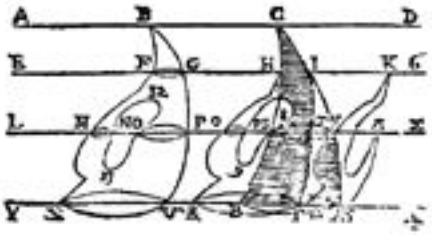
BULLETIN

CSHPM SCHPM



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WHAT'S INSIDE

Canadian Society for History
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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 de philosophie des mathématiques (CSHPM/SCHPM) promotes research and teaching in the history and philosophy of mathematics. Officers of the Society are:

President: **Duncan J. Melville**, St. Lawrence Univ., Canton, NY 13617, USA, dmelville@stlawu.edu
Vice-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 **Antonella Cupillari**, Penn State Erie, The Behrend College, Erie, PA 16563, USA, axc5@psu.edu. The Society's Archives are managed by **Michael Molinsky** (see above).

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

From the President

Since my last column, many members of our society have been actively promoting history and philosophy of mathematics by reporting their research, organizing meetings and workshops, increasing our visibility, and strengthening our ties, especially with the CMS in Canada and the AMS and MAA south of the border. Both history and philosophy were well represented at the Joint Mathematics Meetings in Washington, DC, this past January. There was an MAA minicourse on 'Teaching a course in the history of mathematics', organized by Fred Rickey and Victor Katz, and HOMSIGMAA sessions with generous doses of philosophy of mathematics, including the guest lecture by Chandler Davis and a panel on 'The Intersection of the History and Philosophy of Mathematics', both of which were co-sponsored by the philosophy SIGMAA. Additionally, there was a joint AMS-MAA Special Session on History of Mathematics organized by Joe Dauben, Karen Parshall, Patti Hunter and Deborah Kent, which was housed in an impressively large room that many speakers managed to fill, a testament to the growing interest in history among mathematicians in general.

For several years now, Tom Archibald has taken on the role of bringing history to the CMS at its winter meeting, and he continued that this past year, jointly organizing a session with Alex Jones on History and Philosophy of Mathematics at the meeting in Ottawa in December. A fine slate of speakers presented results across both areas. Thanks to Tom, a session in history has become a routine part of programming for the CMS winter meeting and so will improve our connections with the community of Canadian mathematicians, as has happened on the US side with the activities at the Joint Meetings.

A measure of this integration is our upcoming annual meeting, held in conjunction with the CMS at Memorial University in St. John's, Newfoundland. This is our third joint meeting with the CMS, following meetings at McMaster in 2000 and Waterloo in 2005. We are a society much in demand and have been rotating our meetings between the CMS, the BSHM and the Learneds. This year, Tom Drucker is the organizer for the general session and Tom Archibald is coordinating the special session on 'History of the Rela-

tionship Between Mathematics and the Physical Sciences'. With the two sessions combining to feature two dozen speakers, there will be plenty of history and philosophy on offer. Our May speaker this year, advertized as the CSHPM Plenary Speaker, is Jeremy Gray, who will be speaking on Sunday, June 7, from 10:30 to 11:15. We have, as usual, a strong program, thanks to our many speakers and volunteer organizers. I look forward to seeing many of you in St. John's in June.

Figure 1: Duncan, Peter and the Editor

Along with a busy meeting schedule, another index of the health of a field is publications, both in journals and as books. Here, history and philosophy of mathematics has been going through something of a boom, with members of our society at the fore. In just the past few months have appeared Janet Beery and Jackie Stedall's volume, *Thomas Harriot's Doctrine of Triangular Numbers: The Magisteria Magna*, Kim Plofker's *Mathematics in India*, Bruce Burdick's *Mathematical Works Printed in the Americas, 1554–1700*, Glen Van Brummelen's *The Mathematics of the Heavens and the Earth: The Early History of Trigonometry*, and Jean-Pierre Marquis' *From a Geometrical Point of View: A Study of the History and Philosophy of Category Theory*. Meanwhile, Rob Bradley and Ed Sandifer's *Cauchy's Cours d'analyse: An Annotated Translation* is available for pre-order at Amazon. All this is without mentioning the steady flow of journal articles, nor the continuing solid evidence of our members' production evinced by our in-house *Proceedings*. The field, and the society, is doing well.

Duncan Melville

Announcements

Congratulations to George Englebretsen, who was awarded a DCL, honoris causa by Bishop's University in May 2008!

Bravo also for CSHPM Treasurer Nathan Sidoli, who has accepted a tenure track position at Waseda University in Tokyo. (Nathan has been performing logistical wizardry to fulfill his CSHPM duties, but he has announced that he will step down when we next hold elections in May 2010. It's not too early for Canadian members to consider volunteering themselves or someone else for this key Council position.)

Best wishes to Bob Stein, who officially retired from California State University, San Bernardino, in March. The event was marked with a big party and possibly a bigger cleaning out of his office. His creative commute is described at news.csusb.edu/story_full.asp?articleID=7878. Bob has since returned to his other home base in Portland, OR.

Pat Allaire has been blessed with a second—and instant—grandchild. Her son, Ken, proposed to his girlfriend, Rebeca, in Panama on Christmas Eve 2008. On Christmas Day, he officially adopted Rebeca's two-year-old daughter, Magdiel.

Figure 2: Magdiel Allaire

The latest volume in the Studies in the History of Mathematics Series of the Johns Hopkins University Press is Bruce Burdick's *Mathematical Works*

Printed in the Americas, 1554–1700. He provides bibliographic information and descriptions for 39 treatises and 220 almanacs written in Latin, Spanish, and English, and printed in Mexico, Lima, and the English colonies of Massachusetts, Pennsylvania, and New York. Notable titles include Alonso de la Vera Cruz's 1554 logic text, the *Recognitio Summularum*; *El lunario, Regimiento de Salud, y Pronostico de temporales*, a 1676 almanac by Feliciana Ruiz, the first woman to produce a mathematical work in the Americas; and the English-language *Tenebrae* (1697) by Jacob Taylor, a treatise on solving triangles and other figures using basic trigonometry.

Janet Beery and Jackie Stedall have edited *Thomas Harriot's Doctrine of Triangular Numbers: the 'Magisteria Magna'* for the Heritage of European Mathematics series of the European Mathematical Society. In addition to the 1618 manuscript treatise, they provide commentary and an introductory essay.

John S. D. Glaus has translated and published the 1927 biography, *Leonhard Euler and His Friends*, by Luis-Gustave du Pasquier. Ronald Calinger contributes a historiographical introduction. See the MAA Review by Herbert Kasube, www.maa.org/maa-%20reviews/01211.jpg

Volume 34 of the AMS/LMS History of Mathematics series is *Pioneering Women in American Mathematics: The Pre-1940 PhD's*, by Judy Green and Jeanne LaDuke. Green and LaDuke compiled biographies for 228 women. They also provide an extended introductory essay, comparing the women's family backgrounds, education, careers, and other professional activities. Extended biographies and bibliographical information are available from the companion website for the book: www.ams.org/bookpages/hmath-34.

Jean-Pierre Marquis's *From a Geometrical Point of View: A Study of the History and Philosophy of Category Theory* is volume 14 in Springer's series in Logic, Epistemology, and the Unity of Science. He begins with Eilenberg and Mac Lane's work in the early 1940s and pays particular attention to the philosophical aspects of the evolution of category theory.

Kim Plofker's *Mathematics in India* has appeared from Princeton University Press. Covering antiquity to the early modern period, Kim reexamines the few facts about Indian mathematics that have become common knowledge—such as the Indian origin of Arabic numerals—and sets them in a larger textual and cultural framework. She shows that Indian mathematics appears not as a disconnected set of discoveries, but as a lively, diverse, yet strongly unified discipline, intimately linked to other Indian forms of learning.

Princeton has also published Glen Van Brummelen's *The Mathematics of the Heavens and the Earth: The Early History of Trigonometry.* He treats trigonometric precursors in ancient Egypt, Babylon, and Greece, culminating with Hipparchus; traces the development of trigonometry as a full-fledged discipline in India and Islam; explores applications to geography and seafaring navigation in the European Middle Ages and Renaissance; and concludes that trigonometry retained its ancient roots at the same time that it became an important part of the foundation of modern mathematics.

