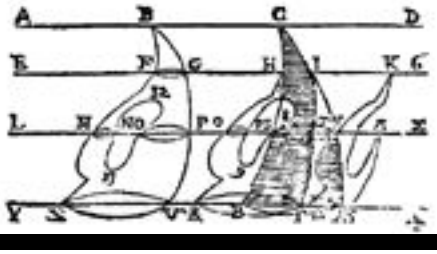
BULLETIN

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
Secretary: **Pat Allaire**, 148-18 60 Ave., Flushing, NY 11355, USA, PatAllaire@gmail.com
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Past President: **Alexander Jones**, Institute for the Study of the Ancient World, New York University, New York, NY 10028, USA, alexander.jones@nyu.edu

Members of Council

Francine Abeles, Kean University, Union, NJ 07083, USA, fabeles@kean.edu
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Sylvia Svitak, Queensborough Comm. Coll., CUNY, Bayside, NY 11364, USA, Ssvitak@qcc.cuny.edu

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). **Tom Archibald**, Simon Fraser University, Burnaby, BC, V5A 1S6, CA, tarchi@math.sfu.ca, serves as CMS Liaison.

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

From the President

As the leaves and memories of summer fade, I want to comment on another strong season for the society, its members, and history of mathematics. The annual meeting of the society was held in conjunction with the Canadian Mathematical Society, at Memorial University in St John's, Newfoundland, on June 6–8. This was our third joint meeting with the CMS, following successful meetings in 2005 at the University of Waterloo and the inaugural joint meeting in 2000 at McMaster. Despite the distances and cost associated with travelling to Newfoundland, the meeting was well-attended. Sixteen speakers in the regular session talked on a wide variety of topics, and there were six speakers in the special session on the *History of the Relationship Between Mathematics and the Physical Sciences*. I thank all the speakers, the organizers (Tom Drucker for the regular session and Tom Archibald for the special session), and the solid audience which included numerous non-members coming from the CMS meeting. The May Speaker this year was Jeremy Gray, who gave a superb lecture, *Mathematics, motion, and truth: the Earth goes round the Sun*, held as a plenary session of the meeting. The audience was large and appreciative—indeed, I believe Jeremy's was the largest audience for a plenary session at the meeting—showing the interest in history of mathematics by the wider mathematical world. When we meet with the CMS, they take on by far the greatest portion of the logistical and publicity work, and I am very grateful for all the work done by Graham Wright, the CMS Executive Director, and especially the indefatigable Gertrud Jeewanjee, Meetings Director of the CMS, as well as the conference scientific directors, David Pike and Danny Dyer.

The AGM of the society was held at the meeting as usual, but eagle-eyed observers of the *Bulletin* will note that the Executive Council was not. A miscommunication on our part with the CMS resulted in the AGM being scheduled so early in the meeting that it left no time for a separate Executive Council meeting. Instead, the Council discussed the agenda items over a period of several days before the meeting by email. While this approach allowed those members of council who were unable to attend the meeting to have input, the diffuse nature of the discussions precluded the production of formal minutes. However,

all the substantive topics discussed came before the membership at the AGM and the resulting minutes can be found elsewhere in this *Bulletin*. I would like to draw your attention to a couple of points from the AGM. As evidenced by the joint meeting with the CMS, and by the regular sessions on history of mathematics offered at the CMS Winter Meetings in past years, we have been developing a close relationship with the CMS. In the past years, much of the burden of fostering this relationship has fallen to Tom Archibald, who has worked energetically in support of our cause. In view of the ongoing nature of the relationship, the AGM approved an official position of CMS Liaison, with Tom Archibald as the first incumbent. I thank Tom for taking on this task, but note that he cannot be expected to continue with it forever. This is a new way for someone to get involved in promoting history of mathematics to the Canadian mathematics community.

Also at the meeting, the proposed amendment to allow electronic voting was passed unanimously. The new procedures come into effect with the next election cycle. In preparation for the elections of new officers at the meeting in 2010, a Nomination Committee comprising Tom Drucker, Rob Bradley and Greg Lavers has been formed. If you have a nomination in mind, please contact one of the members. Nathan Sidoli, our treasurer, has accepted a permanent position in Japan (Congratulations, Nathan!) and is resigning at the end of the current term.

I am pleased that our connections with the CMS are continuing, strengthening, and deepening, but we are a society much in demand. Our upcoming meeting next summer is with the Congress of the Humanities and Social Sciences at Concordia University in Montreal. Our dates are from Saturday May 29 to Monday May 31. The Special Session is being organized by Sylvia Svitak with the topic of *Mathematics and the Liberal Arts*, and Pat Allaire is organizing the General Session. Hardy Grant will be the May Speaker. Mark the meeting in your calendars, watch for deadlines on the website, and I hope to see you all there in May.

Alongside our annual meeting, individual members continue vigorous support for the history and philosophy of mathematics in many different venues. Our society has natural ties with the CMS, but many members hail from south of the border and get involved with organizing sessions at various AMS meetings. In particular, the AMS Fall Western Section Meeting in November at UC Riverside features a special session on *History and Philosophy of Mathematics*, organized by Shawnee McMurran and Jim Tattersall, and our discipline is regularly very well-represented at the Joint Math Meetings in January. The 2010 meeting in San Francisco features an MAA short course on *Exploring the Great Books of Mathematics*, organized by Amy Shell-Gellasch and Glen Van Brummelen; an MAA minicourse on *The mathematics of Islam and its use in the teaching of mathematics*, organized by Victor Katz; an AMS-MAA special session on *History of Mathematics*, organized by Craig Fraser, Deborah Kent and Sloan Despeaux; an MAA session on *Mathematical Texts: Famous, Infamous, and Influential*, organized by Fernando Gouvêa and Amy Shell-Gellasch; the SIGMAA for the History of Mathematics annual meeting, with a guest lecture by Reviel Netz; an MAA session on *Philosophy of Mathematics for Working Mathematicians*, organized by Bonnie Gold and Carl Behrens, and the SIGMAA on the Philosophy of Mathematics annual meeting, with a guest lecture by Charles Chihara.

As you will see on the other pages of the *Bulletin*, our members are involved in far more activities than I can mention. Along with meetings and talks, publications are appearing at an ever-increasing rate, further testimony to the continued strength of the field and hard work of historians and philosophers of mathematics. These may be tough economic times, but the intellectual side is booming.

Duncan Melville

Announcements

We were saddened to learn that the indefatigable Ed Sandifer suffered a major stroke in August, during surgery to clear a blocked artery that had caused a minor stroke earlier in the summer. He had just given his usual bravura speaking performance, during the Opening Banquet at MAA MathFest, and met his goal of running in all 48 continental states. At press time, Ed was continuing to recover and rehabilitate in the acute rehab ward of Danbury Hospital in Connecticut. He is climbing stairs, regaining mobility on his right

side, and able to say "yes" and "no." He continues to be affected by aphasia. Ed's wife, Terry, is happy to bring him encouraging words, which may be sent via email to *tsandifer@earthlink.net* or by postal mail to 3 Juniper Road, Newtown, CT 06470-2010, USA.

Congratulations to Joanne Peeples (El Paso Comm. Coll.), winner of the 2009 MAA Southwestern Section Award for Distinguished Teaching!

Jacques Lefebvre sends greetings to his CSHPM colleagues and reports that he retired from UQAM in September 2000. Since then, he has done some reading and research in the history of mathematics, particularly in how the subject relates to theatre. In addition to traveling in Western Europe, he has spent much of his time in a "new and unexpected activity," as an amateur actor. He has been involved in fifteen to twenty productions in the past nine years.

Robert E. Bradley and C. Edward Sandifer announce the publication of *Cauchy's Cours d'analyse: An Annotated Translation*, in Springer's Sources and Studies in the History of Mathematics and Physical Sciences series. The first English translation of the classic 1821 textbook, this work is accessible to any good calculus student.

Yvon Gauthier will publish "Classical Function Theory and Applied Proof Theory" in a forthcoming issue of *International Journal of Pure and Applied Mathematics* and "Hermann Minkowski: From Geometry of Numbers to Physical Geometry" in *Minkowski Spacetime. A Hundred Years Later*, ed. V. Petkov, Fundamental Theories of Physics, vol. 165 (Springer, 2010). Yvon also has two books forthcoming from Presses de l'Université Laval: *Logique arithmétique. L'arithmétisation de la logique* and *Hegel. Introduction à une lecture critique.* Additionally, he is launching a new collection at PUL under the title, "Logique de la science".

The British Society for the History of Science is celebrating the thirtieth anniversary for BSHS Monographs by creating a digital collection of past monographs. These monographs are now available (free of charge) from the website of BSHS for viewing and downloading.[1]

The International Commission for the History of Mathematics maintains a World Directory of Historians of Mathematics. All members of CSHPM are encouraged to register for the Directory.[2] Members who registered years ago are encouraged to do so again. (As the website for ICHM has been transferred from server to server over the years, some of the older data has been lost.) Registration is very simple and can be completed in moments.

David J. Pengelley, Jerry Lodder, and Guram Bezhanishvili will offer a MAA minicourse on teaching discrete mathematics and broadly related courses using student projects based on primary historical sources, at the Joint Mathematics Meetings in San Francisco, January 13–16, 2010. See www.ams.org/amsmtgs/-2124_intro.html. This minicourse will introduce curricular modules, based entirely on primary historical source material, for courses in discrete mathematics, combinatorics, logic, abstract algebra, and computer science. The modules have been authored by an interdisciplinary team of mathematics and computer science faculty at New Mexico State University and Colorado State University at Pueblo, with support from the U.S. National Science Foundation. In the first session we will discuss the pedagogy behind our approach, give a brief outline of the compendium of projects, and provide initial hands-on participant work using four chosen projects. In the second session we will discuss the four projects in detail, lead group discussions, and offer more interactive activities. Faculty who have tested our projects with students at other institutions will describe their experiences. The projects we have developed so far, as well as our philosophy in teaching with historical sources, can be found on our homepage at www.cs.nmsu.edu/historical-projects. Our historical projects guide students in learning mathematics directly from primary historical sources by the likes of Archimedes, Cantor, Euler, Hamilton, Leibniz, Pascal, Shannon, Turing, Veblen, von Neumann, Fermat, Bernoulli, Boole, Frege, Peirce, Venn, Euclid, Huffman, Cayley, Henkin, Gödel, Peano, Dedekind, Wittgenstein, Russell, Whitehead, and Post.

Clemency Montelle (University of Canterbury, New Zealand) organized the Special Session on the History and Philosophy of Mathematics for the 53rd Annual Meeting of the Australian Mathematical So-

[1] See www.bshs.org.uk/monographs.

[2] See www.unizar.es/ichm/directory.htm.

ciety, held at the west city campus of the University of South Australia in Adelaide, September 28–October 1. Three papers were given during the session: "Limits, Parabolas, and Method of Exhaustion: The Reception of Archimedean Mathematical Techniques in the Seventeenth Century" by Clare Bycroft (Clemency's honours student); "Parallel Discovery, Priority, and Pre-eminence in the History of Logarithms" by Kathy Clark; and "MLC 2078 and the Early History of Mathematical Tables" by Clemency Montelle. The session was well attended by Australasian mathematicians and is yet another example of the growing scholarship in the history of mathematics in the southern hemisphere!

