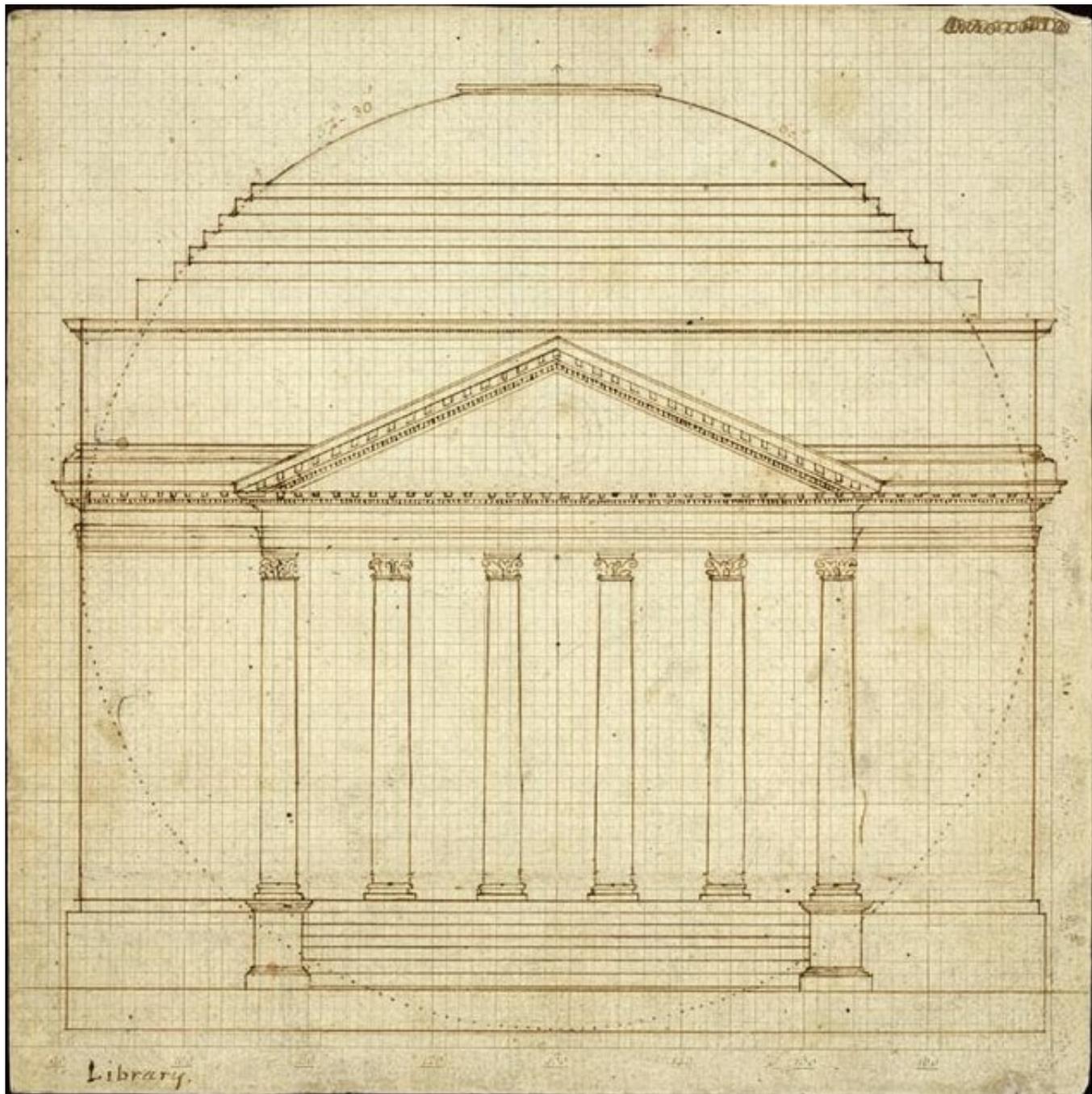


CIRMATH-AMERICAS

UNIVERSITY OF VIRGINIA, 28-30 MAY 2018



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CIRMATH-AMERICAS

28-30 MAY 2018

SCHEDULE OF EVENTS: MONDAY, MAY 28

9:20-9:30 Welcome

9:30-10:00 Ambitious editors discover a divided audience: Nineteenth-century mathematical periodicals in the U.S.

