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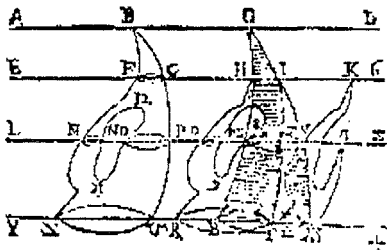
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**Canadian Society for History
and Philosophy of Mathematics**

**Société canadienne d'histoire et
de philosophie des mathématiques**

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ABOUT THE SOCIETY

Founded in 1974, the Canadian Society for 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: **Glen Van Brummelen**, Bennington College, Bennington, VT 05201, USA,

<gvanbrum@bennington.edu>

Vice-President: **Len Berggren**, Math. Dept., Simon Fraser Univ., Burnaby, BC V5A 1S6, Canada, <berggren@sfu.ca>

Secretary: **Pat Allaire**, Dept. of Math. & C.S., Queensborough C. C., Bayside, NY 11364, USA, <pallaire@qcc.cuny.edu>

Treasurer: **Robert Thomas**, Dept. of Math., University of Manitoba, Winnipeg, MB R3T 2N2, Canada <thomas@cc.umanitoba.ca>

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Rebecca Adams, Mathematics Department, Vanguard Univ., 55 Fair Drive, Costa Mesa, CA 92626, USA, <radamsca@yahoo.com>

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The Society's Web page, is maintained by **Robert Bradley**, Adelphi Univ. Garden City, NY 11530, USA <www.Adelphi.edu/cshpm> or <www.cshpm.org>.

The Proceedings of the Annual Meeting is edited by **Michael Kinyon**, Dept of Math. & C.S., Indiana University South Bend, South Bend, IN 46634 <mkinyon@iusb.edu>

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

History of Mathematics at AMS Western Section

A special session on history of mathematics was held at the American Mathematical Society Western Section Meeting at San Francisco State University October 21-22, 2000. The session was organized by Shawnee McMurrin, Cal State San Bernardino, and Jim Tattersall, Providence College.

Following is a list of speakers and their topics: Jennifer Beineke, "The Functional Equation of the Riemann Zeta Function"; Rob Bradley, "Symbolic Algebra as a Foundation for Calculus: D. Gregory's Contribution"; John Heilbron, "Geometry Civilized and Churches Astronomized"; Barnabus Hughes, "Arabic Algebra Before (?) Al-Khwarizmi"; Patti Hunter, "Statistics in the U.S. Comes of Age: A Case Study in American Influence Abroad"; Anatoly Korchagin, "Quadratic, Cubic, and Quartic Cones"; Laura Martini, "Mathematics and Politics: Shaping the Mathematical Landscape in Post-Unification Italy"; Betty Mayfield, "Gerbert: A Guy in the Right Place at the Right Time"; Shawnee McMurrin, "Solving Victorian Math Problems: A Senior Project"; Kristin Moore, "The Collapse of the Tacoma Narrows Bridge"; Karen Parshall, "Nineteenth-century Developments in Geometric Probability: J.J. Sylvester, M. Crofton, J.-E. Barbier, and J. Bertrand"; Adrian Rice, "G.H. Hardy, the London Mathematical Society, and the Rise of Pure Mathematical Research in the First Half of the Twentieth Century"; Amy Shell, "Mina Rees and Her Influence on Mathematical Research"; Jim Tattersall, "The Josephus Problem Revisited".

On Saturday many of the participants met for lunch at the Cliff House, which affords an exquisite view of the Pacific Ocean. They also celebrated Amy Shell's birthday two days early.

Jim Tattersall, Department of Mathematics, Providence College, Providence, RI 02918,

Minutes OF THE CSHPM/CHSPM Executive Council Meeting

June 11, 2000

Hamilton, Ontario

The minutes of the previous Executive Council meeting (July 1999) were approved.

Annual General Meeting Agenda:

1. Treasurer's Report: Robert Thomas will report on the following items: 189 members are paid for the year 2000 at this time. He will raise the issue of whether it is worth the effort for the CSHPM to apply for charitable status. The SSHRC travel subsidies continue to support us. HSSFC dues for 4/1/99–9/30/99 are \$461. After doubling the dues (from \$5 to \$10) for cross-membership between the CSHPS and CSHPM, most of the CSHPS members who had taken out reciprocal memberships in the CSHPM failed to renew.

