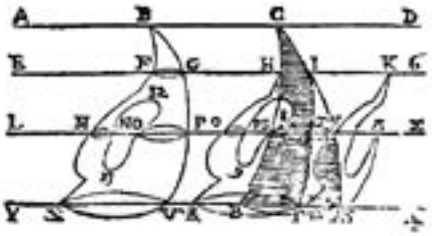
BULLETIN

CSHPM SCHPM



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Canadian Society for History and Philosophy of Mathematics

Société canadienne d'histoire et de philosophie des mathématiques

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ABOUT THE SOCIETY

Founded in 1974, the Canadian Society for History and Philosophy of Mathematics/Société canadienne d'histoire et philosophie des mathématiques (CSHPM/SCHPM) promotes research and teaching in the history and philosophy of mathematics. Officers of the Society are:

President: **Craig Fraser**, University of Toronto, Toronto, ON M5S 1K7, CAN, craig.fraser@utoronto.ca
Vice-President: **Nicolas Fillion**, Simon Fraser University, Burnaby, BC CV5A 1S6, CAN nfillion@sfu.ca
Secretary: **Patricia Allaire**, 14818 60th Ave., Flushing, NY 11355, USA, PatAllaire@gmail.com
Treasurer: **Gregory Lavers**, Concordia University, Montreal, QC H3G 1M8, CAN, Greg.Lavers@concordia.ca
Past President: **Maria Zack**, Point Loma Nazarene University, San Diego, CA 92106, USA, MariaZack@pointloma.edu

Members of Council

Duncan Melville, St Lawrence University, Canton, NY 13617, USA, dmelville@stlawu.edu
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Amy Shell-Gellash, Eastern Michigan University, Ypsilanti, MI 48197, USA, ashellge@emich.edu
Richard Zach, University of Calgary, Calgary, AB T2N 1N4, CAN, rzach@ucalgary.ca

Volunteer Positions

The Society's Web Page (www.cshpm.org) is maintained by **Michael Molinsky**, University of Maine at Farmington, Farmington, ME 04938, USA, michael.molinsky@maine.edu. The Proceedings of the Annual Meeting are edited by **Maria Zack** and **Dirk Schlimm**. The Society's Archives are managed by **Eisso Atzema**, University of Maine, Orono, ME 04469, USA, eisso.atzema@maine.edu. **Hardy Grant**, hardygrant@yahoo.com, and **Amy Ackerberg-Hastings**, aackerbe@verizon.net, edit the CSHPM Notes column for *Notes* of the Canadian Mathematical Society. **Maritza Branker**, Niagara University, Lewiston, NY 14109, USA, mbranker@niagara.edu, serves as CMS Liaison.

New Members are most cordially welcome; please contact the Secretary.

President's Message

It is a pleasure to return to the position of President. The last time I was in this role email was just getting started and the internet was some years in the future. *The Golden Girls* was popular on TV. If a pandemic had occurred then a general shutdown would likely have occurred. We are at least fortunate now that we have the capacity to continue courses, hold meetings and present colloquia online.

I would like to thank Maria Zack and the Council of the CSHPM for their fine work over the past years, and look forward to working with the new team. Also, many thanks to Amy Ackerberg-Hastings for her long-standing editorship of the *Bulletin*, and a warm welcome to Sylvia Nickerson as her replacement in this position. Thanks are also due to Eisso Atzema for his formatting help with the *Bulletin* and to Mike Molinsky for his always excellent work as webmaster of the CSHPM. I am currently becoming familiar in my courses with Blackboard Collaborate and Microsoft Teams, but I still have a lot to learn. I would like to thank our incoming Vice-President Nic Fillion for his work in organizing Zoom talks over the past several months. It has been an edifying experience, both for the content of the papers and the Zoom experience itself. The series has provided some welcome counter balance to the cancellation of our annual meeting in Scotland. These talks will continue on a monthly basis, on the last Friday of each month at 11:00 am Pacific time. The last conference I attended was the joint meeting of the AMS and MAA in Denver in January, where I spoke on the history of canonical transformations in Hamilton-Jacobi theory. It seems like a very long time ago now, when crowded restaurants and people gathering everywhere were the norm. In December I will be giving two online papers on the same weekend, one for a conference that was to be held in Montreal and another for one that was scheduled to take place in England. The current plan is to have the 2021 CSHPM meeting on 12–14 July 2021 in St Andrews Scotland, jointly with the BSHM. At the moment meetings up to six months into the future are being made online, and there is always the possibility that the 2021 CSHPM meeting will also

become virtual. I will be in contact with organizers at the BSHM and keep you posted.

Craig Fraser

Announcements

The Canadian Mathematical Society (CMS) has switched its Winter Meeting, expected to occur in Montreal in December, to virtual format. The meetings will occur 3–8 December 2020. As a result of going online the registration fee is greatly reduced. CSHPM will be hosting a scientific session on the history and philosophy of mathematics (exact day to be determined), organized by Dirk Schlimm and Maritza Branker. Although the call for papers is now closed, registration will open soon at `https://winter20.cms.math.ca/`. For more information on the CSHPM session contact Maritza at `mbranker@niagara.edu`.

HOMSIGMAA News: As many of you know, JMM 2021 will be the last winter meeting with which the MAA will be directly involved. That will also be the last winter meeting featuring the HOM SIGMAA annual meeting and guest speaker. These events will move to MathFest in 2022. For MathFest 2021, there will be some history events, not a formal meeting and speaker.

Registration is now open for the 2021 Joint Mathematics Meetings (JMM) that will take place virtually, 6–9 January 2021. Switching from a planned in-person gathering in Washington, D.C., to a virtual meeting was agreed upon by co-hosts American Mathematical Society and Mathematical Association of America. The 2021 Virtual JMM will be a somewhat scaled-back version of the traditional meeting. For questions about the meeting program, contact `meet@ams.org`. To ask about exhibits, contact `mmsb@ams.org`. To register for the meeting, go to `jointmathematicsmeetings.org/meetings/national/jmm2021/2247_intro`. Hope remains gathering in person will resume for the 2022 JMM in Seattle.

The Canadian Philosophical Association/L'Association canadienne de philosophie announced the following statement from its board on the topic of racism: *Canadian Philosophical Association condemns racism of every form. We stand in solidarity with those protesting police brutality and racist violence, and we join them in calling upon every level of government to take immediate and effective measures against systemic racism. We reaffirm our commitment to facing the contribution of our discipline to discrimination, and we are working to ensure equity, diversity and inclusion in philosophy. We acknowledge our responsibility as scholars to strive toward a more just society.* For more information about the work of the CPA/ACP equity committee, see `https://www.acpcpa.ca/cpages/equity`.

The Canadian Society for the History and Philosophy of Science/Société canadienne d'histoire et de philosophie des sciences, has published issue 100 of *Communiqué*, on the theme of *Decolonizing HPS*. The issue, edited by Jaipreet Virdi & Catherine Rioux, can be viewed on the CSHPS/SCHPS website at `http://www.yorku.ca/cshps1/communique.html`

The TRansforming Instruction in Undergraduate Mathematics via Primary Historical Sources (TRIUMPHS) team hosted a webinar on 17 September about how to apply Primary Source Projects in an online or remote learning environment. Hosted by Diana White, the webinar had more than a dozen attendees who shared tips and experiences with melding projects with online pedagogy. Connect with the TRIUMPHS team and browse projects to adapt to classes on history of mathematics and more at `https://blogs.ursinus.edu/triumphs/`

The History of Science Society has awarded the Sarton Medal to James Bennett. Bennett, known for his work cultivating object-based teaching and research, connected the worlds of the museum, the instrument collector, and the professional historian of science and technology throughout his career. The award citation also noted his pioneering scholarship and curation in the field of instrument studies, leadership in the history of science on an international stage, and attention to the needs of faculty, students, and the public. CSHPM members may recall Bennett delivered the May Lecture in 2003. See the list of all such distinguished speakers at `cshpm.org/archives/invitedspeakers.php`

ARITHMOS: Readings in the history of mathematics from original sources, continues to meet virtually over Zoom. At the most recent meeting on 17 October 2020, discussion continued over Euler's paper "Theoremata arithmetica nova methodo demonstrata". To connect with this group contact Rob Bradley `bradley@adelphi.edu` or go to `home.adelphi.edu/~bradley/Arithmos/index.html`.

Karine Chemla (CNRS-Université de Paris) was named the 2020 recipient of the Otto Neugebauer Prize by the European Mathematical Society, which awards this prize every four years "for highly original and influential work in the field of history of mathematics." Chemla recently delivered a talk to CSHPM members about "The shaping and reshaping of languages and texts for mathematical activity, views from China", at the first of several bi-weekly CSHPM talks for isolated times.

The HPM 2020 History and Pedagogy of Mathematics (HPM) 2020 Satellite Meeting of ICME-14 previously scheduled for 21–25 July 2020 (postponed due to COVID-19) has new meeting dates. The next meeting will take place on 20–24 July 2021 at University of Macau `https://www.um.edu.mo/fed/HPM2020/`. For further information contact Snezana Lawrence (Chair), `snezana@mathsisgoodforyou.com` or Xuhua Sun (Co-Chair), `hpm2020macao@gmail.com`.

As of July 2020, Snezana Lawrence has taken over as chair of the International Study Group on the Relations Between the History and Pedagogy of Mathematics (HPM).

The event on History of Mathematics and Flight has been postponed to 11 September 2021 at Concorde Centre, Manchester Airport, UK. The day planned includes talks about the history of mathematics and flight, with flight being construed broadly to consider the flight of man-made objects, animals, and even fugitives; flight formation, navigation and control.