On March 12, Victor J. Katz delivered the lecture, "Combinatorics in Islamic and Hebrew Sources," to the annual Spring Colloquium of the Immaculata University Department of Mathematics, Computer Science, & Physics.

On March 17 at Swarthmore College, Ken Manders presented "Uniformity and Generality in Mathematics" jointly with Paolo Mancosu's lecture, "Style in History and Philosophy of Mathematics." The session was sponsored by a grant from the Mellon Foundation.

On May 7, Len Berggren will lecture on "Conflict and Synergy in Islam's Relation to the Mathematical Sciences." The lecture is part of a colloquium sponsored by the Center for the Study of Religion at The Ohio State University, which will, in the words of the organizers, provide "a substantive examination of how science, broadly understood to include philosophy as well, has functioned alongside Islam as a religious system."

On June 17, Len Berggren will be giving the last talk in a series of eight lectures on the topic "Science and Islam at the Oxford Centre for Islamic Studies. His talk is titled, "The Mathematical Legacy of Islam." The Kuwait Foundation for the Advancement of Science and the OCIS are sponsoring the series.

The ORESME Reading Group will hold its next semi-annual meeting on Friday-Saturday, October 2–3, 2009, at Xavier University in Cincinnati, OH. The subject of the seminar will be a careful and critical reading of Gauss's work on the theory of errors, now celebrating its bicentennial of publication. The group will approach the "Determination of an Orbit satisfying as nearly as possible any number of Observations whatsoever," the Third Section of the Second Book of Gauss's *Theory of the motion of the heavenly bodies moving about the sun in conic sections* (*Theoria motus corporum coelestium in sectionibus conicis solem ambientium*, 1809), in its 1857 English translation by Charles Henry Davis, published by Dover in 1963 and often reprinted since. There will be two reading sessions, the first on Friday evening, 8:00-10:00, and the second on Saturday morning, 10:00-12:00. Participants are invited to join the group for dinner Friday evening at 6:00 at a local restaurant, and for breakfast Saturday morning at 9:30 at the university. For further information, contact Danny Otero (otero@xavier.edu) or Dan Curtin (curtin@nku.edu), or visit the ORESME web page (www.nku.edu/˜curtin/oresme.html).

The annual meeting of The Euler Society will be July 12–15 at Roger Williams University in Bristol, RI. Registration fees are payable in person at the conference, either by check or by cash; they are expected to be in the neighborhood of US$100. We encourage papers relevant to Euler's life and work, including his contributions to mathematics, science, philosophy, religion or education, as well as papers related tangentially to his life, times or work.Papers may be of two lengths.The short format is 20 minutes, with five minutes for questions.The long format is 50 minutes, also with five minutes for questions. For accommodations, contact the Roger Williams University Conference Center at (401) 254-7300.Be sure to identify yourself as an attendee at the conference. Proposals are due to Ed Sandifer no later than May 15: by email to esandifer@earthlink.net, or by postal mail to 3 Juniper Road, Newtown, CT 06470, USA.

The ARITHMOS seminar will meet at Western Connecticut State University in Danbury, Connecticut, on May 2–3. This seminar will discuss selections from Jakob Bernoulli's *Ars Conjectandi*. For more information, see www.arithmos.org.

Our in-house source on all things HOMSIGMAA, Amy Shell-Gellasch, reports: The MAA Math Fest will take place in Portland, OR, August 6–8. History events include a contributed paper session on " The History and Philosophy of Mathematics, and Their Uses in the Classroom" (organized jointly with POMSIGMAA), as well as an invited paper session on the History of Mathematics organized by Janet Beery and Amy Shell-Gellasch. Speakers in this session include: Fernando Gouvêa, Charlotte Simmons, Janet Beery, and Stacy Langton, as well as Jim Tattersall, who we are happy to welcome back to the circuit! To submit an abstract for the contributed papers session, please visit www.maa.org/mathfest/cps.cfm before May 1. Also, the speaker for the opening banquet is our very own Ed Sandifer!!!!

There are already several events focusing on the important texts of mathematics planned for the Joint Mathematics Meetings in San Francisco in January 2010. Glen Van Brummelen and Amy Shell-Gellasch are hosting an MAA short course the two days prior to the meetings on "Exploring the Great Books of Mathematics." During the meetings Amy and Fernando Gouvêa will organize a contributed papers session, "Mathematical Texts: Famous, Infamous and Influential." Fernando encourages our members to submit abstracts; the deadline is in September. The HOMSIGMAA annual guest speaker will be Reviel Netz, providing an update on the Archimedes Palimpsest.

There will be a Special Session on History and Philosophy of Mathematics at the fall Western Section-Meeting of the American Mathematical Society at the University of California at Riverside on November 7–8, 2009, organized by Shawnee McMurran (Cal. State San Bernardino) and Jim Tattersall (Providence). Participants will include Victor Shapiro (UC Riverside), John Sarli (Cal. State San Bernardino), Janet Beery (University of Redlands), Mario Martelli (Claremont-McKenna), Paul Wolfson (West Chester Univ.), and Larry D'Antonio (Ramapo).

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: Patricia R. Allaire (Queensborough Community College, CUNY), "Yours truly, D. F. Gregory" on 15 October 2008; Harold M. Edwards (Courant Institute), "Kro-

necker's Lost Theorem: An Insight into the Solvability of Algebraic Equations that Goes Beyond Galois" on 5 November 2008; Herbert C. Kranzer (Adelphi), "Two Centuries of Shock Wave Theory and Applications" on 3 December 2008; Salvatore J. Petrilli (Adelphi), "Monsieur François-Joseph Servois: His Life and Work on Differential Calculus" on 4 February 2009; Dominic Klyve (Carthage College), "An Embarrassment of Riches: Euler's Choice of Number Theory Problems Near the End of His Life" on 4 March 2009; Judy Green (Marymount), "New Yorkers Among the Pioneering American Women in Mathematics" on 1 April 2009; and Hugh McCague (York), "The Method of Equal Altitudes, or the Indian Circle, in the History of Mathematics, Cosmology and Architecture" on 6 May 2009.

Nearly ten years after the collegial and successful first meeting, Fred Rickey is considering planning a second History of Undergraduate Mathematics in America conference at West Point for summer 2010. Please monitor his web page, www.dean.usma.edu/departments/math/people/Rickey/hm/.

The Department of History at Michigan State University is adopting the Women in Science Digital Collection established by Judith Zinsser and previously located at the University of Ohio-Miami. With the help of MATRIX, the Department of History will be creating a new website which will include Du Chatelet's papers. Judith has written wonderful introductions to these papers, which will also be on the new website. The goal of the new Women in Science Digital Collection is to EXPAND the collection to feature documents, with introductions wherever possible, for women who made significant contributions to a range of sciences and in a range of time periods. Do you have PDFs, JPEGS, or TIFF files of important documents, illustrations, and/or photos which could be displayed on the website? Is your university willing to share documents in their special collections? Such collaboration would of course result in a credit line, links to your libraries, links to your publications about the featured scientist, and other mutually beneficial arrangements! Please contact Dr. Georgina Montgomery in the Department of History by email at montg165@msu.edu or by postal mail at 35 East Holmes Hall, Michigan State University, East Lansing, MI 48825, USA.

Peter Griffiths has prepared an article, "Economic Cycles: Are They Generated by Trade, Credit or Legislation?" He suggests reinstating American governmental controls on credit and providing a $1500 annual housing benefit directly to individuals. Readers desiring a copy are asked to contact Peter at lowdith73@yahoo.com.

Deadlines have been extended for the conference celebrating the International Year of Astronomy, "Astronomy and its Instruments Before and After Galileo", to be held on San Servolo Island, Venice, Italy, between September 28 and October 3, 2009. For updated info, see web.oapd.inaf.it/venice2009/. Presentations may be in oral or poster form. For early registration (before May 31), abstracts are due by May 15, with notification of acceptance by May 28. The regular conference fee is 280 euros. For late registration (before July 15), the deadline for abstract submission is July 1, with notification of acceptance by July 13. The late registration fee is 330 euros.

