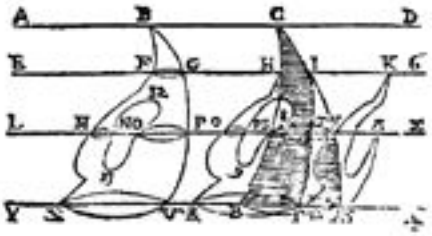
BULLETIN

CSHPM SCHPM



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WHAT'S INSIDE

President's Message [Jean-Pierre Marquis] . . . . . page 2

Articles

Announcements . . . . . page 4
Book Review: The Emperor's New Mathematics [Victor Katz] . . . . . page 8
HPM at AMS Eastern Section [Amy Ackerberg-Hastings] . . . . . page 12
2012 Kenneth O. May Lecturer: Andrew Hodges [Sylvia Svitak] . . . . . page 13
Quotations in Context [Mike Molinsky] . . . . . page 14
Sir Michael Dummett (1925–2011) [Mathieu Marion] . . . . . page 15
Book Review: Iris Runge [Martin Muldoon] . . . . . page 18
Two Oberwolfach Workshops on the History of Mathematics [Tom Archibald] . . . . . page 19

Reports

2012 CSHPM/SCHPM Meeting Programme . . . . . page 9
2011 Financial Statement . . . . . page 11
CSHPM Session at CMS in Toronto . . . . . page 12
2012 CSHPM Nominating Committee Report . . . . . page 14
The CSHPM/SCHPM Discussion List . . . . . page 17
New Members . . . . . page 19
From the Editor . . . . . page 20

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 the 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: **Jean-Pierre Marquis**, Université de Montréal, Montréal, QC H3C 3J7, CA, jean.pierre.marquis@umontreal.ca
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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 **Tom Archibald**, Simon Fraser University, Burnaby, BC, V5A 1S6, tarchi@math.sfu.ca. The Society's Archives are managed by **Michael Molinsky** (see above). **Tom Archibald** (see above) serves as CMS Liaison.

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

From the President

As I write this note, students in my Province are on strike, protesting against the Government's plan to raise tuitions; the race for the Republican presidential nomination looks bizarre, at least from a Canadian perspective; the Canadian Government seems to be hiding information from its citizens; and it is already Spring, a rather unlikely and, in its own way, worrying situation. Amidst all these turbulences, one wonders what historians and philosophers of mathematics, as intellectuals, can contribute. This is precisely the theme of this year's Congress of the Canadian Federation for the Humanities and Social Sciences. More precisely, the title of the Congress is *Crossroads : Scholarship for an Uncertain World*. Needless to say, many mathematicians before us lived in an uncertain world. One of them was Alan Turing, who was born right before WWI and died a few years after WWII. In fact, the year 2012 marks his 100th birthday. Together with the CSHPS, we have decided to celebrate this important event and we will have the great pleasure to welcome Professor Andrew Hodges from Oxford as our May Speaker (and the CSHPS's Drake Speaker). He is one of the world's leading experts on Turing's life and is himself a renowned mathematician. The Federation acknowledged the importance of this event and informed us recently that it will advertise the lecture in all its communications to the public.

This is but one of the reasons why you should come to our next Annual Meeting in Waterloo/Kitchener, from May 27 to 29. Maria Zack is organizing the general session and Sylvia Svitak is in charge of the special session on "Mathematics and Computer Science". Our local organizer is David DeVidi. They have worked hard to put up a very interesting program. I thank them for volunteering for these jobs. As usual, our meeting overlaps with those of the CSHPS and the Canadian Philosophical Association (CPA), and I am sure that delegates of all groups will find talks of interest in all the programs.

Of course, our members are actively involved in the community and participate in numerous congresses, conferences, seminars and lectures. It is impossible not to mention the latest Joint Mathematics Meeting of the AMS and the MAA that took place in Boston in January with 7,200 participants! An extraordinary concentration of mathematicians, teachers, historians,

etc., indeed! Sloan Despeaux and Craig Fraser, two of our members, together with Deborah Kent, organised four sessions on the history of mathematics. An impressive number of members of the Society participated in these events. Duncan Melville spoke about Mesopotamian mathematics, while Alejandro Garciadiego addressed the question of the Spanish edition of Euclid's geometry in the 17th century. Euclid's *Elements* were discussed in another session, when Clemency Montelle examined the book's translation into Sanskrit. Karen Parshall discussed how algebra evolved from Bombelli to Viète, Rob Bradley gave a talk on evolutes in the work of Huygens and Johann (I) Bernoulli, Lawrence A. D'Antonio spoke about Boscovich and the line of best fit, and J. J. Tattersall, in collaboration with Asta Shomberg, presented the method of least squares in the work of Kummell. David E. Zitarelli compared the early histories of two American mathematics departments, the University of Missouri and the University of California at Berkeley.

Philosophers of mathematics had their share of the cake, too. Thomas Drucker and Bonnie Gold, again two of our members, together with Daniel Sloughter, put up an impressive roster of speakers on the subject. Among them, one of our members, Charles Parsons, defended a form of structuralism in mathematics. Both Thomas Drucker and Bonnie Gold still had enough energy to give presentations themselves in the session on the philosophy of mathematics and mathematical practice, a session in part organised by Bonnie as well. Tom gave some thoughts on thought in mathematical practice, while Bonnie argued that philosophy, but not philosophers, of mathematics does indeed influence mathematical practice.

Amy Shell-Gellasch, together with Dominic Klyve, organised a minicourse on reading original sources in Latin for historians of mathematics. Amy was also the force behind the session on the history of mathematics and its uses in the classroom, in which Charles F. Rocca presented James Hamblin Smith's Euclid and Amy herself, in collaboration with Pedro Freitas, discussed aspects of the Maya number system. From a Canadian perspective, the sessions—notice the plural—on mathematics and sports were a real disappointment, since there was only one talk on mathematical aspects of hockey. Our members probably participated in other events as well, perhaps on poetry, or music, or dance and mathematics.

March and April also featured interesting talks and seminars. I will simply mention a few here. In March, Bruce Petrie gave a talk on "Paradigms, Mathematics and Education" in the special session on relations between the history and pedagogy of mathematics at the AMS Eastern Section meeting, while Amy Ackerberg-Hastings spoke on the use of protractors in the teaching of mathematics. Rob Bradley was invited to speak to the Philadelphia Area Seminar on the History of Mathematics about the course of analysis of *le Marquis de l'Hopital*. At the same seminar, in April, Francine F. Abeles spoke about hypotheticals, conditionals and implication in 19th century Britain. I will be giving a talk at the Frederick V. Pohle Colloquium in the history of mathematics on abstraction in early 20th century mathematics, and Robert Thomas will be visiting the same seminar in May, two days after Salvatore J. Petrilli and Anthony Del Latto explore Servois' contributions to mathematics.

This coming meeting will be my last as President. It has been a great pleasure and an honour to serve you. I want to emphasize how pleasurable it is to work for this organization, thanks to the professionalism, enthusiasm and dedication of the members of the Executive. Pat Allaire, the Secretary, is the living memory of the Society, and her work, planning, wisdom and tact assures us that everything is running smoothly and efficiently. Dirk Schlimm, as Treasurer, brings the same assurance, efficacy and rigor. I have many times consulted Glen Van Brummelen, the Vice-President, and Duncan Melville, the Past-President, for advice and each time, they offered me clear, direct, wise and more than useful suggestions. We are also extraordinarily lucky to have Amy Ackerberg-Hastings as our Content Editor of the *Bulletin*. Not only is she supervising the newsletter masterfully, but she has also helped me in countless ways. Of course, the *Bulletin* would not be what it is without the contributions of our Layout Editor, Eisso Atzema, and the finishing touch provided by Maria Zack, our Production Editor. We can also be extremely grateful that Mike Molinsky is our Webmaster and Archivist. Our website is a wonderful window for our members as well as for the world in general. It is up-to-date, clean, well-organised and a mine of information. Taking over from Antonella Cupillari's remarkable work, Tom Archibald is now in charge of the *Proceedings*, and I,

for one, know that Tom will keep up the high standards that were handed over to him. Rob Bradley, Duncan Melville and Greg Lavers, this year's members of the Nominating Committee, again went beating the bushes to find volunteers and make sure that our Society continues to thrive. Last but not least, Francine Abeles, Gregory Lavers, Sylvia Svitak and Adrian Rice, the remaining members of the Executive Council, have all been supportive and diligent and have infused our discussions with relevant, creative and useful insights. I want to express my deepest gratitude to everyone for their kindness, openness and hard work. Thank you and may the Society flourish without losing its personal, creative character.