On October 3–4, the Department of Algebra, Number Theory and Logic of the School of Mathematics of the Aristotle University of Thessaloniki held a conference on "History of Modern Algebra: 19th century and later," dedicated to the memory of Maria Panteki. Plenary speakers included: Ivor Grattan-Guinness (Middlesex), "D company: The British community of operator algebraists"; Wilfrid Hodges (London), "How Boole broke through the top syntactic level"; Tony Crilly (Middlesex), "Nineteenth century British algebra—the careers of Arthur Cayley and Thomas P. Kirkman"; and Leo Corry (Tel Aviv), "From *Algebra* (1895) to *Modern Algebra* (1930): Changing Conceptions of a Discipline. A Guided Tour Using the *Jahrbuch über die Fortschritte der Mathematik*". Other CSHPMers on the program were: Paul Wolfson (West Chester), "Resolvents of Polynomial Equations"; and Amirouche Moktefi (Strasbourg), "Who cared about Boole's algebra of logic in the nineteenth century?"

The tenth annual Midwest PhilMath Workshop was held at Notre Dame on October 10–11. For the anniversary, Hugh Woodin (Cal-Berkeley), Tony Martin (UCLA), and Nik Weaver (Washington U.) gave presentations as part of a special meeting of Notre Dame's weekly Logic Seminar, on the subject of set theory and philosophy. Madeline Muntersbjorn (Toledo) spoke on "Poincaré & Mathematical Discovery," and Gregory Lavers (Concordia) presented the talk, "Frege the conventionalist and Carnap the Fregean."

Invited speaker Judith Grabiner delivered two addresses at the MAA Ohio Section Fall Meeting at Kenyon College, October 30–31: "It's All for the Best: Optimization in the History of Science" and "Lagrange, Symmetry, and Space." At the MAA Eastern Pennsylvania/Delaware Section Fall Meeting at University of the Sciences in Philadelphia on November 7, invited speakers Betty Mayfield and Andrew Simonson spoke on "Women and Mathematics in the Time of Euler" and "Voltaire's Riddle: Micromegas and the measure of all things," respectively. David Cox delivered an invited lecture, "Why Eisenstein proved the Eisenstein criterion and why Schoenemann discovered it first," and led a lunchtime discussion on "Using History in Mathematics Courses" at the MAA New Jersey Section Fall Meeting at the College of Saint Elizabeth on November 7.

Shawnee McMurran and Jim Tattersall organized a special session on history and philosophy of mathematics at the American Mathematical Society Fall Western Section Meeting at the University of California, Riverside, November 7–8. The session featured the following talks: James J. Tattersall (Providence), "Benjamin Finkel and the *Ohio Normal University Herald*"; Mario Martelli (Claremont), "Vito Volterra"; Janet Beery (Redlands), "Sums of Powers of Integers"; John Sarli (Cal-San Bernardino), "The Intrinsic Conics of the Hyperbolic Plane"; Victor Shapiro (Cal-Riverside), "On Green's Theorem"; John Baez (Cal-Riverside), "Who Discovered the Icosahedron?"; James Smith (San Francisco), "Definitions and Non-definability in Geometry: Legacies of Mario Pieri and Alfred Tarski"; Larry D'Antonio (Ramapo), "Gauss and the Sums of Three Squares"; Paul Wolfson (West Chester), "Resolvents of Polynomial Equations"; Harriet Lord (Cal Poly Pomona), "Henri Lebesgue and Arc Length"; and Fran Abeles (Kean), "Hugh MacColl and Charles L. Dodgson on Axioms and Non-Euclidean Geometry".

The Forum for the History of the Mathematical Sciences will again hold a luncheon, sponsored by the Legacy of R. L. Moore Project, during the 2009 History of Science Society Annual Meeting in Phoenix, AZ, November 19–22. History of mathematics on the HSS program includes: two sessions on "Research and Pedagogy: A History of Quantum Physics Through the Textbooks"; "Mathematical Genealogies: Astronomy, Geometry, Number Theory"; "Astronomy and Society"; "From Gibbs to Einstein"; "Mathematical Recreations and the History of Mathematics" (with

talks by Kathryn James, Paul Pasles, Peggy Kidwell, and David L. Roberts); "Reorienting Galileo in his Different Intellectual Traditions"; "God, Soul, and Matter in Early Modern Cosmology"; "The Paris Academy of Sciences in Print" (featuring a talk by Robin Rider); and "Collaborations in Twentieth-Century Mathematics" (organized by Nancy Hall). Andrew Fiss (Indiana) will exhibit "The Changing Place of Mathematics at U.S. Universities, 1865–1880" during the poster session. To join the Forum's mailing list, contact Karen Parshall, khp3k@virginia.edu.

Michel Serfati announces the first half-year 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: Michel Serfati (IREM-Université Paris VII), "L'algébrisation des logiques à plusieurs valeurs de Post (1920-1970). Les origines, de Boole, Sheffer, et Post, à Rosenbloom" on October 21; Philippe Seguin (IREM-Université Paris VII), "Pour l'honneur de l'esprit humain: Nombre et liberté dans les mathématiques allemandes de Gauss à Hilbert" on November 18; Michel Serfati, "La pensée mathématique de Descartes. I–Mathématiques et *Règles pour la Direction de l'Esprit*" on December 2; Pierre Lochak (Institut Mathématique de Jussieu), "Grothendieck, une occasion . . . à ne pas manquer" on January 20; Jean-Pierre Kahane (Académie des Sciences), "Le mouvement brownien, carrefour de disciplines" on February 3; and Régine Douady (IREM-Université Paris VII), "Jeux de cadres en didactique des mathématiques" on February 17. There will be an additional meeting, the second devoted to "Leibniz mathématicien", on December 16, with talks by Herbert Breger (Archives Leibniz) on "Method, Calculus, Theory: Leibniz's Infinitesimal Analysis" and Michel Serfati on "Le principe de continuité dans les mathématiques de Leibniz."

The Section for History and Philosophy of Science and Technology at the New York Academy of Sciences concluded its 2008–2009 season of monthly programs on the evening of May 21 with a lecture by Kim Plofker (Union), who spoke on "Mathematics and Astronomy in India: An evening in honor of David Pingree." A special symposium followed on May 22, devoted to "Astrolabes: An Evening in Honor of Marjorie and Roderick Webster, and David Pingree," and held at the Metropolitan Museum of Art. The symposium featured Clare Vincent (MMA), Bruce Chandler (Staten Island, CUNY), and Bruce Stephenson (Adler Planetarium). Following discussion over the past several months and circulation of a revised Constitution and By-Laws, a vote was taken during the meeting at the Academy on May 21 to reestablish the Metropolitan New York Section of the History of Science Society (MNYSHSS), originally founded on September 1, 1953. Elected to serve as President: Matthew Stanley (The Gallatin School, NYU), Vice President: Sheila Rabin (St. Peter's, NJ); Secretary: Luis Campos (Drew); and Treasurer: Deirdre La Porte (AT&T, retired).

The 2009–2010 schedule of lectures for MNYSHSS includes: Nathan Sivin (Penn.), "Is Chinese Science Really an Exotic Subject?" on October 28; Roger Cooke (Vermont), "The File on Academician N. N. Luzin" on December 3; Bert Hansen (Baruch, CUNY), "Wonders of Nature and Miracles of Medicine: Popularizing Science in *LIFE* Magazine, 1936–1972" on January 27; Peder Anker (NYU), "History of Spaceship Earth Science" on February 24; David E. Rowe (Mainz), "Einstein's Encounters with Mathematicians: The Swiss Years" on March 24; Richard W. Burkhart (Illinois), "Evolutionary Thought before Darwin: Lamarck's *Philosophie zoologique*, Frédéric Cuvier, and the Paris *menagerie*" on April 28; and Naomi Oreskes (Cal-San Diego), "How the Cold War Changed American Science" on May 26. Locations vary; for additional information or to reserve a place for the lecture or for dinner with the speaker after the lecture, please contact Joseph W. Dauben, jdauben@gc.cuny.edu, at least one week in advance of any lecture you plan to attend.

The 2009–2010 schedule for the Philadelphia Area Seminar on the History of Mathematics (PASHoM) includes: Craig P. Bauer (York), "Cryptology on Campus During World War II" on September 17; Danny Otero (Xavier), "Determining the Determinant" on October 8; Frank Swetz, "Glimpses of Chinese Mathematics" on October 15; Shelley Costa, "Throwing the Book at Mathematical Talent" on November 19; John W. Dawson, "Development of Compactness" on December 10; Bud Bowman (Penn. State-Harrisburg) on January 21; David Zitarelli (Temple) on February 18; Eisso Atzema (Maine) on March 18; Alan Gluchoff (Villanova) on April 22. Each talk is preceded by a light supper ($10.00) at 6:00 pm. Contact thomas.bartlow@villanova.edu for directions or

further information.

Upcoming BSHM meetings include: Jeremy Gray's lecture, "Mathematics, motion, and truth: The Earth goes round the Sun", on November 2 at Gresham College; "Motivations for Mathematics" at the Science Museum in London on November 21; and Volker Remmert's talk, "Visual representations of the mathematical sciences in the early modern period," at LMS on December 12. See www.bshm.ac.uk for more information. (To receive BSHM's News Sheets and *Bulletin* by postal mail, sign up for a joint membership when you renew your status in CSHPM on the membership form distributed with this issue.)

The Americas Section of the International Study Group on History and Pedagogy of Mathematics (HPM-Americas), chartered under the International Mathematical Union, will hold its Annual Meeting, on 13–14 March 2010, at the headquarters of the MAA, 1781 Church St. NW, Washington, DC. Those interested in speaking should notify Bob Stein (bstein@csusb.edu), describing the subject of the proposed talk and giving contact information (name, affiliation, postal address, e-mail address, and phone number).

SMURCHOM V (Smoky Mountain Undergraduate Conference on History of Mathematics) will be held at Western Carolina University on 20 March 2010. An invited address will be presented by Adrian Rice (Randolph Macon), "Harmonic Series: A Primer." Abstracts from undergraduates for the poster session and for contributed paper sessions on "History of Mathematics" and "Mathematics Informed by History" are welcome and should be sent to Sloan Despeaux, despeaux@wcu.edu. Limited housing for students is available on a first-come, first-served basis. Funding for this conference is provided by NSF grant DMS-0846477 through the MAA Regional Undergraduate Mathematics Conferences program. Don't miss the History of Math Disc Golf Scavenger Hunt!

This is year 7 of the HOMSIGMAA Student Writing Contest! The deadline for submissions is 31 March 2010. Please contact Amy Shell-Gellasch, shella@beloit.edu, or visit www.homsigmaa.org for more information.

Belfast Conference

This past April, three members of the Society raised a flag labelled "history of mathematics" in a context whose range was much wider. A conference organized by the Centre for Eighteenth-Century Studies at Queen's University, Belfast, took as its unhackneyed theme the year 1759. The three "stars" of the proceedings were General James Wolfe (who in that year altered the course of empire by taking Québec from the French), Laurence Sterne (who published the first two books of *Tristram Shandy*), and George Frideric Handel (who died). The CSHPMers felt very welcome among the several dozen scholars representing other disciplines. Our speakers and topics were: Larry D'Antonio, "The Finger of God: Aepinus on Magnetism"; Hardy Grant, "Mathematics in 1759: Progress and Perspectives"; and Jim Tattersall, "Nyctaginaceous Shrubs and Mathematics: Louis Antoine Bougainville". A fourth talk under the theme of "Mathematics and Science" was given by Patrick McCafferty, a graduate student at Queen's who specializes in folklore; his title was "The Return of Halley's Comet". A first-time visitor to Belfast came away singing the praises of (inter alia) its fine architecture, its superb restaurants, and its sunny-spirited people, many of whom remember very ugly times.