Deborah Kent

10:10-10:40 Mathematics for Philosophers: *The Monist* from 1890 to 1906

Jemma Lorenat

10:50-11:20 Break

11:20-11:50 Aiming for high standards: Solomon Lefschetz as editor of the *Annals of Mathematics*

Della Dumbaugh

12:00-1:00 Lunch

1:00-2:30 Walking Tour of UVa and Conference Photo

2:30-3:00 Making Higher Mathematics Accessible: Miller's Project for a Mathematical Dictionary

Laura Turner

3:10-3:40 Aiming for high standards: Solomon Lefschetz as editor of the *Annals of Mathematics*

Michael Barany

3:30-4:00 Break

4:00-4:30 Biostatistics and the Making of Medical Knowledge

Christopher Phillips

4:30-5:00 Discussion

SCHEDULE OF EVENTS: TUESDAY, MAY 29

9:30-10:00 Charles Davies as a Philosopher of Mathematics Education

Amy Ackerberg-Hastings

10:10-10:40 The Locus of Transnational Exchanges: Mathematical Journals for Students and Teachers, 1860s-1914.

Caroline Ehrhardt

10:50-11:20 Break

11:20-11:50 Circulations of US geometric knowledge by mathematical journals from USA to foreign countries: E. J. Wilczynski and the US school of Projective Differential Geometry between 1900 and 1923

Samson Duran

12:00-2:30 Lunch and collaboration time

2:30-3:00 The Hardy-Littlewood Circle Method: A Case Study in the Circulation of Ideas

Adrian Rice

3:10-3:40 Descriptive geometry from *Le Guide du Carrossier* to *The New York Coach-Maker's Magazine*. A case of transatlantic mathematical circulation through non specialized journals (1865-1872)

Thomas Preveraud

3:30-4:00 Break

4:00-4:30 Popular (?) Math: Conflicting presentations of mathematics education in the 20th-century popular press in America

Emily Redmond

4:30-5:00 Discussion

6:30— Conference Dinner at Orzo

SCHEDULE OF EVENTS: WEDNESDAY, MAY 30

9:30-10:00 Periodicals for engineers in the last decades of the Second Empire in Brazil: market, libraries and auctions.

Rogério Monteiro de Siqueira

10:10-10:40 "Our Technical Books are Weapons of War:" Mathematics and Technical Training during the Second World War

Brittany Shields

10:50-11:20 Break

11:10-12:00 Discussion

12:00-1:00 Lunch

Abstracts of Talks

Ambitious editors discover a divided audience: Nineteenth-century mathematical periodicals in the U.S.

Deborah Kent, Drake University

While American mathematical practitioners in the nineteenth-century generally embraced specialized periodical publications, different editors and subscribers expressed a variety of ideas about the desired nature of these publications. A small group of aspiring editors envisioned a mathematical periodical as an outlet for communicating research-level mathematics. Both the constraints of commercial concerns and a divided readership challenged these aspirations.

Mathematics for Philosophers: *The Monist* from 1890 to 1916

Jemma Lorenat, Pitzer College

In 1890 Paul Carus started *The Monist* as a quarterly magazine “devoted to the philosophy of science” and published by Open Court in Chicago. During its first years of existence, *The Monist* published many articles of mathematical interest from popularizations, to original research, to translations of European texts, to book reviews. This talk will overview the mathematical content and contributors of *The Monist* from 1890 to 1906. In this period, *The Monist* created an image of mathematics for a philosophically-inclined audience. This feature will be exemplified with a closer look at the expository pieces of German mathematician Hermann Schubert.

Aiming for high standards: Solomon Lefschetz as editor of the *Annals of Mathematics*

Della Dumbaugh, University of Richmond

Recognized as one of the most brilliant mathematicians and influential leaders of the American mathematical community in the nineteenth century, Solomon Lefschetz significantly contributed to algebraic geometry, topology and nonlinear differential equations. He served as the chairman of Princeton University’s Department of Mathematics, the president of the American Mathematical Society, and the chief editor of *Annals of Mathematics*. Within this broader understanding of Lefschetz, this talk explores Lefschetz and his contributions to the *Annals of Mathematics*.

Lefschetz served as the main editor for the *Annals of Mathematics* from 1928 to 1958, an important period for the journal. During this time, it became an increasingly well-known and respected journal. Its rise, in turn, stimulated American mathematics. Norman Steenrod, a student of Lefschetz who later served alongside him as editor of the *Annals*, summarized the influence of Lefschetz when he wrote, “[t]he importance to American mathematicians of a first-class journal is that it sets high standards for them to aim at. In this somewhat indirect manner, Lefschetz profoundly affected the development of mathematics in the United States.”

This work specifically looks at Lefschetz’s role as editor of the *Annals*, the papers that were published in the journal, the papers that were not published in the journal, the editorial boards, the presence---or not---of international authors, etc. In particular, we hope to address rumors related to him “favoring” contributions from his students and contributions in topology.

