathematical subjects, the decision-making of book publishers differed from that of mathematical journals. The values that underpinned the decision-making process were different at mathematics journals, general science journals and the book publishers that published mathematics. Each set of values affected the image of mathematics that was cultivated. The article examines the processes of refereeing, and the role of the editor, at nineteenth century mathematical journals by looking at the *Cambridge Mathematical Journal* and *Acta Mathematica*. After that, London's *Philosophical Transactions* is presented as an example of how mathematical articles were selected at general science journals.

Macmillan and Company was one of London's largest publishers and also one of the most important English-language publishers of science and mathematics in the nineteenth century. From the 1870s to 1900 Macmillan received many unsolicited manuscripts on mathematical topics (see Appendix A). This paper looks at the mathematical manuscripts considered for publication by the company, which ones

were accepted or declined, and why. Macmillan's two most important advisors on mathematics during the nineteenth century were Cambridge mathematician Isaac Todhunter and mathematically-trained Cambridge physician Donald MacAlister. An intriguing record survives of MacAlister's work for Macmillan as a publisher's reader in science, and it forms the basis for the following exploration of MacAlister's role as Macmillan's reader of mathematics in the 1880s and 1890s.

## REFEREEING AT MATHEMATICAL JOURNALS

In his brief article about the archives of mathematical journals, Jeremy Gray wrote 'It should be mentioned that the highly structured refereeing system in operation today often had no counterpart in years gone by. Much of the refereeing was done by word of mouth, on an informal basis'.[1] Gray wrote this in 1975, and a considerable amount of writing has since taken place about the founding of mathematical journals and their role in the internationalization of mathematics. In general this work has confirmed Gray's statement about the lack of a highly structured refereeing process within the organization of nineteenth century mathematical journals.

In June Barrow-Green's history of *Acta Mathematica*, we learned how Gösta Mittag-Leffler, with financial sponsorship from the King of Sweden and the help of his fellow Scandinavian mathematicians, was able to found and maintain what would become a highly successful international journal of mathematics.[2] The journal *Acta Mathematica* was begun in 1882 with an editorial board of fourteen (originally including Hugo Gyldén, Sophus Lie, Johan Malmsten, and Hieronymus Zeuthen) and Mittag-Leffler acting as editor. However, Barrow-Green makes it clear in whose hands control of the journal rested:

> Once publication began, Mittag-Leffler became the driving force, and [Sophus] Lie effectively dropped out of the picture. And Lie was not the only member of the editorial board not to play an active part in the journal's early years. Of the fourteen original members of the editorial board, only Malmsten and Zeuthen made any significant contribution. It was Mittag-Leffler who shouldered the responsibilities and Mittag-Leffler who ensured the journal's survival.[3]

The journal was able to attract submissions from some of the mathematical community's most talented members due to Mittag-Leffler's many personal contacts. Moreover, the portrait of Norwegian mathematician

Niels Henrik Abel on its frontispiece provided a standard to which the journal sought to have its submissions aspire.[4] Mittag-Leffler had the ultimate say concerning what was published in *Acta.* As editor, he was the gatekeeper who ensured that the quality of articles in his journal remained high.

In his dealings with German mathematician Georg Cantor, we can find an example of how Mittag-Leffler as editor took responsibility for the content that was published. Cantor's challenging ideas about set theory had generated controversy elsewhere, but Mittag-Leffler decided to publish Cantor's papers on set theory in *Acta* thinking it would be beneficial for the journal and good for Cantor.[5] While Mittag-Leffler's support for Cantor was sincere, he also felt some discomfort about the philosophical aspects of Cantor's mathematics. In 1884, when Cantor received a letter from Mittag-Leffler requesting that he withdraw a paper on the theory of ordered sets from the journal, this decision did not come from a reviewer or the editorial board, but from Mittag-Leffler himself. The decision to publish or not to publish was negotiated between Cantor the author, and Mittag-Leffler the editor. Ultimately the decision not to publish the article led to a break between Cantor and *Acta Mathematica* (Cantor did not publish any further papers in *Acta*), and put a strain on the personal relationship between Cantor and Mittag-Leffler.[6]

As the editor of a mathematical journal, Mittag-Leffler held a great degree of control over what was published, although he likely consulted, on an informal basis, his network of mathematicians. As editor of the *Cambridge Mathematical Journal,* William Thomson undertook a similarly centralized and fluid approach when deciding what to publish.[7] Under his editorship, informal consultations with colleagues constituted the refereeing process.

Duncan Gregory, Archibald Smith and Samuel Greatheed founded the *Cambridge Mathematical Journal* at Trinity College, Cambridge in November 1837. The aim of the journal was to publish short articles on mathematical subjects, including abstracts of important articles from foreign journals and original contributions. Gregory, Smith and Greatheed frequently contributed work anonymously in early issues of the journal, partly to give the impression that contributions were coming from a greater number of authors. In the early stages of many scientific journals, unattributed articles written by the editors helped to fill space.[8]

After William Thomson took over as editor in 1845, the journal evolved into what one might recognize today as a nascent scholarly journal. After its first decade, the journal found a larger audience and a

substantial body of contributors. It became a forum for many previously unpublished authors to gain a reputation. It was also a vehicle through which Thomson exerted influence over the mathematical community, for whom the journal had become a hub. In his article about the *Cambridge Mathematical Journal*, Tony Crilly observes, 'Thomson recognized the value of the journal for the mathematical community, but the fact that it was a useful channel for maintaining a wide range of contacts in the academic community would not have escaped his notice'.[9]

After Thomson became editor he put in place a series of reforms.[10] As part of these reforms, Thomson introduced a system for refereeing articles. While one might assume that this implies the existence of criteria for accepting material, in practice Thomson did not specify any criteria and there were no formal guidelines for referees. However, some of the attitudes that underpinned the decision-making process can be discerned from individual cases.[11]

In one case, the lawyer and mathematician Arthur Cayley advised against publishing an article on analytic geometry by Stephen Fenwick.[12] The reasons he gave were a lack of originality ('almost all, if not the whole of it is known') as well as disorganized material, which, Cayley said, lacked both an overall composition and references to generally known geometrical theorems.[13] Crilly's view of Cayley's intention as a referee is that, as an ambitious young mathematician himself, he took his role as a gatekeeper seriously. As such, Cayley did not hesitate to exclude inferior work from the published record.[14]

George Boole, who also refereed articles for the journal, was less outspoken.[15] While noting that a differential equations paper by Brice Bronwin did not contain anything useful, he nevertheless recommended it for publication because 'it is desirable to have records of our own progress even in directions in which nothing is to be hoped for'.[16]

The editors of the *Acta Mathematica* and the *Cambridge Mathematical Journal* both held a great degree of control over the publication of content. But Mittag-Leffler and Thomson were both accomplished mathematicians themselves and, as such, were also accountable to the mathematical community that they served, for editorship of a journal was a public role. The refereeing process, when it was practiced, consisted in the informal consultation of colleagues.

Refereeing systems were also enacted at general science journals at this time. The Royal Society of London's *Philosophical Transactions* and Taylor and Francis' *Philosophical Magazine* were two such general science journals that published occasional articles of mathematics, and

both journals relied on reviews by referees. Indeed, the Royal Society established a formal refereeing system for *Philosophical Transactions* in 1832. The system required that a Committee of Papers solicited reports from Society Fellows giving recommendations regarding the publication of articles.[17] The surviving record includes correspondence about mathematical articles that their referees and the Committee of Papers considered for publication.

Sloan Despeaux's paper about mathematical articles in the *Philosophical Transactions* demonstrates that the editor there assumed less responsibility for deciding which articles would be published than editors at specialized mathematical journals.[18] Decisions were based on whether a vote of support for an article came from the majority of referees consulted.[19] Sometimes mathematical articles were valued differently at general science journals than at mathematics-specific journals. As Despeaux observes, 'good' articles of mathematics were occasionally passed over because they were deemed too specialized for the audience, whereas 'bad' papers were occasionally published because rejection might offend a powerful author.[20] Despeaux also notes that at general science journals, committees tasked with evaluating mathematical submissions were not always capable of recognizing outstanding contributions to mathematics. [21]

The same questions may be extended to book publishers. How did they decide which mathematical manuscripts to publish? Many book publishers would have been unable to judge a book manuscript in mathematics. The sheer volume of manuscripts being received by many publishing houses also led them to seek assistance with the task of selection. The following sections demonstrate that both these factors contributed to the engaging of readers or other special advisors when decisions about mathematical content were made.

## ORIGIN OF THE PUBLISHER'S READER

As the overall volume of publications increased after the 1850s, it was common for British publishers to employ publisher's readers. The role of the publisher's reader and the relationship these readers formed with the authors they reviewed and the publishers they worked for is largely unknown. Identifying the frequently anonymous publisher's reader has been a difficult task. It was often the case that only the publisher-employer knew a reader's identity. Few readers have been identified by name in the history of publishing and bookselling.[22]

The job of the publisher's reader was multifaceted. The publisher's reader had to understand the book trade and be acquainted with the current literature. He or she had to have a familiarity with the work of living authors, and know the level of esteem in which they were held. The job included assessing each manuscript against the current state of the book market, and advising whether the market was in need of that particular kind of book. Ultimately the job of the publisher's reader was to recommend acceptance or rejection of a manuscript, but over the course of time some played a role in the development of authors' careers and in the shaping of work prior to publication.[23]

To assess the impact of readers on the publication record is difficult, as the British publishing industry was large and diverse. Not all publishers relied on the advice of readers. Since publisher's readers have on the whole remained obscure to history, it leaves historians, such as Linda Fritschner, to speculate on their relative importance: 'Reports suggest that even the unimportant readers have left an indelible imprint on literature, authors, publishers, and the public'.[24]

As for what role publisher's readers may have played in the publication of scientific books, monographs or textbooks, little has been written. At Cambridge University Press, where many mathematical and scientific books were published, it was up to the Syndics of the Press to decide which material would be published.[25] After the 1870s, Cambridge University Press employed publisher's readers whose reports supplemented the knowledge and opinions of the Syndics.[26]

## MACMILLAN & CO. AS PUBLISHERS OF SCIENCE AND MATHEMATICS

Daniel and Alexander Macmillan began publishing books under the Macmillan imprint from a bookshop on Aldersgate Street in Cambridge in 1843. The two brothers, described as having 'descended from peasants' by their biographer, grew their company from inauspicious beginnings into one of the greatest nineteenth century publishing houses in London.[27] By the 1870s, Macmillan equaled Longmans or Rivington in terms of production, backlist, status and influence, despite these venerable publishing houses having been established an entire century earlier.[28] In general, the Macmillan brothers' resourcefulness, reliability and intellectual curiosity lead them to maintain a fruitful balance between idealism and commerce in the publishing enterprise. Daniel and Alexander were 'deeply interested in education, having lacked it themselves'.[29] This characteristic both shaped their publishing program and was one factor leading to its eventual success.