Hardy Grant

GTA STS Symposium

On Friday, May 8, 2009, the Science And Technology programme at Toronto's suburban York University hosted the Second Annual Greater Toronto Area Science And Technology Studies Symposium, organised by Conor Burns (STS, York).

Thirty friendly STS scholars gathered for a civilised 10 AM start, preceded by coffee, tea and schmoozing. Conor called together the formal proceedings. As book review editor for *Isis* (isis@yorku.ca), he issued a request for volunteer reviewers. Later, he sent me a complete list of papers and speakers with their affiliations.

Paul Thompson (History and Philosophy of Science and Technology & Ecology and Evolutionary Biol-

ogy, University of Toronto) presented a wide ranging look at the many animals that have been brought into the human economy in "Domestication in Agriculture: Origins, Perils, Prospects". "Hacking History", by William Kurkel (History, University of Western Ontario) applied a deeply populist, vastly inclusive philosophy to engage with history of science using the power of our new electronic tools.

The biography of the famous 19th-century elephant, Jumbo, was related by Ruthann Dyer (STS, York) in "Animal Biology Revealing the Relationships Between Human Pursuits". Ward's Natural History Establishment had frequent requests for a pint jar of Jumbo's rendered fat, after his tragic end, hit by a train in St. Thomas, Ontario. Kevin Siend's (History, Trent University) "Jail Fever, Class and Contagion Anxieties: or, What Happened to the Plague in the Eighteenth century?" demonstrated that typhoid fever, appearing in more than a dozen aliases, was described with distinct class bias in the pathology texts.

Finally, Stewart McCook (History, University of Guelph) dealt with "Rationalising Coffee Production: Linking Commodity History and the History of Science". How did different growing regions combat the coffee rust, the fungus that attacks the coffee plant that originated in the highlands of the Ethiopia/Kenya borderland?

The idea for the GTA STS symposium started in late 2007, when Katey Anderson (STS, York) and Marga Vicèdo (IHPST, Toronto) realised that both York's STS and Toronto's IHPST had made major advances that called for facilitation of intercommunication. They then asked, why stop there?

The first Symposium was held in May 2008 at Toronto's Victoria College, where IHPST is housed. The informal presentations in a relaxed setting allowed us to get to know each other better. In organising for 2009, Conor told me he was determined to maintain this core purpose but also to go beyond the Toronto core, to get one speaker from each of the five different GTA institutions. The 2009 emphasis of life and environmental sciences emerged despite efforts toward more balanced subject matter. Accordingly, more effort will go into including physical and mathematical sciences in 2010.

Next year, the symposium is expected to be held on Friday, May 7, at downtown Toronto's Ryerson University. Jennifer Hubbard (History, Ryerson), who's quite experienced at arranging successful STS conferences, will be organising. Hope to see you there!

David Orenstein

AGM of CSHPM/SCHPM

The Annual General Meeting of the Canadian Society for History and Philosophy of Mathematics took place at Memorial University Newfoundland, St. John's, BC, on June 6, 2009. The meeting, with approximately 20 members in attendance, was called to order at 12:41 pm by Duncan Melville, President.

Agenda for the General Meeting:

- Approval of Agenda
- Approval of Minutes of 2008 AGM
- Treasurer's Report
- Secretary's Report
- Proceedings Editor's Report
- Bulletin Editor's Report
- Webmaster's Report
- Archivist's Report
- 2010 Meeting
- Future Meetings
- Session organizers and meeting abstracts
- CMS Liaison
- Electronic voting proposal
- Nominations Committee
- Other Business

1. **Motion:** To approve the agenda. **Carried unanimously.**
2. **Motion:** To approve the minutes of the June 2008 Annual General Meeting as printed in the November 2008 *Bulletin*. **Carried unanimously.**
3. a) Nathan Sidoli sent word referring the membership to the May 2009 *Bulletin* for the Treasurer's report. b) Duncan noted that 2008 was a good year overall. While there are some hidden expenses yet to come, such as reconciling BSHM memberships, we also enjoy hidden support, such as much of the costs associated with producing the *Proceedings* and *Bulletin*. c) The travel reimbursement form is posted on the website.

4. The Secretary, Patricia Allaire, sent comparative membership data for 2008 and 2009:

	2008	**2009**
Total Members	193	182
... by Pay Method		
$Can	42	45
$US	103	95
BSHM	42	33
Complimentary	1	1
CSHPS	5	6
... by Status		
Active	159	148
Retiree	35	36
Student	6	7
Developing nation	3	4
Student Associate	0	0
... by Reciprocity		
To BSHM	51	49
To CSHPS	22	22
New Members	9	8
Journal Subscriptions		
Historia	81	79
Philosophia	42	40
Proceedings		
Paid	56	52
Complimentary	27	25
Federation	1	1
Bulletin		
Electronic	NA	104
Paper	NA	78
Donations		
No. Donors	23	29
Amount	$702	$763.50

The reciprocal memberships include complimentary memberships for the Secretary. Donations sometimes come in the form of retirees and students preferring to pay for their complimentary Proceedings. Pat also noted that "payment method " is a rough approximation of nationality. However, members from outside the US and Canada usually pay in $US.

We are doing better in the matter of reciprocal memberships with CSHPS. Delivery of their newsletter to our members has improved and, this year (unlike last year), we received a list of their members requesting reciprocal membership in CSHPM.

More than half the membership opted to receive the *Bulletin* electronically. Neither BSHM nor CSHPS queried their members about the option. Thus, those reciprocal members all received paper *Bulletins*. We should have that matter straightened out in time for the November *Bulletin* or, worst case, for the May 2010 issue. Since mailing to the UK is expensive, there will be a considerable savings for each BSHM member who opts for electronic delivery.

At the last meeting, it was agreed that we would increase the price of the Proceedings to $US 13. Pat apologized for neglecting to make the change when preparing the renewal form.

Dues payment by overseas members without access to US or Canadian dollar checking accounts continues to be a problem. Wire transfers, Western Union money orders, bank drafts, etc, are very expensive for the members. One suggestion is that we ask our Canadian bank what they charge to process a check in euros. Pat's US bank charges $30, but perhaps the Canadian banks are friendlier. If the cost is reasonable, we could either ask the member to add that surcharge to their payment or absorb the cost ourselves. Or perhaps other alternatives can be explored.

In the discussion, Maria Zack mentioned the possibility of creating a PayPal account for handling overseas membership payments via credit card. Bryon Wall said that CSHPS uses PayPal and it works well, so it would be worth it for us to look into it. Sylvia Svitak used SignMeUp.com to register for another conference. Tom Drucker suggested pushing CSHPM membership at the Joint Mathematics Meetings to help recover some of the lost American numbers. This could be done by all members through increased personal evangelism as well as with more formal advertising.

As the former, unofficial *Bulletin* Production Editor (with Rob Bradley), Pat thanked Maria Zack, who accepted the responsibility of printing and mailing the *Bulletin*, effective with the May 2009 issue. Everything went very smoothly.

Rob and Pat also expressed their regrets to the *Bulletin* editors for the stapled format of the

November 2008 issue, instead of the customary booklet. After Amy and Eisso went to a great deal of trouble to format the Bulletin in booklet form, the Adelphi printing office, which had done booklets for us in the past, suddenly became unable to do so. We were already running late so, as not to delay distribution, we settled for the stapled form rather than the more professional-looking booklet.

5. *Proceedings* Editor, Antonella Cupillari, sent word that the deadline for contributions to the 2009 volume will be September 30, 2009. Members are asked to continue to follow the guidelines for authors posted on the Society's website. Bilingual abstracts are strongly encouraged. Submissions should mirror both the content and the length of the talk presented at the annual meeting. Antonella uses gentle needling to enforce this requirement.

   Greg Lavers asked about the possibility of electronic publishing. Duncan noted that this is difficult because each author retains copyright. Maria suggested that the *Proceedings* could be burned to a CD rather than printed and bound. Roger Godard wondered whether libraries would appreciate receiving a disc rather than a paper volume, while David Orenstein raised the archival implications of not printing out at least one copy of the *Proceedings*.

6. a) Amy Ackerberg-Hastings, *Bulletin* Content Editor, reported that things are going well overall. Pat Allaire and Mike Molinsky ensured a smooth transition to the electronic option for the *Bulletin*. Eisso Atzema, as Layout Editor, and Maria Zack, as our new designated Production Editor, are doing a great job. Maria's institution is also providing financial support for the *Bulletin*'s production costs. b) The November 2008 issue was late because the Content Editor (Amy) fell behind. c) Amy solicited member feedback on efforts to broaden and deepen the content of our newsletter. Since producing the paper form of the *Bulletin* in booklet form entails additional effort and monetary costs (approximately $100), she also asked whether the booklet-style physical form is as important to members as it is to her. Tom Drucker voiced support for informal articles, such as his memorial of Mike Mahoney, while David asked members to contribute more reports of meetings they have attended.

7. a) The Webmaster, Mike Molinsky, noted that the main change in the website's content this year was the addition of a page for graduate programs in history of mathematics. He solicited information on other opportunities for advanced study. b) A redesign of the site is in process. Several members have had difficulty accessing the *Bulletin* because the page is set up with frames, so Mike is getting rid of the frames. c) Mike can publish announcements and such to the Web site as soon as they are received. Additional new ideas are always welcome.

8. a) As Archivist, Mike Molinsky reported that he is saving electronic and paper versions of every Society document. b) He thanked John Earle for providing abstracts and programs for the joint meetings with BSHM at Oxford and Cambridge. Abstracts are still needed for the 2005 joint meeting with CMS at Waterloo. c) Mike is in the process of creating a searchable directory of titles, authors, and abstracts for papers in the *Proceedings*. This will replace the PDF files of tables of contents.

9. In 2010, we will be meeting with the Congress (Learneds) at Concordia University in Montréal. Our dates were not set at the time of the meeting, but they are now known to be Saturday, May 29, to Monday, May 31. We will try to continue our practice of having at least one day of overlap with CSHPS and will seek out overlapping or joint sessions with other societies that have similarities with ours, such as CSHM and CSTHA. Greg Lavers volunteered to serve as local organizer.

   The special session topic of Mathematics and the Liberal Arts was approved, with Hardy Grant as May speaker. Sylvia Svitak will organize the special session, and Pat Allaire has volunteered to organize the general session.

10. In 2011, we will have a joint meeting with BSHM at Trinity College in Dublin, July 15-17. Adrian Rice will serve as liaison with BSHM. Proposals/suggestions for short special sessions are welcomed.

    Congress will be held in New Brunswick in 2011, so travel expenses would not necessarily be cheaper for our members. We also agreed to meet with

BSHM at Trinity shortly after the last joint meeting, in Montréal in 2007.

11. For future meetings, the Council recommended that in 2012 we meet with Congress at Waterloo with a special session on Mathematics and Computer Science.