Jean-Pierre Marquis

Announcements

Israel Kleiner announces the publication of *Excursions in the History of Mathematics* (Birkhäuser, 2012). His *A History of Abstract Algebra* (Birkhäuser, 2007) has recently been translated into Japanese and is being translated into Korean.

On June 30, David Orenstein will be retiring from teaching high school mathematics (and biology, chemistry, general science, French, and ESL) after 28 years. Most of this teaching has been at Danforth CTI, a large composite school on the east side of downtown Toronto. David comments: "While I look forward to fully enjoying the glory of the changing seasons of this corner of North America, I know that days of inclement weather, either slushy blizzards or muggy heat waves, can be spent in the climate controlled comfort of the local archives and rare books libraries. There I can pursue my research in the history of Canadian mathematics and science."

Former BSHM President Raymond Flood will be the next Gresham Professor of Geometry at the University of Cambridge, beginning in September 2012, while Tony Mann, also a former BSHM President, has been appointed a Visiting Professor. Flood will lecture on James Clerk Maxwell on 31 October 2012.

Joseph W. Dauben received the 2012 AMS Albert Leon Whiteman Memorial Prize at the JMM in Boston. He was recognized for his contributions to the history of Western and Chinese mathematics and for deepening and broadening the international mathematical community's awareness and understanding of its history and culture. The full citation appears in *Notices of the AMS* 59, no. 4 (2012): 572–575.

In 2011, the History of Science Society awarded the Pfizer Prize for best scholarly book in the history of science to Eleanor Robson's *Mathematics in Ancient Iraq: A Social History* (Princeton, 2008).

To keep up with the events marking Turing's centenary year, see www.turingcentenary.eu.

San Diego JMM preview: Mathematics as a discipline seems to make progress over time, while philosophy is often taken to task for not having made such progress over the millennia. When philosophy comes to tackle issues related to mathematics, one natural topic is how mathematics succeeds in making progress while philosophy does not. POMSIGMAA is sponsoring a session to address the question of whether philosophy can help to explain the apparent progress displayed by mathematics. Another question to explore is whether the mismatch in progress between the disciplines is more apparent than real. As currents of mathematical change gather speed, perhaps a philosophical perspective is needed to make sure that mathematical practitioners do not lose their footing. Papers addressing issues of progress in mathematics and philosophical ways of understanding that progress will help to continue conversations between mathematicians and philosophers (and historians). Session co-organizers are Tom Drucker (Univ. of Wis.-Whitewater) and Dan Sloughter (Furman).

Mathfest Joint Meeting update: Jeremy Gray has accepted an invitation from CSHPM, HOMSIGMAA, and POMSIGMAA to be the Kenneth O. May speaker for our gathering in the summer of 2013.

Francis Hoffman and Elaine Riehm have published *Turbulent Times in Mathematics: The Life of J. C. Fields and the History of the Fields Medal* (Providence, RI: American Mathematical Society, 2011). The foremost Canadian mathematician of his time, Fields (1863–1932) taught at the University of Toronto, championed an international spirit of cooperation in mathematics, and established the Fields Medal, which became the highest award in mathematics.

The AMS announces a recently created "Math History: AMS Books and Resources" webpage, which

points to AMS books (including some free online books), articles, and online features. See www.ams.org/ under samplings/math-history/math-history.

According to Carol Mead, the archivist for the Archives of American Mathematics at the University of Texas in Austin, the AAM now holds over 100 collections of the papers of mathematicians and records of organizations. See www.cah.utexas.edu under collections/math.php. There are crowd-sourcing opportunities available to identify mathematicians in the digital photograph collections. *Convergence* is also soliciting information about photos, along with its usual articles on using history to teach mathematics.[1]

Mark Huber and Gizem Karaali announce the January 2012 issue of the *Journal of Humanistic Mathematics*, which includes articles on the mythology around Galois and arguments for using history of mathematics in the mathematics classroom. See scholarship.claremont.edu/jhm.

The Network of History of Science in Southeastern Europe has launched a new journal, *Almagest: An International Journal for the History of Scientific Ideas*. See www.brepols.net.

REDIMAT is a new online refereed open journal for research in mathematics education that accepts articles in English and Spanish. Ubiratán D'Ambrosio published an article in the first issue. See revistashipatia.com/index.php/redimat.

Princeton University Press announces Bill Cook's book, *In Pursuit of the Traveling Salesman*, along with a free app, Concorde TSP Solver, that allows users to solve traveling salesman problems in minutes. The traveling salesman problem asks, What is the shortest possible route for a traveling salesman to visit each city on a list exactly once and return to his city of origin? William Rowan Hamilton originally defined the problem. The app is available through the iTunes store. Princeton has also published Amy Langville and Carl Meyer, *Who's #1?: The Science of Rating and Ranking*.

The Johannes Kepler Working Group has digitized the first volume of *Gesammelte Werke* (Munich, 1937–). See www.kepler-kommission.de.

The Book of Michael of Rhodes: A Fifteenth-Century Maritime Manuscript, 3 vol. (MIT Press, 2009), which includes a treatise on commercial arithmetic and material on navigation and calendars, has earned the American Historical Association's J. Franklin Jameson Prize for its editors, Pamela O. Long, David McGee, and Alan M. Stahl.

Dissertation Reviews is a new website that offers concise summaries and reviews of dissertations defended after 2009. Reviewers in the history of science and related fields are needed. See dissertationreviews.org.

Taylor & Francis Online now permits authors to allow friends and contacts free access to their published articles through its eprint facility. See journalauthors.tandf.co.uk/.

The Royal Society of London has made its journal archive permanently free to access. This includes 60,000 articles, including *Philosophical Transactions*. Visit royalsocietypublishing.org/search.

Elsevier has announced its intention to price all mathematics journal articles below US$11. The publisher has also made the archives of 14 mathematics journals open from four years after publication, back to 1995. Elsevier has withdrawn its support for the Research Works Act. For more information on Elsevier's open access policies, see www.elsevier.com/openaccess.

The History, Philosophy and Didactics of Science and Technology Programme of the Institute of Neohellenic Research is delighted to announce that their popular exhibition on the Antikythera mechanism has moved to the Musée des Arts et Métiers, Paris.

The 2011–2012 schedule for the Philadelphia Area Seminar on the History of Mathematics (PASHoM) included: Patricia Allaire (Queensborough), "Yours Truly, D. F. Gregory" on 20 October 2011; Chris Rorres (Penn), "The Turn of the Screw: The History and Optimal Design of an Archimedes Screw" on 17 November 2011; Brittany Shields (Penn), "The Architecture of Mathematical Institutes: A Comparative Study of Göttingen and NYU's Mathematical Institutes under the Leadership of Richard Courant" on 8 December 2011; Thomas Bartlow (Villanova), "A Tentative Look at American Postulate Theory" on 19 January 2012; Marina Vulis (Fordham), "Tales of Nineteenth Century Russian Mathematics" on 16 February 2012; Jesse Frey (Villanova), "Data-Driven Nonparametric Prediction Intervals" on 17 Febru-

[1] See: mathdl.maa.org/mathDL/46/.

ary 2012; Martha Yip (Penn), "Counting Upper-Triangular Nilpotent Matrices of a Given Jordan Type" on 16 March 2012; Robert Bradley (Adelphi), "The Origins and Contents of de l'Hôpital's *Analyse*" on 22 March 2012; and Francine Abeles (Kean), "Hypotheticals, Conditionals, and Implication in Nineteenth Century Britain" on 19 April 2012.

After twelve years at the helm of PASHOM (see the retrospective in our November 2010 issue), David Zitarelli and Tom Bartlow are turning the responsibilities for organizing this collegial and intellectual gathering over to new leadership. Alan Gluchoff has agreed to take on the work of making local arrangements at Villanova, but he needs volunteers to suggest ideas for next year's program and one or two people to partner with Alan to arrange the program on an ongoing basis. To volunteer, email Alan at *alan.gluchoff@villanova.edu*.