While Macmillan is famous for having published some of the nineteenth century's most famous literary figures, interest in the scientific side of Macmillan's publishing program has received comparatively little attention.[30] Macmillan had a strong presence in science, as well as in academic publishing and textbooks.[31] The firm also founded the science journal *Nature* (f. 1869).[32] Yet Nowell-Smith's collection of correspondence to and from Macmillan, for instance, contains nothing from Macmillan's scientific authors. He notes the omission thus:

> Some authors of great significance in the history of Macmillans find no place here: the scientists, doctors and musicians … "Hall and Knight" of algebra fame, and many more. Either their letters are of no interest or the stories they have to tell do not fall into the pattern of a scrapbook.[33]

It was during the early period of the Macmillan business that Daniel and Alexander met, and came to know, many of their most successful authors of science and mathematics. In the 1840s and 1850s the brothers operated a bookshop out of number seventeen Trinity Street, Cambridge. Daniel was in poor health and the brothers were heavily in debt, but during their bookstore days they built relationships with some of their most successful authors, many of whom were Cambridge-educated men or Cambridge-connected men. Patrons of the bookstore grew to become Daniel and Alexander's guests, personal friends, and then, in many cases, the authors that they published. Isaac Todhunter and Barnard Smith were two who became acquainted with the brothers at this time, and with whom the Macmillan's developed long-standing publishing relationships.[34] Todhunter and Smith were both Cambridge graduates who authored successful mathematical textbooks for Macmillan.[35]

The stultifying climate of teaching and learning mathematics at Cambridge University during the nineteenth century has been a subject frequently commented upon by historians.[36] The structure of teaching was such that professors often had little reason to be in direct contact with their students. In that atmosphere, Macmillan's bookshop served as common ground, a space that both professors and students frequented. To Morgan, the Macmillan bookshop was a 'little college in itself', the store serving as a location around which an entire social scene developed.[37]

During their Cambridge bookshop days, Macmillan's first publications included previously-published mathematical textbooks that already had proven consistent sales. These included *The Elements of Plane and Spherical Trigonometry* (7th edition, 1852) by J. C. Snowball, *A*

*Companion to Wood's Algebra* (12th edition, 1847) by Thomas Lund and *The Cambridge Course of Elementary Natural Philosophy* (5th edition, 1846), Snowball's compilation of a text by Lund. Both of these textbooks were used in the Cambridge context. The right to print standard works of instruction had long been recognized as a valuable asset to booksellers and publishers.[38] With their first mathematical publications, Macmillan chose conservatively, continuing to serve assured markets.

After beginning their career as mathematical publishers by republishing successful textbooks from established authors, they later established a new group of mathematical authors, some of whom became associated with the firm of Macmillan in particular. As the business became more successful in the 1860s, 1870s and 1880s, Macmillan expanded its publications to include scholarly texts in addition to school and college textbooks. Macmillan's authors in mathematics and mathematical physics grew to include Isaac Todhunter, Barnard Smith, George Boole, William Kingdon Clifford, Charles Dodgson, A. G. Greenhill, Walter W. Rouse Ball, Joseph Wolstenholme, Peter Guthrie Tait, Lord Rayleigh, George Gabriel Stokes, William Thomson, and George Biddell Airy, among others.

The Macmillan list was strong in mathematics and in other academic areas, particularly science and religion. After Macmillan moved its headquarters to London in 1863, it maintained connections with Cambridge. Many of the firm's authors resided there, and the press at Cambridge University continued to be one of Macmillan's main printers for books, catalogues and prospectuses. As David McKitterick has reflected in his history of Cambridge University Press, from the 1850s to the 1880s Macmillan effectively acted as the university publisher for Cambridge, not Cambridge's own University Press. While the Syndics continued with their traditional approach to management that included a small publications program, they failed to evolve in response to the changing times. McKitterick observes, 'The Macmillan list was remarkable for authors from Oxford and London, from Manchester and from the Public Schools … the firm's future was established during these years as what would now be called an academic publisher, a university press in all but name and organization'. [39]

It was the Macmillan brothers and also John Deighton—both Cambridge bookseller-publishers of the nineteenth century—who forged new frontiers in many aspects of science publishing in response to the changing educational needs and interests of nineteenth century Britain.[40] Macmillan's publication history demonstrates their engagement with

the growing importance of science, and the ways in which scientific inquiry was increasingly being pursued, shared and recorded. Charles Morgan also acknowledges Alexander Macmillan's open-mindedness towards science and his recognition of its increasingly important role in society: 'Through [the Darwinian controversies] Alexander held a steadfast conviction that religion and science were allies, not foes, in the interpretation and achievement of human destiny, and the firm's policy reflects his view'.[41] Cambridge University Press, by contrast, continued to be lead by the Syndics whose university traditions may have insulated them from the ways in which the cultural winds were changing.

The result was that Macmillan effectively poached much of the talent that had been trained and molded by Cambridge away from publication with the University, while Macmillan paid the press at Cambridge significant sums for their printing orders. This ultimately grew Macmillan as a publisher while the list of books published by Cambridge University Press atrophied by comparison. McKitterick sees the Syndics as failing to envisage what an academic publisher could do, and describes their management of the press during this time as neglectful. He reflects, '[Macmillan's] success, while the Syndics of Cambridge University Press slept, had repercussions for a century'.[42]

One of the ways in which Macmillan responded to the changing role of science in culture was by producing books for the purposes of elementary science education. Alexander Macmillan noticed the influence of James Maurice Wilson on the introduction of science into the public schools.[43] Wilson, who worked as a mathematics master at Rugby School and then headmaster at Clifton, served on a committee to study the development of science education for the country with T. H. Huxley and John Tyndall at the British Association for the Advancement of Science.[44] Wilson encouraged the introduction of botany, geology and chemistry into the school curriculum. In response to Wilson's activism on this front, Macmillan began to publish elementary school books in these areas. For his authors, Macmillan sought out the most recognized masters in every subject, gathering school textbooks about science from Balfour Stewart, Henry Roscoe, William Stanley Jevons, Silvanus P. Thompson, Joseph Dalton Hooker, Norman Lockyer, Michael Foster, Archibald Geikie and Thomas Henry Huxley.

In touch with the changing needs of education, and interested in engagement with science, Macmillan became one of the most important and influential publishers of science in England. From 1843 to the turn of the century, Macmillan demonstrated what an academic and educational

publisher might do. What the firm discovered and then drew out of Cambridge was 'a mine hitherto almost unworked, of the best book-producing power of the nation, especially for educational works. There was a great want of these, and in every generation of undergraduates were men specially fitted for writing or editing them'.[45]

## MANUSCRIPTS ON SCIENTIFIC AND MATHEMATICAL TOPICS FROM MACMILLAN'S 'SLUSH PILE'

A large number of authors writing about scientific and mathematical topics contacted Macmillan hoping to establish their work through publication. Macmillan and their publisher's readers held sway over these authors. Macmillan and their readers and advisors reviewed many mathematical and scientific manuscripts in the period considered here—from the early days of the business until the twentieth century. From the 1860s onwards Macmillan and their publisher's readers became engaged in choosing which scientific and mathematical books, textbooks and monographs, to publish.

Most of the manuscripts that Macmillan considered for publication were written by men (and a few women) who are now unknown or forgotten. Appendix A contains a list of some of the mathematical manuscripts that were received by Macmillan and considered for publication between 1867 and 1896. It shows that Macmillan considered a large number of elementary arithmetic textbooks submitted by little-known authors.

Many of the works submitted by unknown or lesser-known authors were popularizations of science. In most cases the publisher's readers seem to have regarded the popularizations as offering less than the writings of the eminent scientists who had first proposed the theories. Some of these popularizations had titles such as 'Modern Science', 'Science Explained in Plain English', 'Gems of Science', 'Harmonic Laws of the Universe', 'Science and Religion' and 'The Invisible Powers of Nature'. None of these manuscripts were ultimately published.[46] But while Macmillan also rejected many of the arithmetic textbooks that were submitted, they stood a much greater chance of rising from the 'slush pile' to publication than the scientific popularizations.