    Roger Godard proposed allowing the Executive Council to schedule joint meetings such that repeated visits to the same location and excessive travel distances are minimized. Duncan noted that he would prefer to avoid being rigid about scheduling.

    Several members noted that they enjoy seeing our discipline from a non-mathematical point of view by meeting with Congress and that registration fees for CMS are expensive compared to those of Congress. We have met with CMS in 2000, 2005, and 2009. One logistical challenge is that we have to agree to joint meetings with CMS several years in advance, before they have chosen a meeting location.

    Gregg DeYoung suggested posting future meeting dates on the Web site.

12. 2009 general session organizer, Tom Drucker, reported that CSHPM has accepted roughly 98% of the abstracts submitted for meetings over the years. When there have been more papers than slots on the program, we have resorted to parallel sessions, although that approach tends to have the effect of balkanizing the philosophy papers. Occasionally, a completely inappropriate abstract is submitted. It would be helpful to organizers to be able to submit these abstracts to the judgment of an anonymous referee. Indeed, such an approach has been happening informally for some years. The Council is proposing that this unwritten policy be formalized. The aim is to give future organizers backup without being too prescriptive. The Society would continue to encourage participation by students and others new to the field.

    David Orenstein and Jim Tattersall spoke in favor of the policy, with Jim noting that our tradition of allowing every member the right to present a paper has already evolved toward allowing every member the right to present a proposal to speak.

    The following resolution was thus presented to the membership: "The organizer for a session is entitled to accept abstracts that are satisfactory with regard to scholarly merit, relevance to the Society, and (if it is a special session) the topic of the session. The organizer is entitled to reject abstracts that do not meet these criteria. If the organizer is in doubt about the merit of a submitted abstract, he may turn to a referee with competence in the area of the abstract for guidance. Abstracts may be rejected if there is not sufficient space on the program according to the judgment of the organizer." **Approved.**

13. For several years, Tom Archibald has informally served as CSHPM's representative for organizing history of mathematics sessions at the CMS Winter Meeting. He also recruits speakers for those sessions. He suggested to the Council that this position be regularized, to ensure that this relationship with CMS continues beyond Tom's tenure. **Approved**, with Tom Archibald the first volunteer to hold the position of CMS Liaison.

    Fred Rickey asked whether Tom would welcome volunteer speakers in these sessions so that the sessions grow. Since Tom was unable to attend the AGM due to a scheduling conflict with the CMS AGM, members decided to leave the decision up to him.

14. The amendment on electronic voting, prepared by Robert Thomas and disseminated in the November 2008 *Bulletin*, was **approved unanimously.**

15. We next hold Council elections in 2010. Nathan Sidoli is definitely stepping down as treasurer. He has accepted a tenure-track job in Japan, and logistically it is very difficult to operate a Canadian bank account from East Asia. Tom Drucker, Rob Bradley, and Greg Lavers volunteered to serve on the Nominating Committee.

16. David Orenstein is writing his paper for the 2010 meeting on implementing history of mathematics in his class, in his school, and in his school district. He asked members to send him their ideas and experiences with formulating political strategies in their institutions. Charlotte Simmons and Tom Drucker said that the HOMSIGMAA and POMSIGMAA newsletters would be happy to publicize our news and activities if we send in our announcements.

17. Duncan extended thanks to the meeting organizers, the Council, and those holding the Society's

various volunteer positions.

The meeting was adjourned at 1:39 pm.

Amy Ackerberg-Hastings, For the Secretary

Joint AMS/MAA Meetings in San Francisco

A number of events in history and philosophy of mathematics have been planned for the Joint Mathematics Meetings, to be held in San Francisco, California, January 13–16, 2010. More information can be found on the MAA or AMS websites: www.maa.org or www.ams.org.

- Monday, 11 January, 9:00–16:30, and Tuesday, 12 January, 9:00–17:00: MAA Short Course on "Exploring the Great Books of Mathematics," organized by Amy Shell-Gellasch and Glen Van Brummelen. (NOTE: You must preregister for this course.)
- Wednesday, 13 January, 8:55–10:55 and 14:15–16:30: MAA Session on "Mathematical Texts: Famous, Infamous, and Influential," organized by Fernando Q. Gouvêa and Amy Shell-Gellasch.
- Wednesday, 13 January, 14:15–16:15, and Friday, 15 January, 14:15–16:15: MAA Minicourse on "The Mathematics of Islam and Its Use in the Teaching of Mathematics," organized by Victor J. Katz. (NOTE: You must preregister for this course.)
- Wednesday, 13 January, 14:15–16:15, and Friday, 15 January, 14:15–16:15: MAA Minicourse on "Learning Discrete Mathematics Via Historical Projects," organized by Jerry M. Lodder, Guram Bezhanishvili, and David Pengelley. (NOTE: You must preregister for this course.)
- Wednesday, 13 January, 15:00–15:10: "Uncovering Buffon's *Essai d'Arithmetique Morale*," by Dominic W. Klyve and Anna Lauren, during 3rd MAA General Contributed Papers Session. See also the series of papers in the 8th session on Friday, 15 January, 15:00–16:40.
- Wednesday, 13 January, 17:30–19:30: HOM SIGMAA Business Meeting, Reception, and Guest Lecture by Reviel Netz.
- Thursday, 14 January, 9:00–9:50: MAA Invited Address, "Reasonable Effectiveness: Trigonometry, Ancient Astronomy, and the Birth of Applied Mathematics," by Glen Van Brummelen.
- Thursday, 14 January, 10:00–10:25: "Ramanujan Reaches His Hand from His Grave to Snatch Your Theorems From You," by Bruce C. Berndt, during MAA Invited Paper Session on Gems of Number Theory.
- Thursday, 14 January, 15:00–15:15: "A New Course for Liberal Arts Math: The Mathematics of Calendars and Timekeeping," by Daniel E. Otero, during 2nd MAA Session on Mathematics Courses for the Liberal Arts Students.
- Friday, 15 January, 8:00–10:40: AMS Session on History of Mathematics.
- Friday, 15 January, 13:00–18:20, and Saturday, 16 January, 8:00–10:50 and 13:00–15:50: AMS-MAA Special Session on History of Mathematics, organized by Craig Fraser, Deborah Kent, and Sloan Despeaux.
- Friday, 15 January, 13:00–16:45: MAA Session on Philosophy of Mathematics for Working Mathematicians, organized by Bonnie Gold and Carl Behrens.
- Friday, 15 January, 17:15–19:00: POM SIGMAA Business Meeting, Reception, and Guest Lecture by Charles Chihara.

Janet Beery & Amy Shell-Gellasch

May Medals Awarded

In 1989, the International Commission for the History of Mathematics first awarded the Kenneth O. May Prize in the History of Mathematics. This award honors the memory of Kenneth O. May, mathematician and historian of mathematics, who was instrumental in creating a unified international community of historians of mathematics through his tireless efforts in founding in 1971 the International Commission for the History of Mathematics and in 1974 the ICHM's journal, *Historia Mathematica*. Ken May was also the founder of the CSHPM/SCHPM in 1974. The Kenneth O. May Prize subsequently has been awarded every four years to the historian or historians of mathematics whose work exemplifies the high scholarly standards and intellectual contributions to the field that

May worked so hard to achieve. The prize includes a medal cast in bronze and designed by the Canadian sculptor, Salius Jaskus.

Figure 1: May Medal

The two winners of the 2009 Kenneth O. May Prizes and Medals are, in alphabetical order, Ivor Grattan-Guinness (United Kingdom) and Radha Charan Gupta (India). The prizes were presented on July 31, 2009 at the International Congress for the History of Science and Technology in Budapest, Hungary, by incoming ICHM chair, Craig Fraser. Unfortunately, Prof. Gupta was unable to attend.

Figure 2: Ivor Grattan-Guinness receiving the May Medal from Craig Fraser

Prof. Grattan-Guinness has carried out extensive research on the mathematical sciences in diverse national contexts. He has made important contributions to the history of analysis, set theory and logic. A gifted organizer and editor, Prof. Grattan-Guinness mobilized and oversaw the contributions of hundreds of scholars to reference works in the history of mathematics. These, and his many other, contributions to the field of the history of science have been recognized by his election as *membre effectif* of the Académie international d'histoire des sciences.

Since the late 1960s, Prof. Gupta's research work has focused on the history of mathematics in India, particularly the development of trigonometry. Besides analyzing many mathematical formulas in elliptical Sanskrit verses, Prof. Gupta has published several ground-breaking papers on the mathematical discoveries of the Jaina tradition. His pedagogical publications and lectures in English and Hindi, as well as his sponsorship of numerous endowed lectures, have greatly increased the prominence of history of mathematics in Indian mathematics education and scholarship.

Craig Fraser

XXIII ICHST

Every four years the Division of the History of Science and Technology of the International Union of the History and Philosophy of Science has an international congress. The ICHM (International Commission on the History of Mathematics), though it is a joint commission with IUHPS and the International Mathematics Union, meets with the former group. The twenty-third International Congress of History of Science and Technology was held in Budapest, 28 July to 2 August 2009.

This meeting was particularly rich in history of mathematics, and CSHPM members played a large role in this. Our past president, Alexander Jones of NYU's Institute for the Study of the Ancient World, gave a plenary talk on the *Antikythera* mechanism. Congress symposia are organized specially for the meeting and are accepted by a scientific committee. These involve from 8 to 20 half-hour talks, so each of them is like a mini-conference. Several were organized by our members, or had representation from them. In particular we can note the following, which is doubtlessly not an exhaustive list:

"Status in Mathematics: In Particular the Role of Applications in the First World War," organized by Jeremy Gray and Reinhard Siegmund-Schultze, included papers by June Barrow-Green (Open University), David Aubin (Paris VI), and Deborah Kent (Hillsdale); the first on British Mathematics in WWI, the last two on ballistics in France and the US in particular.

"Mathematical Analysis from the Eighteenth to the Nineteenth Centuries," was organized by Craig Fraser (Toronto) and Michiyo Nakane (Japan), who both presented papers in the session. Craig spoke on Euler's ideas about the use of complex variables, while Michiyo gave a discussion of the place of pathological functions in Weierstrass's work. Adrian Rice (Randolph Macon) spoke on British work on elliptic functions, and Laura Turner (Aarhus) discussed the mathematical mission of G. Mittag-Leffler and its influence on his students.

"Islamic Science in Context," organized by Jamil Ragep (McGill) and Mercè Comes Mayo, included a paper by Glen van Brummelen on Al-Samawa'al and the 480-degree circle.

"Interactions between Mathematics and the Natural Sciences: Scientific Realities and Social Representations, 1750-1950," organized by Tom Archibald (Simon Fraser) and Christian Gilain (Paris VI), included a paper by Tom.

"History of Numerical Tables—the second meeting on History of Mathematics along the Silk Road" included a paper by Nathan Sidoli (Waseda) on "The Function of Numerical Tables in Ptolemy's *Almagest*."

"Introduction of Modern Mathematics in Iberoamerica" included among its organizers our longtime member Alejandro Garciadiego, who spoke on the translation of Kurt Grelling's theory of sets into Spanish.

"The *Antikythera* Mechanism and its Place in the History of Science, Technology, and Ideas" was organized by Alex Jones and Yanis Bitsakis, and Daryn Lehoux (Queen's, Kingston) presented a paper on the parapegmata of this object. Alex also presented a paper in a symposium on "Ancient and Medieval Astronomy in Socio-Cultural Context," about Greek and Babylonian antecedents to Ptolemy's tables.