It is with sadness we note the passing of Peter L. Duren (1935–2020). Duren was professor emeritus of mathematics at the University of Michigan in Ann Arbor. A prolific mathematical writer and editor of several professional journals, Duren published over one hundred research papers and several books on analysis. His interests turned towards history of mathematics later in his career, leading him to become principal editor of the three-volume historical collection *A Century of Mathematics in America*, published by the American Mathematical Society.

The Canadian Science and Technology Historical Association/L'Association pour l'histoire de la science et de la technologie au Canada has launched a new blog on its website `https://cstha-ahstc.ca`. Blog posts feature commentary and analysis on the study of history of science and technology in relation to Canada and Canadians, as well as posts relating to conference and colloquium announcements, calls for papers, research and writing opportunities, and prize announcements.

David Bellhouse was an invited panel discussant at the recent Joint Statistical Meetings (JSM) held in virtual format in August. The panel discussion, entitled "Statistics and Eugenics" came about after the removal of Sir Ronald Fisher's name from the prestigious Fisher Lecture sponsored by the Committee of Presidents of Statistical Societies (COPSS). It was decided to remove Fisher's name after COPSS received complaints about Fisher's involvement in eugenics. Professor Bellhouse talked about the early history of the eugenics movement and the involvement of pioneer statisticians Francis Galton, Karl Pearson and Ronald Fisher.

The Scientific Program and the Public Opening of the 2020 Fields Medal Symposium, honouring Alessio Figalli (Fields Medal 2018) took place 19–23 October 2020. For the first time these events were presented online by The Fields Institute. For more information see `http://www.fields.utoronto.ca/activities/20-21/fieldsmedalsym`.

The British Society for the History of Mathematics continued to program a series of online events for the history of mathematics this fall. On 21 October there was a Gresham Lecture on "Maths and Money" and on 26–27 October a two day "Black Heroes of Mathematics" conference was held. `https://www.bshm.ac.uk`

A set of digital materials on history of mathematics produced by a Kenyon College undergraduate student is now available for anyone to peruse and use. These materials include digital storytelling videos and animations. The main purpose of the project is to help disseminate research findings on primary sources. A sample of topics covered includes history of algebra, decimal point and decimal fractions, scientific method, foundations of optics, influence of Islamic scholars on Copernicus and other Renaissance scholars. To connect with the project go to `https://digital.kenyon.edu/mathislamds/`

A virtual conversation took place with the ghost of Georgian polymath William Nicholson (1753–1815) on 20 October 2020. Nicholson changed the course of history when he launched his eponymous philosophical journal and split water with electrolysis—the technique underpinning the hydrogen fuel cell. Pre-

sented by the Bloomsbury Festival, Nicholson's ghost was raised from his grave in St George's Gardens to join biographer, Sue Durrell, and the Ucell energy team from University College London, for this otherworldly virtual conversation.

Virtual rare book sessions are being offered for the academic year 2020-2021 at the Linda Hall Library. With holdings of over half a million monograph volumes and more than 48,000 journal titles related to science, technology, engineering, and their histories, the Library's collections are exceptionally strong in engineering, chemistry, and physics, natural history, astronomy, and mathematics. In order to keep our collections accessible the Library continues to offer virtual rare book sessions. These sessions are open to courses of all levels, and are planned in collaboration with instructors and integrated into course learning outcomes. Virtual rare book sessions should be requested at least one month in advance. To collaborate with the library on planning a rare book session for your students, please visit `https://www.lindahall.org/virtual-book-session/`, or contact Jason Dean at `cumbyj@lindahall.org` or `deanj@lindahall.org`.

Funding Sources

A reminder that the deadline to apply for long term residential predoctoral fellowships at the American Philosophical Society Library & Museum in Philadelphia is Friday, 29 January, 2021. Although some of the programs have been suspended for 2021–2022, many programs are still being offered. For a complete listing of all APS grant and fellowship opportunities, please visit: `https://www.amphilsoc.org/grants/fellowships`.

The New England Regional Fellowship Consortium (NERFC), a collaboration of 30 major cultural agencies, will offer at least two-dozen awards in 2020–2021. Each grant will provide a stipend of $5,000 for a minimum of eight weeks of research at participating institutions. Awards are open to US citizens and foreign nationals who hold the necessary US government documents. Grants are designed to encourage projects that draw on the resources of several agencies. Collections at the participating institutions are broadly representative of the New England region and span the period from pre-contact to the present day. Grants in the upcoming cycle are for the year 1 June 2021– 31 May 2022. For this fellowship cycle, applications deadlines occur in January, February and March 2021. For more information on the collections or to make an application, consult `http://www.masshist.org/fellowships/nerfc/`.

CollEx-Persée, a network of libraries and archives centers in France, is launching a call for researcher's residencies. Scholars are sought whose research concerns a particular collection held by a library of the CollEx-Persée network, to work together with that library to enhance the value of this collection. The researcher will be hosted in residence by the library in order to develop knowledge of and access to the collection, to design projects to enhance the scientific value of the collection and/or to prefigure enriched digitisation projects. Aimed at permanent and post-doctoral researchers, in France or abroad, the residency will take place between 1 September 2021 and 31 August 2022. Funding granted by CollEx-Persée per residence is a maximum of 50,000 euros. For more information on the CollEx-Persée network see `https://www.collexpersee.eu/le-reseau/`. The call for researchers (in French) can be found at `https://www.collexpersee.eu/appel-a-projets-residences/`. Deadline for applications is 10 January 2021. For questions, please contact `residences@collexpersee.eu`.

The Research Society for American Periodicals invites applications for grants of between $250 and $1,000 to enhance research activities in American periodicals. These grants are intended for early career scholars, graduate students and those who have received their doctorate within the last five years, and are open to those who are researching in place in the midst of the pandemic. The funds may be used in a variety of ways, including but not limited to a subscription to an online database or resource, reproduction or copyright/use fees for brick-and-mortar archival materials or digital database materials, travel to archives, childcare to enable travel or a concentrated period of research/writing, and computer software. The deadline for applications is 1 August 2020. Awards will be announced by 15 August. For more information or to make an application visit `https://www.periodicalresearch.org/#grants`.

Conferences

Due to the COVID-19 pandemic, the IMU regrets to announce that the conference Mathematics without Borders, The Centennial of the International Mathematical Union, Strasbourg, 28–29 September 2020, had to be rescheduled for Strasbourg, 27–28 September 2021. The IMU invites its Adhering Organizations and the mathematical societies worldwide to nominate plenary and sectional speakers for the International Congress of Mathematicians 2022 in St. Petersburg. A document listing the ICM 2022 sections, as proposed by the ICM Structure Committee and decided by the Executive Committee of the IMU can be found at `mathunion.org/fileadmin/IMU/Report/SC/2019/structure_committee_final.pdf`. The Chair of the Program Committee, Martin Hairer, handles all communication concerning the scientific program of ICM 2022. Please direct your proposals for invited plenary and sectional speakers to Martin Hairer using the email address `chair@pc22.mathunion.org`. Nominations should be received no later than 1 November 2020.

The 14th International Congress on Mathematical Education (ICME-14) (postponed due to COVID-19) has new meeting dates. It will take place on 11–18 July 2021 on the Putuo campus of East China Normal University in Shanghai, China (`icme14.org/static/en/index.html`).

People, Places, Practices, is the 5-yearly joint conference of the British Society for the History of Mathematics and Canadian Society for History and Philosophy of Mathematics/La Société Canadienne d'Histoire et de Philosophie des Mathématiques, in collaboration with HOMSIGMAA, the History of Mathematics Special Interest Group of the MAA. People, Places, Practices, postponed due to COVID-19, has new dates. The meeting is rescheduled for 12–14 July 2021 at University of St Andrews, UK. `http://www.mcs.st-andrews.ac.uk/bshm-cshpm/index.shtml`.

The HSS in-person meeting planned for fall 2020 in collaboration with SHOT in New Orleans has been postponed to late November 2021 in New Orleans. Instead of the planned fall meeting, HSS held a Virtual Forum 8–11 October, 2020, at which time Karen Parshall (University of Virginia), organizer of the HSS interest group for the History of the Mathematical Sciences, chaired a Business Meeting. Several talks were delivered related to history of physics, virtual pedagogy and promoting inclusion and diversity in history of science.

Calls for Submissions

The *European Journal of Philosophy of Science* welcomes submissions for its thematic issue on teaching philosophy of science to students from other disciplines. The aim of this topical collection is for scholars to reflect on the challenges associated with teaching philosophy of science to non-philosophers and to discuss ways to overcome these. Especially welcomed are contributions that draw connections between philosophy of science and science education, and that consider how to improve learning strategies for philosophy of science. Papers should not exceed 5000 words (excluding references). Deadline for submissions is 1 December 2020. Questions can be addressed to guest editors Sara Green (`sara.green@ind.ku.dk`) and Joeri Witteveen (`jw@ind.ku.dk`) of the University of Copenhagen.

Springer has the pleasure to launch a new book series titled *Why the Sciences of the Ancient World Matter.* Four titles have already been published; a fifth, *Mathematics, Administrative and Economic Activities in Ancient Worlds* (Editors: Cécile Michel and Karine Chemla), is forthcoming shortly, with other titles in preparation. Manuscripts and project pitches for inclusion in this collection are welcome. Authors may download and fill out a form from the webpage of the book series or email the editors directly: Karine Chemla (`chemla@univ-paris-diderot.fr`), Agathe Keller (`kellera@univ-paris-diderot.fr`) and Christine Proust (`christine.proust@wanadoo.fr`).