Abstracts of Talks, continued

Making Higher Mathematics Accessible: Miller's Project for a Mathematical Dictionary

Laura Turner, Monmouth University

The idea for a mathematical dictionary, to be published in America in the first half of the twentieth century, has been noted in a small handful of texts on the history of mathematics, including (Parshall, 2015; Zitarelli, 2015). As these authors have remarked, the seeds of the idea, in spite of their lengthy germination and wholehearted attempts at cultivation, never bore fruit; it is likely for this reason that the project itself has attracted little historical attention. By the time the idea for the dictionary was broached in 1917, however, America had unquestionably emerged on the international stage as a tried-and-tested contributor to the development of mathematics, and had not only a history to celebrate but also important prospects for the future on the national scale and well beyond.

As a result, while the project for the dictionary itself failed, a closer look at the context and discussions surrounding it nevertheless highlights the optimistic perspective on American mathematics embraced by both the Association and Society at that time, and the practically- and pedagogically-oriented efforts to mitigate what some understood as the American tendency of early and over specialization in mathematics, help bolster research activity in the next generation of practitioners, and “reflect credit upon” American mathematics more broadly.

Reviews, Circulation, and Mathematical Infrastructuralism.

Michael Barany, Dartmouth College

In the late nineteenth and early twentieth century, systematic scientific abstracting played a crucial role in reconfiguring the sciences on an international scale. Beginning in the 1930s and accelerating with the 1940 launch of the American journal *Mathematical Reviews*, such abstracting activities helped to create a fundamental transformation, I shall argue, not just to the geographic scale of professional mathematics but to the very nature of mathematicians' research and theories. It was not an accident that mathematical abstracting in this period coincided with an embrace across mathematical research fields of a distinctive form of symbolic and conceptual abstraction. My analysis will connect the changing social structure of modern mathematical research communities to their changing domains of investigation and resources for representation and consensus-making across wide distances. Using materials gleaned from archives on four continents, I will use the review infrastructure to explain the distinctive forms of personal and textual circulation in post-1930 and especially post-1940 international mathematics.

Abstracts of Talks, continued

Biostatistics and the Making of Medical Knowledge

Christopher J. Phillips, Carnegie Mellon University

This presentation explores the circulation of mathematical concepts within the Americas and between the Americas and Europe through an analysis of statistical techniques used in clinical medicine. Between 1930 and 1980, mathematical tools and concepts developed for use in population-level (epidemiological) studies (risk factor correlation analyses, statistically interpreted clinical trials, longitudinal observation/retrospective studies, etc.) spread widely into clinical medicine. Whereas in 1930 most clinicians would not rely on statistical evidence gleaned from aggregated studies for the treatment of individual patients, by 1980, that was the only acceptable evidence for clinical treatment in much of the West. Though the US-based National Institutes of Health quickly became a dominant funder of medical research (and employed some of the most influential biostatisticians in its institutes), the UK's Medical Research Council and other European medical research agencies were also crucial for establishing guidelines and precedents for the use of statistical data in what has come to be called "evidence-based medicine." Biostatisticians such as Peter Armitage, A.B. Hill, Nathan Mantel, and Jerome Cornfield understood their work as establishing the relevance of probabilistic mathematical models within a discipline that long prized laboratory-based biomedical determinism. This paper explores the spread by looking at co-publication and citation practices and other forms by which ideas circulated in Journals between researchers in the US, UK, and Europe. I argue that focusing on key moments or single individuals misses the larger role that published research articles played for the spread and formalization of mathematical methods of probability and statistics within the practice of clinical research.

Charles Davies as a Philosopher of Mathematics Education

Amy Ackerberg-Hastings, Independent Scholar

Charles Davies (1798–1876)—who taught at the US Military Academy at West Point, New York; Trinity College in Hartford, Connecticut; New York University; and Columbia University—was one of the most prolific and popular compilers of mathematics textbooks in the United States in the 19th century. This talk explores his 1850 *The Logic and Utility of Mathematics, With the Best Methods of Instruction Explained and Illustrated*, which James K. Bidwell and Robert G. Clason, and Phillip S. Jones and Arthur F. Coxford, Jr., in two different 1970 NCTM handbooks, called the "first American book on mathematics teaching methods." First, I will consider the extent to which communication and circulation networks fostered the growth of this reputation, including how *Logic and Utility* was portrayed in reviews in contemporary periodicals. Journals also provided part of the content that Davies plagiarized in this book (specifically, an 1834 article on the utility of mathematics by Davies's brother-in-law), so I will secondly look at that aspect of the circulation of knowledge. Unauthorized and unattributed copying was a theme throughout Davies's publications. Third, *Logic and Utility* appeared in the context of the gradual professionalization (and feminization) of American schoolteaching, so I will think about how Davies's expectations for his audiences can be discerned from the book and from his other contributions to these developments.