Treasurer's Report — Actions Taken: Robert will check with Craig Fraser concerning the origin and possible restrictions of the K. O. May fund, currently dormant and worth about \$2000; he will also look into the situation with regard to a possible dues increase. The division of labour between Secretary and Treasurer was decided as follows: the Secretary will take over the membership duties, collect the dues, and keep the US dollars in an American bank account. The Treasurer will be sent Canadian monies and deposit them into a Canadian account. The Treasurer will keep the books.

Secretary's Report: Glen Van Brummelen will describe the e-mail balloting system introduced this year, and report on the production of a French-language CSHPM brochure.

President's Report: Jim Tattersall will note the following: We will meet with the Learned(s) at the University of Laval from May 25-27, 2001 (Friday–Sunday). Amy Ackerberg-Hastings and Adrian Rice will organize the general session; Jim Tattersall will locate a chair for the special session, which will be on French mathematics. We will meet with the Learned(s) at UT/Ryerson

Polytechnic University on May 25-27, 2002 (Saturday–Monday). Jim will talk with Craig Fraser about getting a list of past officers of the Society, which should appear in a future *CSHPM Bulletin*.

Bulletin Editor's Report: Sharon Kunoff and Tom Drucker will offer a call for contributions, and will arrange for new members' names to appear in upcoming *Bulletins*.

Webmaster's Report: Rob Bradley was asked to obtain the domain name www.cshpm.org for the Society's use.

Proceedings Editor's Report: Jim Tattersall will announce that 231 copies of the 1999 *Proceedings* have been mailed, and that Providence College has graciously covered the mailing costs. It was suggested that future overseas mailings be sent by surface mail.

Nominating Committee's Report: Craig Fraser will be collecting ballots until tomorrow.

Other Business:

1. It was agreed that members who were paid for the year 2000, and new members in the year 2001, should receive the *Proceedings* (iterate for following years).
2. We discussed, but decided against, pursuing the possibility of establishing a SIGMAA in the history of mathematics.
3. The Secretary will send out the first dues notice in October.
4. We propose the following change to the Constitution, to be formally moved in the November *Bulletin* and voted upon at the next AGM in 2001:

Article IV, Section 2: "The Executive Council shall consist of the Officers of the Society, the immediate past President, the Editor(s) of the *Proceedings*, the *Bulletin* Editor(s), [the **Webmaster**,] and four other members of the Society."

The meeting was adjourned.

Glen Van Brummelen (former Secretary)

President's Message

Dirk Jan Struik (1894-2000)

As a child, I first became aware of the history of mathematics through my father. A high school mathematics teacher, he had shelves of amazingly varied books, to spur interest in his students. One of them, a thin volume entitled *A Concise History of Mathematics*, caught my attention early, and I often paged through it. Many of us were introduced to the history of mathematics through this book; in fact, it has been said that Struik's text has increased popular exposure to our field more than any other book.

Superlative words hardly seem to suffice to pay tribute to Professor Struik. He pursued a long and eminent career in differential geometry at MIT, and worked with many of the great mathematicians of the early 20th century. His work in the history of mathematics, begun relatively late in his career, was insightful, broad, and highly influential. I understand that his knowledge, even late in life, was stunningly encyclopedic, yet he maintained a helpful and encouraging attitude to his colleagues. I wish I had had the chance to meet him. He remained active to the end, contributing to *Mathematical Reviews* only several months ago.

Above all, Struik was a man of conscience. His strongly held political and social beliefs were espoused honestly and with integrity, even as a Marxist under the scrutiny of Joseph McCarthy. His care for the oppressed, part of a universal human concern, led to his political beliefs, and I believe that this concern also motivated his pursuit of the history of mathematics. He will be missed, remembered, and honoured.

Meetings, meetings, meetings...

Having moved from a college with more committees than employees to a college with virtually no administrative structure at all, I have recently felt unusually free from the distaste that the word "meeting" conjures. Academic meetings, on the other hand, are events to be anticipated. I may be in the unique position of having more history of mathematics conferences in my agenda

over the next year than administrative meetings. It's hard to imagine how one could be more blessed!

No less than seven meetings and sessions on the history and philosophy of mathematics, and several other events, are scheduled in North America over the next year. Of particular excitement is the regularity with which they are beginning to appear as part of national and regional mathematics conferences. The profile of history is rising among our mathematical colleagues. This year is an opportunity for us to put our best foot forward: to demonstrate the importance and intellectual value of our subject to the mathematics community, in both pedagogical and scholarly terms.

The list below, long though it is, may be incomplete. Please let me know of any other meetings, and we'll announce them in the next Bulletin.