Book Review: Descartes, Pascal & Fermat

Michel Serfati & Domiques Descotes (eds), *Mathématiciens français au XVII^e siècle, Descartes, Fermat, Pascal.* Clermont-Ferrand: Centre d'Études sur les Réformes, l'Humanisme et l'Âge Classique, Centre International Blaise Pascal, 2008, 280 pp. ISBN: 978-2-8451-6354-6. EUR 20,00.

The editors mean this collection of essays to bridge the gap between the sciences and the humanities or between the scientific and the literary disciplines. Descartes and Pascal are certainly known as philosophers and mathematicians—or as a religious thinker in the case of Pascal—but Fermat, as an amateur mathematician and a professional lawyer, is hardly a man of literacy, except for his epistolary exchanges. The most important mathematician in the triad, Fermat, is confined here to a a biographical sketch. It is, however, interesting to discover that all three of them were more or less secretive in their mathematical ventures, suspicious of contradictors, whether reputed *savants* or pugnacious unlearneds.

Michel Serfati's contribution, "Constructivismes et

obscurités dans la *Géométrie* de Descartes. Quelques remarques philosophiques," offers a balanced view of Descartes' geometry, including his geometrical constructivism (inspired by the Ancients) and his actual (and rather obscure) construction of geometrical curves with the help of a compass of his invention. Ivo Schneider's "Trends in German Mathematics at the time of Descartes' Stay in Germany" reviews the work of seventeenth-century German algebraists and geometers who could have influenced Descartes' methodology. From a different perspective, Matheus Araújo Silva, in his "L'imagination dans la *Géométrie* de Descartes: retour sur une question ouverte," shows that Descartes was prone to using physical analogies in his construction of geometrical curves, a fact that could partly explain the obscurities pointed out by Serfati.

The next article, by Bruno Gagneux, "La régle des signes de Descartes: le long cheminement d'une imprécion," offers a careful analysis of Descartes' rule of signs, which determines an upper bound for the variation of signs in a polynomial, a problem which will find its final solution in Sturm's theorem on the number of real roots of an algebraic equation. Kronecker (not mentioned by Gagneux) would further refine Sturm's result in requiring explicit bounds for the intervals of localization (*Isolierung*) of roots.

Maryvonne Spiesser, in her "Pierre Fermat, profil et rayonnement d'un mathématicien singulier," digs into the biography of Pierre de Fermat after Michael Mahoney's initial attempts, but here Fermat's mathematics, e.g. the method of infinite descent, is scarcely touched upon. Spiesser refers nevertheless to the work of Catherine Goldstein and Giovanna Cifoletti, who has written a doctoral thesis on Fermat's synthetic geometry at the University of Montréal under my direction jointly with Gonzalo Reyes. For Fermat's most significant invention in number theory, infinite descent, one should refer to Paolo Bussotti's recent work *From Fermat to Gauss. Indefinite Descent and Methods of Reduction in Number Theory*, Augsburg: Dr. Erwin Rauner Verlag, 2006—see my review in *Dialogue* 47, no. 2 (2008): 403–407.

The last contributions in the volume are devoted to Pascal. In his "La pensée des ordres dans les traités sur la roulette de Pascal," Claude Merker examines the genesis of Pascal's roulette or cycloid, while Dominique Descotes' "Constructions du triangle arithmétique de Pascal" deals with Pascal's triangle and its multiple uses. These analyses scrutinize Pascal's main contributions to mathematics in projective geometry and combinatorics, the works of a precocious child who became an inventive mathematician before turning to religion. Descartes also left mathematics for metaphysics, which he considered a more noble pursuit.

The volume is an important addition to the literature on the seventeenth-century great men in French mathematics: Descartes, Fermat and Pascal. The three knew each other and corresponded, not always on friendly terms. Descartes thought that Fermat was a good mathematician, but a poor metaphysician, adding that "Monsieur de Fermat est gascon, moi non," which means that in Descartes' opinion, Fermat was a braggart; we know, however, that Descartes, with all his reticence, also had some early bursts of chutzpah! Pascal, probably the most sincere of the three, was also deprecated by Descartes; he considered Fermat as the greatest geometer in all of Europe, confessing at the same time that he could not follow his inventions. Finally, it is Fermat, partly lost in his boring job as a court lawyer, who has left the most enduring heritage of seventeenth-century French mathematics.

Yvon Gauthier

CSHPM/SCHPM & CMS Meeting Information

As you know, June 6–8, 2009, we will meet jointly with the Canadian Mathematical Society at Memorial University in St. John's, Newfoundland. To register for the meeting and to reserve housing, please visit www.cms.math.ca/Events/summer09/. A complete schedule for the meeting was not available at press time, but the Executive Council will meet during lunch on Saturday, June 6, and the Annual General Meeting will be held during lunch on Sunday, June 7.

The May lecturer is Jeremy Gray of Open University and the University of Warwick. He will be speaking in the auditorium from 10:30 to 11:15, Sunday, June

7, on the subject, "Mathematics, motion, and truth: the Earth goes round the Sun".

Tom Archibald (Simon Fraser) is organizing the special session, "History of the Relationship Between Mathematics and the Physical Sciences." Expected speakers include:

- Josipa Petrunic (Edinburgh/Toronto): "The correspondence between Sir William Rowan Hamilton and the Peter Guthrie Tait on mathematics in natural philosophy"
- David Orenstein (Toronto District School Board): "Helen Hogg's mathematical methods in establishing variable star light curves"
- Lawrence D'Antonio (Ramapo): "The Development of a Mathematical Model for Magnetism in the 18th Century"
- Amy Ackerberg-Hastings (Md. Univ. College): "John Playfair in the Natural Philosophy Classroom"
- Tom Archibald (Simon Fraser): "Mathematics and the applied sciences in Canada before 1949"
- Menolly Lysne (Simon Fraser): Academic Patronage and Laplace's Early Career
- Robert Moir (Western Ontario): "The Conversion of Phenomena to Theory: Lessons on Applicability from the Early Development of Electromagnetism"

Tom Drucker (Wisc. – Whitewater) is organizing the general session. Speakers on the program include:

- Gregg De Young (American Univ.): "Ziyadat Literature: An Early Form of Commentary in the Arabic Euclidean Tradition"
- Marina Vulis (Norwalk CC and CUNY): "Early Mathematics in Russian Mathematical Textbooks"
- Bruce Petrie (Toronto): "Why Euler Didn't Prove the Irrationality of Pi: A Chapter in the History of Transcendence"
- James Tattersall (Providence): "A Late 19th Century Mathematical Subculture"
- Maria Zack (Point Loma Nazarene): "Robert Hooke and An Attempt to Prove the Motion of the Earth from Observations"
- Byron Wall (York): "Some 19th Century Arguments for the Rational Assignment of Probabilities for Possible Events in Nature"
- Andrew Perry (Springfield): TBA
- Roger Godard (Royal Military College): "Some Examples of Eigenvalue Problems in Mathematical Physics"
- Bruce Burdick (Roger Williams): TBA
- Michael Molinsky (Maine): "The Mathematical Education of a Founding Father, John Adams"
- Charlotte Simmons (Central Oklahoma): "Benjamin Gompertz: Pioneer of Actuarial Science"
- Hardy Grant (York): "Eighteenth Century Mathematics: The Naysayers"
- V. Frederick Rickey (USMA): "Selecting Chairs at West Point"
- W. Jim Jordan (Waterloo): "Structuralist Mirages on the Road from Antiquity: Why the Ancient Greek Mathematicians Were not Mathematical Structuralists"
- Ronny Becker: "Phenomenology of Mathematics"
- Gregory Lavers (Concordia): "Frege the Conventionalist and Carnap the Fregean"
- Joel Silverberg (Roger Williams): TBA

CSHPM presentations are typically 20 minutes in length, with 5 minutes for questions and 5 minutes to set up for the next speaker.