Abstracts, continued

The Locus of Transnational Exchanges: Mathematical Journals for Students and Teachers, 1860s-1914.

Caroline Ehrhardt, Paris 8

While a few mathematical journals aimed at students and teachers had existed since the 1840 (*Nouvelles Annales de mathématiques* in France, *Archiv der Mathematik und Physik* in Prussia), it was in the late 19th century that they became more numerous.

All these journals had focused on the teaching of mathematics and, as such, they were shaped by the educational context of the country in which they were published. From that point of view, these journals were local objects made for local uses. However, leafing through these journals, one can see that they were the locus of transnational exchanges on mathematical knowledge. Their structure was remarkably uniform and, precisely because these journals were all aimed at the same kind of readers, some mathematical topics and practice could circulate between them.

In this talk, I examine how the local and the international dimensions were woven together in journals aimed at students and teachers. How did these journals set up a dialogue across borders? What was the mathematical knowledge that was circulated through them? In return, were there any discernible effects on this knowledge? All in all did these journals make up an international community?

The talk is mainly based on the analysis of a corpus of European mathematical journals published between the 1860s and World War I, but the study of South-American journals made by Eduardo Ortiz will allow me to enlarge its scope to the American continent. I will also sketch elements of comparisons with North American journals aimed at the same kind of audience.

Circulations of US geometric knowledge by mathematical journals from USA to foreign countries: E. J. Wilczynski and the US school of Projective Differential Geometry between 1900 and 1923

Samson Duran, GHDSO – Université Paris-Sud

From the 1930s, historiography has regularly referred to a research school in projective differential geometry, located in the USA, whose major figure is E. J. Wilczynski. We will use this as a starting point to propose a case study, focused on the reception of US knowledge abroad via mathematical journals. This study will allow us to understand both the specificities of the US case for this field of research, and to determine the specific weight of journals for the circulation of US work. In particular, we will be interested in the role of E. J. Wilczynski in these processes.

Abstracts, continued

The Hardy-Littlewood Circle Method: A Case Study in the Circulation of Ideas

Adrian Rice, Randolph-Macon College

The Hardy-Littlewood circle method is a powerful technique in analytic number theory that has been used in hundreds of papers and yielded scores of important results. Its first appearance in print was exactly one hundred years ago, when it was used by Hardy and Ramanujan to derive their famous asymptotic formula for the partition function in 1918. This talk will investigate its subsequent development and refinement by G. H. Hardy and J. E. Littlewood in the 1920s, examining in particular its international diffusion. We will see that by the end of the 1930s, the method was in frequent use, not only in Britain, but in the United States, Germany, and the Soviet Union. This talk will attempt to shed some light on the role played by journals in this diffusion, as well as other means of communication, such as books, lectures, and personal interaction.

Descriptive geometry from *Le Guide du Carrossier* to *The New York Coach-Maker's Magazine*. A case of transatlantic mathematical circulation through non specialized journals (1865-1872)

Thomas Preveraud, Université d'Artois & Université Lille Nord-de-France

In the first half of the nineteenth century in the United States, descriptive geometry was a subject mainly diffused within higher education institutions for the training of the military, engineers or architects. First introduced in military academies, descriptive geometry soon became a subject taught in colleges, especially in those that had already started to offer their students elective courses, or special engineer-training programs. Thus, descriptive geometry went gradually from a restrictive audience subject to a general-interest subject often shown as a sequel of the classical geometry course. Half a dozen textbooks provided a more or less extensive course in the subject, whose authors – professors of mathematics or engineering – largely borrowed from French authors, professors at École normale de l'an III, École centrale, or even secondary education teachers.

This well documented circulation has shadowed another vehicle for the transfer of descriptive geometry: the journals. While American mathematical journals scarcely diffused the subject - with the case of the *Mathematical Monthly* (1858-1861) being an exception– probably because their audience (students and professors) were already recipients of appropriate material (textbooks), non-specialized journals shouldered the transmission of descriptive geometry to an audience whose professional activities were not mainly concerned by mathematical practices. However, they did need descriptive geometry, and a specific presentation. The communication will focus on the coach-maker's corporation and analyze the transfer of descriptive geometry in two dedicated journals of the years 1860: *Le Guide du Carrossier*, published in Paris, and *The New York Coach-Maker's Magazine*, which borrowed some of its contents from its French alter-ego. From a coach-maker perspective, we will show that the growing complication and multiplication of coach models implied a need to get rid of time-consuming particular procedures for the construction of the coach in favor of more general methods of descriptive geometry.