As well as unknown authors whose names appear frequently in the records of manuscripts, these records also include the names of many prominent men of nineteenth century science. These men were frequently authors for Macmillan and also consulted as reviewers on book manuscripts written by others. Appendix B gives a list of

some of Macmillan's readers on scientific subjects. Some of the people Macmillan sought out for opinions were Mary Boole (widow of George Boole), Thomas Henry Huxley, astronomer Norman Lockyer, logician and economist William Stanley Jevons, Scottish physicians T. Laudner Brunton and Sir David Ferrier, and Scottish physicist Balfour Stewart. Mathematicians Joseph Wolstenholme and Isaac Todhunter were consulted about mathematics. In 1881 Charles Darwin and Alexander Dickson were consulted about the possibility of translating Ferdinand von Müller's German botanical text *Befruchtung der Blumen* into English.[47]

Macmillan also turned to these figures when soliciting new material. While corresponding in November 1854 about sourcing Abel's *Oeuvres* for George Stokes, Daniel Macmillan invited Stokes to consider publishing his lectures on physics with Macmillan.[48] While presented by Macmillan as a casual suggestion in passing, it was no doubt a serious offer. In 1854 Macmillan was still a burgeoning publisher, and Stokes already held an impressive list of titles.[49] In this case Macmillan solicited material from a favoured author in the science genre. The record of readers' reports similarly contains examples wherein Macmillan was encouraged to commission books on specific areas of mathematical physics on the advice of his publisher's reader. Daniel, and later Alexander drew upon their circle of friends and acquaintances for advice and turned to them when sourcing material for publication. Many of Macmillan's regular contributors and closest confidents were also frequent attendees at Macmillan's 'Tobacco Parliaments'.[50]

In the early days of the Macmillan business Isaac Todhunter served in an informal role as Daniel and Alexander's consulting expert on mathematics. Letters from Macmillan to their mathematical authors in the 1850s contain oblique references that suggest Todhunter was advising on a variety of topics associated with the presentation, quality and form of mathematical manuscripts for the press.[51] Todhunter's influence over the mathematical books that Macmillan published at this time led to Macmillan displacing some of the well-trodden mathematical textbooks that it had published hitherto with books by new authors. An instance of this was when John Hymers wrote to Macmillan requesting the publisher take up a new edition of his textbook on differential equations. Macmillan discouraged the idea, having undertaken (at Todhunter's suggestion) Boole's book on the same subject.[52] There is little direct record of Todhunter's opinions on these matters, except in the passages of Macmillan's correspondence that refer to him.[53] It is likely that advice was given face to face as Todhunter as well as the Macmillan brothers lived in Cambridge in the 1850s.

After Daniel's death and Alexander's decision to move the headquarters from Cambridge to London, Macmillan's expanding organization established a system in which potential book manuscripts were numbered, dated and recorded as received, with a note as to whether they were reviewed by a reader, and ultimately whether they were accepted for publication or declined. In these records one can observe that mathematical manuscripts were sent to the press with surprising frequency. Manuscripts on mathematical subjects (including topics in mixed mathematics and mathematical physics) were submitted to the press more frequently than manuscripts on any other topic in science. After mathematics, the second most popular science subject in the record of manuscripts was chemistry, followed by botany and the life sciences, including medicine and its related sub-disciplines such as anatomy, pathology, and surgery.[54]

More work would have to be done to identify Alexander Macmillan's closest advisor on mathematical manuscripts in the 1860s and 1870s. Todhunter may have remained a source of informal advice during this time—though in the records of manuscripts there is only one official note of review by him. In 1873 he reviewed a manuscript on 'Differential Coefficients' by John Newton Lyle.[55] In the 1870s, Norman Lockyer (who published *Elementary Lessons in Astronomy* with Macmillan in 1868, and began editing Macmillan's scientific journal *Nature*, in 1869) became Alexander Macmillan's 'consulting physician in regard to scientific books and schemes'. However, whether Macmillan was relying on Lockyer in the 1870s for mathematical expertise specifically is uncertain.[56]

The 1860s and 70s were a time of expansion by the company, and during these decades many mathematical manuscripts were accepted for publication, although no formal review by a publisher's reader or confidant (like Todhunter) is recorded in the records of manuscripts. During this period, books by eminent men of science were rarely turned away from the press and in fact were seemingly expedited when they were received. Manuscripts from reputable scientists were often accepted immediately (without a noted review) and sent to the printer in short order. Perhaps this reflects Macmillan's eagerness to publish what Daniel described as 'first rate' men of science.[57]

Henry Roscoe's lectures on *Spectrum Analysis* (1869) was received, accepted and sent to the printer all on one day in April 1869.[58] Other manuscripts too seem to have been fast-forwarded through the process of receipt, review, and response, which normally took a week or two. They included Lectures by T. H. Huxley; *First Book of Indian Botany* by

Prof. Daniel Oliver of Kew Gardens and London's University College; and *Principles of Reason*, *Elementary Logic* and *Theory of Political Economy* by W. Stanley Jevons. Each was marked in the records of received manuscripts with a squiggly line running through the column where reviews are normally recorded,[59] as the manuscript was received and accepted by the publisher on the same day, and sent to the printer right away. Thomas Clifford Allbutt's manuscript on the ophthalmoscope was accepted on the day it was received in November 1870.[60] Lord Rayleigh sent the second chapter of his book on sound to Macmillan on 2 May 1876, when it was accepted without any note of a review.[61] Other authors who had manuscripts received without review include physician J. Milner Fothergill.[62]

During this period, mathematical manuscripts were also being accepted or declined. Macmillan received the first part of W. K. Clifford's *Elements of Dynamic* on 20 September 1877, and on the same day it was accepted without a noted review.[63] The *Elements of Descriptive Geometry*, by J. B. Millar, was accepted without review in 1876.[64] *Mathematical Problems* (1878) by Joseph Wolstenholme, *A Treatise of the Theory of Determinants* (1882) by Thomas Muir, and *Examples in Arithmetic* (1879) by S. Pedley, were all accepted without review.[65] These authors were all mathematics teachers: Millar was assistant lecturer in engineering at Owens College (Manchester); Wolstenholme a professor of mathematics at the Royal Indian Engineering College (and late fellow and tutor of Christ's College); Muir a mathematical master in the high school of Glasgow; and Pedley a teacher from the Tamworth Grammar school (outside Birmingham).

In some cases the acceptance was immediate because Macmillan had acquired rights to print the second edition of an already published work. For instance Wolstenholme's *Mathematical Problems* had been first published by Macmillan in 1867 (containing 1,628 problems), and published for a second time by Macmillan in 1878 (containing 2,815 problems).[66] When George John Romanes' manuscript on the *Scientific Evidences of Organic Evolution* was accepted immediately in May of 1882, it was a second edition.[67]

On 12 October 1876 Macmillan received a manuscript from unknown author A. Mault, of 66 Blenheim Crescent Kensington W, for the book *Natural Geometry: An Introduction to the Logical Study of Mathematics* (1877). It was accepted for publication a few weeks later on 6 December 1876.[68] While no record of its review exists, I suspect Macmillan might have sought an opinion on it due to the obscurity of the author and the time lapse between the receipt of the manuscript and the date recorded when

a decision was made to publish it. This unusual book was published in 1877 along with a companion product, a box of geometric models to be used by students working with Mault's book about geometry.[69]

Other mathematical manuscripts from this time were declined without a noted review. 'Mathematical Formulae', by R. M. Milburn, and 'Arithmetic and Answers', by John Flint of Glasgow, were returned in 1878.[70] 'Elementary Plane Trigonometry' by Joseph McKinn and 'Geometrical Conic Sections' by H. G. Wills were returned in 1879.[71] 'Rules and Examples in Algebra' by W. Henry Bond, and 'Matriculation Mathematics' by E. H. Matthews, were declined in 1880.[72]

The year 1880 witnessed a change in how Macmillan handled the manuscripts that it received. In the 1880s the records of readers' reports exhibit greater regularity. It was also during this time that Macmillan began to employ a reader to review manuscripts on topics in mathematics and science.[73] Donald MacAlister began reviewing manuscripts for Macmillan in 1880. From 1880 to 1896 most if not all of the manuscripts in mathematics, physics and general science topics received a review by Donald MacAlister.[75]

## MACMILLAN'S READER OF MATHEMATICS: DONALD MACALISTER

Sir Donald MacAlister (1854-1934) was born in 1854 in Earls Dykes East, Perth. Given MacAlister's later involvement in the publishing world, it is notable that Donald's father diverged from traditional family work (farming and fishing) to become a publisher's agent for Blackie & Son. This career initiated the family's move to Liverpool, where Donald grew up and attended school.

As a youth MacAlister showed academic promise, winning the Royal Geographical Society gold medal while attending the Liverpool Institute. MacAlister entered St. John's College, Cambridge, on a scholarship. He took mathematics, graduating Senior Wrangler and winner of Smith's Prize in 1877. He was elected a fellow of St. John's College and taught for a term at Harrow while contemplating his career. As winner of the Geographical Society prize, MacAlister had come to the attention of Francis Galton, who acted as a mentor to MacAlister and encouraged his pursuit of mathematics. Under Galton's patronage MacAlister published a paper on the mathematical distribution of the geometric mean in the *Proceedings of the Royal Society*.[76] However, this would be MacAlister's only publication in mathematics. He decided against pursuing mathematics and turned towards medicine instead.

MacAlister got degrees in medicine from Cambridge, studied at St. Bartholomew's Hospital in London and studied abroad in Leipzig. In 1881 MacAlister returned to Cambridge where he was appointed Linacre lecturer and worked under the Regius Professor of Physic, Sir George Paget. He graduated MD in 1884, and became a consulting physician at Addenbrooke's Hospital. He was recognized in 1886 with election to the Royal College of Physicians.

During the 1880s and 1890s when MacAlister was active as a publisher's reader for Macmillan, he was also an integral part of Cambridge University and its college and university life. He served on the council of the University Senate. From 1893 to 1904 he was a senior tutor at St. John's College. In 1889 MacAlister's life was transformed when a surprising election resulted in his representing Cambridge on the General Medical Council. Thus began a chapter in MacAlister's life for which he is now most frequently remembered: as a longstanding and successful administrator. MacAlister remained a member of the General Medical Council for forty-four years, serving as its president from 1904-31, and by all accounts ruling the council 'with a rod of iron'.[77] In 1907 he was elected principal of Glasgow University, a position he held until 1929, when he became chancellor of the University. By the time MacAlister died in 1934, he had been recognized with thirteen honorary doctorates and made a baronet.