"Working with Pages and Texts" included a presentation by Gregg de Young (American University of Cairo) on "Texts and Diagrams in Medieval Islamic Discussions of Archimedean Solids."

"Mathematical Discoveries and Demonstrations East and West" included a paper by Nobuo Miura (Kobe) on comparative studies in this field in the eighteenth century.

And, besides the symposia on special topics, the regular sessions saw Robin Wilson speak on Gresham College.

If all of this were not sufficient evidence of the breadth of participation and interests of the members of our society, we add that Craig Fraser is now the President of the ICHM, and he presided over the open meeting of that group. As you will read elsewhere in this *Bulletin*, the May Medals were presented.

Despite a grueling 9 hour a day schedule, it was necessary to make choices due to many parallel sessions. The organizers are to be congratulated for making it possible in many cases for people with well-defined interests in one period or area to attend many talks that were of interest. This reviewer was pleased in particular by two things. One was the high level of the talks, many of which reflected substantial new research based on strong empirical content and reflecting a good contact with the literature and thoughtful method. The other was a very strong participation by newer scholars, both recent PhDs and current graduate students. This was evident in many sessions, including those named above, but also in a fine session on "Practices, Views, and Networks in 19th and 20th Century Mathematics," organized by Frédéric Brechenmacher (Lens, France) and Laura Rodriguez (Leipzig).

The next meeting is slated for Manchester, UK, in 2013.

Tom Archibald

Web Review:

Resources at the Cornell University Library

Cornell University boasts one of the largest academic research libraries in the United States. This article

will review some of the resources in the history and philosophy of mathematics provided by the Cornell University Library website.

Historical Math Monographs[3]

In the May 2000 issue of the *Bulletin*, Rob Bradley wrote an excellent review of the prototype website for this collection, which was then being called the Math Book Collection. At that time, although the collection could be browsed by either author or title, there was no ability to search by author, title or keyword. Those search options are now all available. Individual pages can be displayed as image files (in GIF format), as PDF files, or as unformatted plain text.

This digital collection contains 576 mathematics books. As Rob Bradley noted in his review, the majority of the books were published sometime between 1880 and 1920, with a smaller number of texts from earlier parts of the nineteenth century. Another change from 2000 is that now each digital text comes with a link to a corresponding print version available for purchase on Amazon.com.

Collected Works of Mathematicians[4]

This bibliography of published collections of mathematicians' works and correspondence was created and is still maintained by Steven Rockey, the Mathematics Librarian at Cornell University. The bibliography, which was started over thirty years ago, was first posted on the Cornell University Library website in 1996.

The bibliography contains no search options, but it does not really need them, since the works are clearly organized by the mathematicians' last names. In addition to standard bibliographic information (author, title, publisher, city of publication, publication date), the library building and Library of Congress classification number are provided for those books which are in the Cornell collection.

arXiv.org e-Print archive[5]

Originally created in 1991 at the Los Alamos National Laboratories as the LANL preprint archive, this collection is now hosted by the Cornell University Library. The archive contains electronic preprints of papers in all fields of mathematics and statistics, as well as other subjects such as computer science and physics.

Only a small proportion of the more than 500,000 digital manuscripts in the archive involve either the history or philosophy of mathematics, and even with the available search engine, finding them can be a bit of a chore. The following is a small selection of titles and authors of preprints that can be found in the archive:

- "The Golden Age of Statistical Graphs," by Michael Friendly
- "History of the formulas and algorithms for π," by Jesús Guillera Goyanes
- "The Epic Story of Maximum Likelihood," by Stephen M. Stigler
- "Letters from William Burnside to Robert Fricke: Automorphic Functions, and the Emergence of the Burnside Problem," by Clemens Adelmann and Eberhard H.-A. Gerbracht
- "Aryabhata's Root Extraction Methods," by Abhishek Parakh
- "In whose mind is Mathematics an 'a priori cognition'?" by Massimiliano Berti, Antoine Suarez, and Rocco Tarchini

Mike Molinsky

Hugh MacColl Centenary Conference

On the occasion of the centenary of the death of the mathematician, philosopher and novelist Hugh MacColl (1837–1909), a commemorative meeting was held 9–10 October 2009 in Boulogne-sur-Mer (France). MacColl was born in Scotland, where he was raised and educated. He was the brother of the well-known religious controversialist, Malcolm MacColl (1831–1907). After a few years working in different areas of Great Britain, in 1865 MacColl moved to Boulogne-sur-Mer, where he developed the greater part of his work. The town was a leading sea-side city, which attracted an important British community. Thanks to its ideal position between London and Paris, it also

[3]See digital.library.cornell.edu/m/math/

[4]See astech.library.cornell.edu/ast/math/additional/Collected-Works-of-Mathematicians.cfm

[5]See arxiv.org/

developed a rich cultural life. Charles Dickens, for instance, resided there.

In Boulogne-sur-Mer, MacColl worked as a teacher. He obtained his BA in mathematics from London University in 1876. In the following years, he talked regularly at the London Mathematical Society meetings. He published his first paper, on symbolical reasoning, in the journal *Mind* in 1880. From 1884, MacColl devoted much of his time to literature and published two novels: *Mr. Stranger's Sealed Packet* (1889) and *Ednor Whitlock* (1891). One has to wait until 1896 to see him working again in the field of logic. He eventually published his theory in *Symbolic Logic and its Applications* (1906). In the last years of his life, MacColl published several papers on mathematics and religion, collecting some of his thoughts in *Man's Origin, Destiny and Duty* (1909).

Hugh MacColl was known by his contemporaries as the man who introduced several innovations to logic, notably the propositional calculus and the symbolic treatment of modalities, which opened the way to pluralism in modern logic. Unfortunately however, MacColl's innovations were not immediately adopted, and several of his contributions were attributed to others who reintroduced them later. The meeting's aim was to rediscover MacColl's works and to discuss their scientific and historical importance. For this purpose, the participants depicted the state of current research on MacColl's work within its historical context, both within the Boulogne social life and within the international mathematical and philosophical scene.

Speakers included: Stein H. Olsen (Bergen, Norway), "MacColl: A Victorian Intellectual?"; Francine F. Abeles (Kean) and Amirouche Moktefi (Strasbourg & Nancy), "Hugh MacColl on Reading Louis Carroll"; James Tattersall (Providence), "Hugh MacColl's Contributions to *The Educational Times*"; Jean-Marie Chevalier (Paris-Est & Institut Jean Nicod), "Some Philosophical Reasons for Propositional Logic (MacColl, Peirce, et al.)"; Ivor Grattan-Guinness (Middlesex), "Russell and MacColl on 'Implication"'; Fabien Schang (Nancy), "MacColl's Modes of Modalities"; Shahid Rahman (Lille), "Hugh MacColl's Ontological Domains"; and John Woods (Vancouver & King's, UK), "MacColl's Pluralism". Participants also enjoyed a tour of Boulogne-sur-Mer. BSHM was one of the sponsoring organisations of the conference.

Amirouche Moktefi

Convergence Update

Convergence: Where Mathematics, History, and Teaching Interact, is the Mathematical Association of America's free online journal about the history of mathematics and its use in teaching. The journal has now moved to the Mathematics Digital Library (MathDL) and its online journal, *Loci*, but it retains its foci on mathematics, history, and pedagogy. *Convergence* is aimed at teachers of mathematics at both the secondary and collegiate levels. Topics are from mathematics for grades 8–16, with special emphasis on topics from grades 8–14: algebra, combinatorics, synthetic and analytic geometry, trigonometry, probability and statistics, elementary functions, calculus, differential equations, and linear algebra.

We encourage you to visit *Convergence*,[6] to see what the journal has to offer. We especially encourage you to view the article, "Mathematical Treasures," which features digital images of mathematical objects and texts from the George Arthur Plimpton and David Eugene Smith collections at Columbia University Library. Courtesy of the Library, three images are reproduced here: a page from the first known algebra text, *Kitab al-jabr wa l'muqabala*, on which Muhammad ibn Musa al-Khwarizmi (c. 825) solves a certain type of quadratic equation by completing the square; a page from a 1650 manuscript copy of the *Lilavati* on which Bhaskara II (1114–1185) presents a problem about an encounter between a peacock and a snake; and Luca Pacioli's (1445-1509) presentation of a stellated dodecahedron in *De Divina Proportione* (1509).

At the *Convergence* homepage, you'll also find links to:

- Problems from Another Time.
- On This Day in mathematics history.
- Calendar of upcoming mathematics history events.
- Reviews of books, websites, and other instructional materials.
- Our newest articles and classroom activities, along with Tables of Contents for all six volumes (2004–2009) of *Convergence*.

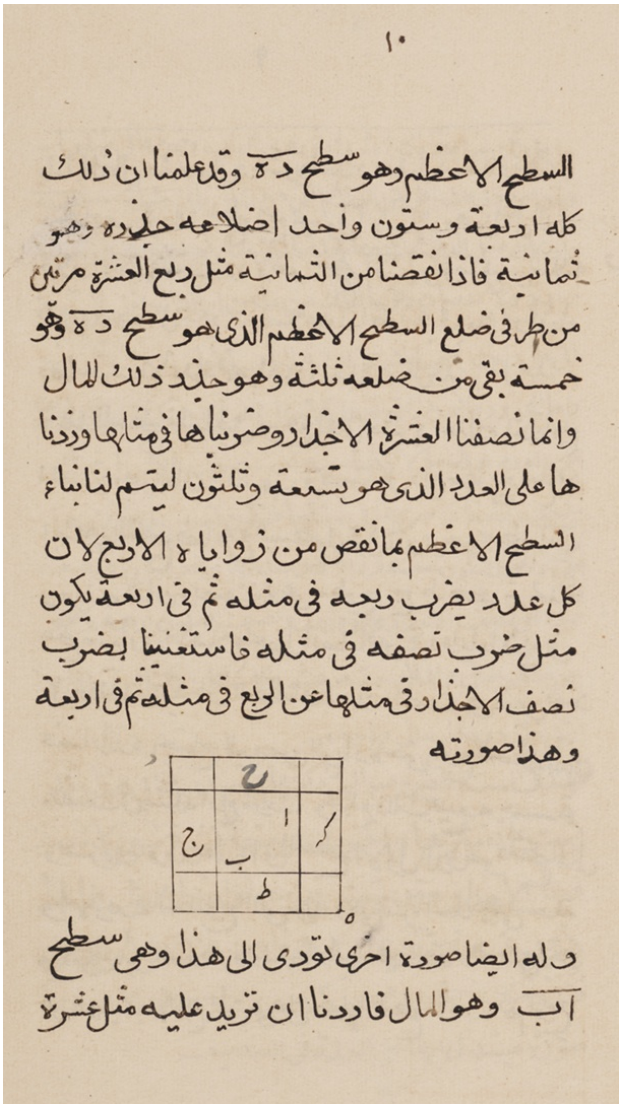

Figure 3: al-Khwarizmi, *Kitab al-jabr wa l'muqabala*

We invite you not only to read *Convergence* and use it in your classes, but also to submit for publication articles of the following types. For further details, please read "Guidelines for *Convergence* Authors" at the *Convergence* homepage.

