

A CONNECTED EFFORT? AMERICAN EDITORS PURSUE MATHEMATICAL JOURNAL PUBLICATION, 1804–1878

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ABSTRACT. — The existing list of American periodicals that include mathematical content prior to the 1876 founding of *The American Journal of Mathematics* suggests a series of discrete attempts to start a specialized mathematical journal. This paper argues that a handful of mathematical practitioners in fact participated in far more sustained and contiguous efforts to start and sustain an elevated level of specialized mathematical periodical publication in the United States in the first three quarters of the nineteenth century.

RÉSUMÉ (Un effort coordonné? Des rédacteurs américains se lancent dans la publication de revues mathématiques, 1804-1878)

La liste des périodiques américains comportant un contenu mathématique antérieurement à la fondation de *The American Journal of Mathematics* pourrait être interprété comme une série de tentatives isolées pour créer un journal spécialisé en mathématiques. Cet article soutient qu'une poignée de praticiens des mathématiques ont en fait fourni des efforts beaucoup plus soutenus et continus pour créer et maintenir une activité de publications périodiques

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mathématiques spécialisées d'un niveau élevé aux États-Unis au cours des trois premiers quarts du XIX^e siècle.

1. INTRODUCTION

Throughout the first three quarters of the nineteenth century mathematical practitioners in the United States worked together with geologists, physicists, and botanists to organize scientific societies, provide publication outlets, and develop employment opportunities for scientists generally. Those working to support these efforts often looked to Europe for ideas about useful professional infrastructure. Mathematical practitioners were among those who gradually began to adopt similar structures within their own scientific specialities. Initial attempts to create a specialized field through educational reform and mathematical publication in the United States characterized these years, which witnessed forays into specialized graduate education and great efforts towards new publications. These efforts parallel the common periodization of the history of science in the United States, where so-called gentlemen of science characterize the colonial and antebellum periods until the 1860s. The Morrill Act of 1862—enacted during the American Civil War—and its creation of land-grant colleges emphasizing agriculture and engineering marks a transition in the landscape of American higher education. Post-war Reconstruction revived national trends of exploration and economic development amid social changes. The late 19th century saw the rise of major firms and a blossoming of university-based research science with associated professional specialization.

In this context, the 1878 foundation of the *American Journal of Mathematics* (*AJM*) marked the first American journal exclusively focused on research-level mathematics, designed primarily for individuals employed as mathematicians. In 1876, Daniel Coit Gilman became the first president of Johns Hopkins University, which he fashioned as the first American graduate university for the advancement of research. University-supported specialized publications featured in this design. Gilman tasked the first professor of mathematics, James Joseph Sylvester, with editing the mathematics research journal. Prior to the *AJM*, American mathematical journals relied on a series of repeated grassroots initiatives from within a group of connected mathematician-editors. Those ambitious 19th-century editors had envisioned a mathematical periodical that would connect readers with

mathematical activity beyond the journal and, ultimately, communicate research-level mathematics. Their ongoing efforts to publish mathematical journals highlight persistent interest in sustaining a specialized mathematical publication in the United States, despite recurring obstacles to that goal. The experiences of these aspiring editors mirror entrepreneurial efforts with a range of science journals elsewhere. For example, The *Edinburgh Philosophical Journal*, the *Philosophical Magazine*, Silliman's *Journal*, and even *Nature*, have origin stories similarly subject to market vagaries.¹

American mathematical journals before the *AJM* often involve peripheral figures, who are sometimes undocumented, anonymous or hard to identify based on limited sources. Little remains as archives from minor figures involved in the story. Copies of the publications themselves can be elusive, while evidence about finances, subscription data, and circulation is often sparse. Manuscript sources for this paper include correspondence, receipts, and notes from one small box in the Joel Hendricks Papers at the Des Moines Historical Society Archives, and the contents of the Charles Gill Papers at Cornell University's John M. Olin Library. There are also relevant manuscripts in the Harvard University Archives as well as the Benjamin Peirce papers from Houghton Library.

2. THE 19TH-CENTURY AMERICAN MATHEMATICAL PERIODICAL

The earliest outlets for mathematical publishing in the United States included a few general science journals—like the *Transactions of the American Philosophical Society* (f. 1771) in Philadelphia, the *Memoirs of the American Academy of Arts and Sciences* (f. 1785) in Boston, or *The American Journal of Science and the Arts* (f. 1819) in New Haven. Most mathematical papers involved surveying or astronomy in the *Transactions*, where ten articles about the transit of Venus filled forty-two percent of the first volume's pages [Hindle 1956]. Mathematics featured in the *Memoirs* mainly involved its applications to geography and navigation. Publications of the period exhibit a broad definition of mathematics, including a range of material from elementary arithmetic and algebra to pure mathematical investigations to scientific applications of all kinds.