The Frederick V. Pohle Colloquium in the History of Mathematics, hosted by the Department of Mathematics & Computer Science at Adelphi University, presented the following speakers this past year: David Zitarelli (Temple), "Hilbert's American Colony" on 5 October 2011; David Lubell (Adelphi), "Let Me Count the Ways" on 2 November 2011; Marjorie Wikler Senechal (Smith), "False Starts in Biogeometry: Whatever Happened to D'Arcy Thompson?" on 7 December 2011; Alexander Jones (NYU), "An ancient Greek analog computer: The Antikythera Mechanism" on 1 February 2012; Larry D'Antonio (Ramapo), "Whose Line Fits Best? A brief history of linear regression" on 7 March 2012; Jean-Pierre Marquis (Montréal), "Abstraction, Formalization, and Axiomatization in Early 20th Century Mathematics" on 18 April 2012; Salvatore Petrilli and Anthony Del Latto (Adelphi), "Servois' Contributions to Mathematics: His Algebra and Perpetual Calendar" on 2 May 2012; and Robert Thomas (Manitoba), "What's most interesting in Theodosios's *Spherics*" on 4 May 2012.

Michel Serfati announces the second semester program for the annual seminar on Epistemology and History of Mathematical Ideas, held Wednesdays at 2:00 pm at the Institut Henri Poincaré in Paris: Dominique Foata (Strasbourg), "Séries q-trigonométriques: la combinatoire de Désiré André revue par Heine" on March 14; Bernard Vitrac (CNRS), "Les démonstrations par l'absurde dans les *Éléments* d'Euclide: inventaire, formulation, usage" on March 28; Marc Rogalski (CNRS), "Rapports entre l'histoire et l'épistémologie des mathématiques et les recherches didactiques: exemples et questions" on April 11; Herbert Breger and Michel Serfati, "Analysis as a feature of 17th century mathematics" and Michel Serfati, "Leibniz et l'invention de la transcendance mathématique" on May 9; and Christophe Delaunay (Univ. Franche), "Cryptographie et le problème du logarithme discret" on May 23.[2]

The ARITHMOS Reading Group met February 25–26 at Western Connecticut State University. The topic of discussion was Chapter 3 of Lagrange's *Lectures on Elementary Mathematics*. On June 23–24, the group will examine selections on Indian and Islamic trigonometry from Victor Katz's sourcebook and selections from Regiomontanus, *On Triangles*. For information, contact Chuck Rocca, *RoccaC@wcsu.edu*.

On March 17, Victor Katz was the keynote speaker for the 100 attendees of the Sixth Smoky Mountain Undergraduate Conference on the History of Mathematics, organized by Sloan Despeaux. See paws.wcu.edu/despeaux/SMURCHOM_VI.

The Korean Society of Mathematical Education hosted the 48th Korean National Meeting of Mathematics Education 6–7 April 2012 at Seoul National University. Papers appeared in the March 2012 issue of *Research in Mathematical Education*.

Bernard Hodgson and Jean-Baptiste Lagrange announce "The didactics of mathematics: approaches and issues: International colloquium in honour of Michele Artigue," a former president of the International Commission on Mathematical Instruction, to be held in Paris 31 May–2 June 2012. See www.colloqueartigue2012.fr.

The 54h Annual Legacy of R. L. Moore Conference, co-hosted by the Educational Advancement Foundation and the MAA, will be held in Austin, TX, 14–16 June 2012. This year's theme is "The Many Faces of Inquiry-Based Learning."

The International Society for the History of Philosophy of Science will meet in Halifax, Nova Scotia, 21–24 June 2012. See hopos2012.philosophy.dal.ca.

[2]See www.irem.univ-paris-diderot.fr/sections/epistemologie.

The Chinese National Association of Mathematics Education & International Conference will be held in Guilin, Guangxi, China, 29 June–2 July 2012. Conference themes include: 1) the history of mathematics educational research in China; 2) domestic and international tendency of mathematics education research; 3) middle school mathematics teacher professional development; 4) middle school mathematics curriculum reform; and 5) modern information technology and mathematics education. See www.camedu.org.cn/html/index.html.

"Turing's Worlds," the 2012 OUDCE-BSHM Joint Meeting, will be held at Rewley House Oxford, 23–24 June 2012, while an additional joint meeting, "Mathematicians and their Gods," will be held 15–16 September 2012.

"Global Health, Environment, Economy, and Energy Using Mathematical Sciences" is the theme of the 6th International Federation of Nonlinear Analysts World Congress, meeting in Athens, 25 June–1 July 2012. See ifna2012.com.

The Seventh Joint Meeting of the British Society of the History of Science, the Canadian Society for History and Philosophy of Science, and the History of Science Society will be held in Philadelphia, 10–13 July 2012.[3]

HOMSIGMAA is sponsoring a contributed paper session on "The History of Mathematics and its Uses in Learning and Teaching Mathematics," organized by Kelli Slaten and Scott Guthery, at MAA MathFest, 2–4 August 2012 in Madison, WI. POMSIGMAA is hosting a reception and guest lecture by Janet Folina (Macalester), "Is the Proof in the Picture? Seeing, Believing, and Provings."

The Philosophy of Science Association will hold its 23rd Biennial Meeting in San Diego, 15–17 November 2012, in conjunction with the annual meeting of the History of Science Society. See www.philsci.org.

epiSTEME 5, the Fifth International Conference to Review Research on Science, Technology and Mathematics Education, will be held 7–11 January 2013 at the Homi Bhabha Centre for Science Education, TIFR, Mumbai, India. One of the four conference strands is Historical, philosophical and socio-cultural studies of STM implications for education. Paper proposals are due May 15. See episteme5.hbcse.tifr.res.in.

ICMI's EARCOME6 conference will be held at Prince of Songkia University, Phuket, Thailand, 17–22 March 2013. See earcome6.kku.ac.th.

An international conference marking the 300th anniversary of Jakob Bernoulli's *Ars Conjectandi* will be held 15–16 October 2013, in Basel. The meeting will be held in conjunction with the meeting of the Swiss Statistical Society. See www.statoo.ch/bernoulli13.

The Dibner History of Science Program offers historians of science and technology the opportunity to study in the Burndy Library and other history of science and technology resources at the Huntington Library and Gardens in Pasadena, CA. Short- and long-term awards are available; the application deadline is 15 December 2012. See the Research link at www.huntington.org.

The Linda Hall Library in Kansas City, MO, offers Residential Fellowships of up to US$3,000 per month for one to nine months. The library supports research projects by doctoral students, postdocs, and independent scholars in science, engineering, and technology; in the history of science, engineering, and technology; or in interdisciplinary topics that link science or technology to the broader culture. The application deadline is 3 January 2013. See www.lindahall.org/fellowships/index.shtml.

The Dolph Briscoe Center for American History, of which the Archives of American Mathematics is a component, invites students of the history of mathematics to apply for the Smith Research Travel award. Five fellowships of up to US$1,000 are given for use between 1 September 2012 and 31 August 2013. See www.cah.utexas.edu/services/smith_travel.php.

The University of Calgary Department of History and Department of Philosophy now jointly offer programs leading to a Masters in the History and Philosophy of Science. The program builds on particular research and teaching strengths in philosophy, history and classics at the University of Calgary and also draws on course offerings in the humanities, the natural and social sciences. Highly motivated Canadian and international students who have a great interest in interdisciplinary subjects are invited to consider the program. See www.phil.ucalgary.ca/grad/hps.html.

History Matters, a yearly undergraduate history jour-

[3] See www.hssonline.org/Meeting/3_Society.html.

nal, solicits top undergraduate research papers for online publication. For more information, see the journal's website at www.historymatters.appstate.edu/.

Book Review: The Emperor's New Mathematics

The Emperor's New Mathematics: Western Learning and Imperial Authority During the Kangxi Reign (1662-1722), by Catherine Jami, Oxford: Oxford University Press, 2012, 452 pp.

This is a very detailed study of one aspect of a short period of Chinese history, the reign of the Kangxi Emperor from 1662 to 1722. In particular, the author deals with Kangxi's study and use of mathematics in his reign and with his eventual creation of a huge and detailed compilation of mathematics. We learn how Kangxi employed the knowledge of the Jesuit missionaries, who were in China from 1582 to 1773, but never gave any indication of accepting their religion.

Kangxi, a contemporary of both Louis XIV of France and Peter the Great of Russia, was the second ruler of the Qing dynasty, the "foreign" Manchu dynasty that conquered Beijing in 1644 and soon gained control of all of China. The Manchus quickly adopted Chinese culture and institutions; they succeeded so well that they ruled for over 250 years.