There is a new blog section on the HSS Women's Caucus website. Titled Coffee Break, this section will be updated every two weeks with a summary of publications, articles, and announcements about women in the history of science or by caucus members. It will be a space for women's caucus to share news and work, as well as catch up with colleagues in between annual meetings. Checkout Coffee Break at `http://hsswc.weebly.com`. Send your contributions to Jaipreet Virdi at `jvirdi@udel.edu`.

The International Union of History and Philosophy of Science and Technology (IUHPST) invites sub-

missions for the 2021 IUHPST Essay Prize in History and Philosophy of Science. This biennial prize competition seeks to encourage fresh methodological thinking on the history and philosophy of science and related areas. Entries in the form of an essay of 5,000–10,000 words in English are invited, addressing this year's prize question: "What can history and philosophy of science, technology and medicine contribute to our current global challenges?" What constitutes a current global challenge is left to the judgment of the authors, but examples include the coronavirus pandemic, climate change, socioeconomic inequality, racism, the refugee crisis, and science denialism. Deadline for submissions is 15 January 2021. The author of the winning entry will be invited to present the work at the 26th International Congress of History of Science and Technology (ICHST) to be held in Prague, Czechia, 25–31 July 2021, and will receive a cash prize of 1,000 US dollars and a waiver of the Congress registration fee. A more detailed call for entries can be found at `http://dhstweb.org/wp-content/uploads/2020/08/IUHPST-Essay-Prize_2021-call.pdf` and on the DHST website: `http://dhstweb.org/awards/iuhpst-essay-prize`.

Are you a researcher in the history of science, technology and medicine? Have you completed a postgraduate degree within the last five years? If the answer to these questions is 'yes', you can enter the 6th Notes and Records Essay Award for a chance to win £500 (or local currency equivalent) and publication of your winning essay in the history of science journal *Notes and Records*. One runner-up will also receive £250 and there will be £100 in prizes for an additional three 'honourable mentions'. All winning categories will benefit from a free online subscription to *Notes and Records* for one year. Deadline for entries is 28 February 2021. Further information available at `https://royalsocietypublishing.org/rsnr/essay-award`

The History of Mathematics Special Interest Group of the Mathematical Association of America is pleased to announce its eighteenth annual Student Paper Contest in the History of Mathematics. This contest is open to all undergraduate students, whose papers will be judged by a panel of specialists for content, originality, and presentation. Typically first and second place winners are chosen. Topics can be drawn from any field of mathematics: papers can address a single person or topic, or be an historical survey of a topic or school of thought. Submissions should be approximately 5000 words in length, formatted in a font that is easy to read, and saved as a single PDF file, including a title page with title of the paper, the author, school, and complete contact information. Papers are expected to include a full citation list with not too many web-based sources. Students submitting a paper need not be currently taking a history of mathematics course. All papers should be single-authored. Eligible papers are those written within the past year while the author was an undergraduate. The submissions deadline for this prize is 31 March 2021. Results will be announced via email and on the HOM SIGMAA website in May. Submissions and questions can be directed to Dr. Amy Shell-Gellasch `ashellge@emich.edu`.

Publications

George Englebretsen, Professor Emeritus in the Department of Philosophy at Bishop's University recently published *Figuring It Out: Logic Diagrams* (De Gruyter, 2010) (`degruyter.com/view/title/542000`)

Hans J. Haubold (United Nations) published "A. M. Mathai Centre for Mathematical and Statistical Sciences: A Brief History of the Centre and Prof. Dr. A. M. Mathai's Research and Education Programs at the Occasion of His 85th Anniversary," in *Creative Education* 11, 356-405 (March 2020), a case study on the history of the Centre for Mathematical and Statistical Sciences, Kerala, India, covering also an overview of the Centre's research and education programs in a diverse range of topics.

Zuoyue Wang (California State Polytechnic University, Pomona) recently published the following with Jinhai Guo. "Transnational Mathematics and Movements: Shiing-shen Chern, Hua Luogeng, and the Princeton Institute for Advanced Study from World War II to the Cold War" in *Chinese Annals of History of Science and Technology* 3, no. 2 (2019): 118–165, part of a special issue of the journal guest edited by Danian Hu.

Audrey Maria Price defended the following dissertation in 2017: *Pure and Applied: Christopher Clavius's Unifying Approach to Jesuit Mathematics Pedagogy* at University of California, San Diego. It can be found through ProQuest Dissertations Publishing

#10633544. This dissertation examines the pedagogical project of Christopher Clavius (1538–1612) as a key step in the development of modern mathematics.

A new book on women in mathematics edited by Eva Kaufholz-Soldat and Nicola Oswald has been published by Springer. Volume 6 in the series, "Women in the History of Philosophy and Sciences", *Against All Odds: Women's Ways to Mathematical Research Since 1800* looks at the lives of Dorothy Wrinch, Emma S. Woytinsky, Otton Nikodym and Grace Chisholm Young among others. Kaufholz-Soldat and Oswald use their reflections on this history to motivate questions about gender parity in mathematics today. For a table of contents, go to `https://www.springer.com/gp/book/9783030476090`.

Euleriana, an open access eJournal focused on Leonhard Euler and Euler-related scholarship, is set to launch with its first issue in Winter 2021 (early February). *Euleriana* will be published twice annually, with many different types of content, including translations, historical and archival notes, book reviews and more. The definition of Euler-related scholarship includes Euler's own work, mathematicians whose careers were roughly contemporaneous with Euler (Lagrange, Goldbach, Bernoullis, etc.), and the institutions and academies where he worked. In addition, historical reflections on Euler's work as it appears in modern mathematics will be considered. The managing editors of this venture are Erik Tou (University of Washington, Tacoma) and Chris Goff (University of the Pacific). The editors are Rob Bradley (Adelphi University), Lawrence D'Antonio (Ramapo College of New Jersey), Cynthia Huffman (Pittsburg State University), Dominic Klyve (Central Washington University), and Michael Saclolo (St. Edward's University).

In Memoriam Ranjan Roy (1947–2020)

Ranjan Roy, who had been a faculty member at Beloit College in Beloit, Wisconsin for 38 years, died unexpectedly on the 12th of August. Born in India on 16 January 1947, he received his doctorate from SUNY–Stony Brook. He received teaching awards from Beloit College and the Wisconsin Section of the Mathematical Association of America, and then proceeded to win the Haimo Award for teaching from the national MAA. He was one of the authors (along with George Andrews and Richard Askey) of the volume on special functions in the Cambridge series *Encyclopedia of Mathematics and its Applications.* He is best known to historians for his *Sources in the Development of Mathematics: Series and Products from the Fifteenth to the Twenty-first Century* (published by Cambridge in 2011). That volume was favourably reviewed in the *Notices* of the American Mathematical Society by Tom Archibald, who wrote, "Among personal views of mathematics that use history as a key to understanding, Roy's book stands out as a model."

Thomas L. Drucker

Some Historico-Mathematical Musings on the COVID-19 Pandemic

In March 2020, as the pandemic was beginning to take hold, the Royal Society put out an urgent call for volunteers with modeling skills to contribute to model building for the spread of COVID-19. This might seem odd to some of you since there are already simple mathematical models for the growth of epidemics. I will take a non-random walk through history to show you a couple of them.

One of the most famous epidemics with recorded data is the plague of 1665 in London, England whose second wave was extinguished by the Great Fire of London in 1666. The first table shows the cumulative weekly number of deaths from 25 April 1665 to 26 December 1665. The data show a distinctive S-shaped curve. At the beginning of the plague, the cumulative number of deaths rose slowly, then took off exponentially, and finally slowed down to reach an asymptote once the plague had run its course.

The S-curve applies to getting the disease as well as dying from it. The second table shows the cumulative weekly number of confirmed H1N1 cases in Australia during the flu outbreak there from 13 May 2009 to 9 September 2009.

In both epidemics, the growth seen is natural growth as there were no appropriate treatments for the plague in 1665 and the flu vaccine for Australia in 2009 was in the process of development; it was not administered until later in the year. Had there been some kind of medical intervention you would have seen a kink in the curve shortly after the intervention.

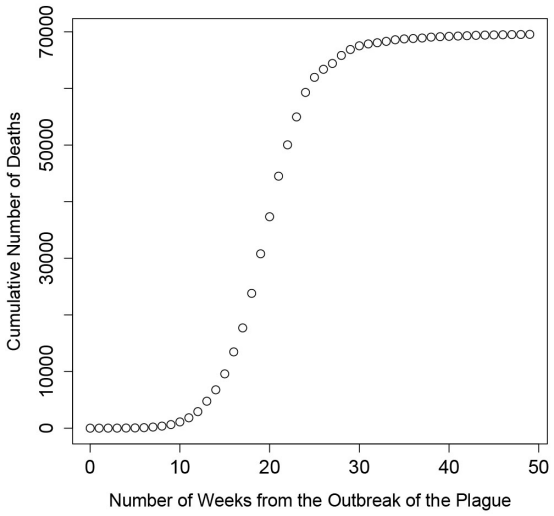

Figure 1: London Plague of 1665

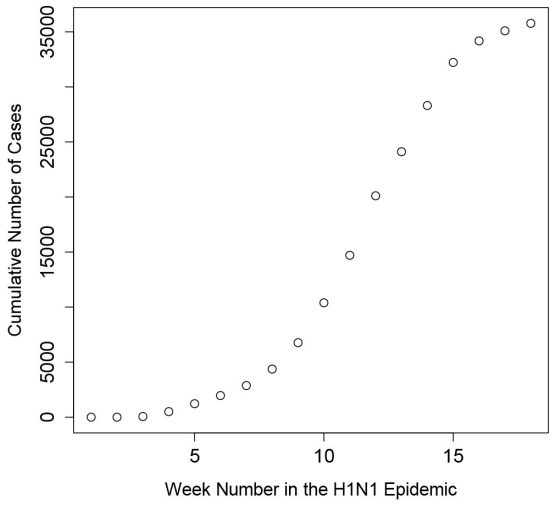

Figure 2: Australian Flu Epidemic of 2009

Growth models have been around for at least a century now. The American biostatisticians, Raymond Pearl and Lowell Reed from Johns Hopkins University suggested a growth curve model in 1920. Pearl had studied statistics with the pioneering statistician Karl Pearson; the two corresponded for several years. The Pearl and Reed growth curve for y_t , the expected number of deaths or cases at time t, is of the form

$$y_t = \frac{\alpha}{1 + \beta e^{-\gamma t}}$$

where α, β, and γ are the parameters of the model. Parameter α represents the upper asymptote, β represents the growth range, and γ represents the growth rate. Using the decennial census results, Pearl and Reed used their model to examine population growth in the United States from 1790 to 1920. In 1959, Francis Richards of Imperial College, London, refined the model to get

$$y_t = \frac{\alpha}{(1 + \beta e^{-\gamma t})^{\delta}}$$

where the reciprocal of the additional parameter δ is the slope of growth. Doing a quick check on the Internet, I found that some researchers have been applying these kinds of models to COVID-19 pandemic data.