Tom Archibald & Tom Drucker

Annals of Science Prize

Submissions are being accepted for the 2009 *Annals of Science* best paper prize. This prize is offered every two years to the author of an original, unpublished essay in the history of science or technology, which is not under consideration for publication elsewhere. The prize, which is supported by Taylor & Francis, is intended for those who are currently doctoral students, or have been awarded their doctorate within the past four years. Essays should be submitted to the Editor (T. H. Levere, annals.science@utoronto.ca) in a form acceptable for publication in *Annals of Science*. See the webpage of the Journal (www.tandf.co.uk/journals/authors/tascauth.asp) for a style guide.

The winning essay will be published in the Journal, and the author will be awarded US$500 and 1 year's free subscription to *Annals of Science*!

Papers should be submitted by September 30, 2009; the winner will be notified by December 31, 2009. The Editor's decision is final.

Past winners of the prize include: Luciano Boschiero, "Natural Philosophical Contention Inside the Accademia del Cimento: The Properties and Effects of Heat and Cold," 60 (2003): 329-349; David Pantalony, "Rudolph Koenig's Workshop of Sound: Instruments, Theories, and the Debate over Combination Tones," 62 (2005): 57-82; and Daniela Monaldi, "Life of μ: The Observation of the Spontaneous Decay of Mesotrons and its Consequences, 1938-1947," 62 (2005): 419-455.

[Editor's Note: A PDF flyer to hang in your department or distribute to students is available by emailing aackerbe@verizon.net.]

Katharine Brown

2008 Financial Statements

The following financial statements cover the period 1/1/2008 through 12/31/2008.

	$ Can.
Income	
dues/subscr.	14146.10
SSHRC travel grant	3480.00
TOTAL	17626.10
Expenses	
CFHSS dues (2008)	1786.72
Philosophia Mathematica	2318.40
Historia Mathematica	3929.26
Proceedings	1887.48
Postage etc.	970.16
Meeting expenses	3319.33
May speaker	250.00
Travel claims	5094.70
Bank charges	24.22
CUMC meeting grant	300.00
TOTAL	16260.94
NET	1365.16
Balance	32074.84
TD Mortgage Corp.	3850.06
TOTAL	35924.90

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 1.26 has been used to convert American dollars into Canadian ones.

As usual, the TD Mortgage Corporation GIC fund was rolled over to mature in February 2010.

There was an overall surplus this year after the deficit of $2077.17 in 2007. The 2007 expenses for BSHM reciprocal membership fees ($650.72) and for the CUMC meeting grant ($300.00) were not expended in 2008: the Canadian Undergraduate Mathematics Conference treasurer did not request funds, as had been done in the past; reciprocal fees are charged only when the number of reciprocal members needs to be balanced out. In 2008, 45 BSHM members requested reciprocal membership in CSHPM, while 55 of our members requested reciprocal membership in BSHM. The two societies have tried to set rates that are approximately equal in Canadian dollars and British pounds. It would thus appear that we owe BSHM for 10 reciprocal memberships in 2008. However, after member counts were exchanged last year, the BSHM Treasurer did not present a bill for the difference, as is our custom.

Following Council discussions after last year's financial report, we agreed to pay out travel expenses to the amount of the SSHRC grant and $250 to the May Speaker as honorarium from our operating costs. I failed to follow this policy, however, because I misplaced some of the reimbursement requests the first time I calculated the travel expense claims and instead of simply telling some members that we couldn't pay any of their expenses, I ended up paying out more than the SSHRC grant. The total excess was about $1286, which is about the same amount as our practice before we made the policy change.

The opening bank balance for 2008 was $27430.90. The increase in the ending balance, beyond 2008's net income of $1365.16, is due to the decline in the value of the Canadian dollar compared to the U.S. (The conversion factor in 2007 was 1.01.)

Nathan Sidoli

Cauchy in Quebec City

If you were in Vancouver last year for the Learneds at UBC, you might remember my paper on an 18th-century manuscript on conic sections produced at the Seminaire de Quebec. (See vol. 21 of the *Proceedings*, pp. 128–134.) This past March, I returned to Quebec City for another short research visit.

One of my discoveries came while looking for connections with the conservative Catholic French mathematician Augustin Cauchy. The result consisted of several of Cauchy's books, three student notebooks, a copy of a poem and one letter.

The letter was written from Paris in December 1857 by one of the teaching fathers, Thomas-Étienne Hamel, to his Superieur, Louis-Jacques Cassault. Hamel had been sent to Paris for advanced study at the Ecole des Carmes, in preparation for the full development of the newly established Laval University. Cauchy was one of his teachers.

This four-page letter starts with a polite address and then recommends another priest to teach at the Petit Seminaire. Regarding Cauchy, Hamel recommends that Cassault hurry to acquire his collected works, both for their high quality and for Cauchy's high standing as a mathematician and a Catholic.

"Monsieur le Superieur. . . .

"Voici d'autre chose. Cette fois, cela re-garde un peu les sciences – Monsieur Cauchy qui on regarde comme le premier mathematicien de l'Europe, a publie un certain nombre d'ouvrages qui ont change par leur rigueur la face des mathematiques en fixant les idees sur les bases memes de cette science. Ces ouvrages seront, dit-on, la base des progres futurs. Or plusieurs sont maintenant hors de vente chez les libraires quoique leur auteur vive encore – Comme il ajoute continuellement a ce qu'il a deja fait, on ne sait pas s'il recommencera une nouvelle edition. En attendant les ouvrages epuises se vendent d'occasion mais deplus en plus chers a mesure qu'ils deviennent plus rares. J'attire donc l'attention du Seminaire la dessus, en cas qu'il se propose d'acheter les oeuvres completers de cet illustre savent, aussi recomandable du reste par sa piete que par sa science. . . .

"J'ai l'hommeur d'etre
Monsieur le Superieur
Votre tres humble et
tres-obeissant serviteur
Thos. E. Hamel ptre"

David Orenstein

Book Review: A Primer for Mathematics Competitions

A Primer for Mathematics Competitions, by Alexander Zawaira and Gavin Hitchcock (Oxford, New York: Oxford University Press, 2009), 350 pp. ISBN: 978-0-1995-3988-8. US$45.

Based solely on the title, this new book aimed at helping to prepare students to participate in national Mathematical Olympiads might seem a questionable choice for a review in the *Bulletin*. A glance at the cover, however, reveals the connection: part of the book's description is the claim that an "unusual feature of this book is the attention paid throughout to the history of mathematics—the origins of the ideas, the terminology and some of the problems, and the celebration of mathematics as a multicultural, cooperative human achievement." Although obviously the book is first and foremost about problem solving, some historical content is certainly provided.

The book is organized into eight "toolchests" of related mathematical topics: geometry, algebraic inequalities and induction, Diophantine equations, number theory, trigonometry, sequences and series, the Binomial Theorem, and counting techniques. Each of these eight chapters is designed to be independent of the others, and they can be read in any order. In most cases, whenever material from a different chapter is required for a particular example, a reference is provided directing the reader to the appropriate section. The final chapter of the book provides a collection of miscellaneous problems requiring the methods covered in the previous chapters as well as tying in some other topics not covered in the book.

The sections in each chapter begin with one or more "appetizer" problems; that is, problems that should challenge the student, but that can be solved using the techniques and theorems reviewed in the section. For example, the chapter on combinatorics begins

with the following problem: "Distinct 3-digit numbers are formed using only the digits 1, 2, 3 and 4, with each digit used at most once in each number formed. What is the sum of all possible numbers so formed?"

Each chapter concludes with a set of problems, although the number of problems provided varies based on the length of the chapter; for instance, the chapter on geometry contains 51 problems, but the chapter on the Binomial Theorem ends with only five. Solutions to all of the problems are provided.