Part of the early success of the dynasty was evidently due to Kangxi's decision to become knowledgeable in the mathematical sciences, so that he could be involved in such important functions as keeping the calendar and constructing the twelve pitchpipes that set the tone for ritual music. For example, Jami tells the story of how the emperor had to arbitrate a controversy over an intercalary month in the Chinese lunisolar calendar. His own Astronomical Bureau had made a recommendation, but the Jesuits convinced him that the Bureau had made several errors. Ultimately the Jesuits were proved correct, and Kangxi appointed one of them to be Administrator of the Calendar. As Kangxi recalled two decades later, "Seeing with Our own eyes that no one at Court understood the calendar, We felt sick at heart. During the little leisure time left to Us by the many affairs of the State, We have devoted Ourselves to astronomy for more than twenty years, so that We have taken a view of its broad outlines and will not come to be confused about it." (p. 75)

Thus Kangxi required the Jesuit missionaries to tutor him in mathematics, including methods of calculation, theoretical and applied geometry, astronomy, trigonometry, and logarithms. But Kangxi also studied some of the ancient Chinese mathematical methods that had survived in various compilations, and he frequently tried to reconcile these older methods with the more modern European ones. Typical of the Chinese problems was one about inkstones and brushes: "A borrows seven inkstones from the B family, and returns him three fine-haired handles, compensating in coins four full hundreds and eighty; it's exactly even, and done. Yet C borrows nine brushes from B, and returns him three inkstones from Duanxi; one hundred and eighty are compensated to B; it's even. How much should the prices of these two kinds be?" (p. 40) Jami brings up this problem frequently, showing how it was originally solved, using rectangular arrays, and how the Jesuits solved it using written European methods.

The Jesuits submitted their lecture notes to the emperor as they were tutoring him, and some of these were published during the 1690s. Kangxi took it upon himself to write the preface of one volume, explaining his reasons for believing that mathematics is important for the state: "The principles of numbers are extremely subtle; the uses of numbers are extremely great. Therefore, although reading widely and examining thoroughly is in every respect a scholarly occupation, understanding numbers is a priority for intelligent gentlemen. For therein must lie the beginning of the investigation of things to extend one's knowledge. If one can truly clarify numbers, then one's knowledge will necessarily be solid. If knowledge is solid, then in dealing with affairs, one will necessarily be reliable beyond doubt. When there is no doubt, all affairs are completed." (p. 199)

As one of the culminating efforts of his reign, Kangxi in the last decade of his life ordered the compilation of a major "official" mathematical work, the *Essence of numbers and their principles imperially composed*, along with companion works on astronomy and harmonics. Jami describes the process by which this work was prepared, noting that the "imperially composed" part of the title was real, that in fact Kangxi

contributed greatly to the writing and editing of this work. Although this massive work of 4,900 pages is based in part on the lecture notes produced by the Jesuits, by the time of its compilation the Jesuits had lost favor with the emperor. Besides, the Chinese always believed that much of the modern European mathematics taught by the Jesuits was based on older Chinese sources. Thus, the book is a blend of ancient Chinese mathematical ideas with modern European concepts. Interestingly, the advanced Chinese work of the thirteenth century of Qin Jiushao, dealing with solving congruences and solving polynomial equations of arbitrary degree, had been forgotten in China by the seventeenth century. For instance, when the compilers of the *Essence of numbers* decided to include a remainder problem, they merely adapted the old one from the *Mathematical classic of Master Sun*: "Suppose there is some money, of which one does not know the total amount. Counting it by threes the remainder is 2 pieces; counting it by fives the remainder is 3 pieces; counting it by sevens the remainder is 2 pieces. One asks how much the total amount of money is." (p. 355) The description of the solution, however, goes beyond the work of Master Sun, with a very detailed explanation to enable the solution of similar problems.

Although Jami's work does not contain much mathematics as such, it is a fascinating study of how, in late seventeenth century China, a decision by the Emperor helped to return mathematics to an important place in Chinese society. Mathematics in ancient times—in China and elsewhere—had been the province of those in authority, and Kangxi believed that returning the subject to its rightful place would help him in administering the empire and asserting his authority, especially because he was a foreigner ruling over China. As Jami shows, Kangxi was successful partly because he was able to balance the imported European mathematics of the Jesuits with ancient Chinese knowledge.

Victor J. Katz

2012 CSHPM/SCHPM Meeting Programme

The Annual Meeting of the Canadian Society for History and Philosophy of Mathematics will be held at the University of Waterloo and Wilfred Laurier University in Waterloo, Ontario, 27–29 May 2012. All CSHPM sessions are on the University of Waterloo campus, in Physics Hall. Except for the one-hour Drake/May lecture, presentations are 20 minutes, with 5 minutes for discussion and 5 minutes of set-up before the next talk. Many advance thanks to the program organizers, Sylvia Svitak and Maria Zack, and the local organizer, David DeVidi.

Sunday, May 27

9:00 PRESIDENT'S WELCOME (Jean-Pierre Marquis)

GENERAL SESSION I: HISTORIANS (PHY 150; Presider: Dan Curtin)

9:15 Duncan Melville (St. Lawrence): "After Neugebauer. Developments in the historiography of Mesopotamian mathematics"

9:45 Scott Guthery (Docent Press): "Raymond Clare Archibald and the Provenance of Mathematical Tables"

10:15 BREAK

GENERAL SESSION II: GEOMETRY (PHY 150; Presider: Glen Van Brummelen)

10:30 Gregg DeYoung (American U.-Cairo): "Euclidean Geometry in Two Medieval Islamic Encyclopedias"

11:00 Joel Silverberg (Roger Williams): "Fathers of American Geometry: Nathaniel Bowditch and Benjamin Peirce of Salem, Massachusetts"

11:30 Craig Fraser (Toronto): "Analysis, geometry and visualization in the early nineteenth century"

12:00 LUNCH BREAK & CSHPM EXECUTIVE COUNCIL MEETING (PHY 150)

SPECIAL SESSION III: MATHEMATICS AND COMPUTER SCIENCE (PHY 150; Presider: Sylvia Svitak)

14:00 Antonella Cupillari (Penn. State-Eric) and Patricia Allaire (Queensborough, CUNY): "The First 486 Decimal Digits of $\sqrt{2}$"

14:30 Jonathan P. Seldin (Lethbridge): "Curry's Work on Computers in the Early Days of Computing"

15:00 Amy Ackerberg-Hastings (UMUC & NMAH): "Slide Rules as Computers and on Computers"

15:30 BREAK

GENERAL SESSION IV: STATISTICS (PHY 150; Presider: Duncan Melville)

15:45 Roger Godard (RMC): "A tutorial history of least squares: influential points and influence functions"

16:15 David Bellhouse (UWO): "A Synoptic Huygens"

16:45 Lori L. Murray and David Bellhouse (UWO): "The Construction of Edmond Halley's 1701 Map of Magnetic Declination"

Monday, May 28

GENERAL SESSION V: PHILOSOPHY (PHY 150; Presider: Thomas Drucker)

9:15 Jean-Pierre Marquis (Montréal): "Ways of Math-Making: the uses of the axiomatic method in 20th century mathematics"

9:45 Francine Abeles (Kean): "Nineteenth Century British Logic on Hypotheticals, Conditionals, and Implication"

10:15 BREAK

GENERAL SESSION VI-A: ASTRONOMY (PHY 150; Presider: David Bellhouse)

10:30 David Orenstein (Toronto): "M-251 from Quebec City: A Multiply Connected Early Canadian Manuscript in the Mathematical Sciences"

11:00 Paul R. Wolfson (West Chester): "Newton, Inverse Squares, and Elliptical Orbits"

11:30 Glen Van Brummelen (Quest): "A Survey of the Mathematical Sciences in Medieval Islam, 1995–2011, Part II: Astronomy, Algebra, Arithmetic"

GENERAL SESSION VI-B: MATHEMATICAL WORKS (PHY 235; Presider: Amy Ackerberg-Hastings)

10:30 Michael Molinsky (Maine-Farmington): "Mathematics in the Library of Congress: 1800–1815"

11:00 Dale McIntyre (Grove City): "Ten Mathematicians Who Recognized God's Hand in their Work"

12:00 CSHPM ANNUAL GENERAL MEETING (LUNCH PROVIDED) (PHY 150)

SPECIAL SESSION VII—MATHEMATICS AND COMPUTER SCIENCE (PHY 150; Presider: Hardy Grant)

14:00 Maryam Vulis (Norwalk & USMMA): "Russia: History of Computing"

14:30 Sylvia M. Svitak (Queensborough, CUNY): "Mathematical Proof and Computer Science"

15:00 Allan Olley (Toronto): "Automating Mathematics before the Computer: Some of the early work of Wallace J. Eckert"

15:30 Thomas Drucker (Wisconsin-Whitewater): "Le rêve de Turing, ce n'est qu'un cauchemar de Leibniz"

16:00 BREAK

16:30 THE STILLMAN DRAKE/KENNETH O. MAY JOINT LECTURE, by Andrew Hodges (Oxford): "What does Alan Turing tell us about the history of science?" (PHY 145; Intro. Jean-Pierre Marquis (CSHPM) & Kathleen Okruhlik (CSHPS))

Tuesday, May 29

GENERAL SESSION VIII: ALGEBRA (PHY 150; Presider: Rob Bradley)

9:00 George P. Styan (McGill): "An illustrated introduction to magic squares from India"

9:30 Daniel J. Curtin (NKU): "Girolamo Cardano argues that minus times minus is minus, not plus"

10:00 Maria Zack (Point Loma Nazarene): "Through the Looking Glass: Dodgson's View of Determinants"

10:30 BREAK

GENERAL SESSION IX-A: PHILOSOPHY (PHY 150; Presider: Gregory Lavers)

10:45 Daniele Molinini (Paris): "What's the Matter with the Deductive Nomological Model?"