While the circumstances under which MacAlister became a publisher's reader for Macmillan are not entirely clear, it is possible that Todhunter recommended him to the job.[78] Being familiar to the Cambridge community, MacAlister probably knew many of the authors whose work he reviewed. But MacAlister took care to work for Macmillan anonymously, as was the custom of publisher's readers, and remained circumspect about his work for the firm. His biography, written posthumously by his wife, for instance, does not mention his role.[79] In MacAlister's reports for Macmillan he explains how he took steps to conceal his identity as Macmillan's reader when he consulted colleagues for their opinions about a manuscript.[80]

As a reviewer, MacAlister was academically qualified to judge the relevance and originality of elementary to college-level presentations of mathematical subjects. He was also attuned to the qualities of a manuscript that would be of concern to a publisher. Was there a book on Macmillan's backlist that already covered the subject matter? Was there a rival book already published in the market? MacAlister's reports addressed these

questions. His reports often identify the prospective audience for a manuscript, recommending the work as destined for mathematicians, students, practical men or engineers. Often he declares it rubbish and therefore not fit for any audience, in his opinion.

MacAlister's reviews frequently comment on the social connections or peer recognition of the author, and he associates the author's reputation and identity with his estimation of the book's financial success.[81] His judgments of authors range from descriptions like a 'good man', 'a clever and rising man of the second-rank', 'self-taught school master', 'Intelligent working man', to the statement: 'there are numerous signs that the writer though he may be a good arithmetician is not a fully educated man'.[82] About a manuscript on light and heat, MacAlister writes that 'the author's knowledge is book knowledge only', furthermore recommending that due to an unfortunate similarity between the author's name and the author of an already well known book 'which was an atrocious piece of bungling, and is tabooed by all good teachers', Macmillan would do well to decline the work with thanks.[83]

MacAlister also provides opinions as to whether the manuscript he is evaluating would be useful to students or if he expects it to have a remunerative sale. Even if the work is deemed to be neither of these, MacAlister sometimes recommends a highly accomplished work as a 'credit to publish', implying that it would be advantageous for Macmillan to be associated with a highly accomplished work or a prestigious author, even if the publication resulted in little financial gain to the company.[84]

About the manuscripts he did not favour, MacAlister describes these texts as in turn ill-arranged, imperfect, a boiling down, containing blunders, having a foreign style, too antiquarian, flighty, crude, clumsy, repetitive, a book of rough notes, half-brained, made-up, or full of misunderstandings. About a manuscript entitled 'Arithmetical Papers', MacAlister recommends declining the book as it offers little more than cramming tips.[85] MacAlister calls C. Pendlebury's book on arithmetic too verbose. A proposal for spherical trigonometry by N. M. McClelland is charged with bad style, being a mere collection of problems set in examinations, with meager notes, and at that not even ready for press.[87]

In some cases, a book is seen to be too costly to produce. About a book 'On Light' aimed at working men and amateurs, MacAlister recommends cutting costs by skimping on engravings, since a book for this market can be successfully sold, in his opinion, for a maximum cost of four shillings.[88]

MacAlister's reports also contain advice for how the form and style of material should be presented. In many cases he discourages the 'lecture-style' in which manuscripts are initially presented, noting that publishing mathematics in the lecture style is passé.[89] He advocates regrouping the material according to natural divisions of the subject, under numbered sections and chapter headings.[90] He suggests that large and small type be used, with propositions and proofs printed larger than the body text, and boldface used to create emphatic words.[91] He also insists upon continuously numbered examples. Particularly with textbooks, the inclusion of problems and solutions is deemed important.[92] References to solutions published elsewhere, or references to standard texts, is encouraged.[93] With respect to diagrams, he recommends that lines be made bold and varied with thick, thin, dotted or plain lines with arrowheads as appropriate, and that solid figures be drawn in perspective. In general, his guidance is to make mathematical illustrations '*artistic* rather than merely *geometrical*'.[94]

MacAlister places more importance on the organization, presentation, and usability of mathematical texts than he does on the incorporation of new mathematical methods in the content. On one occasion, MacAlister notes that presenting the differential and integral calculus side by side is a 'fresh idea', and observes that the author A. G. Greenhill introduces 'from the beginning [of the book] the newer developments' in the subject, revealing from the start 'the bigger vistas of what great things [the student] is entering upon'.[95] This observation is made with the tone of moderate praise. In fact MacAlister estimates the book is unlikely to have any great success. Because so many books are published on calculus, he explains, the only room to distinguish a new book from the others is in refining the style of presentation, rather than in the way in which the subject itself is treated.[96]

MacAlister discourages what he calls the 'Euclidizing' method within elementary algebra. He also criticizes certain mathematics textbooks as 'quite unsuited to English needs', without explaining further what, in his view, the English needs are.[97] More than once a textbook is deemed unsuitable because it is too foreign or too French.[98] MacAlister was aware of contemporary controversies about how geometry ought to be taught, and saw in this a renewed interest in the subject, and possibly a reason for new books in this area. About one manuscript on geometry he wrote: 'Geometrical teaching is in so transitional a state just now that any attempt to reconcile old and new will at least gain some hearing'.[99]

While MacAlister never elaborated on what he meant when he said that a mathematics textbook was 'too French', one wonders whether 'too French' was MacAlister's expression of disdain for analytical methods in mathematics. It has been observed that methods and theories of mathematical analysis being developed in continental Europe were not generally integrated into the mathematical culture of England, or at least not into the Cambridge culture of mathematics, which largely taught mixed mathematics ('water, gas and electricity' subjects), using synthetic methods.[100] The influence of the Analytical Society, the publication of its *Memoirs* in 1813, and mathematical journals such as the *Cambridge Mathematical Journal* encouraged some cross-fertilization between Continental and British mathematical cultures.[101] Nevertheless, when Bertrand Russell reflected on his mathematical training at Cambridge in the 1890s, he noted that while studying mathematics there he had never even heard of Karl Weierstrass, Richard Dedekind, Georg Cantor, Gottlob Frege or Giuseppe Peano, let alone studied the theories they had developed.[102] Given the climate at the time, MacAlister likely perpetuated the resistance to any incorporation of newer mathematical methods into standard curriculum materials when he described some manuscripts as unsuitable for 'English needs'. Unfortunately, this attitude kept English students from being exposed to important new ideas in nineteenth century mathematics. Cambridge experienced a precipitous decline in the number of mathematics students towards the end of the century, which has been linked to the fact that the system of mathematics education there presented mathematics as a prescribed and stagnant subject.[103]

In the realm of science, MacAlister's reader's reports show how a learned man of this era was still assumed to have adequate knowledge to make contributions to—or judgments about—many areas of science. In the 1880s and 1890s, MacAlister reviewed manuscripts on subjects as diverse as chemistry, trigonometry, micro-botany, mushrooms, light and heat, conic sections, orthographic projection, the diseases of field crops and heredity. Only on a few occasions did he seek the opinion of someone more expert than himself to judge the quality of the work.

Over the period surveyed here, MacAlister held significant sway over Macmillan's scientific and mathematical publishing program, although his power as a publisher's reader was not absolute. Macmillan did not always solicit MacAlister's opinion, nor did Macmillan's decision about what to publish always align with MacAlister's recommendation (although usually it did). During his time working for Macmillan, manuscripts by what Macmillan may have considered to be first-rate men

still circumvented the review process. A manuscript on the 'Scientific Evidences of Organic Evolution', written by Darwin's protégé George Romanes, was immediately accepted without review in 1882.[104] When, in 1883, the manuscript 'Excursions of an Evolutionist' by John Fiske of Harvard University arrived via the literary agent A. P. Watt, it was accepted promptly without MacAlister having reviewed it.[105]

The level of remuneration that MacAlister received for working as a reader with Macmillan is not known, but it safe to assume that he did not undertake the work for the sake of notoriety, as his role as a publisher's reader was not made public. Since he was asked to read many manuscripts of which he disapproved or was critical, one also assumes he did not undertake the role solely for its pleasures either. As the eldest son in a large family with middling means, MacAlister provided for his own education, and into adulthood he continued supporting his family, providing living and educational expenses for his younger brothers and sisters. Perhaps, if Macmillan offered him reasonable compensation for the work, financial reward was his motivation.

## CONCLUSION

During the second half of the nineteenth century, but particularly from the 1880s onwards when it was at the peak of its powers as a popular and educational publisher, Macmillan and Co. was actively reshaping the public image of science. Channels of procurement, production and distribution gave the Macmillan publishing empire considerable power, but only a few people at the top played a role in deciding which scientific and mathematical content would be supported by that power. It was a model of book publishing that put responsibility for decision-making in the hands of just a few people.

Some of Macmillan's mathematical textbooks were astonishingly successful, with the most widely-produced ones rivaling Macmillan's best-selling fiction titles in terms of their circulation.[106] These books made their way all around the world, to Canada, Australia, India, the United States, and to other places with English-speaking populations. Macmillan's textbooks presented an English image of mathematics and promoted the authors of these texts—men associated with English institutions (mainly Cambridge)—all over the world.

Many of Todhunter's mathematics textbooks, and those of J. Hamblin Smith, ended up in Canada, where they were prescribed at the University of Toronto and at the Hamilton, Ontario high school where Canada's first

notable research mathematician, John Charles Fields, was taught. After he left Canada for doctoral and post-doctoral study abroad, Fields always testified to the quality of education he had received in Canada, although he did note that his grounding in calculus had been 'irremediably and fundamentally [false]'.[107] This fallacious grounding was likely connected to the English mathematical textbooks that were so widely used, and the fact that these originated from a culture that had for nationalistic and pedagogical reasons failed to update the representation of mathematics in their educational curriculum.[108]

What this example might confirm for us is that, within each genre of the print medium of mathematical knowledge, there were separate cultures each with their own acceptable standards. Mathematical journals were run by editors who were themselves developers of new mathematics, and who maintained their own standards according to the contributors they could attract. In his dealings with one of the most visionary mathematicians of the nineteenth century, Gösta Mittag-Leffler recognized the importance of Cantor's work. Mittag-Leffler, however, was sensitive about what would appear on the public record in his journal (as were Boole and Cayley, in their reviews for the *Cambridge and Dublin Mathematical Journal*). In the case of Cantor's work on ordered sets, Mittag-Leffler may have declined to publish Cantor's paper because he expected it to be controversial with *Acta Mathematica*'s readership, and perhaps feared it would even undermine his credibility as editor.[109]

As Sloan Despeaux has pointed out, the situation at general science journals was slightly different. The culture of mathematics developed there was often more aligned with mathematics in the service of other sciences. Articles that explored the higher echelons of mathematical theory were not always welcome.[110] Editors of general science journals had to consider their readers, many of whom did not have the skills or the inclination to read articles of pure mathematics. Mathematics that was too specialized could be regarded negatively, and the referees that were assigned to give advice were not always the best at identifying the new mathematics that would later become important.