Abstracts, continued

Popular (?) Math: Conflicting presentations of mathematics education in the 20th-century popular press in America

Emily T. H. Redman, University of Massachusetts Amherst

Mathematics holds a peculiar position in American culture. At once, math is revered, respected, and aptitude in it is presumed to represent greater intellect; it's also seen as formidable, rigid, and dull—the sore spot in many people's memories of high school. These contrasting valuations of mathematics are clearly seen in the treatment of mathematics education in popular media in the United States in the 20th century. By the second half of the century it was common to see popular press articles ruing the supposed decline of mathematical proficiency in the country, often linking the failure of students to excel with nationalistic concern and brimming with suggestions for enticing students to study more of a subject presumed to need a make-over. At the same time, however, we see the emergence of a number of “recreational mathematics” columns and features being published, both in newspapers and magazines as well as in journals like *Scientific American* and the eponymous *Journal of Mathematical Recreation*. Many of these columns—the most famous written by Martin Gardner—were quite popular with some even enjoying decades-long runs. This paper aims to juxtapose these two common representations of mathematics in popular culture to better understand how Americans in the 20th century defined an emotional response to the field in complex terms.

Periodicals for engineers in the last decades of the Second Empire in Brazil: market, libraries and auctions.

Rogério Monteiro, University of São Paulo

The last two decades of the Second Empire (1870-1890) is a period usually known by the crisis of the D. Pedro II reign and the rising of the republic in November 1889. In terms of technology and engineering, we also identify an important inflexion point: the division of the Imperial Military Academy into the Central School and the Military School in 1963, consolidated, in 1874, by the replacement of the Central School by the Polytechnic School and, in the first years of the 1890, by the foundation of the Polytechnic School of São Paulo (1893), the Engineering School of Porto Alegre (1896) and the Mackenzie College (1896). Not for nothing did we identify, along these institutional changes, the edition of the first periodicals totally dedicated for engineers, many syllabus adaptations and some debates on the place of mathematics in the engineers' formation. For some of engineers, especially for those associated to the positivist church, the pursuit of abstraction and rigor in some periodicals and by some engineers was pedantic and useless. “Examine the periodicals from the Polytechnic School of France. How much waste of mental effort, how much unfortunate digressions you will see there”, said the Moraes Rego brothers in the preface of their book of algebra, in 1885. (*continued on next page*)

Abstracts, continued

(Rogério Monteiro, continued)

In my recent habilitation thesis, I analyzed these debates on the specialization of mathematics among the engineers from the 1880 decade to the 1920, explaining the connections of this process with the circulation of Auguste Comte books and the professionalization of mathematics in Brazil. Now, in my talk, I would like to back to those originals decades in order to see how this specialization process was conceived in the market of periodicals for engineers and how all this process affected the circulation of these periodicals. Although among the periodicals edited in Brazil, it is possible to identify those totally dedicated to railways, constructions and mining, some students of both Polytechnic and military schools are still editing periodicals with articles on mathematics, engineering and poetry, following the “belles lettres” tradition of the first half of the nineteenth century. Along this analysis on the index of these periodicals, I will also compare the local production with the circulation of similar foreign print matters using as source some catalogs of librarians specialized in importation, the contents of library described in public auctions and some reports of public libraries on purchases and consultations of their collections.

With the description of the market of periodicals for engineers I hope to historically localize the position of Moraes Rego brothers and others positivists in a long-term process of separation between military engineers, civil engineers, mathematicians and physicists. In some sense, the history of edition and circulation of these print matters is also the history of specialization into this field.

"Our Technical Books are Weapons of War:" Mathematics and Technical Training during the Second World War

Brit Shields, School of Engineering & Applied Science, University of Pennsylvania

In November, 1942, the *New York Times* ran a story titled, "Our Technical Books are Weapons of War: They are Needed for Use in the Field and on Production Lines." The journalist, James S. Thompson, described the conflict as "a war of science" and described the landscape of federally-funded programs to train military and civilian people for the technical demands of the conflict. One of the most well-funded and prolific programs was the Engineering, Science, and Management War Training Program, sponsored and administered by the US Office of Education. By the close of the program, over 1.7 million people had enrolled in courses, including 86,000 enrollments in mathematics courses. In this talk, I will explore the ideology behind the program and specifically how and why mathematics was understood to be a critical underpinning of technical training for advanced engineers.

CIRMATH

Circulations des mathématiques dans et par les journaux : histoire, territoires et publics



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