11:15 Susan Vineberg (Wayne State): "Locating Mathematical Depth"

11:45 W. Jim Jordan (Waterloo): "Much Ado about Something: Husserl and Frege on the Concept of 'Number'"

GENERAL SESSION IX-B: HISTORY AND THE TEACHING OF MATHEMATICS (PHY 235; Presider: Mike Molinsky)

10:45 Bruce Burdick (Roger Williams): "Military Matters in the Printed Mathematical Works of Colonial Latin America"

11:15 George Rousseau (Leicester): "Some History of the Quadratic Reciprocity Law"

11:45 Diana White (Colorado-Denver): "What are the potential benefits of incorporating the history of math into classroom teaching of mathematics?"

12:15 LUNCH BREAK

GENERAL SESSION X: GEOMETRY (PHY 150; Presider: Maria Zack)

14:00 Robert Bradley (Adelphi): "Burning Ambition and Reflected Glory: de l'Hôpital and Bernoulli on Caustics"

14:30 Christopher Baltus (SUNY-Oswego): "Brook Taylor in Perspective: Perspective Drawing as a Central Collineation"

GENERAL SESSION XI: PHILOSOPHY (PHY 150; Presider: Jean-Pierre Marquis)

15:00 Gregory Lavers (Concordia): "Carnap on the existence of abstract objects"

15:30 Michael Cuffaro (UWO): "Kant's Views on non-Euclidean geometry"

16:00 CLOSING REMARKS

17:00–19:00 CFHSS PRESIDENT'S RECEPTION (Physical Activities Complex)

2011 Financial Statement

The following financial statements cover the period 1/1/2011 through 12/31/2011.

	$ Can.
Income	
dues/subscr.	12,127.91
SSHRC travel grant	3,480.00
CFHSS 2010 meeting profit	627.73
TOTAL	16,235.64
Expenses	
CFHSS dues (2011/2)	3,645.11
Historia Mathematica	3,085.92
Philo. Mathematica	2,008.70
Proceedings	1,450.45
Postage etc.	1,150.38
Travel claims (AGM)	3,471.72
Bank charges	166.01
Transfer to GIC	4,000.00
TOTAL	18,978.29
NET	(2,742.65)
Balance (12/31/11)	33,723.30
TD Mortgage Corp. (matures 09/16/13)	3,896.48
TD Mortgage Corp. (matures 03/26/14)	4,000.00
TOTAL	41,619.78

Comments:

Because the Society has 2 accounts, one in US dollars, we keep two different accounting systems. At the request of the editors, we have combined the numbers for these accounts. The numbers given are in Canadian dollars. A conversion factor of 0.979 has been used to convert American dollars into Canadian ones.

The TD Mortgage Corporation GIC fund that matured in February 2011 was reinvested (for 30 months, at a rate of 2.15%). As was decided at the 2011 Annual General Meeting, an additional amount of $4,000 was invested in a 30-months GIC (unfortunately, only for a rate of 1.8%). In order to meet the due date without delay, the membership for the CFHSS was paid twice this year (for the periods 1/10/2010–30/9/2011 and 1/10/2011–30/9/2012). Since Penn State did not cover the mailing costs for the *Proceedings* in 2011 as it did in the previous years, this created additional expenses of approximately $800. Overall, the Society's assets increased $1,065.05 over last year.

Dirk Schlimm

CSHPM Session at CMS in Toronto

The Winter meeting of the Canadian Mathematical Society took place in Toronto, December 9–12, 2011. A CSHPM-sponsored session on the History and Philosophy of Mathematics was on the program. The session was organized mostly by Craig Fraser of IHPST at Toronto, with input from Tom Archibald (SFU) and Menolly Lysne (Douglas College).

The meeting was particularly rich in presentations by Ph.D. candidates and postdoctoral fellows. Josipa Petrunic (UC London and Toronto) led off with a spirited defense of Wittgenstein's view of mathematical knowing, contra Jim Brown and Marcus Giaquinto. Doctoral student work included contributions from Bruce Petrie (Toronto, on Lambert and π); Jemma Lorenat (SFU, on the Malfatti problem); Sylvia Nickerson (Toronto, on the printing of mathematics during the Victorian period); Alex Koo (Toronto, on Mark Steiner's ideas about the relationship between internal and external explanation in mathematics); and Aaron Wright (MIT and Toronto, on the role of images in concept formation in recent mathematics, beautifully illustrated by the work of Roger Penrose).

Other contributors included David Bellhouse (UWO), who gave examples of mathematicians active in the insurance market in eighteenth-century England, overturning an older picture of a lack of impact by such writers in this arena. Bill Hackborn (Augustana) focused on Tartaglia's and Galileo's respective contributions to ballistics. Deborah Kent (Hillsdale) presented an image of the astronomical community in the United States in the nineteenth century centered on the discovery of Neptune. And, appropriately for a meeting with so many doctoral candidates, Tom Archibald presented a case of a Paris doctoral thesis on differential Galois theory that contained no correct results. The meeting was significantly enhanced by Thai food at chez Fraser!

Tom Archibald

HPM at AMS Eastern Section

The Americas Section of the International Study Group on the Relations Between History and Mathematics and the American Mathematical Society collaborated to include a Special Session on Relations between the History and Pedagogy of Mathematics on the program of the AMS Eastern Section meeting held at George Washington University in Washington, DC, on March 17–18, 2012. Session organizers David L. Roberts and Kathleen M. Clark solicited fifteen talks exploring aspects of the history of mathematics, the pedagogy of mathematics, and the history of the pedagogy of mathematics. Additionally, the keynote address, "Mathematical relations between the USA and Brazil in the Early Post World War II Era," was delivered by Ubiratan D'Ambrosio.

In the presentations on history of mathematics, Peggy Kidwell described the factually accurate version of the story of the invention of the Fifteen Puzzle and pointed out how widely the mathematical aspects of the puzzle were discussed. Chris Rorres examined Archimedes' surprising lack of work on floating cylinders, and Victor Katz shared his reflections on determining whether mathematics in medieval Islam can be defined as "algebra." From a pedagogical standpoint, Bruce Petrie reported on his efforts to train students in creative mathematical thinking in a history of mathematics course, while Kurt Kreith continued the themes he has raised in previous meetings by explaining how he has used mathematical models by Malthus and others to engage students' interest. Kathy Clark reported on her study of how studying historical problems contributed to prospective teachers' development of mathematical thinking. Ilhan Izmirli considered the extent to which "radical constructivism" may be fruitfully employed in education.

Dave Roberts provided some historical examples of American mathematicians who involved themselves in debates over how to train the few for mathematical mastery and the many for mathematical literacy. Walter Meyer charted the growth in teaching by technology and in discrete math courses, particularly in the last quarter of the twentieth century, while Fred Rickey and Theodore J. Crackel explained what they have learned in the course of making sense of George Washington's two surviving cipher books. Florrie Fasanelli discussed Andrew Ellicott's biography, including his education and teaching. Betty Mayfield reviewed Philip S. Jones's prominence in using history to teach mathematics. Marina Vulis highlighted aspects of the textbooks by A. P. Kiselev, while Amy Ackerberg-Hastings told the story of how protractors

became a fixture of American middle school classrooms. Kristina Leifeste shared her work toward cataloguing appearances of the diagonal scale in mathematics textbooks.

The Americas Section continued its quest to sample all of the famous and reasonably priced cuisine in DC by leading an excursion to Bread & Chocolate during the Saturday lunch break. Some speakers have provided notes or slides to the website, www.hpm-americas.org. Graduate student and regular Americas Section meeting attendee Emily Redman is coordinating arrangements for the group's next conference, to be held at the University of California-Berkeley October 27–28, 2012. We will be taking advantage of the campus's proximity to Northern California wineries. To be added to a mailing list and receive further information, please contact Kathy Clark, *drkclark@gmail.com*.