The claim that attention is "paid throughout to the history of mathematics" is something of an overstatement. While the earlier chapters, particularly the chapter on geometry, contain many instances of historical discussion, the frequency of those discussions diminishes dramatically as one moves further into the book. For example, in the last three chapters, there are only two extremely brief references to the history of mathematics: the fact that Pascal's Triangle can be traced back to both Blaise Pascal and Halayudha, and the association of Dirichlet with the Pigeon-Hole Principle. In many other cases, not even this token amount of historical context is provided; for example, while the problem solving applications of the Cauchy-Schwarz Inequality, Fermat's Little Theorem and the Weierstrass Inequality are presented, they are accompanied by no historical details.

In the earlier parts of the book, the coverage of the history of mathematics is more frequent and slightly less terse. The first chapter begins with a two-page summary of the origin of the word "geometry" and some discussion of geometric knowledge in Babylon, Egypt and Greece. The problems at the end of the first chapter include proving the Pythagorean Theorem based on the diagrams from Propositions I.47 and VI.31 of Euclid's *Elements*; the solution provided for the second proof briefly discusses incommensurable numbers. There is a condensed description of the Library and Museum at Alexandria, which lists some of the mathematicians who studied or worked there and even explains why the title of Ptolemy's *Mathematical Collection* eventually became the *Almagest*. Later chapters contain very short descriptions of Bombelli and the discovery of imaginary numbers, Simon Stevin and decimal representation, and Diophantus.

As the word "primer" in the title suggests, the book is intended to provide only an introductory foundation for problem solving techniques. At the end of the book, a list of "Further Training Resources" is provided. In addition to other books on problem solving, this list directs readers to history of mathematics texts by Boyer & Merzbach, Eves, and Katz, as well as to the MacTutor website.

Although the actual amount of historical material in the book was small and mostly limited to the first chapter, the book was still very interesting. Except for a few minor typographical errors and occasional odd notational choices (for example, in one problem, the area of triangle ABC was labeled A), the material was extremely well written and organized. This book would be useful not only to students preparing for competitions, but also as a reference book for undergraduate students and as a source of interesting and challenging problems for secondary education and college teachers to use in their classes.

Mike Molinsky

HPM Americas Section

The Americas Section of the International Study Group on the Relations Between History and Pedagogy of Mathematics held its annual meeting at the MAA Carriage House in Washington, DC, on March 14–15, 2008. The Friday afternoon before the meeting, Fred Rickey and Florrie Fasanelli organized a rare book tour of the United States Naval Observatory Library; attendees remarked on their "counterpoint commentary."

Janet Heine-Barnett (Colo. State-Pueblo) started things off Saturday morning with a report to the audience of 17 on her work developing and site testing three student projects in Boolean algebra. These modules on George Boole, Edward Huntington, and Claude Shannon are available at www.cs.nmsu.edu/-historical-projects/. I then presented a preliminary version of the work you all will hear about at the CSHPM AGM. Next, Betty Mayfield (Hood) shared her experience taking two students to SMURCHOM, the undergraduate history of mathematics conference organized by Sloan Despeaux. Finally, Shirley Gray (Cal. State-Los Angeles) urged us not to let the ongo-

ing examination of the Archimedes Palimpsest under the auspices of the Walters Art Gallery overshadow J. L. Heiberg's achievements in reading the text between 1906 and 1908.

I mentioned last year that I am a fan of lunches from Whole Foods Market, so let's move on to the business meeting. A variety of upcoming prospective events were announced. Florrie managed to engineer an "election" that resulted in my becoming the Americas Section treasurer and David L. Roberts ascending to the newly-created position of secretary. Basically, our functions are to provide additional signing authority for the Section's modest bank account, help maintain the Web site, and make sure the Section continues should anything befall president Bob Stein. The Section still needs to reach out to math historians and pedagogists in Mexico, South America, and Canada so that we truly reflect the "Americas."

After the business session, Alexander Karp (Teachers College, Columbia) evaluated the state of Soviet mathematics education before and after the Central Committee passed a set of resolutions in 1931. The reforms seemed to improve basic mastery in a larger number of students but did not prepare talented students for higher achievements. Marina Vulis (New Haven) then described the 1703 Russian textbook, *Arithmetika*, by Leonty Magnitsky. Dave R. closed the afternoon with his talk on the linkages chapter in *Tools of American Mathematics Teaching*—he, Peggy Kidwell, and I could not go through an entire day without plugging our book!

Since this correspondent apparently cannot read a calendar and scheduled her church choir's first performance in two years for March 15, I can provide only titles for the Sunday morning session: Tom Bartlow (Villanova) talked about "Edward V. Huntington on Teaching the Calculus"; Michel Helfgott (E. Tenn. State) discussed the "Pedagogical Implications of Cardano's *Ars Magna*"; and Ilhan Izmirli (American) spoke on "Does a Postmodernist Philosophy of Mathematics Make Sense? Is $2 + 2 = 5$ Correct As Long As One's Personal Situation or Perspective Required It?"

In 2009, the Americas Section will return to the Carriage House on March 13–14. There may be a visit to the Dibner Library. We are exploring other locations for future meetings, including the D. E. Smith collection at Columbia University, the Chemical Heritage Building and American Philosophical Society in Philadelphia, and cities in the Midwest and West Coast.

Amy Ackerberg-Hastings

From the Webmaster

I always welcome any suggestions for ways to make the CSHPM website (www.cshpm.org) a more valuable resource to the Society. In particular, I would like to encourage your advice in improving the following sections of the website:

Calendar. Please let me know of any history and/or philosophy of mathematics events that are missing from the calendar.

Links. Although I try to check through the links to other websites of interest relatively frequently, please notify me if you find any broken links. I'd also appreciate suggestions for any additional links to online resources. In particular, I've started a page with links to undergraduate and graduate programs in the history or philosophy of mathematics. The list currently contains the programs at Simon Fraser University, the University of Toronto, York University, the University of Chicago, the City University of New York and the University of Virginia, and I would welcome information on any other available programs.

Archives. The archives section of the website contains the past issues of the *Bulletin*, as well as copies of the schedules and abstracts from each Annual Meeting and the table of contents of each meeting's *Proceedings*. The archives are currently missing the abstracts of the talks at the 2004 (held in Cambridge with the BSHM) and 2005 (held in Waterloo in conjunction with the CMS) meetings; if anyone could provide copies of those abstracts, it would be extremely helpful. This summer, I plan to complete a searchable database of all of the titles and abstracts from the *Proceedings*. Please let me know if you have suggestions for other archival materials that would be helpful to have online.

Mike Molinsky

Web Review: Twitter

Based on my unscientific observation that half the articles in the *Washington Post* each day mention it, Twitter appears to be the must-use technology *du jour*. Established in 2006, Twitter is a social networking service in which users are asked to text or post responses of fewer than 140 characters to the question, "What are you doing?" At www.twitter.com, a user may also register to follow the "tweets" of other "twitterers." Responses to tweets are not expected, though. Twitter employees encourage users to follow their friends, but famous Twitter feeds include American actor and Demi Moore spouse, Ashton Kutcher (581,000 readers) and bicyclist Lance Armstrong (448,000 readers).

I did not recognize any historians or philosophers of mathematics among the 1000 most popular Twitter users. Meanwhile, I can't think of anyone for whom I personally want constant updates on daily life—even my husband or Colin Firth. Still, I don't want to entirely turn into the curmudgeon chasing rotten kids off my virtual lawn, either. So, I checked to see what evidence of the history and philosophy of mathematics may be found on Twitter.

Although Twitter permits searching as far back as 1 January 2008, a search for "history of mathematics" returned results only to 19 February 2009. On March 27, typeqaz, who appears to be a book buyer named Dina, announced Clifford Pickover's forthcoming *The Math Book: From Pythagoras to the 57th Dimension, 250 Milestones in the History of Mathematics*. On March 21, mindblink, who sounds like a student in computing, came into a bunch of history of mathematics books and a box of Girl Scout cookies. On March 6, elbieinwaterloo was excited that Steve Furino would be teaching history of mathematics this summer at the University of Waterloo. Perhaps some of our members know "Steverino"; he was instructor of the year at Waterloo in 1998 and earns high marks on the Rate My Professors Web site for his off-topic anecdotes and "math history Fridays" in his regular mathematics classes. On March 1, veraobmana posted a link to the MacTutor Web site. On February 19 and 27, Kapester and TheDarcinator were both doing their history of mathematics homework. Meanwhile, Matty Reynolds and Dave Gorman had a conversation about the origin of zero on February 26.