At book publishers, if we take Macmillan as our sole example, the situation was different again. Macmillan's publishing program included mathematics, and developed materials for broad educational purposes on mathematical topics. Mathematical textbooks, especially on the scale in which Macmillan produced them, had greater reach than most other printed sources in mathematics, and gave many students their first impressions of the subject. However, the values that influenced the image

of mathematics presented in them were closely tied to national traditions and cultural values. As such, the material that proceeded to publication frequently reinforced established ideas. In the case of Macmillan's mathematical books, and the culture of English mathematics that they reflected, some of these established ideas had already been proven incorrect, as both Russell and Fields later noted.

## ACKNOWLEDGEMENTS

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## Appendix A: Mathematical manuscripts received by Macmillan and Co., 1867-96

The following table is a record of some mathematical manuscripts Macmillan and Co. recorded receiving between the years 1868 and 1896. As Macmillan developed, they adapted record-keeping procedures to keep track of received manuscripts and corresponding readers' reports. The following list was compiled from the Records of Manuscripts and Readers Report books in the Macmillan Papers, British Library, London. A year, author or action given in brackets indicates some uncertainty in my interpretation of the paper records. DM, DMcA, and DMA are variations on the initials of Macmillan's reader of science, Donald MacAlister.

| *Author* | *Manuscript* | *Year* | *Action* | *Reviewer* |
|---|---|---|---|---|
| Airy, G. B. | New edition of Astronomy | [1886] | | DMcA |
| Airy, Osmund | Optics | 1869 | sent for revision | |
| Aldis, Mr. | Great Giant Arithmos' Elementary Arithmetic | 1881 | accepted | DM |
| Alexander, Tho. | Applied Mechanics Elementary Treatise | 1878 | accepted | |
| Allen, A. Jukes | Geometrical Dynamics | 1884 | declined | DMcA, Chambers |
| Anon. from Hong Kong | Arithmetic | [1886] | [declined] | DMcA |
| Anonymous | Key to Todhunter's Spherical Trigonometry | 1885 | declined | DMcA |
| Aveling, F. W. | Light & Heat | 1887 | declined | DMcA |
| Boevy, Prof. Henry | Applied Mechanics | 1882 | declined | DM |
| Bond, W. Henry | Rules and Examples in Algebra | 1880 | declined | |
| Boole, George | Professor Boole's Logic | 1868 | [accepted] | Prof. Price |
| Bottomley | Dynamics | [1886] | | DMcA |
| Bourne, C. W. | Key to Todhunter's Conics | 1886 | accepted | [DMcA] |

| | | | | |
|---|---|---|---|---|
| Bower, J. | Elementary Physics | 1884 | declined | DMcA |
| Briggs | Plane Analytic Geometry | [1885] | [declined] | DMcA |
| Browne, W. R. | Papers on Foundations of Mechanics | [1881] | [declined] | [DMcA] |
| Calvelly, R. S. | Perspective | 1884 | declined | John Sparkes |
| Candler, H. | Help to Algebra | 1885 | declined | DMcA |
| Carell | Calculus of Variations | [1885] | | DMcA |
| Chundersen, Baba Kshirode | Student's Elements of Resolution of Algebraical Expressions | 1885 | declined | DMcA |
| Clifford, W. K. | Collected Lectures and Essays | [1879] | accepted | |
| Clifford, W. K. | Seeing and Thinking | [1879] | accepted | |
| Clifford, W. K. | 1st part Elements of Dynamic | 1877 | accepted | |
| Coales, Dr. | Lectures on Mechanics | 1883 | declined | DMcA |
| Constable, Samuel | Beginner's Geometry | 1881 | accepted | DMcA |
| Cotterill, J. H | Treatise on Applied Mechanics | 1880 | accepted | DMcA |
| Cotton, R. H. | Geometrical Optics | 1882 | declined | DM |
| Cumming, Linnaeus | Book on electricity | 1875 | accepted | B. Stewart |
| Cumming, Linnaeus | Geometrical Conics | 1878 | | |
| Curtis, William Fitz-Harry | Primer of Arithmetic | 1883 | declined | DM, R. B. Hayward |
| Davison & Mayo | Arithmetic Papers | 1885 | declined | DMcA |
| Dougherty, J. A. | Spherics and Nautical Astronomy | [1885] | | DMcA |
| Dyer, J. M. | Algebraical Examples | 1884 | declined | DMcA |
| Eagles, J. H. | Constructive Geometry of Plane Curves | 1884 | accepted | DMcA |

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|---|---|---|---|---|
| Easton, J. G. | Algebraical Factors | 1884 | declined | DMcA |
| Edwards, J. | Differential Calculus | 1886 | accepted | DMcA |
| Elton, E. H. | Offer of Trigonometrical Examples | 1887 | declined | [DMcA] |
| Evans, A. Palmer | Arithmetic | 1874 | declined | |
| Evers, Henry | Trigonometry | 1883 | declined | DMcA |
| Ferguson, J. | Mechanical Philosophy | 1885 | declined | DMcA |
| Fielden, Mrs. | Euclid | 1882 | [declined] | [DM] |
| Fielden, Mrs. | Arithmetic Lessons | 1882 | declined | DM |
| Flint, John | Arithmetic and Answers | 1879 | declined | |
| Gallaby, W | Plane Co-ordinate Geometry | 1884 | declined | DMcA |
| Gibson and Webb | Euclid | 1884 | declined | DMcA |
| Gillman, C. | "-(x-y)2, or the Uselessness of Algebra | 1868 | declined | |
| Goyen, P. | Higher Arithmetic | [1886] | | DMcA |
| Graham, R. Hudson | Comparative Statics | 1882 | declined | DMA, J. Wolstenholme |
| Greaves, J. | Elementary Statics | 1885 | accepted | DMcA |
| Greenhill, A. G. | Integral and Differential Calculus | 1885 | accepted | [DMcA] |
| Greenhill, A. G. | Proposed Hydrostatics | 1886 | declined | DMcA |
| Greenhill, W. A. [A. G.] | Elliptic Functions | 1886 | accepted | DMcA |
| Hall | Euclid proposal | 1885 | accepted | DMcA |
| Hall and Knight | Algebra for Schools | 1884 | accepted | DMcA |
| Halstead, G. B. | Elements of Geometry | [1885] | import a few | DMcA |
| Hammarion, Miss | Astronomie Populaire | 1884 | declined | DM |

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|---|---|---|---|---|
| Hammond, A. de L. | Problems in Elementary Mathematics | 1880 | declined | W. J. [Jevons] |
| Hammond, A. de Lile | Exercises in Algebra | 1883 | declined | DM |
| Heiss | Algebraic Problems | [1886] | [declined] | DMcA |
| Henchie, E. J. | Mensuration | 1885 | declined | DMcA |
| Hewitt, George M | Geometry | 1884 | declined | DMcA |
| Hooker, G. N. | Plane Trigonometry | 1887 | declined | DMcA |
| Hospitalier | Hospitalier's Formulaire | [1883] | | Silvanus P. Thompson |
| Houston | Proposed Higher Arithmetic | 1884 | declined | DMcA |
| Hunter, R. St. J. | Key to Todhunter's Differential Calculus | [1887] | accepted | DMcA |
| Ibbelson, W. I. | Elasticity | 1884 | accepted | DMcA |
| Jackson, Louis | Civil Engineering Book | 1882 | declined | [DM] |
| James, H. A. | Perspective Explained on Geometrical Principles | 1885 | declined | DMcA, J. Sparkes |
| Jevons, S. | Elementary Logic | 1870 | accepted | |
| Kirkman, J. P. | Exercises in elementary trigonometry | [1882] | declined | |
| Knight, W. T. | Algebraic Factors | 1881 | | |
| Knox, A. | Certain Infinitesimal Quantities | 1884 | accepted | DMcA |
| Knox, Alexander | MS on Differential Calculus | 1884 | accepted | DMcA |
| Köing | Question of translating Köing | 1881 | | DM |
| Lanza | Curve-Tracing | [1885] | [declined] | DMcA |
| Lock | Proposal for a second part of his Trigonometry | 1883 | accepted | [DM] |