Amy Ackerberg-Hastings

2012 Kenneth O. May Lecturer: Andrew Hodges

2012 marks the 100th birthday of Alan Turing, and celebrations are planned around the world. The Canadian Society for the History and Philosophy of Mathematics (CSHPM) and the Canadian Society for the History and Philosophy of Mathematics (CSHPS) are proud to join in the celebration. Together, these societies sponsor the 2012 Stillman Drake/Kenneth O. May Joint Lecture at the Congress of the Canadian Federation for the Humanities and Social Sciences (CFHSS) and are honored to announce that Andrew Hodges, Wadham College, Oxford University, is the keynote speaker.

Dr. Hodges, who is in much demand as a speaker in this celebratory year, is recognized as Turing's definitive biographer (*Alan Turing: the Enigma*). The 1983 first edition of this biography was followed by later English editions and translations into other languages. New centenary editions are being planned for 2012; see www.turing.org.uk/book/ for more information. As a leading expert on Turing, Hodges also maintains the Alan Turing Home Page, www.turing.org.uk/turing/.

Figure 1: Andrew Hodges

Dr. Hodges, a mathematical physicist and science writer, has been at Wadham College since 1986. He was elected a Fellow in 2007 and appointed Dean starting from the 2011–2012 academic year. He is also a member of Oxford University's Mathematical Institute and its Mathematical Physics Group, contributing to the theory of twistors, one of his current mathematical and scientific interests. Recent publications and further information are available on his webpage at Wadham College.

At Waterloo, Dr. Hodges will lecture on "What does Alan Turing tell us about the history of science?"

Abstract

In 1936 Alan Turing published his famous paper 'On Computable Numbers . . .'. It created the concept of mathematical computability, defined the idea of a universal machine, and gave a new description of mental operations. Turing went on to play a leading part in wartime cryptography, and then to design an electronic computer, to found the theory of Artificial Intelligence, and to create a new branch of mathematical biology. While surveying the narrative of Turing's life, in this his centennial year, I will discuss his own observations about the nature of science and the place of the individual scientist. I will also highlight the difficulties of charting the progress of scientific ideas, illustrated by the question of how the Church-Turing thesis was originally formulated, and by the question of the origin of the digital computer.

Sylvia Svitak

2012 CSHPM Nominating Committee Report

The nominating committee (comprising Gregory Lavers, Rob Bradley, and Duncan Melville) has contacted the following people who agree to stand for the positions below. Thanks to Jean-Pierre Marquis for participating in the discussion and offering suggestions. It is the recommendation of this committee that the following people should stand for election:

President: Glen Van Brummelen, Quest University
Vice-President: Elaine Landry, University of California, Davis
Secretary: Patricia Allaire, Queensborough Community College, CUNY
Treasurer: Dirk Schlimm, McGill University

Council:

Francine Abeles, Kean University
Gregory Lavers, Concordia University
Adrian Rice, Randolph-Macon College
Sylvia Svitak, Queensborough Community College, CUNY

We thank the candidates for their willingness to serve the Society. The other positions (Past President, various editors, Webmaster, Archivist, CMS Liaison) do not require elections.

On April 7, the Secretary distributed ballots electronically to those members with an email address, along with instructions for voting online. For those who prefer to vote by postal mail or hand delivery, a paper copy of the ballot is included with this *Bulletin*. The Secretary must receive ballots before the AGM begins on Monday, May 28.

Gregory Lavers

Quotations in Context

> "Today, it is not only that our kings do not know mathematics, but our philosophers do not know mathematics and—to go a step further—our mathematicians do not know mathematics." — J. Robert Oppenheimer

In April 1958, the theoretical physicist J. Robert Oppenheimer presented a talk to the International Press Institute in Washington, D.C.; six months later, the full text of the speech was published in an article in *Harper's Magazine*, "The Tree of Knowledge." In this article, Oppenheimer talked about the nature of scientific knowledge and the way it had changed over the centuries:

> There are enormous differences between our world of learning today—our Tree of Knowledge—and those of Athens, or the Enlightenment, or the dawn of science in fifteenth- and sixteenth-century Europe.

Oppenheimer discussed the growing number of scientists and the spread of scientific knowledge, the relationships and differences between "pure" and "practical" science, and the consequences of scientific progress. He concluded the speech by arguing that the continuing growth of science would inevitably pose difficulties in achieving the goal of nuclear disarmament.

It was only in the introduction of the speech that Oppenheimer talked specifically about mathematics. In order to show how much knowledge has changed over the centuries, Oppenheimer offered an example from ancient Greece:

> You can get some suggestion of how shattering these changes have been if you remember that Plato, when he tried to think about human salvation and government, recommended mathematics as one of the ways to learn to know the truth, to discriminate good from evil and the wise from the foolish. Plato was not a creative mathematician, but students confirm that he knew the mathematics of his day, and understood it, and derived much from it.

It is at this point that the subject quotation of this column appears. When shown out of context, the quotation could be taken to mean that today's mathematicians do not know *any* mathematics; however, Oppenheimer only argued that, in contrast to Plato's day, it was no longer possible for any one person to comprehend *all* of mathematics:

> Today, it is not only that our kings do not know mathematics, but our philosophers

> do not know mathematics and—to go a step further—our mathematicians do not know mathematics. Each of them knows a branch of the subject and they listen to each other with a fraternal and honest respect; and here and there you find a knitting together of the different fields of mathematical specialization.

While Plato's *Republic* may have argued that an ideal ruler should be well versed in mathematical knowledge, Oppenheimer concluded the introduction to his speech by stating that, while the continued study of mathematics was undeniably well and flourishing, "it is not likely today that our most learned advisers—the men who write in the press and tell us what we may think—would suggest that the next President of the United States be able to understand the mathematics of the day."

Mike Molinsky

Sir Michael Dummett (1925–2011)

Sir Michael Dummett died peacefully at home, surrounded by his family, on 27 December 2011. He was survived by his wife Ann (*née* Chesney), three sons and two daughters; one son and one daughter predeceased him. Sadly, Lady Dummett, to whom he had been married for nearly 60 years and who took care of him in his last years, barely survived him for six weeks, passing away suddenly on 7 February 2012.

Michael Anthony Eardley Dummett was born 27 June 1925 in London, the son of a silk merchant. One is tempted to paraphrase W. V. Quine about Russell and say of his life that it was 'as broad as it was long'. He was a First Scholar at Winchester College and won a scholarship to study history at Christ Church, Oxford, in 1943, when he was called up to the military, serving in the Intelligence Corps in India and Malaya, before returning to Oxford in 1947 to gain a First in Philosophy, Politics and Economics (PPE) in 1950. While stationed in Edinburgh, he was received into the Roman Catholic Church in 1944, authors such as G. K. Chesterton having had an early influence on him. A devout Catholic henceforth, he wrote numerous papers, often controversial ones, on theological and Church matters in various ecclesiastical journals such as New Blackfriars.

Dummett was elected to a Fellowship at All Souls, Oxford, in October 1950, where he would remain until 1979, when he succeeded Sir Alfred Ayer as Wykeham Professor of Logic. He then moved to New College until his retirement in 1992, at which point he was made *emeritus*. In 1962, he had been appointed to a Readership in Philosophy of Mathematics, where his predecessors had been Friedrich Waismann and Hao Wang. A Harkness Fellowship allowed him to further his mastery of logic with Leon Henkin, John Myhill, Paul Halmos and others at the University of California in Berkeley in 1955 (this is also when he first met his life-long friend Donald Davidson), and some of his earliest publications were on so-called 'intermediate logics'; a paper with E. J. Lemmon, 'Modal Logics between S4 and S5' (1959), introduced what later became known as 'Kripke trees'. With J. N. Crossley, he set up a very successful undergraduate course at Oxford in Mathematics and Philosophy, for which he assumed a heavy teaching load in logic before the appointments of Robin Gandy and Dana Scott.

During his career, Dummett held numerous visiting positions, including at Stanford and Princeton, and gave several prestigious lecture series, including the William James lectures at Harvard (1975), the Gifford Lectures at St. Andrews (1997), and the Dewey Lectures at Columbia (2002). While lectures in Bologna led to the publication of *The Origins of Analytical Philosophy* (1991), these last two series resulted in some of his last books, respectively, *Thought and Reality* (2006) and *Truth and the Past* (2004); his last book was to be *The Nature and Future of Philosophy* (2010).