I applied Richards's model to the 1665 plague data using nonlinear least squares to estimate the parameters (fixing the upper asymptote at $\alpha = 69600$). My predicted model is shown in the third table by a solid line against the original data given by the small circles. The model fit captures the beginning and end of the plague fairly well with some deviation in the middle. It also does a good job at replicating the shape of the growth of the plague. Richards's model might be reasonable to use. So why is the Royal Society putting out requests for volunteers when researchers are already applying these simple models to the pandemic data and publishing their results? The reasons came early on in the growth model discovery process. They were clearly expressed in 1927 by another pioneering statistician, Sir Ronald Fisher. Fisher attacked the use of Pearl's model to study population growth on four fronts. The most pertinent one here for epidemics is that the use of the model for prediction was questionable. Estimation of the curve once the epidemic is over is quite different from estimation when one is in the middle of the epidemic or near the beginning of the epidemic. The estimate of the upper asymptote, for example, is highly dependent on where you are in the epidemic. Short-term predictions might be fine, but long-term predictions from the middle of the pandemic could be quite inaccurate. And predictions for the longer term are what are needed for healthcare and other planning. Fisher's insight is something we regularly relearn. For a mathematical model to represent reality, it is first based on scientific theory. Then not only must the model fit the observations that are made, but also it must give accurate predictions. This was what Newton's

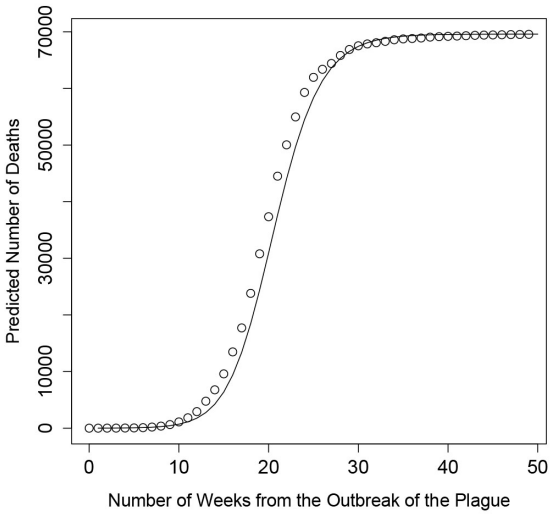

Figure 3: Predicted Deaths Using Richards' Model

models did for celestial mechanics as they appear in the *Principia Mathematica*.

David Bellhouse

BSHM conference *Mathematics in Times of Crisis*

On 6 July the British Society for the History of Mathematics held their online conference entitled "Mathematics in Times of Crisis". It consisted of three sessions of pre-recorded talks (made available on the BSHM website), each followed by a live Zoom meeting for questions and further discussion.

The first session of the conference was focused on "Individuals in Crisis", and included three talks. The first, given by Richard Simpson, focused on the "forgotten talent" of Paolo Ruffini and his contributions both to abstract algebra and the medical understanding of typhoid fever. Then Norman Biggs discussed the life and work of William Tutte, involved in British code-breaking during World War II. Finally, Tony Gardiner closed the first session by describing his efforts to learn more about Alison Falconer; a mathematics undergraduate at Cambridge alongside Freeman Dyson during the 1930s, who went on to serve as a talented teacher in both England and America during World War II. The online discussion following these talks included an interesting conversation about the need to write more inclusive histories of mathematics.

The second session, entitled "Mathematical Crises", featured talks on crises of a more theoretical nature. The first presentation – given by Henrik Sørensen and Anton Suhr – discussed Abel's representation of elliptic functions. They introduced the notion of *practices* as a way of understanding Abel's unique blending of traditions during what is now seen as a period of crisis in the foundations of analysis. In the second talk David Robertson very effectively situated the famous incompleteness theorems of Kurt Gödel within the context of the foundational crisis of the early twentieth century, and described their impact on Hilbert's Program. Finally, Michael Friedman examined the metaphorical reactions to the *crisis of intuition* which arose as a consequence of the staggering abstractness of modern mathematics. The discussion on this series of talks was wide ranging. It included insightful dialogue on how crises in mathematics invite the use of historical analysis in philosophy, and how mathematical crises embody a dual nature in that they destroy old mathematical traditions but give rise to new ideas and techniques.

The final session, "Responses of the Mathematical Community," featured four talks that blended social and theoretical history. Stefano Gulizia began with his talk describing Kelper's ideas and methods amid a crisis concerning the reality of astronomical hypotheses. Then Brigitte Stenhouse discussed her work on historical translations of Laplace's *Méchanique céleste* and how the decline of British mathematics was remedied by improved English translations of the work. The third talk – given by Michael Barany – examined the tumultuous history of international mathematical conferences during the period between 1939 and 1950, and how they reflected various political tensions. Finally, Peggy Kidwell of the Smithsonian concluded the talks with her discussion of mathematical instruments that played a role in various crises throughout history. The discussion session following these talks was lively and included many questions to each of the presenters, and considered topics such as the role of data in mathematical crises, ontology and religion, and the perceptions of gender in mathematics among others.

Not only was the online format of the conference successful, but the theme of mathematics in times of crisis was far more robust that I had expected and offered many interesting questions to consider. What might have otherwise been an unlikely topic will hope-

fully inspire further investigation based on the fruitful discussions that took place during the conference.

Christopher Kaumeyer

Help Wanted

The Society is looking for an ongoing volunteer: Webmaster. The responsibilities of the webmaster include hosting and maintaining the CSHPM website (`www.cshpm.org`), updating the online membership form each year, moderating the Council and Announcement list-servs, creating the online ballot for biennial elections, and supervising the CSHPM Facebook and Twitter accounts. For more information or to volunteer, contact Mike Molinsky, *michael.molinsky@maine.edu*.

Elect to Teach with *MAA Convergence*

MAA Convergence has offered articles on the history of mathematics and its use in teaching alongside an ever-expanding collection of online resources to help readers teach mathematics using its history since 2004. Recent publications include two classroom projects especially relevant in a US election year. Janet Heine Barnett's "The French Connection: Borda, Condorcet and the Mathematics of Voting Theory" examines the 1784 treatise, "Mémoire sur les élections par scrutin" by Jean Charles, Chevalier de Borda, and 1785's *Essai sur L'Application de L'Analyse à la Probabilité des Décisions Rendues à la Pluralité des Voix* by Marie-Jean-Antoine-Nicolas de Caritat, Marquis de Condorcet. In addition to learning about the men's historical context and biographies, students evaluate different methods for counting votes and assess their strengths and weaknesses. Meanwhile, Jeff Suzuki's "Apportionment: What's Your Fair Share?" uses US Census data from 1790 to guide students through explorations of what it means for each state to get its fair share of congresspersons.

In the ongoing "Series of Mini-projects from **TR**ansforming **I**nstruction in **U**ndergraduate **M**athematics via **P**rimary **H**istorical **S**ources," the TRIUMPHS team has added two more mini-Primary Source Projects (mini-PSPs):

- "Braess' Paradox in City Planning: A Mini-Primary Source Project for Multivariable Calculus Students," by Ken Monks;

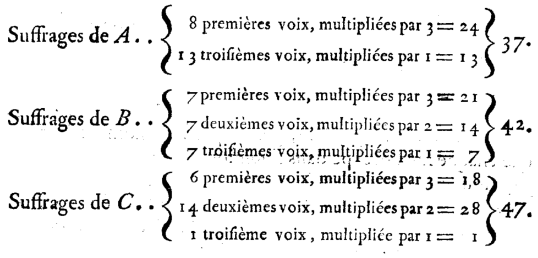

Figure 4: Excerpt from Borda's "Memoire"

- "Topology from Analysis: A Mini-Primary Source Project for Topology Students," by Nick Scoville.

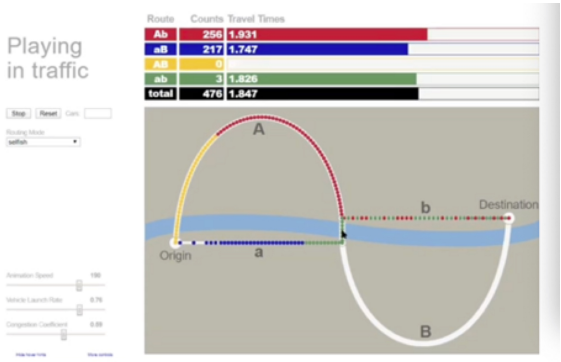

Figure 5: Animation of Braess' Paradox

Additionally, Danny Otero has added the episode, "Hipparchus' Table of Chords," to his series of curricular units based on primary source texts for use in teaching and learning trigonometry.