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|---|---|---|---|---|
| Lock | Arithmetic proposal | [1885] | [accepted] | DMcA |
| Lock, John | Euclid proposal | [1886] | | DMcA |
| Low, D. A. | Applied Mechanics | 1886 | declined | DMcA |
| Lupton, Sydney | Numerical Tables & Constants in Elementary Science | 1884 | declined | |
| Lyle, John Newton | Differential Coefficients | 1873 | declined | Mr. Todhunter |
| Lynam, J. D. | Key to Todhunter's Conics | 1885 | declined | DMcA |
| Maccoll, Hugh | Elliptical Solutions of Algebraic Problems | [1884] | declined | DMcA |
| Macfarlane, Alex | Applied Arithmetic | 1884 | accepted | DMcA |
| MacGregor | Mechanics | [1886] | | DMcA |
| MacGregor, Prof. J. G. | Kinematics & dynamics | 1886 | accepted | DMcA |
| Martineau, C. A. Miss | Heat | 1878 | accepted | |
| Matthews, E. H. | Matriculation Mathematics | 1880 | declined | |
| Mault, A. | Natural Geometry | 1876 | accepted | |
| McAulay, Alexander | Quaternions for school boys | 1895 | declined | DMcA |
| McCarthy | Key to Todhunter's Mensuration | [1884] | accepted | DMcA |
| McClelland and Preston | Spherical Trigonometry | 1885 | accepted | DMcA |
| McClelland, N. M. | Spherical Trigonometry | 1886 | declined | DMcA |
| McClelland, W. J. | MS on Spherical Trigonometry | [1884] | declined | DM |
| McClelland, W. J. | Spherical Trigonometry | 1884 | declined | DM |
| McClinton, Thomas | Lines Cut Harmonically | 1884 | declined | DMcA |

| | | | | |
|---|---|---|---|---|
| McKinn, Joseph | Elementary Plane Trigonometry | 1879 | declined | |
| McPherson, Dr. J. G. | Proposal for a small book on Quaternions | 1885 | declined | DMcA |
| Milburn, R. M. | Mathematical Formulae | 1878 | declined | |
| Miller, J. B. | Elements of Descriptive Geometry | 1877 | accepted | |
| Mitchison, A. M. | Elementary treatise on corresponding theorems in geometry | 1880 | | W. J. [Jevons] |
| Muir, Thomas | Determinants | [1878] | accepted | |
| Olley, H. R. | Geometrical Optics | 1882 | declined | [DM] |
| Openshaw, T. W. | Mathematical Formulae | 1883 | declined | |
| Pedley, S. | Exercises in Arithmetic | 1878 | accepted | |
| Pedley, S. | Useful Mensuration | 1887 | declined | |
| Pendlebury, C. | Arithmetic | 1885 | declined | DMcA |
| Pinkerton, R. H. | Dynamics | 1887 | declined | DMcA |
| Pluckett, Captain G. J. | Orthographic Projection | 1881 | declined | DMcA |
| Ray, Saradaranjan | Elements of Geometry | 1896 | accepted | DMcA |
| Ray, Saradaranjan | Beginner's Algebra | 1896 | accepted | DMcA |
| Ray, Saradaranjan | Algebra | 1896 | accepted | DMcA |
| Ray, Saradaranjan | Elementary Trigonometry | 1896 | accepted | DMcA |
| Rayleigh, Lord | Chapter II of Book on Sound | 1876 | accepted | |

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|---|---|---|---|---|
| Roach, J. | Trigonometry | 1885 | declined | DMcA |
| Roach, J. | Trigonometry | [1887] | | DMcA |
| Roach, J. | Trigonometry | 1885 | declined | [DMcA] |
| Robinson, J. R. | Elementary Dynamics | 1887 | declined | DMcA |
| Robinson, John L. | Work on nautical surveying | 1881 | accepted | DM |
| Saughton, J. K. | Nautical Surveying | 1872 | declined | |
| Senior, M. H. | My First Trigonometry | [1883] | declined | DMcA |
| Sexton, Humbolt | Quantitative Analysis | 1885 | declined | DMcA |
| Shann, George | Heat in relation to the Steam Engine | [1877] | accepted | |
| Sheddon, J. | Geometry of Curves | [1886] | | DMcA |
| Shortland, Vice-Admiral | Nautical Surveying | 1885 | | DMcA |
| Smith, Charles | Conic Sections | 1881 | accepted | DMcA |
| Smith, J. Brook | Arithmetic | 1870 | accepted | |
| Smith, R. Prowde | Mathematical Examples | 1886 | declined | [DMcA] |
| Sonnenchein, A. | Arithmetic for Children | 1870 | | |
| Stanley, W. J. | Properties and motions of fluids | 1881 | declined | DM |
| Stapley, A. Mackenzie | Deductive Logic | 1883 | declined | |
| Staveley, R. | MS on Fresnel's Theory of Double Refractions | 1883 | declined | DMcA |
| Tebay, Septimus, B. A. | Mensuration | 1867 | declined | |

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|---|---|---|---|---|
| Thomas, J. V. | Key to Todhunter's Differential | 1886 | declined | DMcA |
| Thomson, W. | Algebra | 1885 | declined | DMcA |
| Thudichum, Dr. | Spectrum Analysis | 1869 | declined | Mr. Lockyer |
| Vaughn, William | Metric Arithmetic | 1869 | declined | |
| Wace, Henry | Method of Logarithms | 1870 | declined | |
| Wait & Jones | Algebra | 1887 | declined | DMcA |
| Williams, H. A. | Factors in Algebra | 1884 | declined | DMcA |
| Willis, H. G. | Geometrical Conic Sections | 1879 | declined | |
| Wilson, J., | Revised Euclid | 1880 | declined | DMcA, W. Jevons |
| Wolstenholme, Joseph | Geometry Problems | 1878 | accepted | |
| Wood, J. G. | Miscellaneous Papers | 1885 | declined | DMcA |
| Wright, Lewis | On Light | 1881 | accepted | D. MacAlister |
| Young, E. W. | Book on engineering | 1873 | accepted | |
| | Mensuration for Army Exams | [1886] | [declined] | DMcA |

## Appendix B: Some of Macmillan's readers of science, 1867-96

The following table lists some of Macmillan's readers on scientific topics during the years 1868 and 1896. This list was compiled from the Records of Manuscripts Received and Readers Report books from the Macmillan Papers, British Library. This is not a comprehensive list. However, it does reveal some of Macmillan's trusted advisors on scientific topics, and reflects how frequently, and in what years, these readers were active. I have made some assumptions in producing this list of reviewers, as in some cases I deduced a full name from initials or a shortened form given in the records.

| *Name* | *Year(s) when active as a reviewer (known number of reviews in the preceding year)* | *Subjects of manuscripts reviewed* |
|---|---|---|
| Donald MacAlister | 1880 (1), 1881 (>9), 1882 (>7), 1883 (>7), 1884 (>21), 1885 (>26), 1886 (>18), 1887 (>9), 1895 (1), 1896 (>4) | General science and mathematics |
| John Stewart Mackenzie | 1893 | Evolution, heredity, ethics, sociology |
| James H. Cotterill | 1895 | Engineering |
| Joseph Wolstenholme | 1882 (1) | Statics |
| T. H. Vines | 1881 (1) | Pathology |
| H. E. Roscoe | 1881 (2) | Chemistry |
| Alexander Dickson | 1881 (1) | Botany |
| Charles Darwin | 1881 (1) | Botany |
| T. H. Huxley | 1868 (1), 1881 (1) | Zoology |
| W. Stanley Jevons | 1869 (1), 1878 (1), 1880 (3) | Mathematics, economics |
| C. Schorlemmer | 1881 (1) | Chemistry |
| Thistleton Dyer | 1883 (1) | Micro-botany |
| M. Foster | 1883 (1) | Physiology |
| R. B. Hayward | 1883 (1) | Arithmetic |

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|---|---|---|
| Silvanus P. Thompson | 1883 (1) | Electricity |
| T. Lauder Brunton | 1878 (1), 1880 (1), 1885(1) | Biology, disease |
| J. Sparkes | 1877 (1), 1884 (1), 1885 (1), | Linear perspective (for artists) |
| Chambers | 1884 (1) | Dynamics |
| Sir David Ferrier | 1878 (1) | Medicine |
| Mrs. Boole | 1867 (2), 1872 (1), 1873 (1) | Natural Philosophy |
| Norman Lockyer | 1868 (2), 1869 (3), 1873 (1), 1880 (1) | Agriculture, geography, mineralogy |
| Balfour Stewart | 1875 (1) | Electricity |
| Prof. Price | 1868 (1) | Logic |
| Isaac Todhunter | 1873 (1) | Mathematics |

## NOTES

1 Jeremy Gray, 'Archives of Mathematical Journals', Historia Mathematica, 2:2 (1975), 202.

2 June Barrow-Green, 'Gösta Mittag-Leffler and the Foundation and Administration of Acta Mathematica', in Mathematics Unbound: The evolution of an international mathematical research community, 1800-1945, eds. K. H. Parshall and A. C. Rice (Providence, RI, 2002).

3 Ibid., pp.147-8.

4 Ibid., pp.140, 146.

5 Ibid., p.150.

6 Ibid., p.153.

7 William Thomson acquired the title of Lord Kelvin in 1892. However, during his editorship of the Cambridge and Dublin Mathematical Journal, he was still known as William Thomson. For the sake of consistency, he will be referred to as such throughout this article.

8 Bertrum MacDonald and Jennifer Connor, 'Science, Technology and Medicine: Constructing Authorship', in History of the Book in Canada, eds. Y. Lamonde, P. L. Fleming and F. A. Black, Vol. 2, 1840-1918 (Toronto 2007), p.178.

9 Tony Crilly, 'The Cambridge Mathematical Journal and Its Descendants: The linchpin of a research community in the early and mid-Victorian age', Historia Mathematica, 31:4 (2004), 455-97, (at p.480).

10 These reforms included a name change (to the Cambridge and Dublin Mathematical Journal), the requirement that every article be signed by the author's name (eliminating pseudonyms and anonymity), affiliation with a new publisher (Macmillan and Co.), and an expressed wish to expand the body of authors and readers beyond any specific academic affiliation.

11 See Crilly, 'The Cambridge Mathematical Journal and Its Descendants', p.481.

12 Stephen Fenwick was a mathematical master at the Royal Military Academy at Woolwich, and an editor at The Mathematician, another mathematical journal than operated from 1843 to 1850.

13 Arthur Cayley quoted in Crilly, 'The Cambridge Mathematical Journal and Its Descendants', p.481.

14 For more about Arthur Cayley and his role in the development of British mathematics, see Tony Crilly, Arthur Cayley: Mathematician laureate of the Victorian age (Baltimore 2006).