By searching for "philosophy of mathematics," I discovered that Adam Wagner was reading Charles Seife's *Zero: The Biography of a Dangerous Idea* on March 23, while Matt Jakob was reading *Philosophy of Mathematics: Selected Readings*, edited by Paul Benacerraf and Hilary Putnam, on March 20. On March 19, Todd Suomela linked to his blog post on "Bias and Naive Philosophy of Mathematics." On March 4, fidelisera, an Arizona 19-year-old, was thinking about taking philosophy of mathematics next semester. On March 1, lareecarucker, a features reporter for the *Jackson Clarion-Ledger* was reading "a book about the philosophy of mathematics." On February 28, pyridine, a neuroscientist in Melbourne, name-checked Eugene Wigner's 1960 article, "The Unreasonable Effectiveness of Mathematics in the Natural Sciences" and juxtaposed it with "The Unreasonable Uselessness of Philosophy in the Natural Science," which appears to be his own phrase. He didn't like the 4th "Futurama" movie, either, while I found the DVD acceptable; maybe I don't care about pyridine's cranky opinions.

Since abbreviating is supposed to be the point of texting, I also checked "hist math" and "phil math." These searches provided a larger number of results, but they mainly returned students doing their history homework and their mathematics homework. I did find out that Shawna Bowler of Denver, CO, who twittered a mind-boggling 100 times on March 26, expected to receive a CD set on the history of mathematics from the library on March 16. On March 14, Lauren Beaver and Kait Rankins had read part of Denis Guedj's novel *The Parrot's Theorem* in their history of mathematics class; in trying to remember the plot, Kait commented, "Can you imagine when it's 3.14.15? Math nerds will explode." On March 8, tsmosca was reading Thomas Heath's *History of Greek Mathematics*, in which he "skipped ahead to Hippias' quadratix. Pre-Euclidean construction & subsequent critiques strikingly sophisticated." On February 27, struthious twittered 2 comments on his reading: " Frege on Mill's phil of math: 'pebble and gingerbread arithmetic'" and "Lakatos' *Proofs and Refutations* is fun, fun, fun! Brilliant hist/phil of math."

Does Twitter currently have any use for historians

and philosophers of mathematics? For finding out about these subjects, the service seems only to provide insights into what non-professionals are thinking about. As the paragraphs above may indicate, this is a rather labor-intensive process with results that may not be very scintillating. Might historians and philosophers of mathematics profitably employ Twitter in the future? This is also uncertain, since it is difficult to imagine any of us exerting the marketing effort to develop a substantial following (although I would enjoy "tagging along" when our interesting members travel to interesting destinations). Still, it is useful to know that our students may be twittering and tracking tweets. I did search for the names of several prominent historians and philosophers, but I found multiple references for only one person, John Conway. Nick Hobson of Hoking, UK, did reprint a quote from Robin Wilson that gives us a pun on which to end: "I once gave a talk on classical Greek mathematics; in honour of *Casablanca* it was called 'Here's Looking at Euclid'."

Amy Ackerberg-Hastings

CMS Winter Meeting

The CSHPM continued its regular annual presence at the Winter Meeting of the Canadian Mathematical Society in Ottawa, December 6-8, hosted by Carleton University. The session, organized by Tom Archibald and Alex Jones, provided a showcase for recent research in both history and philosophy of mathematics. The talks were excellent and the organizers are proud to have been associated with the event.

Pre-modern mathematics was represented by Duncan Melville (St. Lawrence Univ.), who spoke on the role of problem texts in Old Babylonian mathematics; and by Kim Plofker (Union College), who discussed Greco-Persian geometry in seventeenth-century India. Paul Rusnock of Ottawa and Dirk Schlimm (McGill) spoke on philosophical aspects of the work of Bolzano and Pasch, respectively. The remainder of the papers covered material from the eighteenth century to the present. Highlights included Robert Dawson (St Mary's) on reconstruction of a slide rule for complex numbers; David Bellhouse (Western Ontario) with an iconographic inquiry into engravings in Euler's *Introductio*, and Brenda Davison (SFU) on G. H. Hardy's *Course of Pure Mathematics*. There were also fine contributions from V. Fred Rickey (USMA), Craig Fraser (Toronto), Deborah Kent (Hillsdale), Florin Diacu (Victoria), and Stan Burris (Waterloo).

Abstracts are online at http://www.cms.math.ca/-Events/winter08/abs/

The CMS has been kind enough to schedule another history and philosophy session for the Winter meeting at Windsor, Ontario, December 5-7, 2009. Those interested in presenting their recent research should contact Tom Archibald, tarchi@sfu.ca.

Tom Archibald

Inequalities As Political Argument

You might remember that the Canadian Conservative minority government's initial response to an impending economic crisis was excessively strange. To counter this, a Liberal-NDP coalition government with Bloc Québécois support was proposed.

I was in full agreement with this reasonable response to government malignity and incompetence, so I joined the pro-coalition rally that filled Nathan Phillips Square in front of Toronto City Hall on Saturday, December 6, 2008.

I was singularly struck by how much mathematical argument and symbolism were part of the rally. Particularly noteworthy were the protest signs that said simply "$62 > 38$". This was the mathematically succinct way of undermining the Conservatives' argument that the proposed Coalition was undemocratic. The Conservatives had received only 38% of the vote in the October 2008 election. The combined opposition parties who supported the coalition (Liberals + Bloquistes + New Democrats + Greens) had polled 62%.

Similarly many people sported a campaign button with a colour-coded diagram. The colours and parties were as follows: blue for Conservative (surrounded by a solid line in the replica illustration accompanying this article), red for Liberal (surrounded by a dotted line), green for Bloc Québécois (surrounded by a dash and 2 dots), and orange for New Democratic (sur-

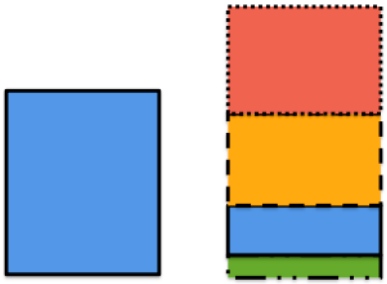

Figure 3: A Colour-coded Diagram

rounded by a dashed line). Thus, the button graphically stated that the opposition parties held a majority in the House of Commons. It was circular, of course, and measured about 6 cm in diameter.

Even as I write (March 30, 2009), I still see posters that say: "I'm Part of the 62% Majority!"

While not Tensor Analysis or Galois Theory, mathematical arguments have been part of greatest recent debate in Canadian political history.

David Orenstein

Erwin Kreyszig (1922-2008)

Erwin Kreyszig, who died suddenly on December 12, 2008, was active in the affairs of CSHPM for several years, speaking on a variety of subjects in nearly every annual meeting from 1983 to 2003. But Kreyszig's lifetime also included multiple careers as researcher, supervisor, textbook author and academic administrator in several institutions in four countries. His mathematical interests were unusually broad and his 163 publications include papers in partial differential equations, mathematical physics, numerics, differential geometry, applied statistics and the history of mathematics. He worked with renowned 20th century mathematicians including Stefan Bergman, Tibor Radó, John Todd and Garrett Birkhoff.

Erwin was born in Pirna (near Dresden), Germany, on January 6, 1922. He studied Physics and Mathematics at the University of Darmstadt, obtaining a doctorate in Mathematics (1949) under the supervision of A. Walther. His dissertation on the generalized sine integral [1] deals with a special function of two complex variables, much of it concerning the question of how the zeros with respect to one variable vary with the other variable. This work already illustrates some of the qualities which were to characterize his later work: information on the history of the subject, attention to detail, use of diagrams and visual aids, and unification of earlier results.