- Canadian Mathematical Society Winter Meetings, Dec. 10-12, 2000, Vancouver: J. L. Berggren, CSHPM Vice-President, is organizing a special session on the history of mathematics..
- The AMS/MAA Joint Mathematical Meetings, Jan. 10-13, 2001, New Orleans: If you'll be attending, don't plan much time during the meetings to visit New Orleans! Ron Calinger is organizing a panel discussion entitled "The Muse of History: Writing Biographies of Mathematicians", which will include Joe Dauben, Joan Richards, and Manfred Kronfellner. Joseph Auslander and CSHPM member Bonnie Gold will host a session entitled "Philosophy of Mathematics: That Which is of Interest to Mathematicians". Cheryl Olson and Douglas Ensley are organizing a session on "Great Theorems of Mathematics". CSHPM member Eleanor Robson will give an MAA Invited Address, "Neither Sherlock Holmes nor Babylon: A Reassessment of Plimpton 322". CSHPM member Chuck Lindsey will present his web-based history of mathematics course. Finally,

Robin Wilson will be bringing back his popular dramatic presentation on the mathematics of Lewis Carroll.

- AMS Western Sectional Meeting, Apr. 21-22, 2001, Las Vegas: a historical session is being organized by past CSHPM president Jim Tattersall, and CSHPM members Adrian Rice and Shawnee McMurrin.
- AMS Eastern Sectional Meeting, Apr. 28-29, 2001, Hoboken, NJ: CSHPM Secretary Pat Allaire and CSHPM Webmaster Rob Bradley are organizing a historical session.
- The big event: the CSHPM Annual Meeting, May 25-27, 2001, Québec City. Louis Charbonneau is organizing the special session on French mathematics; Amy Ackerberg-Hastings and Adrian Rice are organizing the general session.
- AMS Eastern Sectional Meeting, Oct. 10-12, 2001, Williamstown, MA: Jim Tattersall, Della Fenster, and I are organizing a historical session.

In addition, the quadrennial meeting of the International Congress of History of Science will be held in Mexico City this August. (I smell the workings of a certain AMS associate secretary, and past CSHPM president, in the large collection of historical sessions at AMS meetings. Thanks, Jim!) Let's keep up the momentum in the years to come. I'll be attending a number of these meetings, and hope to see some of you there. Finally, a meeting schedule to view with relish!

G. Van Brummelen

David E. Zitarelli of Temple University will offer a Chautauqua course on the history of mathematics in America from May 31 to June 2, 2001, in Philadelphia. The course covers the development of mathematics and mathematics education in the United States from the Colonial period up to the 1950s. The major emphasis is on the period 1875-1925, when the U.S. emerged from a backwater observer to an international contributor. Zitarelli has been at Temple University since receiving his Penn

State Ph.D. in algebraic semigroups in 1970. He was the abstracts editor of **Historia Mathematica** from 1988 through 1999. His paper on American mathematics in the period 1890-1950 will appear in the **Monthly** in 2001.

Call for Papers: AMS Spring Sectional Meeting

There will be a Special Session on the History of Mathematics to be held at the Spring Eastern sectional meeting of the AMS in Hoboken, NJ, on April 28-29, 2001. The organizers are Pat Allaire, <pallaire@gcc.cuny.edu> and Rob Bradley, <bradley@adelphi.edu> <http://rob.bradley.org>

Submissions of abstracts for 20-minute talks in the history of mathematics, from any historical period, relating to any mathematical discipline or historically informed papers on the philosophy of mathematics are welcome. Abstracts should be submitted directly to the AMS. Instructions for abstract submission can be found at <http://www.ams.org/abstracts/>. The deadline for submission of an abstract is January 9, 2001. If you intend to submit an abstract, please let one of the organizers know at your earliest convenience, even if it will be some time before you make your submission to the AMS.

The usual AMS policies apply to this session: speakers receive neither fees nor reimbursement of expenses, and must even pay their own conference registration fees, currently running at about US \$40 for AMS members. Pat and Rob have said that they can provide you with a personalized letter of invitation, if this will help you to secure funding from your institution. Please plan to attend the history session in Hoboken even if you are not in a position to give a paper. It is expected to be an enriching and informative, with significant participation from the community of historians of mathematics.