- Expository articles on the history of topics in the grades 8–16 mathematics curriculum.
- Translations of original sources appropriate for grades 8–16.
- Classroom activities, projects, or modules for grades 8–16.
- Classroom testimonials describing your experiences using a particular teaching aid, article, book, or website.
- Reviews of books, articles, teaching aids, and websites.
- Announcements of conferences and events for our Calendar.

[6]See http://mathdl.maa.org.

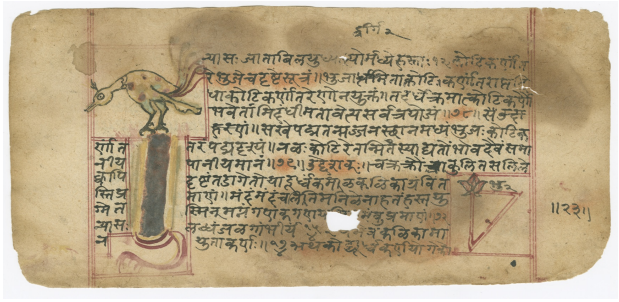

Figure 4: Bhaskara II, *Lilivati*

Finally, if you would be willing to serve as a referee for articles submitted to *Convergence*, please let one of the editors know what topics and types of articles you would prefer to review.

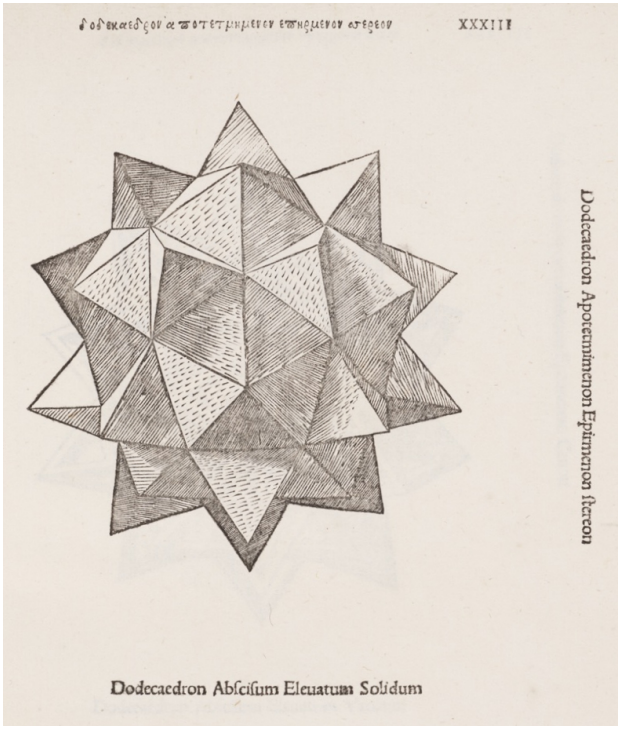

Figure 5: Luca Pacioli, *De Divina Proportione*

Convergence founding editors Victor Katz and Frank Swetz continue to serve the journal as advisors, as project directors for its NSF grant, and as authors of the ongoing "Mathematical Treasures" project. The

journal's current editors are Janet Beery[7] of the University of Redlands and Kathy Clark[8] of Florida State University.

Janet Beery & Kathy Clark

Quotations in Context

> I must study politics and war that my sons may have liberty to study mathematics and philosophy. My sons ought to study mathematics and philosophy, geography, natural history, naval architecture, navigation, commerce and agriculture in order to give their children a right to study painting, poetry, music, architecture, statuary, tapestry, and porcelain. –John Adams

In 1780, John Adams returned to Paris as the new minister empowered by the Continental Congress to negotiate treaties concerning both peace and trade with Great Britain. Since such negotiations would not take place for several years, Adams found himself somewhat at loose ends immediately after his arrival. Among other things, he spent some of his time in seeing the sights of Paris. Unlike his previous mission, when he had arrived in France unable to speak the language and had lived on the outskirts of Paris with Benjamin Franklin, Adams was now residing in the center of Paris at the Hôtel de Valois, close to the Palais Royal and Tuileries gardens.

Over the course of the spring, Adams sent dozens of letters back to his wife Abigail, who had remained in Braintree, Massachusetts. In a letter posted on May 12, he described some of his explorations:

> To take a walk in the gardens of the palace of the Tuileries, and describe the statues there, all in marble, in which the ancient divinities and heroes are represented with exquisite art, would be a very pleasant amusement, and instructive entertainment, improving in history, mythology, poetry, as well as in statuary. Another walk in the gardens of Versailles would be useful and agreeable.

However, not surprisingly given Adams's temperament, he would have greatly preferred to be spending his time on more important and productive tasks:

> But to observe these objects with taste and describe them so as to be understood, would require more time and thought than I can possibly spare. It is not indeed the fine arts which our country requires. The useful, the mechanic arts, are those which we have occasion for in a young country, as yet simple and not far advanced in luxury, although perhaps much too far for her age and character. I could fill volumes with descriptions of temples and palaces, paintings, sculptures, tapestry, porcelains, etc. – if I could have time. But I could not do this without neglecting my duty. The science of government it is my duty to study, more than all other sciences: the art of legislation and administration and negotiation, ought to take place, indeed to exclude in a manner all other arts.

It is at this point that the subject quotation of this column appears. Interestingly, the letter shows that the reference to mathematics was not part of his initial draft of the statement. In the letter, the first sentence of the quotation originally began, "I must study politics and war that my sons may have liberty to study painting and poetry." However, Adams drew a line through "painting and poetry" and replaced it with the familiar "mathematics and philosophy" instead.

The complete contents of this letter can be found in the Adams Family Papers electronic archive.[9] In addition to the correspondence between John and Abigail Adams, the archive also contains Adams's (incomplete) autobiography as well as parts of his journals.

Mike Molinsky

Iceland Conference

On June 21-23, 2009, Kristín Bjarnadóttir (Iceland), Gert Schubring (Bielefeld), and Fulvia Furinghetti (Genova) organized a conference on "on-going research in the history of mathematics education" in

[7] janet_beery@redlands.edu
[8] kclark@fsu.edu

[9] See www.masshist.org/digitaladams/aea/

Garþabær, Iceland. They invited a number of familiar faces from the International Commission on Mathematical Instruction and me. While ICMI and ICME were new acronyms for me and I still cannot promise to explain them correctly, I really enjoyed getting to know these folks and the numerous Icelanders that Kristín got involved in the meeting.

We had three full days of talks in the school at which Kristín used to teach. Hans Christian Hansen described mathematics education in Denmark in the twentieth century, while Man Keung SIU (Hong Kong) gave an even broader overview for East Asia. For the case of Westphalia, Gert Schubring asked, "How to Relate Regional History to General Patterns of History?" José Manuel Matos (Nova de Lisboa) looked at the reception of modern math in Portuguese classrooms, and Harm Jan Smid (Leiden) considered "Foreign Influences on Dutch Mathematics Education" in the nineteenth and twentieth centuries. Jason Kastanis and Nikos Kastanis (Aristotle U. of Thessaloniki) named several histories of mathematics education and wondered whether these works reflected a "cognitive" approach to historiography.

Bernard Hodgson (Laval), Livia Giacardi (Torino), and Fulvia Furinghetti discussed various aspects of the history of ICMI and its journal, *L'Enseignement Mathématique*. I reported on "John Playfair in the Natural Philosophy Classroom," while Kristín Bjarnadóttir presented the educational activities of Björn Gunnlaugsson (1788–1876). Gert read Wagner Rodrigues Valente's (Sao Paulo) paper on "History of Mathematics Education in Training Teachers of Mathematics: Considering Its Potentialities." Þorsteinn Vilhjálmsson (Iceland) explained how the medieval Norse navigated by measuring solar noon altitude.

Marta Menghini (Sapienza U. of Rome) spoke about "The Teaching of Intuitive Geometry in Early 1900s Italian Middle Schools: Programs, Mathematicians' Views and Praxis." Pauline Romera-Lebret (Nantes) reviewed treatments of the geometry of the triangle in American and European textbooks between 1888 and 1952. Johan Prytz (Uppsala) summarized the prosopography of people who debated geometry instruction at the lower secondary level in Sweden, 1920–1960, which appeared in his dissertation. Eileen Donoghue (Staten Island, CUNY) argued that the twentieth-century New York State Regents Algebra Examinations provide insights into the curriculum. Jeremy Kilpatrick (Georgia) examined "The Social Efficiency Movement in the United States and Its Effects on School Mathematics."

Figure 6: Iceland Conference participants

As you can see in the accompanying photograph (taken by Guþný Helga Gunnarsdóttir), many participants seized the opportunity to bring their families to the Reykjavik area, including my spouse, Nelson, and infant, Peter. We had opportunities to see Iceland's unique beauties on our own, but Kristín also planned a packed social calendar for us. We saw a house museum of a typical farm family and enjoyed dinner with the mayor of Garþabær; toured a new geothermal plant and tramped about Þingvellir; and exchanged toasts with the President of Iceland at his official residence, Bessastaþir, the former Latin School building. A proceedings volume for the conference is in process, and a next meeting is planned for Portugal in 2011. The organizers are also forming a working group to continue research into the history of mathematics education; contact Kristín, krisbj@hi.is.

Amy Ackerberg-Hastings

Book Review: Medieval Italian Practical Mathematics

Jacopo da Firenze's *Tractatus Algorismi and Early Italian Abbacus Culture*, by Jens Høyrup (Basel: Birkhäuser, 2007), 482 pp. ISBN: 978-7643-8390-9.

US$139.[10]

Introduction to abbacus mathematics

The Italian vernacular texts on practical mathematics, flanked in time by Fibonacci's *Liber Abaci*(1228) and Luca Pacioli's *Summa de Arithmetica* (1494), have traditionally elicited little interest from historians. These abbacus[11] books appeared for the most part to be abridgements of Fibonacci's opus, with no interesting developments to speak of. Fortunately this picture has changed, thanks mainly to the numerous editions and commentaries by Italian historians in the past few decades. For the history of algebra, these *libri d'abbaco* show that the search for solutions to cubic and quartic equations in Christian Europe did not begin with Pacioli, but extends back at least to the first part of the 14th c.

Abbacus books were ostensibly written in connection with the abbacus schools of central and northern Italy, where for two years or so the children of merchants and the nobility learned basic mathematics. The books contain instruction in arithmetic with Hindu-Arabic numerals, usually accompanied with worked-out problems ("ragioni"). Many of these problems are posed as mercantile questions, and they are solved by a number of methods, including the rule of three, false position, and algebra. Some books also cover mensuration.

Jens Høyrup (hereafter H.) now gives us an edition, translation, and commentary of an early treatise: the 1307 *Tractatus Algorismi* (*Algorithm Treatise*), composed in Montpellier by one Jacopo da Firenze. H.'s book is divided into two parts, roughly equal in size. The first part, "Jacopo, his treatise, and abbacus culture", is H.'s commentary. The second part, "The Vatican manuscript edition and translation", is followed with an appendix, "The revised version, Milan and Florence", containing a combined edition of the two other manuscripts.

[10]Editor's note: Jeff Oaks, of the University of Indianapolis, details this book's claims and his criticisms in an expanded version of this review. That version may be found on the Society website, www.cshpm.org.

[11]The Italian word ABBACO/ABACO refers to calculation, and not to the comparatively recent eastern calculating instrument.