Further, Bill Berlinghoff and Fernando Gouvêa have shared two volumes of reproducible student activity sheets developed to accompany their well-regarded textbook, *Math through the Ages*. "Pathways from the Past: Classroom-Ready Materials for Using History to Teach Mathematics" is especially suitable for practicing and pre-service teachers of secondary mathematics and those involved in teacher training. A copy of the 2020 winner of the HOM SIGMAA Student Paper Contest, "Did Archimedes Do Calculus?" by Jeffrey Powers, is also available from *Convergence*.

Interested in contributing? We'd love to hear from you at *convergence@maa.org*! *Convergence* publishes expository articles on the history of topics in the grades 8–16 mathematics curriculum; translations of primary sources; classroom activities, projects, or modules for using history to teach mathematics; and classroom testimonials after applications of such activities, projects, or modules. Guidelines for Authors

may be found on the journal's website, `maa.org/press/periodicals/convergence`.

Janet Barnett & Amy Ackerberg-Hastings

Off the Shelf: *Vector and Tensor Analysis*

During pandemic confinement, I relied more and more on our extensive home library. To pursue studies in theology: *The Jewish Annotated New Testament*; local history: *The Streets of Riverdale*; literature: *Canopus in Argos*; history of Canadian science: *Geological Survey of Canada Annual Report 1897.*

My mathematics collection includes Homer Vincent Craig's *Vector and Tensor Analysis* (1943) McGraw-Hill Book Company, "produced in full compliance with the government's regulations for conserving paper and other essential materials" during World War II.

The five page preface "admits a dislike for differentials used as 'small quantities'.... [V]ector analysis should be employed freely in topics of advanced calculus.... [I]nvariance is... is one of the dominant notions of modern mathematics.... I have... place[d] one special kind of invariance in the limelight - invariance of functional form and its natural generalizing tensors expressed as contractions." He goes on to say "[T]here might be a place for a text on vector and tensor analysis which (1) would be available to people who are not thoroughly prepared in advanced calculus and yet would avoid the harmful use of differentials as small quantities; (2) would apply vector analysis to topics in advanced calculus and to tensor analysis and use tensor notation in vector analysis and advanced calculus...; (3) would emphasize invariance of functional form."

Craig credits many authors "for I have studied some of their books and papers at various times before my notes were put in final form." He applauds "Hlvaty... on differential geometry and tensor analysis, and Conant's second volume on the calculus." By the way I do posses the *first* volume of Conant. "[My] innovations are the direct results of my desire to emphasize invariance." He thanks Jane Moore Craig, his wife, and several of his colleagues for encouragement and reading drafts of the work. At the time of publication Craig was Professor of Applied Mathematics and Astronomy at University of Texas.

The fourteen chapters of the book are grouped into four parts (A,B,C,D). Each part is followed by a one page bibliography of key references, often early landmark works. Each part (Mathematical Background, Elementary Vector Analysis, Tensors and Extensors, Applications) is divided into articles (17, 33, 10, and 18) respectively.

Part A, Mathematical Background, Chapter I, Preliminary Remarks, outlines the book's purpose and best use, together with a short historical sketch of the development of vectors and tensors. Craig also emphasizes the importance of invariance and the avoidance of common errors in mathematical proof. We then jump into infinite sequences and series without the usual excursion through the basics of set theory. Craig gives a clear presentation of $\delta - \epsilon$ methods, concisely reviews sequences, limits and one variable derivatives and integrals. Rolle's Theorem was lifted out of my knowledge reserve.

Part B deals with Elementary Vector Analysis, starting in Chapter VI with basic assumptions and the definition of vectors as directed line segments. Their linear operations and various scalar and vector products are defined and presented with an emphasis on their invariant properties and frequent applications, especially to geometry. After looking at n-dimensional spaces and their metrics in Chapter VII, Chapters VIII and IX present the differential and integral vector calculus of three dimensional Euclidian space. For differential calculus we have the derivative of a space curve, divergence and curl defined and applied to the geometry of curves and surfaces as well as coordinate transformations. Line, surface and volume integrals lead to the theorems whose names I remember so well from second year calculus: Gauss's, Green's and Stokes's.

In Part C, Craig first defines tensors and extensors and develops their algebra. He starts their calculus by "The formation of extensors from tensors by differentiation with respect to the parameter". Their calculus ends with "the Rieman-Christoffel tensor as a criterion for the nature of a given space". This leads naturally to Part D, Applications, where Chapters XII-XIV are devoted respectively to classical dynamics, special relativity and general relativity. The last sentence of the the last section of the last chapter

once again praises invariants: "[T]he theory of relativity may be regarded as a triumph of the invariantive viewpoint."

I decided to dedicate this appreciation to the host of *Jeopardy*, Alex Trebek, on his eightieth birthday, 22 July 2020. That is because the rest of this appreciation will be in the form of a series of questions. Who was Homer Vincent Craig? What was his role during World War II, when *Vector and Tensor Analysis* was published? For example did he teach Air Force personnel navigation, as did astronomer Frank Scott Hogg at University of Toronto? Was his book ever adopted as a course book? If so, when and where? How innovative was this approach to teaching calculus? How many other contemporary calculus textbooks were so strongly rooted in the history of their topic? Where did Craig get his strong commitment to using the history of mathematics? Who were his teachers? Who were his students?

Why does the University of Texas math department have his In Memoriam page behind an identification wall? Why has Wikipedia no Homer Vincent Craig page? When I tried to provide one, I was moved to ask why does Wikipedia make it so hard to try? What is the history of my own copy? Where and when did I get it? Does the circled number eight on the front flyleaf mean the price I paid? What was the price of the newly published *Vector and Tensor Analysis*? And what would it be in 2020 dollars, both $US and $CAN. Was it sold in Canada, and at what price? What is its value as a vintage book in today's market? Who can I ask about the materiality of this book? Or about its pedagogy, especially as compared to it predecessors and successors? Craig gives applications to traditional geometry, classical dynamics, and special and general relativity; how well prepared was the intended student audience to receive these applications? How strong was the physics background of the typical student using *Vector and Tensor Analysis*? Which physics and other natural science courses would they be taking? Any other math courses? How recognizable was the concept of contrasting classical and relativistic dynamics?

Especially when this textbook appeared during WWII, what would be the age and gender distribution of the students attending the lectures? Or the ethnic, racial or religious distribution? How many would be attending in uniform? Of which service? Why don't you try to answer these questions or hand them out as an assignment to your students? Or set more questions about Craig and his book? Or make the establishment of the new question set another assignment? With the permission of our editor these answers or questions could appear in subsequent issues of this *Bulletin*.

David Orenstein

Quotations in Context

"Errors using inadequate data are much less than those using no data at all."

Modern sources frequently attribute the quotation above to the English mathematician Charles Babbage (1791-1871), but the statement is only a paraphrase of Babbage rather than a direct quotation. In 1832, Babbage published *On the Economy of Machinery and Manufactures*, a work which explored general principles of manufacture and commerce through scientific study and statistical analysis. In the volume's preface, Babbage stated that he had written the work for a general audience, intentionally avoiding "all technical terms" and writing so that understanding "is within the power of almost every person possessing a tolerable education."

In Chapter 14, "Of Price as Measured by Money," Babbage examined variations in the average price of a wide variety of manufactured goods (including anvils, frying pans, spoons, and clothing buttons) in Birmingham over the course of many years. Babbage gathered his statistics both through personal records of households and published sources, including a series of reports written by committees of the House of Commons in Parliament. But Babbage clearly saw the need for much more data, making a direct plea to business owners where he strongly urged them to maintain accurate databases of average prices of products and other information, emphasizing that the collection and distribution of such data would be highly valuable benefiting both commercial interests and the public at large.

On page 112, Babbage concluded his entreaty by discussing the problems that naturally arose from theories based on little or no actual data:

> Political economists have been reproached with too small a use of facts and too large an employment of theory. If facts are wanting, let

> it be remembered that the closet-philosopher is unfortunately too little acquainted with the admirable arrangements of the factory; and that no class of persons can supply so readily, and with so little sacrifice of time, the data on which all the reasonings of political economists are founded, as the merchant and manufacturer; and, unquestionably, to no class are the deductions to which they give rise so important. Nor let it be feared that erroneous deductions may be made from such recorded facts: the errors which arise from the absence of facts are far more numerous and more durable than those which result from unsound reasoning respecting true data.

The final sentence above appears to be the source of this column's "quotation." Note that, unlike the modern version, Babbage's actual words referred not to errors from using inadequate data, but rather to the idea that flawed logic might be used to derive inaccurate conclusions from valid and substantial data.

Mike Molinsky

A Cartoon from the Editor's desk

I had the intention to write an Off The Shelf column for this issue in keeping with Amy's ongoing column series. I had chosen Isaac Todhunter's *A History of the Mathematical Theory of Probability: From the time of Pascal to that of Laplace*, originally published in 1865. I acquired it from Craig Fraser when he was cleaning out his office. I am interested in learning more about the development of probability, but also was curious about this volume because of my begrudging admiration for Todhunter. A professor of mathematics in nineteenth century Cambridge, Todhunter was not a mathematician of great note but he did author a run of mathematical textbooks so successful his record may not be surpassed until Stewart's *Calculus* more recently.