The organizers can be contacted by email or by post at: **Pat Allaire**, Dept. of Math & C.S. Queensborough CC, CUNY, Bayside, NY 11364, **Rob Bradley**, Dept. of Math & C.S., Adelphi Univ., Garden City, NY 11530 516-877-4496

At Cross-Purposes: The Gödel-Zermelo Letters

Gregory H. Moore

The eminent mathematicians Ernst Zermelo and Kurt Gödel corresponded briefly, in 1931, but their letters are still intriguing. Zermelo attacks Gödel's Incompleteness Theorem, gently in his first letter, then forcefully in his last one. Gödel defends his theorem quietly, lecturing Zermelo on the rudiments of formal systems.

When Zermelo initiated this correspondence, his career was almost over. It would soon end when he was removed from the University of Freiburg for refusing to give the Hitler salute. By contrast, Gödel was at the beginning of his. Yet he had already achieved two of his three most important results, the Completeness and Incompleteness Theorems. In this correspondence the old and experienced Zermelo, whose views on logic had been largely formed decades earlier, was confronted with the brilliant young Gödel.

Both Zermelo and Gödel were influenced by Hilbert, but in different ways. Zermelo adopted the young Hilbert's approach to the axiomatization of geometry and the real numbers about 1899-1900, while Gödel was influenced by the mature Hilbert's formalization of logic (Hilbert and Ackermann 1928). Such formalization played little part in Zermelo's published work. Nor, unlike Gödel, did he use *Principia Mathematica* or first-order logic.

The correspondence also reflects their contrasting personalities. Gödel's letter was cautious, detailed, at times pedantic. Zermelo's letters were short, argumentative, even pugnacious. Throughout his career, Zermelo had been stimulated by spirited intellectual debates. His first was in the 1890s about thermodynamics. The second, between 1904 and 1908, concerned his Axiom of Choice (see Moore 1982, 85-160). The third, with Gödel over the Incompleteness Theorem, continued a dispute between Zermelo and Thoralf Skolem that began two years earlier. This dispute arose from Zermelo's 1929 article

responding to critiques which Abraham Fraenkel and John von Neumann had made of the concept of "definit" property used in Zermelo's 1908 axiomatization of set theory. Zermelo (1929) axiomatized "definit" property in what amounted to second-order logic, since he quantified over propositional functions. Soon Skolem attacked Zermelo's approach and argued that set theory must be formulated in first-order logic instead. He insinuated that Zermelo's use of second-order logic could make his system contradictory by reintroducing Russell's Paradox (1930, 338-339).

The first sign of Zermelo's counterattack on Skolem came in a letter which Reinhold Baer, Zermelo's close friend, wrote to him on 27 May 1930: "In your war against Skolem, may you have victory and lots of booty." Baer was uncertain whether Zermelo would succeed: "You want to prove that a domain of sets in which the Axiom of Choice is satisfied cannot be countable in any more inclusive domain of sets? For that purpose you must have a very sharp Axiom of Separation! I am very eager to learn how generally that is valid." Zermelo sent Baer an argument about keeping cardinals invariant in larger domains, but in his reply of 2 June, Baer was not completely convinced.

Zermelo first responded publicly to Skolem's attack at the annual meeting of the Deutsche Mathematiker-Vereinigung, held in Bad Elster on 15 September 1931, and spoke there immediately after Gödel's talk on his incompleteness theorems. Zermelo's talk (1932) attacked Skolem's approach and offered an infinitary logic as an alternative foundation for mathematics. But the abstract of the talk also attacked Gödel's Incompleteness Theorem.

Zermelo's criticism of Skolem and Gödel was a defense of mathematics against assaults on Cantor and Hilbert. Zermelo saw Cantor's work as threatened by Skolem's relativism. Skolem had argued against the existence of sets that were uncountable in an absolute sense, since any axiomatization of such sets would have a countable model. Zermelo counterattacked by introducing an infinitary logic, modeled on the

cumulative type hierarchy that he had recently introduced for set theory (1930). The main point of this infinitary logic was to insure that, within it, every true sentence was provable, and this was his answer to Gödel's threat to Hilbert. Zermelo had no interest in questions of effectivity, perhaps reflecting the earlier debate over the Axiom of Choice, where his opponents had used effectivity to argue against that axiom.

Yet in 1929 Zermelo had deviated from Hilbert's logic on an important point. While Hilbert's logic was finitary, Zermelo's new logic was not. Zermelo first made it public in his lectures at the University of Warsaw in May 1929. His first lecture insisted that mathematics was not determined by its subject matter (e.g., space and number) but was "a systematization of the provable and, as such, an applied logic". He stood on the brink of a more general notion of proof than that accepted by Frege, Peano, and Hilbert: "A 'proof' is the derivation of a new proposition from other previously given propositions, by whose truth its own is established through general logical rules or laws" (Zermelo in Moore 1980, 135). A proof, he insisted, might not be of finite length. In his fourth lecture he argued that "mathematics is infinitistic in its essence and is founded on the assumption of infinite domains; it can be designated precisely as the 'logic of the infinite' " (ibid., 136).