While at Berkeley in 1955, Dummett and his wife became involved in the American civil rights movement, joining the N.A.A.C.P.—he was to meet Dr. Martin Luther King in Montgomery, Alabama, during that year. Back home, he became involved in the fight against racism and, later on, immigration laws, which meant, *inter alia*, that he often had to interrupt tutorials to drive to Heathrow to defend migrants threatened with deportation. Ann was at his side in this political struggle and also did work on her own; she would publish a moving book, *A Portrait of British Racism* (1973). His organisational role included helping to found the Oxford Committee for Racial Integration (1964) and the Joint Council for the Welfare of Immigrants (1967) and serving on the executive

of the Campaign Against Racial Discrimination. He synthesized some of his views late in his life in *On Immigration and Refugees* (2001), which takes a stance contrary to that of John Rawls' *The Law of Peoples* (1999), on grounds partly derived from his Catholicism.

Dummett's interest in social issues was not limited to political action against racism and on immigration; he also made many contributions to social choice theory in an early seminal paper with R. Farquharson, 'Stability in Voting' (1961), an application of game theory to the theory of voting, and in later books, *Voting Procedures* (1984) and a more popular version, *Principles of Electoral Reform* (1997), where he pioneered an electoral system known as the Quota Borda System.

His devotion to the political struggle against racism explains why publication of his first major book, *Frege. Philosophy of Language* (1973), on the German mathematician Gottlob Frege (1848–1925), was delayed for almost a decade. (He published only one paper between 1965 and 1972.) Typically, the book had almost no footnotes and no references to Frege's work, as he assumed everyone would know where to look; they were added in the margins of the second edition (1981). Also typically, when asked for an introduction to this new edition, he was so thorough that he produced another 600-page volume, *The Interpretation of Frege's Philosophy* (1981). And the original companion volume, *Frege. Philosophy of Mathematics*, was only published in 1991, after his only sabbatical year, at Stanford. Some of his writings on Frege were also anthologized in *Frege and other Philosophers* (1991). Although a key influence on Russell and Wittgenstein, Frege was forgotten by mid-century and Dummett almost single-handedly revived his philosophical reputation, showing the centrality of his contributions for the tradition of analytical philosophy. The current 'neo-Fregean' programme in the philosophy of mathematics, although not initiated by him, owes a lot to his work, as do a number of key figures such as George Boolos, Richard Heck, and Crispin Wright (the last two had studied under him). His own ideas were, however, only partly influenced by Frege, and his exegesis of Frege's writings forms only part of his contributions to philosophy.

In his student days Dummett had come under the spell of Wittgenstein through his association with G. E. M. Anscombe, although he quickly moved away. He later became the target of often vicious attacks by 'Wittgensteinians', but some of this early influence in fact remained, e.g., in his use of the dictum 'meaning is use' in the philosophy of language. His fundamental ambition was to provide a new philosophical basis to the intuitionism of the Dutch mathematician L. E. J. Brouwer (1881–1966), about which he wrote an important study, *Elements of Intuitionism* (1977, 2000), on the basis of arguments in the philosophy of language partly inspired by Wittgenstein. For that purpose, he introduced in 'Realism' (1963) an 'anti-realist' challenge in the theory of meaning, which profoundly influenced the course of analytical philosophy for the following decades, mainly in the manner in which a number of traditional metaphysical problems were to be reformulated and discussed. The challenge was to the cogency of the 'realist' theory of meaning, which provides a rationale for the adoption of the principle of bivalence, an 'anti-realist' theory would end up justifying instead that we abandon this principle, and hence the Law of Excluded Middle, as intuitionists do. He thus argued against the idea that, for some classes of propositions, a proposition can be said to be true or false independently of one's ability to recognize its truth or falsity. The whole manoeuvre could be seen alternatively as a generalization of intuitionist arguments against the universal validity of the Law of Excluded Middle. His many papers on these issues, including the seminal papers 'Truth' (1958) and 'The Philosophical Basis of Intuitionistic Logic' (1973), were collected in *Truth and other Enigmas* (1978) and *The Seas of Language* (1993).

One should note that Dummett, along with the philosophically inclined logicians Dag Prawitz and Per Martin-Löf, was probably the first major philosopher fully to adopt the standpoint of Gentzen's natural deduction systems as opposed to the axiomatic approach (he distanced himself from Frege on this point); he explained the meaning of logical particles in terms of use, as given in the introduction and elimination rules of these systems, and argued for an harmony between these two aspects, which is not respected by the classical rule for negation. His book *The Logical Basis of Metaphysics* (1991), which contains a systematic presentation of his anti-realist stance, remains of interest for logicians working in proof theory. But Dummett

always insisted that he only issued a challenge to the realists, and he often expressed doubts about the cogency of anti-realism. Although he believed that in philosophy one ought to 'follow where the argument leads', he assumed that, if anti-realism were shown to contradict his religious beliefs, then something must be wrong with anti-realism; on the other hand, he even revived, in the last chapter of *Thought and Reality*, Berkeley's argument for the existence of God, arguing that realism is only tenable on a theistic basis.

Dummett is considered today as one of the greatest British philosophers of the 20th century. For the above contributions, he received many awards in his lifetime, including the Lakatos award in the philosophy of science (1994), the Rolf Shock prize for logic and philosophy (1995), and the Lauener prize for an outstanding oeuvre in analytical philosophy (2010). He was also elected twice to the British Academy, in 1968 and 1995—having resigned in 1984 because of the British Academy's failure to defend itself against funding cuts by the Thatcher government—and he was knighted in 1999 for 'services to philosophy and racial justice'.

His prose is often perceived as terse and difficult to take in, but he was very attentive to the proper expression of his thoughts and careful in his choice of words, so that his prose, grammatically faultless, is certainly clear, if not easy to understand. He deplored the fact that standards of literacy were declining, including among Oxford students, and he even wrote a book, *Grammar and Style for Examination Candidates and Others* (1993) to instruct them.

Dummett was well-known for his chain-smoking and for his infectious sense of humour. He enjoyed reading science fiction novels and loved jazz music—he was fond of telling that he heard Billie Holiday in a nightclub in Chicago in 1955. He was also a passionate card player, discovering the game of tarot while on vacation with his family in France. He became an expert on the game, publishing *eight* books, including *The Game of Tarot* (1980) revised in two volumes as *A History of Games played with the Tarot Pack* (with J. McLeod, 2004). In an exchange with Dame Frances Yates, he argued for the baselessness of claims concerning the occult significance of the pack, a case that he later developed in two books, including, with R. Decker, *A History of the Occult Tarot 1870–1970* (2008).

I studied under Dummett's supervision from 1986 to 1991. My first tutorial with him was a wonderful introduction to analytical philosophy and its particular ahistorical approach. Finding out that I wanted to write a thesis on philosophy of mathematics, he said something like this: "You must start from the beginning, and that is Frege, since nothing worthy had been written beforehand. As for Frege, you must start with his definition of numbers, so read §§55–80 of the *Grundlagen der Arithmetik*, write a paper telling me what you think of it, and come back in two weeks." During his long career, he supervised numerous students, up to 15 at one time. His students include successful mathematicians such as Douglas Bridges and logicians from Storrs McCall to Kosta Dosen. In his lectures, he would pace up and down, speaking while smoking a cigarette, posing momentarily to think of the best formulation of his thought, and hardly ever referring to his notes. His uncompromising search for the truth and convictions, his sense of humour, and his high integrity never failed to inspire great affection.

Mathieu Marion

The CSHPM/SCHPM Discussion List

The CSHPM/SCHPM general discussion mailing list was originally made available on Yahoo Groups in 2004 by Robert Bradley. Three years later, due to continuing technical problems with Yahoo, the mailing list was moved to a new address at the University of Maine at Farmington (*cshpm@umf.maine.edu*). Membership on the discussion list has always been voluntary, with members having to submit their email address and request to be placed on the list, and at present less than a third of all CSHPM members are on the list.

The "discussion" list has unfortunately become something of a misnomer, since there hasn't been any back-and-forth discussion of any topic on the list for over two years. Recently the list has only been used to post announcements (and, as noted above, since over two-thirds of members are not on the list, such announcements do not reach the majority of the membership). Traffic on the list has become so low that

many people who are on the list don't even realize it; for example, I've temporarily removed the message promoting the discussion list from the society website (www.cshpm.org) because, out of the last ten members who have asked to be added to the discussion list, eight were in fact already on it.

Given the membership overlap between the two societies, it is interesting to compare the activity on our discussion list with the HOMSIGMAA mailing list. Although many announcements are posted to both of the lists, even people who are members of both lists send requests for information or ask questions about resources on a history of mathematics topic exclusively to the HOMSIGMAA listserv.