James Stewart's calculus textbooks were ubiquitous during my student days in Canada. They earned Stewart enough money to build a famous architectural house in Toronto's Rosedale neighbourhood near where rapper Drake now lives. As I teach at McMaster University I am reminded of Stewart by the prominent display of the many hundred editions of his textbooks in the lobby of the math building, the same place Stewart once taught. Although these textbooks left indelible impressions on hundreds of thousands of undergraduate students in Canada at least, Stewart lacks any remembrance in the *Dictionary of Canadian Biography*. His legacy combines notable success as a textbook author with LGBTQ advocacy and working professionally as a violinist. I hope one day Stewart might be added to this catalogue of notable Canadians.

Todhunter, by contrast, engaged in several notable battles in his day. He participated in a pamphlet war with Cambridge author Thomas Lund over the assertion Todhunter plagiarized Lund's *Algebra* textbook. He entered debates around revising the dominant approach to teaching geometry. Todhunter was in favour of retaining Euclid as the basic text for introducing the student to geometry. Many voices of educational reform in nineteenth century England advocated for changing the standard curriculum to include more exercises and less reliance on memorization and rote learning. Of course, Todhunter had published his own edition of Euclid, *Elements of Euclid for the Use of Schools and Colleges* in 1862. His thinking about educational reform was shaped by his own identity as a textbook author who stood to lose or gain in the revising of curriculums.

Upon opening *A History of the Mathematical Theory of Probability*, Todhunter's familiar, decisive voice begins laying out his approach to compiling a history of this subject. Motivated, he says, by the success of his earlier book *History of the Calculus of Variations during the Nineteenth Century*, he will take up probability as his next subject, noting that as "mathematical histories are but rarely undertaken it seems desirable that they should not be executed on a meager and inadequate scale." At 620 pages, he managed to compile a sizable volume, encompassing anticipations of the subject in the works of Cardano, Kepler and Galileo, before beginning with Pascal and Fermat. Topics range over early theories of permutations and combinations and early researches into mortality and life insurance, before arriving at James Bernoulli's *Ars Conjectandi* and De Moivre's *Doctrine of Chances*. Contributions by Euler, D'Alembert, Bayes, Lagrange and Condorcet are each given their own chapter, culminating with Laplace and the method of least squares. Other chapters look at groups of papers by lesser-known histori-

cal figures whose works Todhunter viewed as intermediary or transitional. Augustus De Morgan's library of rare books was consulted in his research. Todhunter dedicates the book to George Boole who had died the year before publication.

I haven't read much of the volume yet, but spending more time with it this winter I will discover what Todhunter's opinions were about these topics. I wonder if historical opinion has changed much between Todhunter's nineteenth century viewpoint and today. My own curiosity has shifted towards more culturally inclusive viewpoints. Two other books on my nightstand are *Mathematics Across Cultures: A History of Non-Western Mathematics*, edited by Helaine Selin, and recently *Code of the Quipu: A Study in Media, Mathematics and Culture* by Marcia and Robert Ascher. In the latter work the authors make the point that the roots of graph theory can been found in diverse cultures where riddles of tracing patterns without lifting a finger are common. If we see the makings of mathematical inquiry in these examples, then "in the context of games, religious beliefs, Sunday strolls in Königsberg, or line systems, people have pondered the same problem" throughout many human cultures and periods of history (p. 164). I might venture that moving history of mathematics beyond Eurocentrism is one way contemporary historians might update or qualify Todhunter's view.

Since my comments on Todhunter's volume remained preliminary, I decided my editorial contribution to this issue could be expanded by contribution of the following cartoon, inspired by a recent meme going around about the scariest moments of 2020. The image is of a skeleton at a desktop computer Zooming with several other skeletons. It lands pretty close to the reality of our daily teaching and working lives these days. One of the funniest images I've seen in a while, it inspired me to create a comic specifically for the CSHPM *Bulletin*.

Instead of Zooming into the eternal afterlife I imagined Isaac Newton in 2020. As many recalled in March when news of COVID-19 set in, Newton lived through a university closure and worked from home during a plague. As I prepare to teach virtually from home in January, I take heart from Newton's perspective on his life and times. Truth is ever to be found in simplicity, and not in the multiplicity and confusion of things. I might add to that a sense of humour will help get us through.

Figure 6: Newton in 2020

Sylvia Nickerson

CSHPM/SCHPM Executive Council Meeting

The meeting of the Executive Council of CSHPM-SCHPM took place on 18 June, 2020, being held virtually via Zoom and called to order by Maria Zack, President, at 8:00 a.m. PDT. The following members were present: Amy Ackerberg-Hastings, Patricia Allaire, Eisso Atzema, Craig Fraser, Greg Lavers, Duncan Melville, Mike Molinsky, Sylvia Nickerson, Andrew Perry, Dirk Schlimm, Richard Zach, and Maria Zack.

The agenda for the meeting was approved, and minutes from the 2019 Executive Council meeting were accepted as printed in the November 2019 *Bulletin*.

Secretary's Report: Patricia Allaire presented comparative membership data for 2019 and 2020:

	2019	**2020**
Total Members	140	132
Members By Address or Organization		
Can	42	32
US	78	82
Other	19	17
BSHM	15	13
CSHPS	6	8
Complimentary	0	0
Members By Status		
Active	70	65
Retiree	43	46

Student	8	3
Developing Nations	3	2
Student Associate	1	1
Unknown	15	13
Members by Pay Method		
Online	101	95
Snail Mail	17	15
Reciprocal Members	21	21
Complimentary	1	1
New Members	13	7
Reciprocal Memberships		
To BSHM	44	44
To CSHPS	20	17
Journal Subscriptions		
Historia (paper)	46	43
Historia (electronic)	6	6
Philosophia	12	15
SCIAMVS	8	6
Proceedings/Annals		
Federation	1	1
Hardcover	8	8
Paperback	15	9
Electronic	7	14
Bulletin		
Paper	34	26
Donations		
No. Donors	16	21
Amount	$873.50	$761.50

Pat conjectured that the numbers of student members and new members were both down because the joint conference with BSHM was postponed until 2021. She noted that a number of students join for a single year in order to present at our conference.

Treasurer's Report: Greg Lavers presented a report for fiscal year 2019. The 2019 statements were published in the May 2020 *Bulletin*. Greg noted that there was a problem in that duplicate checks were sent as payment for *Historia*. The matter has been corrected. The winner of the student paper was not able to cash the check in Europe. Richard Zach was able to use his Euro checking account to help. FedCan will be sending a check to cover overdue reimbursement. Pat said that CSHPS is eager to settle accounts with us, so she and/or Greg should be hearing from the new Treasurer shortly.

***Bulletin* Editor's Report:** Amy Ackerberg-Hastings presented that content-gathering, editing, and layout processes all went smoothly in 2019–2020. As all members are likely now aware, closures related to the COVID-19 pandemic has made it impossible to distribute print copies of the May 2020 issue to date. Everyone appears to have been understanding of the necessity to have an all-electronic distribution; at least, the Content Editor received no complaints and in fact was sent a larger amount of positive feedback than is typical. She thanked the co-editors, Eisso Atzema and Maria Zack; the Secretary, Pat Allaire; the Webmaster, Mike Molinsky; all of our 2019 contributors; and the Executive Council for their roles in making the *Bulletin* a successful newsletter for our Society.

Amy announced that Sylvia Nickerson has agreed to assume the position of Content Editor. The transition is in process. As always, the editors seek submissions for upcoming issues. Please send reports on conferences attended, professional and personal news, announcements of events or publications of interest to historians and philosophers of mathematics, photographs, and the like to Sylvia at `s.nickerson@mail.utoronto.ca` at any time. Submissions close each April 1 and October 1.

CMS *Notes* Column Editors' Report: On behalf of co-editor Hardy Grant, Amy Ackerberg-Hastings reported they had had another successful year in 2019, shepherding columns to publication for all six CMS *Notes* issues. They were especially delighted that four young scholars provided three of those columns, including both of the philosophical pieces that appeared last year. CMS's Communications and Fundraising Officer turned over again, but they settled in quickly with the new contact.

A draft for the 37th column is in hand at the time of reporting. Despite ongoing recruitment efforts, the balance between philosophy and history submissions has dropped below 1:3; Amy and Hardy will continue to send out general and individual invitations, but could also use members' help with encouraging our philosophers to contribute. The thirty-six columns published so far have come from twenty-nine authors, including six jointly authored submissions. Four members have contributed three columns each, while an additional five members have written two columns. After a suggestion from Glen Van Brummelen, the editors have been having discussions with Maria Zack about the feasibility of assembling a col-

lected volume of columns with Birkhäuser or another publisher.

They continue to require that at least one author of a submission be a current member of CSHPM. Contributors should aim for 1200 words plus a biographical note, although the transition in 2020 of CMS *Notes* to a wholly online publication has both rendered the length requirement somewhat moot and made it easier to include multiple illustrations. Amy and Hardy do, though, consider it a virtue to avoid testing the patience of readers. They invite members to contact them with ideas for columns, whether they plan to write the pieces themselves or want to suggest a potential author.

***Annals* Editors' Report:** Maria Zack presenting on behalf of herself, Dirk Schlimm, and Greg Lavers, reported that due to requests to move away from the title *Proceedings*, they have officially been renamed the *Annals*.

Birkhäuser has extended our contract for another three years. These are the volumes for 2020, 2021 and 2022. The terms are the same. Greg Lavers will be taking up the role as co-editor as Dirk "retires" from the role. Maria noted her gratitude for Dirk's expertise and his ability to get graduate students to help with proofing, particularly for the philosophical and French texts.

Because of a series of unexpected events, many of the 2019 conference participants did not get the papers that they intended to submit completed (only seven final papers were submitted). In addition, COVID-19 has postponed the 2020 Annual Meeting. After consultation with our editor at Birkhäuser, it was decided to combine the 2019 and 2020 issues into a single volume. We will be working with the seven authors to finish up their papers, contacting those who could not get their papers completed to see if they would like to complete their papers and submit them, and soliciting some new submissions (we already have a few proposals). The title of *Annals* provides some greater latitude in papers that can be included in the volume. The 2019/2020 *Annals* will have 1 November as the deadline for new submissions.