From the abstract of his talk, Zermelo's lecture might seem highly critical of Gödel. In fact, it was not. In a letter of 7 October 1931 to Baer, Zermelo noted "At Bad Elster I avoided any direct polemic against Gödel, both in my lecture itself and afterwards. One should not frighten off enterprising beginners" (Zermelo in Tausky-Todd 1987, 47). Yet the letter to Baer was bitter: "I deliberately had Gödel's lecture put on *before* mine and asked that they be discussed *together*. But the sole consequence of my loyalty was that the whole discussion was put *further* back at the unjustified suggestion of Fraenkel (who stabs me in the back at every opportunity!) and then petered out" (ibid.).

Six days after the Bad Elster meeting, Zermelo's

first letter to Gödel argued that Gödel's proof of the Incompleteness Theorem contained an error. Gödel's replied by lecturing Zermelo patiently, as one might lecture a schoolboy, about the difference between a formula and a term in a formal system. But Gödel continued by emphasizing an important point that was not at all evident in his 1931 paper: the class of true formulas of the system is never expressible in the system, and hence there are true formulas that are not provable. Here Gödel clearly indicated the result, usually credited to Tarski alone, that truth is undefinable in a formal system containing arithmetic.

Zermelo's reaction to the limitations of finitary logic was by no means peculiar to him. No less a logician than Rudolf Carnap (1936) was also driven to infinitary logic by the Incompleteness Theorem. His new rule of inference with infinitely many premises was intended to reduce the gap between truth and provability. Meanwhile Zermelo (1935) gave the beginnings of an infinitary proof theory. Despite appearing in a prominent journal, Zermelo's paper attracted no interest. The time was not yet ripe for infinitary logic.

Zermelo preserved a negative impression from his contacts with Gödel. Replying on 1 October 1941 to Paul Bernays, who had congratulated him on his 70th birthday, Zermelo regretted that his work on set theory (except the Axiom of Choice) was ignored. In particular, he had not been invited to the conference on foundations held in Zurich during December 1938. He added that his work after 1904 was not even mentioned in its proceedings, "whereas the dubious merit of a Skolem or a Gödel was widely promulgated. In that regard I recall that already at the Bad Elster meeting my lecture about systems of propositions was excluded from the discussion, thanks to an intrigue by the Vienna School represented by Hahn and Gödel. So it goes, apparently, for anyone who has no 'school' or clique behind him. But perhaps the time will come when my works too will again be discovered and read."

(See Gödel P. 8)

Gödel (cont. from P. 7)

The day came when Zermelo's works on set theory were read again, but his work on an infinitary logic was not. Infinitary logic was only accepted as part of logic in the mid-1950s with the work of Leon Henkin, Carol Karp, Dana Scott, and Alfred Tarski. This flowering of infinitary logic was motivated by desires contrary to those of Zermelo. He had wanted a strong logic in order to eliminate countable models of set theory. Those who worked on infinitary logic in the 1950s wanted a weak infinitary logic which stayed close to first-order logic and preserved many of its desirable properties but had more expressive power. In the interim, the earlier work on infinitary logic (see Moore 1997) was forgotten.

Yet, in a sense, Zermelo had his revenge. By the 1960s infinitary logic became an integral part of mathematical logic, despite the wishes of Gödel (1944), who had argued vigorously against it.

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- 1932 "Über Stufen der Quantifikation und die Logik des Unendlichen", *Jahresbericht der Deutschen Mathematiker-Vereinigung (Angelegenheiten)* 41, 85-88.
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Frederick V. Pohle Colloquium Series

On October 4, 2000, CSHPM member Amy Shell kicked off the 2000-2001 season of the Frederick V. Pohle Colloquium Series on the History of Mathematics. Amy, a recent D.A. from UI Chicago is an assistant professor at West Point. She spoke on "Mina Rees and Her Influence on Mathematical Research" to an intimate and appreciative audience.

The Series, now in its third year, is a monthly series of talks on the history (and sometimes philosophy) of mathematics chaired by Pat Allaire and Rob Bradley at Adelphi University and services mainly mathematics professors in the Queens/Nassau County area of New York State. Fred Pohle, a former chairman of the department, was an applied mathematician and an avid student and teacher of the history of mathematics.