After further work in Germany on complex analysis and differential geometry, Kreyszig moved to the United States in 1954. His first position was at Stanford University, where he interacted especially with Stefan Bergman. He started to work on complex theoretic methods in partial differential equations, one of his main areas of activity for several subsequent years. During 1956–60 he was at Ohio State University, where he was promoted to the rank of Professor in 1957. One of his activities during this period was the writing of *Advanced Engineering Mathematics* [2], a textbook now in its 9th edition in English, not to mention the various translations that have appeared over the years. Wiley was to publish several of his other books, including his textbook on functional analysis [3], now in the Wiley Classics series.

Those were the days when, even for senior academics, openings were more available than at any time before or since. Kreyszig was much in demand and was able to leave his mark on several institutions (Graz, Düsseldorf, Karlsruhe) as well as hold various visiting positions! Amazingly, in addition to performing administrative tasks and continuing his mathematical researches, he found the time to become involved in writing textbooks in statistics.

By 1973, Kreyszig was ready to return to North America, where he took a position at the University of Windsor, moving to Carleton University in 1984. After retirement from Carleton he was given the title of Distinguished Research Professor. He continued to play an active role in the Department, maintaining his office and continuing his research.

Erwin was quick to become involved in the Canadian mathematical community. He served as a member of the Board of Directors of the Canadian Mathematical Society in the years 1977–83 and 1987–89 and on Committees of the Society related to publications throughout the 1980s.

Our Society was to profit from his increasing interest in the history of mathematics. One of his first major projects in this area was the early history of functional

analysis, joint work with Garrett Birkhoff [4]. The topics on which he lectured at CSHPM meetings were very varied: development of the concept of function, history of the calculus of variations, Leonhard Euler, evolution of engineering mathematics, and history of numerical analysis were some of the areas on which he spoke. But we also had some overview topics: "Surfaces and Manifolds —their general impact", "Curves and their influence on the development of mathematics", "On the concept of space in analysis, geometry and physics" and "'Modern' starts: Formative period of 20th century mathematics", his contribution to the 2000 special session, "History of Mathematics at the Dawn of a New Millennium". But Erwin was no dilettante. Every one of his talks was meticulously prepared, and so were the written versions in the annual proceedings.

Figure 4: Erwin Kreyszig (1922-2008)

Erwin Kreyszig was pre-deceased by his wife Herta (née Lied) in 1996. She had obtained a doctorate in geography from the University of Mainz. The couple had two sons: Walter, who is Professor of Music at the University of Saskatchewan, and Herbert, a New York-based consultant in finance and business strategies for investment banks and private corporations.

Much of the biographical information provided here was taken from [5], which contains many more details of Erwins life and career. I am grateful to Herbert Kreyszig for further information and comments and for the photo, taken by Michael Hale in 2007.

References

[1] E. Kreyszig, "Über den allgemeinen Integralsinus $Si(z,\alpha)$", *Acta Mathematica* 85 (1951), 117-181; "Der allgemeine Integralkosinus $C(z,\alpha)$", *ibid.* 89 (1953), 107-131.
[2] E. Kreyszig, *Advanced Engineering Mathematics*, Wiley, New York, 1962 (9th edition, 2006, 1248 pp.).
[3] E. Kreyszig, *Introductory Functional Analysis with Applications*, Wiley, New York, 1978 (Wiley Classics Series, 1989, 704 pp.).
[4] G. Birkhoff and E. Kreyszig, "The establishment of functional analysis", *Historia Mathematica* 11 (1984), 258-321.
[5] Manfred W. Kracht, "In honor of Professor Erwin Kreyszig on the occasion of his eightieth birthday", *Complex Variables* 47, no. 6 (2002), 453-461.

Martin Muldoon

Quotations in Context

> Arithmetical symbols are written diagrams and geometrical figures are graphic formulas. –
> David Hilbert

This comment may sound a little too pat, like an aphorism purveyed by some "new-age" guru. However, given the awesome credentials of its author, we must certainly treat his statement with respect, and we may understand it better by exploring its context.

The statement is quoted in the form provided above in Robert Edouard Moritz's compilation of writings, *On Mathematics and Mathematicians* (formerly titled *Memorabilia Mathematica or the Philomath's Quotation Book*). Moritz's referenced source is Hilbert's article, "Mathematical Problems," in the *Bulletin of the AMS* (8 (1902): 437–479), a translation by Mary Winston Newson of the original *Mathematische Probleme* published in the *Göttinger Nachrichten* in 1900. This was before a French translation was published in 1902 in the Proceedings of the Second International Congress of Mathematicians, held in Paris in 1900 and at which Hilbert presented this paper, containing the 23 open problems that were to become renowned as challenges for the coming century. The complete English text of this article is included in Ben Yandell's vivid book, *The Honors Class: Hilbert's Problems and their Solvers* and was also reprinted in the *Bulletin of the AMS* 37 (2000): 407–436 (available online at www.ams.org/bull/2000-37-04).

The quote as given by Moritz turns out to be a truncation of the following sentence: "The arithmetical symbols are written diagrams and the geometrical figures are graphic formulas; and no mathematician could spare these graphic formulas, any more than in calculation the insertion and removal of parentheses or the use of other analytical signs."

Preceding this sentence, Hilbert states his opposition to the opinion that only the concepts of analysis or even arithmetic alone are "susceptible of a fully rigorous treatment." He argues that regardless of the source of mathematical ideas, such as from geometry or physics, it is possible to set up an exact axiomatic system that "shall be in no respect inferior to those of the old arithmetical concepts." He then discusses how new signs are developed from new concepts, being chosen to remind us of their sources, as "geometrical figures are signs or mnemonic symbols of space intuition." Examples include his claim that the expression $a > b > c$ is always associated in mathematicians' minds with "the picture of three points following one another on a straight line as the geometrical picture of the idea 'between'."

Following this is a paragraph consisting of the sentence from which our quotation is taken. Then Hilbert goes on to stress that "in order that these geometrical figures may be incorporated in the general treasure of mathematical signs, there is necessary a rigorous axiomatic investigation of their conceptual content." He concludes this section by mentioning Hermann Minkowski's work *Die Geometrie der Zahlen* (The Geometry of Numbers) as "an example of an arithmetical theory operating rigorously with geometrical ideas and signs."

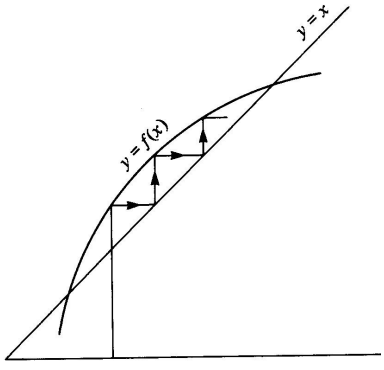

Figure 5: The Fixed Point Theorem Without Words

To conclude with a related viewpoint, John Littlewood (in *Littlewood's Miscellany*, a book of his writings compiled by Béla Bollobás) gives a self-described "sermon" against what he calls the (then) increasing practice of avoiding pictures in mathematics. He writes that his pupils "*will* not use pictures, even unofficially and when there is no question of expense" (of printing), a comment calling to mind Bourbaki's notorious aversion to pictures in their expositions. Then he goes on: "A heavy warning used to be given that pictures are not rigorous; this has never had its bluff called and has permanently frightened its victims into playing for safety. Some pictures, of course, are not rigorous, but I should say most are (and I use them whenever possible myself)." He claims that they may be legitimately used not only for definitions but also for pictorial *arguments*, illustrating his point with a figure that is "[f]or the professional the only proof needed" of the 'fixed point theorem' in one dimension. This concept of a "proof without words" makes up part of the currently popular approach of visualization in mathematics. It seems that Hilbert would have appreciated this trend.

Dan Sonnenschein

AGM of CFHSS

The Annual General Meeting of the Canadian Federation of Humanities and the Social Sciences took place in Ottawa on 7–8 March 2009. Highlights of the discussion included:

Funding. The Government of Canada is giving $87.5 million per year to higher education—40% of which goes to Humanities & Social Science.

Copyright Law. The copyright act in Parliament has been dropped (June 2008) because of the election in October 2008. A new copyright act will be tabled. See also my report in the May 2006 *Bulletin*.