15 George Boole was largely self-taught as a mathematician, something that distinguished him from the majority of English mathematicians, who were graduates of the universities at Cambridge, Oxford, Dublin or London (see the listing in Table 2, Crilly, 'The Cambridge Mathematical Journal and Its Descendants', p.491). After a decade of contributions to mathematics, Boole became the first professor of mathematics at Queens College, Cork in 1849.

16 George Boole quoted in Crilly, 'The Cambridge Mathematical Journal and Its Descendants', p.481. Brice Bronwin was a curate in the parish of Denby Dale in Yorkshire who wrote papers on pure mathematics and astronomy.

17 The Committee of Papers was a subgroup of the Council, who managed the selection, editing, and publication of papers in the Philosophical Transactions and later in the Proceedings of the Royal Society.

18 Sloan E. Despeaux, 'Fit to Print? Referee reports on mathematics for the nineteenth-century journals of the Royal Society of London', Notes and Records of the Royal Society of London, 65:3 (2011), 233-52.

19 Ibid., p.245. In the first decades of referring at Philosophical Transactions, well-known figures of the British mathematical community frequently served as referees. George Peacock, Arthur Cayley, Henry J. S. Smith, George Boole, William Spottiswoode and Archibald Smith were some of these. Initially the pool of mathematical referees for Royal Society publications was restricted to the Fellowship (and as Despeaux notes, this was a small number—in 1830 only forty-eight Fellows identified as mathematicians, astronomers or physicists). By 1891 it had become common practice to also use referees who were not necessarily members of the Royal Society.

20 Ibid., p.236, 239. Despeaux gives two examples. Arthur Cayley submitted some highly technical work that was not published in the Philosophical Transactions because its content surpassed even the understanding of his referees, let alone the average Royal Society Fellow. On the other hand, rejection was handled with care when the paper originated from Sir Frederick Pollock, mathematician, parliamentarian, Attorney General, and Chief Baron of the Exchequer.

21 Ibid., p.245-6. Despeaux's example is the Royal Irish Academy's rejection of William Rowan Hamilton's 1824 submission 'On Caustics'. Hamilton resubmitted an enlarged version of the article two years later as 'Theory of Systems of Rays'. This paper expressed fundamental ideas that contributed to Hamilton's later fame as a mathematician.

22 Linda Marie Fritschner, 'Publishers' Readers, Publishers, and Their Authors', Publishing History, 7 (1980), 45-100 (at p.46).

23 Ibid.

24 Ibid., p.94.

25 The Syndics of Cambridge University Press was a committee drawn from senior members of the Cambridge University community.

26 David McKitterick, A History of Cambridge University Press, Vol. 3, New Worlds for Learning, 1873-1972, (Cambridge 2004), p.87.

27 Charles Morgan, The House of Macmillan (1843-1943) (London 1943), p.1.

28 Simon Eliot, '"To you in your vast business": Some features of the quantitative history of Macmillan 1843-91', in Macmillan: A publishing tradition, ed. E. James (Basingstoke 2002), p.11.

29 Morgan, p.2.

30 Macmillan published authors Matthew Arnold, Alfred Tennyson, and William Butler Yeats, as well as notable titles such as Gone with the Wind and Alice in Wonderland. Elizabeth James notes that Macmillan's scientific publishing program, as well as its industry leadership (e.g. its role in the formation of the Net Book Agreement), has yet to be studied. See Elizabeth James, 'Introduction', in Macmillan: A publishing tradition, ed. E. James (Basingstoke 2002), p.xix.

31 Eliot, p.24.

32 Recent work by Melinda Baldwin has shed light on the history and evolution of the journal Nature into an important vehicle for scientific communication in Britain. Melinda Baldwin, 'The Shifting Ground of Nature: Establishing an organ of scientific communication in Britain, 1869-1900', History of Science, 50:2 (2012), 125-54; Melinda Baldwin, '"Keeping in the race": Physics, publication speed and national publishing strategies in Nature, 1895-1939', The British Journal for the History of Science, [forthcoming] 46 (11/2013), pp.1-23. Available as FirstView article online at: http://journals.cambridge.org/abstract_S0007087413000381 [Accessed 23 November 2013].

33 Simon Nowell-Smith, 'Introduction', in Letters to Macmillan, ed. S. Nowell-Smith (London 1967), p.13.

34 Morgan, pp.30 & 37.

35 Macmillan printed more than 597,000 copies of Barnard Smith's Arithmetic for Schools between 1854 and 1920, and 693,000 copies of Isaac Todhunter's Algebra for Beginners during the period 1863-1917 (First Editions Book, Macmillan Papers, British Library, London, UK, p. 472, 594). The current article makes extensive use of the Macmillan Archive (British Library Add MS 54786-56035), which comprises correspondence and papers of the publishing firm of Macmillan and Company. Included in Macmillan's many extensive records of their publishing activity are a series of production ledgers, the Editions Books, which list the number of books ordered, date of publication, name of printer, type and date of paper ordered, etc., for each title published. The first Editions Book, detailing Macmillan's publications to the year 1892, is held in the Macmillan Archive in the Palgrave-Macmillan head offices in Basingstoke, UK. Subsequent volumes are found in the British Library. For convenience the British Library holds a CD-ROM copy of the first Editions Book. This digital copy of the first Editions Book

is provided as a convenience to researchers. However, the original source is not a part of the British Library's manuscript collections, and the CD-ROM is not listed in their catalogue or in the records of manuscripts. It was, however, the British Library's CD-ROM copy of the first Editions Book consulted by this author. For more about Todhunter and Smith's mathematical textbooks, see Abhilasha Aggarwal, 'Mathematical Books for and in India in the Nineteenth Century', British Society for the History of Mathematics Bulletin, 22:1 (2007), pp.11-21 (at p.11); Rimi B. Chatterjee, 'Macmillan in India: A short account of the company's trade with the Sub-Continent', in Macmillan: A publishing tradition, ed. E. James (Basingstoke 2002), p.156; June Barrow-Green, '"The Advantage of Proceeding from an Author of Some Scientific Reputation": Isaac Todhunter and his mathematics textbooks', in Teaching and Learning in Nineteenth-Century Cambridge, eds. J. Smith and C. Stray (The History of the University of Cambridge. Texts and studies, Vol. 4, Rochester 2001), p.189.

36 See Tony Crilly, 'Arthur Cayley as Sadleirian Professor: A glimpse of mathematics teaching at 19th-century Cambridge', Historia Mathematica, 26:2 (1999), 125-60, (at p.129); June Barrow-Green and Jeremy Gray, 'Geometry at Cambridge, 1863-1940', Historia Mathematica, 33:3 (2006), 315-356, (at, pp.320-1); Sheldon Rothblatt, The Revolution of the Dons: Cambridge and society in Victorian England (London 1968); Andrew Warwick, Masters of Theory: Cambridge and the rise of mathematical physics (Chicago 2003).

37 Morgan, pp.30 & 34.

38 Jonathan R. Topham, 'A Textbook Revolution', in Books and the Sciences in History, eds. Marina Frasca-Spada and Nick Jardine (Cambridge 2000), pp.318-19.

39 David McKitterick, A History of Cambridge University Press, Vol. 2, Scholarship and Commerce, 1698-1872 (Cambridge 1998), p.397.

40 Jonathan R. Topham, 'Two Centuries of Cambridge Publishing and Bookselling: A brief history of Deighton, Bell and Co., 1778-1998, with a checklist of the archives', Transactions of the Cambridge Bibliographical Society, 11 (1998), 350-403. London's Taylor and Francis were also important printer-publishers of science. They served as printers to most of London's scientific societies, and published numerous periodicals on emerging scientific topics. See William H. Brock and Arthur J. Meadows, The Lamp of Learning: Two centuries of publishing at Taylor & Francis (2nd edn; London 1998).

41 Morgan, p.71.
42 McKitterick, Vol. 2, p.401.
43 Morgan, p.71.
44 H. B. Mayor, 'James Maurice Wilson (1836-1931)', Oxford Dictionary of National Biography [Oxford DNB] (Oxford 2004). Available online at: http://www.oxforddnb.com [article 36960] [Accessed 21 Jan 2013].
45 McKitterick, Vol. 2, p.387.
46 See Records of Manuscripts Received, 1866-83 (BL Add. MS 56016). An anonymous reviewer wrote of one popularization, titled The Science of Method submitted by J. O. Connell: 'It is deplorable to think of the time which must have been spent in producing this laborious farrago—three parts of the sentences in which are absolutely meaningless. I went over one test chapter with a thoroughly learned man in this special subject, and he agreed with me that it was pure rubbish—not because its meaning is wrong, but because it has no meaning. It would be a discredit to publish it'. Readers Reports 1871-77 (BL Add. MS 55933), fo.5.
47 Readers Reports, 1880-83 (BL Add. MS 55935), fo.92.
48 General Letter Book, 1854-55 (BL Add. MS 55376), fo.70.
49 Stokes, besides being Senior Wrangler and first Smith's prizeman at Cambridge in 1837, was appointed to the Cambridge Lucasian professorship of mathematics in 1849, and served as a secretary for the Royal Society from 1854 until he became president in 1885. Later on, Macmillan did publish some lectures Stokes gave at South Kensington in the 1870s and 1880s.
50 In 1858 Alexander expanded the Cambridge-based business to include an office in the Covent Garden area of London. Five years later Alexander would move from Cambridge to London, establishing the business headquarters there. But for the five years between the creation of the London office and while Cambridge remained the base, Alexander travelled to the city every Thursday for the night. Alexander's weekly visits to London became an occasion to gather socially with the intellectuals, authors and scientists who mingled in Macmillan's growing sphere. In the words of Robert Bowes, Alexander's nephew who operated their London premises, these get-togethers in the London office were 'at home to all and sundry, when tea and stronger fluids, with occasional tobacco, were going on' (Robert Bowes, quoted in Morgan, p.50). These occasions became known as the 'Tobacco

Parliaments', and were somewhat legendary gatherings that attracted artists and writers of fiction as well as men of science. Some of the regular attendees included the painter Holman Hunt, the sculptors Thomas Woolner and Alexander Munro, and the writers Lord Tennyson, Thomas Hughes and Charles Kingsley. Among the scientific guests were T. H. Huxley, William Sharpey, and Herbert Spencer. The talk revolved around 'Darwin and conundrums with general jollity pleasantly intermixed' (Morgan, pp.50-2). According to Alysoun Sanders, Archivist at Macmillan Publishers Ltd., no further research has been carried out about these gatherings, other than what Charles Morgan has written about in his biography of the firm. Alysoun Sanders to Sylvia Nickerson, personal e-mail correspondence, 31 July 2012.