Further, Maria noted Fred Rickey and Dan Curtin are in process of completing a paper that Joel Silverberg was working on when he became ill. Pat will contact members who have paid for the 2019 *Annals* to inform them that their payment will cover the 2-year volume when issued.

CSHPM Student Paper Award: Maria Zack reported that the 2018 student paper contest winner was: Aurélien Jarry, "L'equivalence duale de categories: a third way of analogy?" Maria noted challenges had been encountered in getting his award to him. Furthermore, no graduate student papers were submitted in 2019, and it is unclear if submissions will be received for the 2020 award. Maria asked for suggestions regarding how to handle the award, which was followed by some discussion. Conversation focused on the fact that the purpose of the award is to encourage and assist graduate students. The tentative plan is to give $500 to each of the three graduate students who are CSHPM members for 2020. A final decision will be made after further consideration by the Council.

Webmaster's Report: Mike Molinsky reported that CSHPM has been using Google Groups for the Council and Announcement listservs for the past year. There have been no problems reported, so it appears to be working smoothly. There were a few problems with the online membership form (which suddenly started truncating membership addresses for no known reason when they were sent to the Secretary), but that issue was eventually resolved.

Mike noted his wish to step down as the society's webmaster, in lieu of anyone taking on the position, he is willing to continue in the position for another year. It was further noted that managing the online membership form and its connection to PayPal is a major technical challenge. Any new webmaster must have appropriate skills.

Archivist's Report: Eisso Atzema handled several requests for information and documentation requests. As always, most of these requests involve CSHPM members who have passed away and *Proceedings* articles that are hard to locate elsewhere. Eisso updated the archives' inventory to include the most recent *Proceedings* and *CMS Notes*. Furthermore, the membership lists have been unpdated. The archives hold a list of all members from 1976 to 1995 and it seemed reasonable to update this list —especially in view of the requests about deceased members. Except for a 4-year gap in the early 2000s, the annual membership lists can be used. For the missing years, new members were listed in the *Bulletin*. The only

members not fully accounted for were those who were listed as new members at some point during the 4-year period, but were no longer members afterward. He listed those members as members for just the year that they were reported as a new member. All in all, a plausible membership list was complied up to 2015. Eisso will continue updating the membership list for each year up to 2020.

Election Results: Pat Allaire reported that sixty-five votes were submitted through SurveyMonkey. The following slate was elected:

President: Craig Fraser
Vice-President: Nicolas Fillion
Secretary: Patricia Allaire
Treasurer: Greg Lavers
Duncan Melville, Council
Andrew Perry, Council
Amy Shell-Gellasch, Council
Richard Zach, Council

Phil Math Preprint Archive: No report was received.

***SCIAMVS* Journal:** A report was submitted via email by Nathan Sidoli. The editors are Charles Burnett, Takao Hayashi, Takanori Kusuba, Nobuo Miura, Ken Saito, Takanori Suzuki, Ken'ichi Takahashi, Michio Yano. The Associate Editors are Sonja Brentjes, Karine Chemla, Gregg De Young, Ryuji Hiraoka, Annick Horiuchi, Annette Imhausen, Alexander Jones, Michela Malpangotto, Clemency Montelle, Robert Morrison, Mohammad Mozaffari, Christine Proust, Qi Han, Jamil Ragep, Jacques Sesiano, John Steele.

New Developments: In 2019, Qi Han has agreed to join the editorial board. We are happy to have access to his expertise on Chinese mathematical sciences and the transmissions between Chinese and Western sciences in the early modern period. For the 2019 issue, we changed some minor aspects of the printing process which brought down our costs for both printing and shipping. We also changed the company that hosts the website, which will save some costs there. Hence, the operating costs for 2019 were funded through subscriptions alone.

Submissions and Papers: In 2019, we again received only 4 new papers (as in 2018, down from 12 in 2017), but fortunately we still had two papers from last year in the production or review process. In volume 20 (2019), we published two papers submitted in 2017, and two submitted in 2018. This leaves us with two long papers currently under review. Due to the COVID-19 pandemic, there has been little activity this year, and we have so far not heard from anyone interested in submitting a new paper.

Subscriptions and Dissemination: In 2019, we had two new institutional subscriptions including all back issues (India and China). In the coming year, I will try again to increase this, especially in areas whose libraries do not hold many copies of the journal, such as the Middle East, Africa, India, and Asia (excluding Japan). Frankly, however, I am not very hopeful that we can add more than one or two institutions per year, and we may already be near capacity.

The commercial databasing service Scopus, by Elsevier, now includes information for *SCIAMVS* volumes 11-18 (2010-2018). I will try again to interest them in including the bibliographic information for volumes 1-10 (2000-2009), as well. The *Isis* Cumulative Bibliography is now available on the open internet as a searchable database. Since all of the volumes of *SCIAMVS* are cataloged here, the bibliographic information for all *SCIAMVS* articles can now be found through this database.

Issues and Concerns: In 2019, there was a significant drop in the number of individuals who purchased the 2018 issue from our European distributor (Pórtico Librerías, Spain). We hope that this will not continue in 2020, but if it does, we may have to think about another way of distributing individual copies to those who do not have a subscription.

Goals for 2020: We will continue to promote the journal among our colleagues, and try to sell a few more institutional subscriptions, including all back issues, especially in geographical areas where there are few library holdings of the journal. We will continue to seek ways to increase our online and electronic exposure. If you know anyone who is doing critical editorial work on a source text in the pre-modern mathematical sciences, please encourage them to send it to *SCIAMVS*.

CMS Liaison: No report received from Maritza Branker, however, Dirk said that he and Maritza are coordinating a History of Math Session at the CMS December meeting in Montreal.

Future Meetings: The next CSHPM/SCHPM meeting will be a joint meeting with BSHM at St Andrews University in Scotland, 12-14 July 2021. Greg

suggested that we put forth a call for papers aimed at graduate students. No students submitted proposals to CSHPM, but Maria will check with BSHM to learn if they have any graduate students on the program. Locations for Congress and for CMS for 2022 are not yet determined.

Other Business: Maria Zack reported BSHM will host an on-line conference "Mathematics in Times of Crisis" on July 6. Talks will be available on the BSHM website and via Zoom. Nic Fillion had proposed via email that CSHPM hold an online colloquium series during summer 2020, so the Council continued its discussion of possible formats and frequencies during the meeting. There was some inclination toward holding a one-time virtual mini-conference. Nic and Craig will continue to work out the details. A suggestion was made that we have a brief Zoom AGM in connection with the virtual conference. Richard suggested that we wait until the specifics of the conference are finalized before deciding on the exact date and time.

The meeting was adjourned at 8:55 a.m. PDT.

Patricia Allaire, Secretary

Logic Supergroup's Day of Inclusive Logic

On June 10th, following the lead of #ShutDownSTEM and #ShutDownAcademia, the Logic Supergroup, which comprises logic groups across the world and hosts virtual talks by speakers in lieu of physical seminars or colloquia, engaged in a Day of Inclusive Logic in support of Black Lives Matter and the protests currently underway. To that end, logicians met online for twenty-four consecutive hours between 0:00 and 24:00 GMT to discuss ways we might make logic more inclusive and thereby take a small step in efforts to mitigate racism.

Over 40 logicians from at least eight different countries participated in the discussions. Discussion generally fell into three categories. People were interested in talking about inclusive teaching practices, resources for diversifying the field of logic, and activism we as logicians could be a part of.

Teaching suggestions for diversifying logic courses and suggestions for how to make logic more accessible for students from a wide variety of backgrounds included getting rid of genius culture and stereotypes in logic, focusing on logic as a practical tool which requires practice to get good at, using low cost materials, implementing mastery grading and providing mentorship opportunities.

Several resources were identified as good candidates for increasing diversity in logic (both in teaching and research). People also had several suggestions for improving current resources and developing new ones. Some of the suggestions were to add more diversity to, e.g., the *Stanford Encyclopedia of Philosophy*, by including more entries on Black, Indigenous, and People of Color (BIPOC) folks, and also by acknowledging the work of BIPOC folks in entries which are already present, to compile a list of resources about less studied logics, and to track the number of female and BIPOC participants in logic events. One notable resource that started to develop over the course of the day was a collection of some of the lived experiences of BIPOC logicians. Participants were also very keen to talk about concrete actions we could take immediately. Some of the proposed actions included diversifying the Logic Supergroup speaker list and drafting a Supergroup statement about our commitment to diversity and inclusivity, including concrete steps we will take to achieve more diversity. Additionally, participants drafted a letter template that individuals could use to send their own letters to their professional societies in order to encourage them to take steps to address issues of racism and exclusion within their fields. Finally, a change in thinking was suggested. We should all transition from thinking about logic as a field of great dead white men who were "geniuses" to recognizing those men for the flawed creatures they were, whose "genius", relied on the subjugation of many women and BIPOC around them, and ensuring that the Wikipedia, SEP, etc., pages for these logicians acknowledge that.

Of course, the discussion was wide-ranging, and this short summary cannot account for everything. For more information about the specifics of the discussion, please contact Shay Logan at *shay.a.logan@gmail.com*. The event was very helpful in finding ways that we might take an active stand in fighting racism and increasing diversity in logic. The next steps are to do some of the things suggested. Send the letters to your professional organizations, take steps to make your classrooms more inclusive, make changes to *Wikipedia* or email an SEP editor when

you notice something is missing or incorrect about BIPOC folks, etc. For more information about the Logic Supergroup, go to `sites.google.com/view/logicsupergroup/the-logic-supergroup`.