Digitization: Google. Google (of San Francisco) scanned approximately 7 million titles between 2004 and 2007. These are uncorrected PDF OCR materials. It has over 2.5 petabytes and is still growing: 2.4 billion bytes of works printed before 1923, 2.6 billion bytes of works published between 1923 and 1963, and 10 billion bytes of post-1963 works. Google is being sued and has until June 2009 to give a binary (accept

or not) decision. It probably has to obey the Berne Convention on copyrights.

Google is not particularly interested in preservation. It is supposed to give $60 for each title to the author. For books still under copyright, it is only supposed to publish about 20% of the manuscript.

Digitization: Implications. There was a talk on "mass digitization"—long term preservation of data & digital research. Questions for the future: (1) Who should pay? (2) How should we make the material available? (3) Do we have the capacity? In 2007, the amount of printed material exceeded the amount one could store electronically.

Upcoming Meetings. In 2009, CFHSS will meet at Carleton University in Ottawa; in 2010, at Concordia University in Montréal; in 2011, at University of New Brunswick and St. Thomas University in Fredericton; in 2012, at the University of Waterloo and Wilfrid Laurier University.

For information about the Federation's ongoing projects, please monitor http://www.fedcan.ca.

Ed Cohen

Mathematical Ephemera

This issue's installment is not ephemera (short-lived or transitory printed matter such as a pamphlet or advertisement). As with previous columns, though, this excerpt's historical significance may not be immediately obvious.

John Playfair, *Outlines of Natural Philosophy, Being Heads of Lectures Delivered in the University of Edinburgh*, vol. 1 (Edinburgh: Archibald Constable, 1812), 104-109.

176. The strength of men, and of all animals, is most powerful when directed against a resistance that is at rest: when the resistance is overcome, and when the animal is in motion, its force is diminished; lastly, with a certain velocity, the animal can do no work, and can only keep up the motion of its own body...

177. Therefore, till experience has led to a more accurate result, we may suppose the strength of animals to follow the law expressed by the formula, $\mathrm{W} = \mathrm{P}(1 - \frac{v}{c})^2$.

This equation, supposing W and v variable, is an equation to a parabola, the construction of which will serve to represent this law more clearly to the imagination.

A formula for expressing the law of animal action was first proposed by Euler, in a Dissertation on the Force of Oars. *Mém. Acad. de Berlin*, 1747. That which he employed was $\mathrm{W} = \mathrm{P}(1 - \frac{v^2}{c^2})$, different from both those we have mentioned, but a function of the first, and one that becomes 0, when $v = c$. Euler, however, changed this to another, *Mém. Acad. de Berlin*, 1752, and *Nov. Com. Petrop.* VIII. p. 244., the same that we have adopted. He appears to have done so merely on account of the analogy thus preserved between the action of animals and fluids. The physical fact mentioned above, is a better reason for the preference.

178. The *effect* of animal force, then, or the quantity of work done in a given time, will be proportional to $\mathrm{W}v$, or to $\mathrm{P}v(1 - \frac{v}{c})^2$, and will be a *maximum* when $v = \frac{c}{3}$, and $\mathrm{W} = \frac{4\mathrm{P}}{9}$, that is, when the animal moves with the one-third of the speed with which it is able only to move itself, and is loaded with four-ninths of the greatest load it is able to put in motion. . . .

179. It appears to be a certain fact, that when a man carries only his own weight, the quantity of his action, that is, the height he is able to ascend in a given time, multiplied into his weight, is greater than when he carries any additional load; and Coulomb thinks it probable, that this diminution of action, is in proportion to the additional load carried. Now it appeared from his experiments, that when a man carried a load equal to his own weight, his action was reduced nearly one-half; and, therefore, supposing the reduction always proportional to the load, if w be the weight of the man's body, l an additional load, which he is made to carry, H the height to which he ascends in a given time, when walking freely, and h the height to which he ascends in the same time with the load l; then his action in the latter case, or $(w + l)h$, is reduced $w\mathrm{H}(1 - \frac{l}{2w})$; and therefore also $h = \frac{w\mathrm{H}(1-\frac{l}{2w})}{w+l}$.

Suppose that a man is loaded with one-fourth of his own weight; then $h = \frac{w\mathrm{H}(1-\frac{1}{8})}{w(1+\frac{1}{4})} = \mathrm{H}\left(\frac{1-\frac{1}{8}}{1+\frac{1}{4}}\right) = \mathrm{H}(.699)$.

The value of H is deduced from the ascent of the Peak of Teneriffe. BORDA, accompanied by eight men, on foot, ascended in the first day (7^h45^m), to the height of 2923 metres, or 9593 feet. This was at the rate of 1225 feet in an hour. Had each of the men carried a load equal to the fourth part of his weight, they would only have ascended at the rate of 857 feet an hour.

When $1 - \frac{l}{2w} = 0$, or $l = 2w$, the height $h = 0$. With a load equal to twice a man's weight, he could not ascend.

180. The strength of a man being supposed to follow the law now laid down, its greatest effect in raising a weight, will be when the weight of the man is to that of his load as 1 to $-1 + \sqrt{3}$, or nearly as 4 to 3.

New Members

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

Janet Heine Barnett
Colorado State University-Pueblo
Pueblo, CO
USA

Sandra Caravella
Flemington, NJ
USA

W. J. Jordan
Waterloo, ON
Canada

Francis Jeffry Pelletier
Edmonton, AB
Canada

Bruce J. Petrie
North York, ON
Canada

Mark C. R. Smith
Queen's University
Kingston, ON
Canada

Alison Wylie
University of Washington
Seattle, WA
USA

From the Editor

First, I am pleased to welcome Maria Zack of Point Loma Nazarene University as our new Production Editor. She has seen to the printing and mailing of the issue that those of you who have chosen to continue receiving the *Bulletin* on paper are now holding in your hands. Maria has also secured funding from her institution for printing and postage. Also, a hearty thank you to Pat Allaire and Rob Bradley, who had been serving unofficially and jointly as Production Editor since November 2006. Thanks as well to Eisso Atzema, who continues as Layout Editor to transform the raw text I play with into a lovely TeX document.

Second, thanks to everyone who contributed articles and announcements for this issue. Our Webmaster, Mike Molinsky, changed media to review a print source for a change of pace, while Dan Sonnenschein also provided Mike with a break by handling this issue's Quotations in Context column. In the future, Mike would like to don his other hat as our Archivist to launch a new regular column, so there are opportunities for others to contribute Web reviews or suggest quotations to place in context.

Similarly, I would love to receive submissions for the ongoing Mathematical Ephemera column, which contains brief transcripts of those primary sources that might otherwise (and perhaps deservedly) slip into obscurity. I am also interested in launching a Material Witness column, for brief accounts of mathematical instruments and objects, in addition to a methodology corner for notes on current or useful approaches in historiography or philosophy.

One of my favorite occasional columns in the *Washington Post* is Jonathan Yardley's "Second Reading," in which he takes another look at novels and memoirs which were significant in his youth in the 1950s and considers whether these books have stood the test of time. I often wonder which works in math history and philosophy we ought to pull off of our own shelves for reevaluation. Several years ago, we ran a regular feature, How I Learned to Love the History of Mathematics. To relaunch this column, I need your stories about how you got started in the history or philoso-

phy of mathematics.

We are trying to increase the breadth of contributors, as well, so I was deeply appreciative when Yvon Gauthier and Martin Muldoon accepted assignments for this issue. Remember, you don't have to step forward yourself to write for the *Bulletin*; volunteer a colleague from whom you'd like to hear, and I will do the arm-twisting for you. The next submission deadline is October 1, 2009.

Finally, don't forget to look back at the November 2008 issue for the text of the proposed constitutional amendment to permit electronic voting in our biennial Council elections. This amendment is on the agenda for St. John's. I hope to see many of you there!

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 (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 Amy Ackerberg-Hastings at the above email address, or by postal mail to 5908 Halsey Road, Rockville, MD 20851, USA.

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