CSHPM members, have featured prominently in the Colloquium's first two years. Future speakers include Fran Abeles (November 9), Rob Bradley (December 6), Rudiger Thiele (January 24), Glen Van Brummelen (February 7), Greg Moore (March 7), Agnes Kalemari (April 4) and Karen Parshall (May 2).

For more information, visit www.adelphi.edu/~bradley/fvp, or email Rob at bradley@adelphi.edu. Pat and Rob welcome suggestions and volunteers for the 2001-2002 schedule.

Minutes of the Annual General Meeting, June 12, 2000

The minutes of the 1999 Annual General Meeting were approved.

1. **Treasurer's Report:** Robert Thomas reported a small surplus for the year 1999. As of this point in 2000, 189 members have paid dues.

Motion: To approval the 1999 financial statement and the addendum to the 1998 financial statement. **Carried.**

Motion: To table the pursuit of charitable status for the CSHPM until a future need arises. **Carried.**

Motion: To cover Robert Thomas's out-of-pocket expense incurred in his role as Treasurer in the past year (hiring an accountant). **Carried**

2. **Secretary's Report:** Glen Van Brummelen thanked Robert Thomas for handling a great proportion of the duties between Secretary and Treasurer over the past year, and reported on the Council's recommendations for distributing the work between the two jobs. He thanked Ariane Robitaille for her efforts in translating the society's informational brochure into French, and Rob Bradley for taking over the duties of Webmaster. He thanked Jim Tattersall, outgoing President and *Proceedings* editor, for his fine service to the Society in both these roles.

3. **President's Report:** Jim Tattersall reported on the following:

- He thanked the general session organizers Pat Allaire and Rob Bradley, and the special session organizer Tom Archibald. This joint meeting with the Canadian Mathematical Society has been very fruitful so far.

- The CSHPM/SCHPM's Annual Meeting in 2001 will take place with the HSSFC Congress (the Learned's) at the University of Laval, May 25-27 (Friday-Sunday). The general session will be organized by Amy Ackerberg-Hastings and Adrian Rice; the topic for the special session will be French Mathematics.

- The CSHPM/SCHPM's Annual Meeting in 2002 will take place with the Learned's at UT/Ryerson Polytechnic University,

May 25-27.

- At the AMS-MAA meetings, January 10-13, 2001 in New Orleans, Eleanor Robson of Oxford University will give a plenary lecture; Karen Parshall and David Zitarella will organize a joint special session on the history of mathematics; Fred Riskey and Bill Dunham will organize a contributed paper session on Euler; Doug Ensley will organize a contributed paper session on great theorems in mathematics; and Ron Calinger will organize a special session on The Muse of History: Biography, which will feature talks by Joan Richards and Joseph Dauben.

- Thanks to Greg Moore for efficiently handling the local arrangements and to those chairing the sessions for this meeting; to McMaster University for their hospitality; to the trustees of the E. P. May fund for their generosity; to SSHRC for their continued support of travel grants for our speakers; to Louis Charbonneau for acting as Jim's representative at the Canadian National Committee (CNC); to Ed Cohen for acting as our representative to the HSSFC; to Sharon Kunoff and Tom Drucker for the absolutely marvelous job they do on the *CSHPM/CSHPM Bulletin*; to our councilors Rebecca Adams, John Fauvel, Alexander Jones and Craig Fraser for their assistance; to Robert Thomas, Jacques Lefebvre, Hardy Grant, Israel Kleiner, Craig Fraser, Glen Van Brummelen, and Tom Archibald who were always there to answer what must have seemed a myriad of questions; to Providence College for their help publishing and mailing the *CSHPM/SCHPM Proceedings*; congratulations to Michael Kinyon for assuming the editorship of the *Proceedings* beginning with volume 13; to the Nominating Committee (Sharon Kunoff, Craig Fraser, and Robert Thomas) for their hard work in selecting a slate of candidates.

4. **Proceedings Editor's Report:** Jim Tattersall reported that 227 copies were mailed out as of 6/1/2000 (100 to the USA, 66 to Canada, 26 to the UK, and 35 dispersed to Argentina, Australia, Belgium, Bosnia, Brazil, Croatia, Costa Rica, Denmark, Malta, Taiwan, Sweden, France, Germany, Iceland, Italy, Israel, Indonesia, Japan, (See **Minutes** P. 11)

History of mathematics à la française

Tom Archibald

The main purpose of this note is to increase reader awareness of the extent and vitality of the history of mathematics community in the hexagon, as the French Republic is often dubbed in its own press. My knowledge is very lacunary and the treatment is necessarily selective, so I apologize to the many people whose efforts won't be described. One specific difference of the French situation is the existence of a research body, the CNRS, which employs researchers in nationally-funded permanent and short-term positions, which exists in parallel to the universities.