Manuscripts, edition, and translation

H. names the three extant manuscripts **F** (Florence, Biblioteca Riccardiana 2236), **M** (Milan, Trivulziana 90, dated by watermarks to ca. 1410), and **V** (Vatican, Biblioteca Apostolica Vaticana Lat. 4826, dated by watermarks to ca. 1450). H.'s edition and translation are based on the Vatican manuscript, which he divides into 22 chapters (p. 10). Of those, Chapters 16 to 19 and 22 are not found in **F** or **M**. Chapters 16 and 17 are of particular importance because they cover algebra.

Chapters 1 through 10 explain basic arithmetic: how to operate with whole numbers and fractions expressed with Arabic numerals. Chapters 11 to 15 cover the rule of three, interest calculations, problems involving units of measurement, and mercantile, "recreational", and geometry problems. Chapter 16 gives the rules for solving the six simplified equations of degrees 1 and 2 together with several worked-out problems.[12] Chapter 17 gives the rules for solving reducible third and fourth degree equations. H. puts the next problem, about mixing grains, in Chapter 18 by itself, since it does not fit with the contents around it. Chapter 19 gives problems whose solutions seem to be generalized from the rules given in Chapter 16. Chapters 20 and 21 cover the fineness of coins and alloying problems. Last is Chapter 22, offering more mixed problems of the same kind as Chapters 14 and 15.

The pages of the edition/translation are divided into two columns. The Italian text is on the left, and the English translation on the right. This makes cross-referencing easy. By giving a very literal translation of **V**, H. succeeds in conveying the linguistic, social, and pedagogical dressing that make the abbacus text what it is. His translation may take some getting used to, but it is worth the effort.

Høyrup's two main claims

Prior to H.'s work in Italian mathematics, historians were comfortable with the assessment of Louis Karpinsky and Warren van Egmond that the chapters on algebra in **V** were a later addition, and that Paolo

[12]In modern notation, the six equations are $ax = b$, $ax^2 = b$, $ax^2 = bx$, $ax^2 + bx = c$, $ax^2 + c = bx$, and $ax^2 = bx + c$.

Gherardi's 1328 *Libro di Ragioni* (*Book of Problems*) contains the oldest extant treatment of algebra in Italian. Further, historians were in agreement that, by and large, abbacus books are abridgements and adaptations of Fibonacci's massive *Liber Abaci*. In the first half of the book and in previously published articles[13] H. argues instead that (1) the extra Chapters 16-19 and 22 of **V** were part of Jacopo's original 1307 treatise, and (2) that early abbacus books drew their material from some other line of transmission from the Islamic world.

I devote the rest of this review to H.'s arguments. Briefly, to show (1), H. relies on a flawed analysis of word choice and orthography and an application of circular reasoning. There is no reason, then, to suppose that Jacopo's book originally contained the algebra in **V**. Claim (2), however, is argued well. Additionally, H. correctly claims that abbacus algebra does not derive from Arabic or Latin texts. But much of his evidence is wrong, and shows that he does not understand certain fundamentals of medieval algebra.

Claim (1): The extra chapters of V were part of Jacopo's original treatise

H. presents his arguments for (1) in the chapter "Three Manuscripts". His first step is to show that one of **V**, **F**, or **M** is a faithful copy of Jacopo's original (or at least their common archetype). He begins by comparing the spellings FACT... vs. FATT... (from FACTO, "to do, to make") in **V** and **F**. Among the 35 places where both manuscripts have the word, there are 7 instances where both have the spelling CT, 8 where both have TT, and 20 where **V** has CT and **F** has TT. There is no instance where **V** has TT and **F** CT. H. writes, "If the spellings of both manuscripts had resulted from independent variation with respect to the archetype (the scribe of **V** mostly preferring CT, the one of **F** mostly TT), the 7 FACT of **F** would have been distributed randomly over the relevant 35 FACT+ FATT of **V** (or, reciprocally, the 8 FATT of **V** randomly over the relevant 35 FACT+ FATT of **F**). In this situation the odds are around 13.2% that no FATT in **V** will correspond to FACT in **F** — namely $\frac{28!\cdot 27!}{20!\cdot 35!}$." (p. 15 n. 33)

[13]The main articles are his [2000], [2001], [2005], and [2006], which are not listed in the book's bibliography.

Because scribes DO have preferences, the spellings will NOT result from random variation. The scribe responsible for **F** would not change a TT to a CT, nor would the scribe of **V** change a CT to a TT. All we can say is that the common archetype (probably) had the 7 CTs and the 8 TTs common to **F** and **V**. We can say nothing about the original spellings of the 20 other instances of the word.

The same kind of invalid reasoning is then applied to the choices of the words PRENDERE vs. PIGLIARE, and PARTIRE IN vs. PARTIRE PER. From all this, H. draws the conclusion that one of **V**, **F**, or **M** must be close to the original regarding these choices (p. 16). But it is easy to see that the common source of the three manuscripts may have been something in between them all, and the preferences of different scribes led to the versions we now have.

From here H. makes an appeal to the uniformity of **V** to show that Jacopo is responsible for all 22 chapters of **V** (p. 24). But because he failed to show that **V** is a faithful copy of Jacopo's original for the common chapters, it makes more sense that a later scribe realigned a hybrid text to his own dialect and word preferences (such modifications are common in abbacus texts).

On the next page H. calls on evidence regarding algebra which will be provided later in the book: "As we shall see, at least the algebra [of **V**] must be dated well before Paolo Gherardi's work from 1328, which leaves very little time for insertion of extra material into the original treatise and for a thorough reworking by an independent hand. All in all, the most reasonable assumption is thus that the algebra (and the supplementary mixed problems of Chapter 22) belong to the original treatise, and that **V** as a whole reproduces all major and most minor features of Jacopo's treatise faithfully." (p. 25). But looking ahead to the chapters which discuss algebra (pp. 100-115, 147-182), we do not find the promised evidence. Instead, he treats his conclusion as already established!

The core of H.'s argument is padded with many other notes and observations, none of which give us any reason to question that the algebra in **V** was added by a later scribe to Jacopo's text.[14] In fact, in 2008, War-

[14]The argument regarding the "partnership model" is just too weak.

ren van Egmond presented a new argument that the algebra of **V** is a later intrusion. Most abbacus algebras classify and solve some collection of equations of degree higher than 2.[15] To trace textual influences, van Egmond studied the selection and the order of the higher degree equations in 91 manuscripts, which he classified into families. He notes that Chapter 17 of **V** belongs to the "Benedetto family". This family consists of eight texts, dating from ca. 1390 to ca. 1470. The earliest representative, titled *Tratato Sopra l'Arte Arismetricha* (*Treatise on the Art of Arithmetic*), gives the same list of equations we find in Chapter 17 of **V**, plus two more at the end. If Chapter 17 really dates to 1307, then this family has a very large gap in time which cannot be accounted for. Thus, Van Egmond writes that Chapter 17 "was undoubtedly added to a manuscript containing some sections copied from Jacopo's earlier work."[16]

H. is not just pushing for **V**'s Chapters 16 and 17 to be the earliest KNOWN Italian treatment of algebra. He even maintains that it was the VERY FIRST abbacus algebra ever written! "[Jacopo] was apparently the first to introduce the solution to the six fundamental cases and to (most of) those cases of the third and fourth degree that can be reduced by simple means... He also appears to have introduced the habit of applying algebra to MUÇĀMALĀT-[i.e. merchant-]problems." (p. 181-2) The only evidence I can find for this assertion is on p. 153, where he notes that the algebra in **V** "avoids all abbreviations in the technical algebraic terminology, as if the author was conscious of introducing a new field of knowledge where readers would be unfamiliar with the terminology and therefore unable to expand abbreviations correctly." (see also pp. 9, 167) Other 14th c. algebras, too, use no abbreviations. So are we to assume that their authors were also conscious of "introducing a new field of knowledge"?

Further, by way of more casual guessing based on an incorrect stemma, H. concludes that the inspiration for Italian algebra did not come from Italy or Montpellier (where both Jacopo and Paolo Gherardi wrote), but to an unknown "area ?" (p. 167). Later on he narrows down this location as "indeed one area, to be identified with, located in or encompassing the Catalan region" (p. 181). This is "the only Romance-speaking area outside Italy where the next 150 years offer any evidence of algebraic interest" which does not include the area of Montpellier. But if we stick to the FACT that Jacopo and Paolo Gherardi wrote in Montpellier, then Montpellier remains the best candidate for the environment from which early abbacists drew their material, including algebra.

Claim (2): Abbacus books are not abridgements of Fibonacci's opus

In his chapter "The Abbacus Tradition", H. presents evidence that Fibonacci's *Liber Abaci* is not the primary source for early abbacus books. He compares the contents of Fibonacci's book with the earliest extant abbacus treatise, the late 13th c. *Livero de l'Abbecho* (*Abbacus Book*). The anonymous author wrote that he compiled it "according to the opinion of master Leonardo Fibonacci" (p. 31), but H. shows that the contents betray the claim. In fact, only two of the 15 chapters of this book contain material taken from the *Liber Abaci*. H. attributes the reference to Fibonacci as possibly "an instance of embellishment" to a "culture hero" (p. 40).

H. sets aside a good portion of his book to the question of the sources of abbacus algebra. Here, too, he is correct that it does not derive from the known Latin books, nor from the Arabic originals from which translations were made. But his arguments on "Normalization", "Examples", and " JABR and MUQABALA" are completely wrong (pp. 155-158). H. has been repeating these errors in one article after another,[17] so I feel it is time to address them. I have no room left here, but I include a discussion of his arguments in the longer web version of this review.

Concluding remarks

Many readers of this review will wonder how such a prominent publication can contain so many fundamental mistakes. After all, H.'s claims have been published before in good journals. It turns out that his first paper on Jacopo ([2001]), containing the details

[15] Where solutions were given to irreducible cubic and quartic equations, they are false.

[16] [Van Egmond 2008, 313].

[17] See his [2000, 57-58; 2001, 23, 26, 27; 2001b, 113; 2006 8-12, 15-17].

of his argument that the algebra dates to 1307, never passed through a peer review. It is part of a 1999 conference proceedings which was evidently distributed only to the participants. In his *Centaurus* article of 2000 he writes "I intend to publish this evidence elsewhere",[18] and in his 2006 *Historia Mathematica* article he refers to the 2001 "publication" and says "Repetition of the details of the extensive argument would lead too far".[19] It is likely that the few peers who saw H.'s [2001] did not put in the effort to evaluate it critically.

Despite H.'s efforts to show that Jacopo was first, Paolo Gherardi's 1328 *Libro di Ragioni* remains the oldest known Italian book with algebra, and he probably learned this algebra in the environment of Montpellier. On the other hand, H. has done the field a great service by pointing out that abbacus texts are not merely vulgarized compendia of Fibonacci's *Liber Abaci*, a finding which should encourage further studies in abbacus mathematics.

Keeping in mind all its faults, H.'s book has a lot to offer about abbacus texts and their place in the broader history of mathematics. The best part is the edition and translation of **V**, which will give even the casual reader a taste of mathematics of a different kind than we learn today, one written and cultivated by trade groups for pedagogical and practical reasons, rather than by theoretical mathematicians who pursue knowledge for its own sake.

Jeffrey A. Oaks

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[18] [Høyrup 2000, 65 n. 9].
[19] [Høyrup 2006, 7 n. 5].