Given the lack of traffic, one possibility would be to eliminate our voluntary discussion list and replace it with a mailing list containing the entire membership that the Executive Council could use to send out announcements. I will discuss this issue as part of the Webmaster's Report at the Annual Meeting in Waterloo; if you won't be at the meeting, please feel free to send me your feedback directly at *michael.molinsky@maine.edu*.

Mike Molinsky

Book Review: *Iris Runge*

Iris Runge: A Life at the Crossroads of Mathematics, Science, and Industry, by Renate Tobies, translated by Valentine A. Pakis, foreword by Helmut Neunzert, Birkäuser, 2012, xxii + 456 pp., ISBN 978-3-0348-0229-1.

Iris Runge (1888–1966) had a privileged upbringing and education. She was the daughter of the Göttingen applied mathematician Carl Runge and a descendent, on her mother's side, of the du Bois-Reymond family. Max Planck was a godparent of one of her sisters, and Richard Courant married another. At 23 she published a joint article with Arnold Sommerfeld. For more than twenty years she worked as an industrial mathematician with Osram and Telefunken, companies engaged in the manufacture of electronic tubes and related products.

Much of this book is devoted to a description of Iris Runge's career as an industrial mathematician, which was pioneering in several respects. Apart from helping her colleagues with the mathematical aspects of their work and using classical mathematical methods in studies of the design of incandescent lamps and electronic vacuum tubes, she did research in the use of graphical methods and was a leader in the use of mathematical statistics for quality control.

The author has had access to several sources of letters and documents written by or connected with Iris Runge. These add appeal to the narrative, given that she lived in truly "interesting times". We learn that she held social democratic views and was active politically in the years following World War I. She wrote to her mother in 1930 (p. 303): "that I differ from the majority of the middle class, despite my bourgeois intellectual roots, by firmly embracing a revolutionary attitude". The following year she wished (p. 304) that the forces of democracy "would lure the youth and the intellectuals away from National Socialism toward a socialism worthy of the name" and recalled Heinrich Heine's poem of 1844, "When I think of Germany at night, My sleep is gone and killed outright".

With the rise of fascism, she had to restrict her political activity to charitable organizations, but even in that realm by 1938 she wrote (p. 307), "it is no longer possible to conduct any social work without first obtaining a Nazi stamp of approval". Given the inexorable march of events, Iris Runge thought of leaving Germany, as many of her friends and colleagues had been forced to do. She became a close friend of the historian of science George Sarton, and it appeared at one point as though this connection might secure her a position in the United States. But it was not to be.

In a letter to Lise Meitner (November 26, 1938) she wrote:

> A few days ago I read in the journal Nature that you have recently turned sixty, and I would therefore like to take this opportunity to wish you all the best and a belated happy birthday. Unfortunately, these times are not exactly ripe for celebrations and congratulations. Here we are forced to live under the weight of horror and shame. But the feeling of paralysis that has resulted from these circumstances should not prevent me from expressing to you, in the most heartfelt of ways, how much I hope that you have found a space where you

> can feel content and where you can enjoy many more years of fruitful activity. Indeed, work is the only thing that can keep one alive; it somehow maintains its value no matter how insane the world has become.

Of course, at this time, Iris Runge did not make her political views public. On the other hand, as an "Aryan" industrial researcher, even at a time when industry was under firm state control and contributing to the war effort, she was relatively immune from requirements of allegiance to the party in power.

With its concentration on the formative influences and her work as an industrial researcher, the present book has relatively little information on the last twenty years of Iris Runge's life. In the postwar years, she returned to academe, and developed her interest in the history of science. She published a biography of her father in 1949 and a German translation of *What is Mathematics?* by Courant and Robbins in 1962.

In this scholarly work, with its rich collection of footnotes, photographs and references, the author has taken great pains to document the various aspects of Iris Runge's life and career. The publishers have produced a very fine product with a price to match ($149.00 according to their web site). Readers with institutional access to the Springer eBook Collection will be able to download an electronic version without charge or to purchase a printed-on-demand paperback copy at USD 24.95 (US and Canada).

Martin Muldoon

Two Oberwolfach Workshops on the History of Mathematics

The Mathematisches Forschungsinstitut Oberwolfach (MFO) recently hosted two workshops in the History of Mathematics.

The first, organized by June Barrow-Green (Open University), Della Fenster (Richmond), Reinhard Siegmund-Schultze (Kristiansand), and Joachim Schwermer (Vienna), ran from October 30 to November 5, 2011, on the topic "Emigration of Mathematicians and Transmission of Mathematics: Historical Lessons and Consequences of the Third Reich." While a complete account of the meeting will appear in the Oberwolfach Reports, here we note the opening keynote papers by Mitchell Ash and Reinhard Siegmund-Schultze, which provided a nuanced view of the various kinds of migration entailed by Third Reich policy and looked carefully at open questions as well as recent changes in the conditions for research in the field. A number of these lacunae were then addressed in the talks. I'll mention in particular the rich archival work of Annalisa Capristo on the situation in Italy, preliminary catalogs for Poland and Hungary by Roman Duda and Peter Gabor Szabo, and an informative account of the situation in the former Czechoslovakia by Helena Durnova and Jan Kotulek. A number of papers focused on individual mathematicians, including: Emmy Noether (Yvette Kosmann-Schwarzbach), Felix Bernstein (Norbert Schappacher), and Emil Artin (Della Fenster). A report on a current travelling exhibition on the subject of German-Jewish mathematicians was provided by two of exhibit's creators, Moritz Epple and Birgit Bergmann. The exhibition website is gj-math.uni-frankfurt.de. Overall, the meeting revealed how much remains to be understood about this extremely complex topic.

The second meeting, organized by Jeanne Peiffer (Paris), Norbert Schappacher (Strasbourg), and Tom Archibald (SFU), considered the question of "Explicit versus Tacit Knowledge in Mathematics," taking a very long-term view of the issue by looking at examples from many cultures and time periods. The workshop ran from January 7 to 11, 2012. Tacit knowledge has been defined variously by such authors as the chemist and philosopher Michael Polanyi and the sociologist Harry Collins; the usual example is the knowledge of how to ride a bicycle, something that is not only rarely described in language but which resists full description. In mathematics, the idea is linked to Bourdieu's inconscients d'école, things one learns necessarily but incidentally while acquiring a discipline. So many approaches were taken to the question that it would be impossible to produce a reasonable synthesis, but those interested may see the account of the meeting in a forthcoming Oberwolfach Reports.

Tom Archibald

New Members

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

Ross B. Gingrich
Southern Connecticut State University
New Haven, CT
USA

Jemma Lorenat
Simon Fraser University
Burnaby, BC
Canada

Pavel Janda
Prague
Czech Republic

From the Editor

By the time you read this issue, our 2012 meeting will be a few short weeks away. The conference website, congress2012.ca, contains tips for finalizing travel arrangements, getting online, and getting around Waterloo and Kitchener. For things to do and see, visit the aptly named www.explorewaterlooregion.com. Our Webmaster's update on the cshpm email list and the 2011 financial statements are just two of the items on the agenda for the AGM, so you do not want to miss this important discussion. Remember also to submit your vote for the Executive Council election.

This *Bulletin* offers a variety of contributors and articles for your spring reading pleasure. I thank all of our authors, both those who came forward unsolicited and those whose arm I (gently) twisted. As always, we accept news items of interest to historians and philosophers of mathematics, reports on conferences attended, and personal and professional announcements. I also welcome suggestions for memorials, book and web reviews, and informative or thought-provoking column-style articles. The next submission deadline is October 1, 2012, and I can be reached at *aackerbe@verizon.net*.

Thank you also to our officers, Councillors, and the volunteers who keep the Society's other functions operating smoothly. Their assistance and encouragement is invaluable. The *Bulletin* reaches your hands or computer screen especially due to the continued efforts of Eisso Atzema, Layout Editor; Maria Zack, Production Editor; Pat Allaire, Secretary; and Mike Molinsky, Webmaster.

Amy Ackerberg-Hastings

About the Bulletin

The *Bulletin* is published each May and November by a team of 3 volunteers: Content Editor Amy Ackerberg-Hastings (aackerbe@verizon.net), Layout Editor Eisso Atzema (atzema@math.umaine.edu), and Production Editor Maria Zack (Maria-Zack@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 Amy Ackerberg-Hastings at the above email address, or by postal mail to 5908 Halsey Road, Rockville, MD 20851, USA.

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