The Revue d'histoire des mathématiques

First of all, I would like to draw attention to the fact that the Société mathématique de France (SMF - the CMS or AMS counterpart) publishes a journal, the *Revue d'histoire des mathématiques*, which has articles in both French and English. The current editor in chief is Jeanne Peiffer of the Centre Alexandre Koyré. The overseas subscription rate is 420 francs a year (under \$100 Canadian), with a reduction for members of the SMF. In the French tradition, you can also order individual numbers. More details, including abstracts, can be found at <http://smf.emath.fr/>. Submissions of original research are encouraged.

Major editorial projects

Two major editions of collected works are currently underway. The D'Alembert edition has funding which should see the publication of its first fruits within the next two years. Scholars of the eighteenth century are well aware of the difficulty of accessing D'Alembert's work, much of it produced as monographs or pamphlets, much in difficult-to-obtain academy journals. The project, which involves such scholars as Christian Gilain, Eric Brian, Irène Passeron, François de Gandt and Pierre Crépel, envisages the publication of his literary works as well as his mathematical and scientific endeavours, and there will be detailed commentary on the mathematics.

The other major project concerns Henri Poincaré. Poincaré's collected works are published, but this edition will include much of his correspondence, largely unpublished, with other mathematicians and scientists. The effort is being conducted by the *Archives Henri Poincaré* in Nancy, with the participation of Gerhard Heintzmann, Philippe Nabonnand, and Scott Walter (among others). Several publications have already resulted, including a previously unpublished historical reflection by Poincaré on the discovery of Fuchsian functions (edited by Jeremy Gray and Scott Walter); and the correspondence with Mittag-Leffler, edited by Philippe Nabonnand.

Research Groups and Seminars in Paris

While there are regular seminars on the history of mathematics in other centres (notably Nantes, Lyon, Lille and Poitiers), Paris is the main seat of such activity. An extraordinary number of seminars occur quasi-regularly during the academic year (essentially from October to June) which touch on all periods and all aspects of the field. Themes for the seminars vary annually. Contributors are for the most part post-doctoral scholars, though graduate students attend and sometimes present their work. Research in the history of mathematics exists in contact with the history of science and technology, with the mathematical community, with the philosophy of science, and with educational research. As you might expect, there are differences in methodology and in research emphasis both within and between these different communities.

Many of those associated with the history of science community are at the Centre Alexandre Koyré, a hybrid institution which houses university-based researchers, CNRS researchers, and people associated with the Muséum d'histoire naturelle. Two of the best-known historians of mathematics there are Amy Dahan, the author of a book on Cauchy, who is currently interested in US mathematics in the twentieth century (among other things); and Jeanne Peiffer, who has worked extensively on the Bernoulli edition and is also involved with the D'Alembert edition. CSHPM

members had the opportunity to hear Amy Dahan at the joint meeting with BSHM last year in Toronto.

The CNRS researchers are attached to a multiplicity of different units with varying missions and emphases. One example is REHSEIS, a group which includes Karine Chemla, the eminent historian of Chinese mathematics, and Roshdi Rashid, some of whose works on the history of mathematics in the Arab world are available in English. Another is the CRHST (Centre de recherche en histoire des sciences et techniques) which likewise has a focus strongly associated with history of science and technology. This centre is housed at the Cité des Sciences et de l'Industrie, a science centre, and recently welcomed Canadian researcher David Aubin, supported by a SSHRC post-doctoral fellowship to work on issues related to the history of chaos theory and catastrophe theory. Still another group, to which Liliane Beaulieu (of Montreal) is attached, is concerned with the history of Bourbaki.

University mathematics departments also house a number of researchers. The only professorship of the history of mathematics is held by Christian Gilain, who has written extensively on the history of differential equations. A considerable number of CNRS researchers do some university teaching, however, and a considerable number of people with mathematics teaching posts are active in historical research. Here I would mention Catherine Goldstein, whose interesting book on the history of number theory has yet to be translated into English. Furthermore, in some cases university researchers with appointments in pedagogy also have historical interests: Hélène Gispert is a case in point. Likewise, various government offices house researchers: Bruno Belhoste, for example, author of the Cauchy biography published in English by Springer, is at the National Institute for Pedagogical Research.