Teresa Kouri Kissel

AGM of CSHPM/SCHPM

The Annual General Meeting of the Canadian Society for History and Philosophy of Mathematics took place as a virtual meeting via Zoom, on 21 August, 2020. The meeting was called to order at 1:10 pm by Maria Zack, President, with twenty-four members present.

Agenda for the General Meeting

1. Approval of Agenda
2. Approval of minutes from the 2019 AGM
3. Treasurer's report
4. Secretary's Report
5. Bulletin Editor's Report
6. CMS *Notes* Column Editors' Report
7. *Annals* (formerly *Proceedings*) Editors' Report
8. CSHPM Student Paper Award
9. Webmaster's Report
10. Archivist's Report
11. Election Results
12. Phil Math Preprint Archive
13. *SCIAMVS* Journal
14. CMS Liaison
15. Summer Colloquia
16. Future Meetings
17. Other Business

1. The agenda for the general meeting was approved.
2. Minutes from the 2019 AGM were accepted as printed in the November 2019 *Bulletin*.
3. Greg Lavers presented the reports described in the Executive Council meeting minutes regarding statements of income and expenditure for the Society. He observed that duplicate checks were sent as payment for *Historia*, but noted that this matter has been corrected.
4. Patricia Allaire presented comparative membership data for 2019 and 2020. (Please refer to the CSHPM Executive Council Minutes in this issue of the *Bulletin* for the data.)
5. Amy Ackerberg-Hastings, on behalf of co-editors Eisso Atzema and Maria Zack, announced that Sylvia Nickerson will be the new Content Editor. Items for inclusion should be sent to `s.nickerson@mail.utoronto.ca`. Deadlines remain 1 October and 1 April, but early submissions will ease the transition. Amy received a great deal of positive feedback on the content of the May 2020 (electronic only) issue. Maria expects the November 2020 issue will be distributed in both print and electronic form, as usual. Amy thanked all who had contributed to the *Bulletin*, Layout Editor (Eisso) and Production Editor (Maria), as well as Pat Allaire, Mike Molinsky and the Council. Tom Drucker expressed the organization's thanks to Amy for her sixteen years as editor.
6. Amy Ackerberg-Hastings, on behalf of co-editor Hardy Grant, noted that thirty-eight columns for CMS *Notes* have been published or are in press, including nine on philosophy and twenty-nine on history. There have been thirty-one authors or co-authors, including six co-authored columns. There were five graduate student authors, including four CSHPM prizewinners. Four members have contributed three columns each, and five have contributed two columns each. Amy stated that contributors must be CSHPM members. Length of articles should be at minimum 1200 words. Illustrations are welcome. A biographical note should be included. All submissions should be sent to `aackerbe@verizon.net` and `hardygrant@yahoo.com`. Contributions from philosophers are especially sought.
7. Maria, on behalf of Dirk Schlimm and Greg Lavers, noted the *Proceedings* have been officially renamed the *Annals*. Birkhäuser has extended our contract for another three years (volumes for 2020, 2021, 2022). The price will not change. Greg Lavers will replace Dirk Schlimm as co-editor, as Dirk is "retiring" from that role. Volumes for 2019 and 2020 will be combined. Authors of papers in process will be notified. Preliminary deadline for new papers is 1 December, but Maria needs to know now if a new paper is in process. Papers do not need to be on material presented at a CSHPM meeting.
8. Maria Zack commented that no papers were submitted in 2019. Instead, travel grants were given to graduate students in 2019. For 2020, the Council has authorized graduate "bursaries" from which we awarded $500 CDN to each of three graduate student members.
9. Mike Molinsky reported the Society has been using Google Groups for the Council and Announcement listservs. There were a few problems with the on-

line membership form but those issues were eventually resolved. Mike noted his interest in eventually stepping down as the society's webmaster, however, he has not heard from anyone interested in taking on the position. He is willing to continue in the position for another year.

10. Eisso reported that he has the data necessary to update the Archive's list of members for all but a few years.
11. Patricia Allaire reported the election results (recorded in CSHPM Executive Council Minutes in this issue).
12. No report was received from Elaine Landry of the Phil Math Preprint Archive.
13. A communication was received by email from Nathan Sidoli, editor of the *SCIAMVS* Journal (recorded in CSHPM Executive Council Minutes in this issue).
14. Maritza Branker reported that CSHPM will organize a session at the CMS Winter Meeting, which will now be virtual. The registration fee for this meeting has been reduced by 90%. To date, she has received 4 submissions, but will do additional publicity in hope of attracting additional speakers.
15. Nic Fillion reported that to date, there have been two virtual colloquia this summer, with fifty-three and thirty-five attendees respectively. Jamie Tappenden will speak on 21 August, and Jean-Pierre Marquis will speak on 4 September. It was agreed that virtual colloquia should continue into the fall. The membership will be polled as to the preferred day and time. Amy Shell-Gellasch will publicize the colloquia to members of the HOM SIGMAA.
16. The 2021 meeting will be a joint meeting with BSHM at St Andrews in Scotland, 12–14 July, 2021. Locations for Congress and for CMS for 2022 are not yet determined.
17. Amy Ackerberg-Hastings expressed thanks from the membership to Maria.

The meeting was adjourned at 1:45 pm.

Patricia Allaire, Secretary

New Members

Congratulations to the following new members who have joined the Society since our last Bulletin. We look forward to your contributions.

Jenny Patricia Acevedo-Rincon
Atlantico
Colombia

Chloe Armstrong
Appleton, WI
USA

John Baldwin
Chicago, IL
USA

Reed Clements
Vancouver, BC
Canada

Jambes Cromie
Université Sainte-Anne
Pointe-de-l'Église, NS
Canada

Robert Dawson
Halifax, NS
Canada

Silvia De Toffoli
Princeton, NJ
USA

Campo Elias Flórez Pabón
Norte de Santander
Colombia

Jeff Powers
Grand Rapids, MI
USA

Abby Quick
Washington, DC
USA

Jabel a Ramirez Narranjo
Las Palmas de Gran Canaria
Las Palmas
Spain

David Waszek
Montreal, QC
Canada

Chris Christensen
Fort Thomas, KY
USA

From the Editor

It was 2003 when I first read Joan Richard's *Mathematical Visions: The Pursuit of Geometry in Victorian England*. This book was my first introduction to scholarship in history of mathematics. I consumed

it in a bachelor apartment during a season in which Halifax, Nova Scotia was destroyed by hurricane Juan and "white Juan", a storm so large it took five days for the city to shovel out. I personally was looking for a direction in which to go and history of mathematics seemed to provide the answer. I enrolled in the graduate program at UofT for history and philosophy of science rather than mathematics at Dalhousie. Eighteen years later, I find myself writing this short "From the Editor" for the CSHPM from the attic of my family home in Hamilton, Ontario during a global pandemic. I am in a different time period and geography yet continue enjoying this connection to history and philosophy of mathematics. So few things endure. With mathematics, we have a special connection to something that does.

I take over the mantle of *Bulletin* Editor from Amy. Thanks to Amy for her many years of service to the society in her role as editor. I look forward to hearing from you about how the *Bulletin* can grow and serve you as members.

This issue is I hope along the lines of what you have come to expect. I am happy to include articles from frequent contributors as well as new voices. You will peruse a reflection on how mathematics has historically modelled disease as well as a report about racial inclusion in teaching and practicing logic. I expect the questions that motivate our field will be moulded by current events as our lives are shaped by these conditions for the next several months or more.

Our newsletter's next submission deadline is 1 April 2021. Let's hope the disruptions of 2020 will be waning pleasantly in the rearview by that time. That may be hopeful, but hope remains for me that 2021 can be a better year. The editors continue to seek news items of interest to historians and philosophers of mathematics and personal and professional announcements. We also welcome suggestions for memorials, reports on conferences relevant to historians and philosophers of mathematics, book and web reviews, and informative or thought-provoking column-style articles. I will continue to honor submissions for Amy's ongoing column series including Models of Mathematics, Off the Shelf, and Mathematical Ephemera. I am open to new lines of investigation as well that members may wish the *Bulletin* take up. I would be interested to hear from younger scholars who are pursuing new lines of research or re-evaluating well travelled paths in new ways. Contributions of opinion or editorial style articles offering arguments or particular perspectives on the state of the field would be welcome. I am certainly open to the contributions of philosophers and encourage them to make this space their own. Feel free to write me your proposals.

Microsoft Word (please turn off its auto-formatting features such as "curly quotes") and LaTeX data files (not compiled PDFs) are easiest for the editors to deal with. We also prefer that image files be sent separately, rather than embedded into a Word or PDF document. Submissions may be sent to *s.nickerson@utoronto.ca*. The *Bulletin* reaches your hands or screen due to the continued labors of Eisso Atzema, Layout Editor; Maria Zack, Production Editor; Pat Allaire, Secretary; and Mike Molinsky, Webmaster.

Sylvia Nickerson

About the Bulletin

The *Bulletin* is published each May and November by a team of 3 volunteers: Content Editor Sylvia Nickerson (s.nickerson@utoronto.ca), Layout Editor Eisso Atzema (eisso.atzema@maine.edu), and Production Editor Maria Zack (MariaZack@pointloma.edu). Material without a byline or other attribution has been written by the editors. Les pages sont chaleureusement ouvertes aux textes soumis en français. Comments and suggestions are welcome and can be directed to any of the editors; submissions should be sent to Sylvia Nickerson at the above email address. Members, readers and prospective contributors may also contact Sylvia by post. Direct correspondence to 115 Mary Street, Hamilton, Ontario, L8R 1K4, CANADA.