¹ For more on 19th century publication outside of the United States, see [Apple et al. 2012; Ausejo & Hormigón 1993; Baldwin 2015; Bidwell 2019; Crilly 2004; Despeaux 2002a;b; Gérini 2002; Schubring 1993; Secord 2014; Topham 2016; Verdier 2010].

With few exceptions, technical scientific or advanced mathematical training was rare and, especially early in the century, many among the educated American elite remained both dubious about the status of such education and skeptical about science as a profession or even, in some cases, as an activity. While a vocal minority maintained a strong interest in doing American science in an American way, even they still worked to formulate an understanding of what that might mean [Beach 1972, p. 118]. Consequently, there was at best a meager audience available for a scientific publication.

Todd Timmons' prosopographical study [Timmons 2004] indicates that between 1771 and 1834, eighty-four American authors published mathematics in the *Transactions of the American Philosophical Society*, the *Memoirs of the American Academy of Arts and Sciences*, or *The American Journal of Science and the Arts*. He estimates that between forty and fifty percent of these authors may have been college graduates, while the rest would have had at most a high school education. Of the eighty-four authors of contributions identified as mathematics, thirty-three served at one time or another as professors at American colleges, although the actual tenure of many was quite short. Ten of these were listed as professors of mathematics exclusively, and six of those worked at the military academy at West Point, where the mathematical curriculum initially consisted of geometry, arithmetic, logarithms, and algebra from Charles Hutton's *Course in Mathematics*. Professors had the option of including fluxions starting in 1816. By 1825 all cadets were learning some calculus from Sylvestre-François Lacroix, Jean-Louis Boucharlat, or Hutton, depending on their rank. In 1817, after his study of the *École polytechnique*, Superintendent Sylvanus Thayer focused on elevating the curriculum and using French mathematical texts including Lacroix's *Algebra*, Adrien-Marie Legendre's *Geometry*, and Boucharlat's *Calculus*. By 1818, mathematics occupied cadets for about 6 hours per day, six days a week. Content at that point consisted of arithmetic, algebra, surveying, and trigonometry as well as analytical and descriptive geometry [Rickey & Shell-Gellasch 2010]. West Point provided the most advanced technical education available in the United States at the time. Beyond the military academy contributors in Timmons' study, other authors of mathematical papers included a civil engineer, an astronomer, an actuary, several secondary school teachers, clergymen, and merchants [Timmons 2004, p. 435]. Mathematical contributions populating the pages of these early American general science journals came from little known and minimally documented figures.

The first American periodical dedicated to mathematics was a quarterly publication edited by George Baron called *The Mathematical Correspondent*, which appeared in 1804 [Hogan 1976]. Baron emigrated from England, where he was reportedly a colleague of Hutton at the Royal Military Academy in Woolwich.² The year before West Point officially became the United States Military Academy in March of 1802, Baron taught mathematics there in September of 1801. Shortly thereafter, Baron was court-martialed and disgracefully dismissed. He moved to New York City, from where he would launch *The Mathematical Correspondent* [Rickey & Shell-Gellasch 2010, pp. 4–5].

In his opening preface, Baron lamented that “exertions of learned men to disseminate mathematical information in other countries ... [are] most shamefully neglected in the United States” [Baron 1804a, p. iii]. Baron looked to the British puzzle journal *The Ladies’ Diary* for inspiration and believed the opportunity to publish results would provide a unique and powerful motivation for readers to elevate their mathematical skill. He and Hutton both believed *The Ladies’ Diary* had done more to train mathematicians than all the mathematical authors in England. Broadly, *The Mathematical Correspondent* aimed to enrich “the common stock of mathematical knowledge” [Baron 1804a, p. iv].

Given Baron’s view of mathematical learning in the United States, he proposed a graduated approach to a problem journal. Early volumes would include problems that could be solved with elementary mathematics, while later issues would “gradually ascend towards the higher regions of the sciences,” being mindful to stay “adapted to the present state of learning in America” [Baron 1804a, p. iv]. To improve that state, Baron also printed explanatory notes about principles of arithmetic, and about applications of geometric propositions to navigation.³ Each issue included a prize question, the best solution of which would be published in the following issue, and the contributor awarded a silver medal. Baron fully expected the enterprise to be profitable and planned to use income from journal sales to fund the prize medals.

Eight issues of *The Mathematical Correspondent* appeared between May 1804 and February 1806. The initial subscription list includes 347 names, with orders for a total of 487 copies.⁴ Two booksellers in London and Quebec account for seventy total copies. Only three of the 347 subscribers had

² This is widely cited, but without solid evidence and contested by [Crackel 2002, p. 304]. Also, see [Rickey 2002].

³ See, for example, [Baron 1804b;c; Tagart 1804].

⁴ *Mathematical Correspondent* 1, pp. 241–248.