51 For example, in 1855 Daniel wrote to George Boole about his differential equations manuscript, commenting 'The title you suggest to us seems very good and Mr. Todhunter to whom I showed it liked it too'. See Daniel Macmillan to George Boole, 12 September 1855 (BL Add. MS 55377, General Letter Book 1855).

52 See Daniel Macmillan to George Boole, 12 September 1855, and Daniel Macmillan to John Hymers, 16 September 1855 (BL Add. MS 55377, General Letter Book 1855). It was a new edition of Hymer's A Treatise on Differential Equations, and on the Calculus of Finite Differences (1839), published by Deighton in Cambridge and Rivington in London, that Macmillan presumably turned down.

53 See General Letter Books from 1855-56 (BL Add. MS 55376, 55377 and 55379).

54 Records of Manuscripts Received, 1866-99 (BL Add. MS 56016-56018).

55 John Newton Lyle was a mathematics professor from Westminster College in Fulton, Missouri USA. The manuscript was returned to the author. Presumably, Todhunter did not recommend its publication (BL Add. MS 56016, fo.31).

56 Alexander Macmillan quoted in Charles L. Graves, Life and Letters of Alexander Macmillan (London 1910), p.262. See also Baldwin, 'The Shifting Ground of Nature', p.128.

57 In an 1854 letter to Thomas Lund, Macmillan expressed value in having the best minds write elementary textbooks: 'There is doubt that there is room enough for several first rate school books on such subjects as algebra … It is same and good for the educational

prospects of England that first rate Cambridge Mathematicians should strive to produce the best elementary works. This field has been too long in the hands of quacks'. See Daniel Macmillan to Thomas Lund, 28 October 1854 (General Letter Book, 1854-1855, BL Add. MS 55376).

58 BL Add. MS 56016, fo.9.

59 Ibid., fo.11, 16 and 20.

60 Ibid., fo.18.

61 Ibid., fo.42. This record indicates that the second chapter of volume one (not the text of the second volume) was sent at this time. Note that Macmillan published volume one of Rayleigh's Theory of Sound in 1877, while volume two appeared in 1878.

62 BL Add. MS 56016, fo.41.

63 Ibid., fo.49.

64 Ibid., fo.45. One wonders whether Alexander Macmillan may have turned to his network of informal advisors on these occasions. For instance Stanley Jevons, a man within Macmillan's circle, may have known J. B. Millar from his time working at Owens College. Millar was a civil engineer and assistant lecturer in engineering at Owens College in Manchester.

65 BL Add. MS 56016, fo.51, 53 and 57.

66 See James Foster, A Bibliographical Catalogue of Macmillan and Co's Publications from 1843 to 1889 (London 1891), p.165. I am grateful to June-Barrow-Green for pointing this out.

67 BL Add. MS 56016, fo.83.

68 Ibid., fo.44.

69 Foster, p.324.

70 BL Add. MS 56016, fo.58 and 60. Milburn's Mathematical Formulae was published by Longmans in 1880. Flint was the author of a previously published textbook in Glasgow.

71 BL Add. MS 56016, fo.64 and 65.

72 Ibid., fo.69 and 70. W. Henry Bond is identified as headmaster of Barrow School, Borden, Kent.

73 Other readers were employed by Macmillan at this time. The reports of Thomas E. Page (active 1893-1899), Henry Stuart Jones (1895-1904), and Frederic Relton (1879-1925) are held within the Macmillan Archive, British Library.

74 The first report attributed to MacAlister occurs in November 1880 (BL Add. MS 56016, fo.73).

75 While most of MacAlister's reports are identified by the initials DM, DMA or DMcA, his full name appears in (BL Add. MS 55935, fo.47).

76 Donald MacAlister, 'The Law of the Geometric Mean', Proceedings of the Royal Society of London, 29:196-199, (1879), 367-76.

77 A. J. Crilly, 'MacAlister, Sir Donald, First Baronet (1854-1934)', Oxford Dictionary of National Biography [Oxford DNB] (Oxford 2004). Available online at: http://www.oxforddnb.com [article 34659], [Accessed 11 June 2011].

78 MacAlister and Todhunter were 'old friends' according to MacAlister (BL Add. MS 55940, fo.137).

79 Edith MacAlister, Sir Donald MacAlister of Tarbert, By His Wife; With Chapters by Sir Robert Rait and Sir Norman Walker (London 1935).

80 In one review, MacAlister writes about the difficulty of consulting a Cambridge colleague for his opinion as this person also knew the prospective author: 'If I ask him he would at once connect me directly with you, and I shall be freer in the future if the connection is not so public' (BL Add. MS 55935, fo.171).

81 BL Add. MS 55935, fo.26; Readers Reports 1886-71 (BL Add. MS 55931), fo.174.

82 BL Add. MS 55939, fo.129.

83 BL Add. MS 55940, fo.135.

84 'Elliptic Functions' by W. A. Greenhill [this is probably A. G. Greenhill, whose book The Application of Elliptic Functions, was published by Macmillan in 1892], H. B. Halstead's 'Elements of Geometry', and a book on the calculus of variations were recommended for publication on this basis. BL Add. MS 55939, fo.54; Readers Reports 1883-84, (BL Add. MS 55936), fo.164; Readers Reports, 1883-85 (BL Add. MS 55937), fo.73.

85 BL Add. MS 55939, fo.16.

86 Ibid., fo.17.

87 Ibid., fo.17.

88 BL Add. MS 55935, fo.63.

89 Ibid., fo.32.

90 BL Add. MS 55937, fo.46.

91 BL Add. MS 55940, fo.16.

92 BL Add. MS 55935, fo.96.

93 Ibid., fo.32 and 63.

94 BL Add. MS 55940, fo.16; BL Add. MS 55937, fo.46.

95 BL Add. MS 55937, fo.53.
96 Ibid.
97 Ibid., fo.26.
98 BL Add. MS 55936, fo.81; Readers Reports, 1867-82 (BL Add. MS 55932), fo.25.
99 BL Add. MS 55935, fo.26. About another geometry manuscript, he mentions: 'Euclid and elementary geometry are being much shaken up just now, but there are several much more promising books in the field than this'. Readers Reports 1884-85 (BL Add. MS 55938), fo.22.
100 Warwick, p.434.
101 See Philip C. Enros, 'The Analytical Society (1812-1813): Precursor of the renewal of Cambridge mathematics', Historia Mathematica, 10:1 (1983), 24-47.
102 Bertrand Russell, My Philosophical Development (London 1959), p.39.
103 Nicholas Griffin and Albert C. Lewis, 'Bertrand Russell's Mathematical Education', Notes and Records of the Royal Society of London, 44:1 (1990), 51-71 (at p.57).
104 BL Add. MS 56016, fo.83.
105 BL Add. MS 56017, fo.3.
106 Some 525,000 copies of Todhunter's edition of The Elements of Euclid were printed between 1862 and 1903. In comparison, 577,250 copies of the firm's top-selling fiction title (Charles Kingsley's Westward Ho!) were printed during the same period. Even at a time when classic mathematics texts were being eclipsed by modern demonstrations of the subject, Euclid's Elements could rival a literary work for the distinction of best-selling title for its publisher. This evidence was retrieved from the First Editions Book, Macmillan Papers, British Library, London, UK.
107 Elaine McKinnon Riehm and Frances Hoffman, Turbulent Times in Mathematics: The life of J. C. Fields and the history of the Fields medal (Providence RI, and Toronto 2011), p.22.
108 Joan Richards, in her book Mathematical Visions, develops the idea that the English viewed mathematics as an empirically flawless body of knowledge. They did not, in general, regard mathematics, and in particular geometry, as capable of growth, failure, or change. As such, mathematics held special cultural value in English culture and society, for its ability to provide an exemplar, or norm, for truth. Richards argues that this image of

mathematics was particularly expressed in England's educational structures, and shaped the approach to teaching mathematics at the University of Cambridge. Joan L. Richards, Mathematical Visions: The pursuit of geometry in Victorian England (Boston 1988).

109 Some of Cantor's mathematical contemporaries considered his work illegitimate. Joseph W. Dauben, 'Georg Cantor and Pope Leo XIII: Mathematics, theology, and the infinite', Journal of the History of Ideas, 38:1 (1977), 85-108 (at pp.89-91). For more about Cantor's life and work see I. Grattan-Guiness, 'Towards a Biography of Georg Cantor', Annals of Science, 27:4 (1971), 345-91; Joseph W. Dauben, Georg Cantor: His mathematics and philosophy of the infinite (1979; repr. Princeton 1990).

110 As Richard Taylor explained with regard to including mathematics in the Philosophical Magazine, 'It is not in [the editor's] power to admit any very great quantity of pure mathematics. The majority of the readers of the Magazine are more interested in other sciences, and the Magazine would soon cease to exist if it were more than sparingly supplied with articles on lofty mathematical subjects … The papers of the Philosophical Transactions, of the Memoirs of the Royal Irish Academy, of the Cambridge Philosophical Society, of the Cambridge Mathematical Journal, &c, are much fitter vehicles for extensive mathematical discussion than those of the Philosophical Magazine'. Taylor quoted in Brock and Meadows, p.100.