Two Streams in PoM Conference

A conference entitled "Two Streams in the Philosophy of Mathematics: Rival Conceptions of Mathematical Proof" was organized by Brendan Larvor and held at the University of Hertfordshire, Hatfield, UK, 1-3 July 2009.

While the conference was primarily philosophical, because of the practice-based tendency of the speakers many talks involved history, and some were overtly historical. For example, Charlotte Werndl spoke on "Justifying definitions in mathematics—Going beyond Lakatos", and the title of Ivor Grattan-Guinness's talk was "Theory building and proof in applied mathematics".

Since the topic of the conference was rival conceptions of proof, carefully drawn distinctions were another focus of many papers. For example, Yehuda Rav, one of the invited speakers, contrasted the purely algebraic approach to proof as articulated by Lagrange against the Gaussian distinction between notions and

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notations. Dirk Schlimm, in his paper "Two sides of an old coin: The debate between Pasch and Klein on the role of mathematical intuition", distinguished the formalist tendencies of Pasch from the intuitive approach of Klein. Pasch worked within his university to articulate examination standards, while investigating gaps in proofs, supplying axioms and making implicit assumptions explicit. In contrast, Klein was an international figure on the mathematical scene, organizing conferences and reforming education, all while re-imagining the character of spatial intuition and the relation between pure mathematics and the applied sciences.

Schlimm's case study was an excellent illustration of the distinction drawn in Madeline Muntersbjorn's essay ("Poincaré and the growth of mathematics") on Poincaré's view that not all mathematical minds think alike: some are more analytical while others are more intuitive. Neither kind of mind is superior to the other, for mathematical discoveries depend on the interactions that this epistemological diversity makes possible. These themes were brought up to date in the final paper, by invited speaker Michael Harris, wherein the role of "scare quotes" was considered in the process of naming mathematical referents.

According to Harris, mathematicians spend far less time concerned with the nature of proof than philosophers—but they spend more time concerned with the business of naming mathematical entities. The particular name Harris considered was "avatar", asking whether this newly christened entity was introduced merely for theatrical effect or whether mathematicians use this name to refer to an underlying theoretical realm wherein avatars—without the scare quotes—manifest. Harris hinted that perhaps philosophers tend to restrict their attention to "android mathematics" as practiced not by real people but by idealized abstract "mathematicians."

Of course, the process of studying idealizations is familiar to mathematicians, but the role idealization plays in the history and philosophy of mathematics may mark an important distinction between historians and philosophers. In any case, the conference was stimulating and memorable. (As evidence, Madeline asks us to see the host, Brendan Larvor, holding forth at dinner in the accompanying photo, while Robert Thomas is in the center at the head of the table.)

Figure 7: Two Streams in the Philosophy of Mathematics

While it is clear that proof continues to play an indispensible role in the practice of mathematics, it is also clear, in light of the papers presented, that there is far more to mathematical practice than the construction of formal proofs.

Robert Thomas and Madeline Muntersbjorn

Mathematical Ephemera

This issue's installment of the mathematically weird and incompetent is an excerpt from the notes taken by George Rennie (1791-1866) during John Playfair's course in natural philosophy at the University of Edinburgh during the 1808–1809 academic year. George was the son of the engineer John Rennie and ultimately had a successful career as a designer of machinery himself. As a student, though, his work was so sloppy as to often be incomprehensible and incomplete. Although there was a diagram to accompany the proof reprinted here, George frequently mentioned a diagram but did not actually draw it. His manuscript notebook is held by the Dibner Library at the Smithsonian's National Museum of American History. This excerpt comes from about five-sixths of the way through the course. It introduces the principles of the barometer and leads into Playfair's explanation of how to measure heights with the instrument.

The Earth is surrounded by a fluid called *air* which though not apparent is manifest in several ways. It is that invisible substance with which all animals are

surrounded. It gravitates and its pressure is very considerable. Air is absolutely necessary to the support of animal life, to combustion, &c. These however are part of its Chemical properties, whereas its Gravity, Compressibility &c are its Mechanical properties. That the air has Gravity is evident.

Exp[eriment]. If we take a tube having a piston within it, & suppose the piston to be as the bottom of the tube. If in this condition the lower end of the tube be immersed in a fluid, it will be found that upon raising the piston the water will follow it up the tube. But let the tube be ever so long the water will not rise higher than 33 Ft. & consequently the pressure of the Air is equal to that of a column of water of 33 Ft in height. The same Experiment will answer with a column of Mercury but which not be found to rise higher than 29 1/4 Inches remembering that the specific Gravity of Mercury 13.6 times than its equal bulk of Water. Therefore 29 1/4 = Pres[sure] of Air.

If the tube be 31 Inches long & filled with Mercury & if filled (the tube must be hermetically sealed at one end) and one end immersed (with the open end downwards) in a basin of Mercury then Mercury in the tube will fall to 29 1/4 & the remaining will be a vacuum, this is the most perfect of all Vacuums.

The Instrument described is called a Barometer, or measurer of the weight of the Air. There are various methods of constructing them & may be easily obtained according to the person's taste. The Barometer has now become a considerable appendage to a house not only in possession of scientific people but of considerable utility to Gentlemen Farmers &c. by whom it is used to indicate the state of the Weather.

1. In calm weather, inclined to Rain the Measure in the Barome[te]r is low
2. In good weather the Mercury is high.
3. In windy weather the Mercury falls very low, with relation to the point it blows in.
4. In calm frosty weather the Mercury stands high
5. After stormy weather the Mercury generally rises fast.

There are many other observations necessary but the rise & fall cannot always be depended upon. Thus far has be said of the Barometer where it relates to changes of density in the Atmosphere it remains to show the Method by which heights of Mountains &c are to be ascertained. The general mode is intricate but we shall therefore supply a more simple one in its place.

Prop.
As the density at B :
density of air at $C :: BE : CF$
or DQ
$BE : CF :: pB : pc$
or $BE : BK :: pB : pc$
$BE : EK :: pB : BE\,X\,BC$
$CF : FL :: pc : CE\,X\,BC$
$BE : EK :: CF : FL$
$BE : CF :: CF : DG$
$DB = \mathrm{Log}\,BE = \mathrm{Log}\,DG$
$DB = \mathrm{mLog}\,b = \mathrm{Log}\,n\beta$
$B = \mathrm{mLog}\,30 = \mathrm{Log}\,29$
$m = E/D$

The pressure of the atmosphere may be said to be the pound to the sq[ua]re Inch but as it presses equally in all direction no inconvenience upon the human body is felt. If we take away part of the pressure by some means or other, as for instance to place his hand over an open receiver of an Air Pump, upon the air contained within being withdrawn the hand will be press upon the Receiver so tight as to be at most impossible to withdraw having proved its pressure. It remains to prove its compressibility. & this experiment will show its compressibility, for if we take a bent Tube hermetically sealed at the shorter bend in which Mercury is already at the level GF. If more Mercury be poured in the tube it will condense the Air contained in the space GE & the density of the given quantity of Air is inversely as the compressing force. Thus if a certain weight compresses so much air, twice this weight will compress it a quarter of its bulk &c. & so on.

Experience has shown that the Atmosphere which surrounds the Earth is of different densities. And various experiments have authorised us to suppose that Air at all distances from the Earth is more or less dense; according as it is situated nearer to, or farther, from it, or in other words as it is pressed by a greater or lesser weight of superincumbent air. This density however, from the vast expansion of air leads only in conjectures, with respect to its height. Suppose the Air at a certain altitude be half as dense as at the surface of the Earth. Then at twice that altitude the air will be

four times as dense as on the surface & soon Having a knowledge of this last formula, leads to one more certain & more expeditious than the long laborious calculation, of the above, that is the measurement of heights by the Barometer. From the foregoing description of this instrument, we may infer that the altitude of the Mercury of a Barometer will not be so great as that in a Barometer placed on the Sea Shore. Now those altitudes being as the densities & the density of the Sea Shore being called one; we say as the height of the Barometer at the surface is to the height of the Barometer on the Mountain so is *one* to the density of the air on the top of the Mountain & finding the density thus obtained in the Table, we have the perpendicular distance between the situations of the Barometers. There is much more than this however to be done, in measuring heights, as the general method is extremely tedious, the following one by Professor Playfair may be more acceptable.

Barometer 29.555

Thermometer 33

Barometer at Top of An. Lat. 28.770

Thermometer D[itt]o—31 3/4

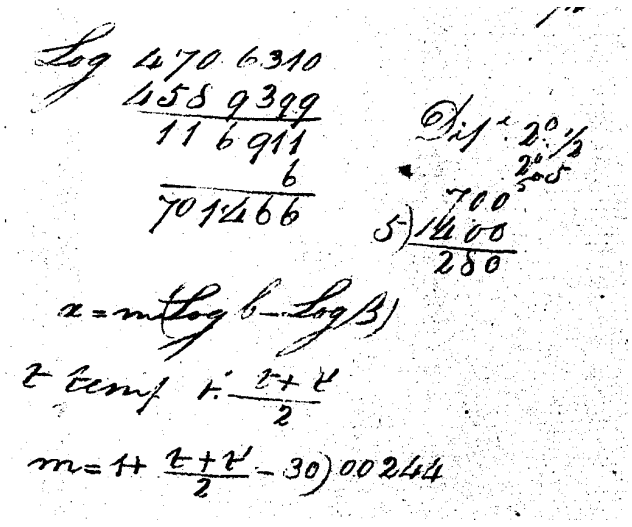

Figure 8: Rennie's calculation of Playfair's method

New Members

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

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From the Editor

This edition is packed with meeting reports and a terrific variety of other items for your reading pleasure. By all accounts, our effort to launch an electronic version for those who prefer to peruse onscreen went very successfully. Thanks to Eisso Atzema, Maria Zack, Pat Allaire, and Mike Molinsky for implementing the transition so smoothly. Tom Drucker, Hardy Grant, and I have also been discussing how to reach out to potential members, as well as to those CSHPMers who have not been active in some time. I always welcome ideas for *Bulletin* contributions I might solicit, as well as your own news, articles, and photos. The next submission deadline is April 1, 2010.

We break some new ground in this issue with two versions of our book review: a summary here, and a fully-developed essay that is posted on the CSHPM website. Thanks to Jeff Oaks for putting so much care and thought into his evaluation of Jens Høyrup's transla-

tion. In general, the *Bulletin*'s book review policy is informal. Sometimes, publishers send an unsolicited copy to one of the editors or to the Webmaster; I then look for a member with interests related to those of the book to prepare a review. Members are also encouraged to arrange for their publishers to remember the *Bulletin* when sending out copies of their books for review. Finally, members sometimes propose to review a book that they believe deserves wider attention from CSHPM members. With a few exceptions, we aim for reviews to be around 1000 words in length.

The Call for Papers is included inside this issue. Our Secretary, Pat Allaire, will also be distributing the 2010 membership letter and renewal form, whether you receive the *Bulletin* in paper or electronic form. Remember that the Nomination Committee is hard at work, looking for Council candidates before elections at the next Annual General Meeting. We will gather as part of the "Learneds" May 29–31; watch your mailbox and the CSHPM website for the registration booklet and other information about Congress 2010. (The Canadian Federation for the Humanities and Social Sciences is also maintaining a meeting website at www.congress2010.ca.) Hope to see you all in Montréal!

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.