This very short list reveals only a fraction of the richness of this diverse community. CSHPM members are hereby encouraged to realize that

French is one of the society's official languages, and to make contact with this remarkable body of scholarship. While books and journals published in France are not easily available in Canada and the US, online ordering makes locating and paying for such works far easier than was the case even a year or two ago.

Tom Archibald, is a member of the Dept. of Math. and Stats., Acadia University, NS. He recently spent some time in France researching the History of Mathematics in the French Republic.

Minutes (Cont. from P. 9)

Mexico, Spain, and Portugal. Michael Kinyon was recognized as the next *Proceedings* editor.

5. **Bulletin Editor's Report:** The editors, Sharon Kunoff and Tom Drucker, issued a call for contributions from members for the next *Bulletin*.

6. **Webmaster's Report:** Rob Bradley reported that the Society now owns the rights to the domain name www.cshpm.org.

7. **Election of Officers:** Craig Fraser, on behalf of the Nominating Committee (himself, Sharon Kunoff, and Robert Thomas), announced the results of the election. 51 ballots were cast. The results are as follows: Glen Van Brummelen (President), 51 yes; Len Berggren (Vice-President), 51 yes; Pat Allaire (Secretary), 51 yes; Robert Thomas (Treasurer), 50 yes; Rebecca Adams (Councilor), 50 yes; Roger Godard (Councilor), 50 yes; Hardy Grant (Councilor), 50 yes; Alexander Jones (Councilor), 51 yes. All candidates are elected.

8. **Old Business:** none.

9. **New Business:**

Motion: To entitle the organizer(s) of general and special sessions at the AGM to the same travel reimbursement benefits as speakers.
Carried.

The Treasurer and Secretary will look into placing some of the Society's funds into an interest-bearing account.

The meeting was adjourned.

Glen Van Brummelen (with thanks to Jim Tattersall)

Challenges to Science in the Revolutionary Era, 1905-1921: The Experience of the Moscow Mathematical Society

Paul Buckingham

The period between 1905 and 1921 encompasses a period of great turmoil in Russian history. Two major revolutions, the First World War, and a vicious civil war further complicated broad social, political, and economic changes taking place in the Russian Empire. All of Russian society faced hardship and change. This includes the growing mathematics community in Moscow centered on the Moscow Mathematical Society. The challenges facing science and scientific development in Russia can be clearly seen through the example of the difficulties faced by the mathematicians in this time of troubles. Political pressures and simple bureaucratic red tape were prominent issues in the story of science and mathematics in Russia during the Revolutionary Era.

By 1905, the Moscow Mathematical Society had been in existence for nearly forty years having been officially organized in 1867. It was the foremost mathematical society in the Russian Empire and its membership included over seventy Russian and a dozen foreign members with the active core of the society being formed by the mathematics professors and students at the University of Moscow.¹ By the same year, the Society had also published nearly twenty-five volumes of its scholarly journal, *Matematicheskii sbornik*.² The journal was widely distributed abroad but mostly disseminated among the universities and other mathematical societies in Russia. It was, however, the most important, and virtually the only, journal dedicated solely to mathematics in Russia. The future of the society was promising despite ongoing financial difficulties. Moscow mathematicians were becoming more and more connected to the European mathematics community though, indeed, Russia and the Moscow mathematicians were still largely behind the great mathematics centers in

France, Germany, and Great Britain.

The year 1905 also brought a new president for the Moscow Mathematical Society. In November 1905, the respected mathematician and physicist, Nikolai Egorovich Zhukovskii (1847-1921), also known as the father of Russian aviation, was elected to lead the Society.³ The new president was, like those before him, a major figure in the Moscow scientific community. As a scientist, Zhukovskii made fundamental contributions to the study of aerodynamics, hydrodynamics, and general mechanics. As president, Zhukovskii would guide the society through one of the most desperate times in Russian history. These desperate times were further complicated by political pressures and the ever-present bureaucratic red tape with which scientists and mathematicians needed to deal.

A difficulty widely affecting science in Russia was the centralized nature of the Russian bureaucracy. As a state-sponsored scientific organization, and there were few other kinds, the Society needed to deal with government red tape and make use of political connections from time to time in order to achieve its goals. A clear example of the sometimes baffling nature of the bureaucracy in Russia that often hindered the normal activities of the society is demonstrated in an absurd series of letters from 1907 to 1908. The society had in its possession a large portrait of the late president of the Society, Nikolai Bugaev (1837-1903). This portrait was hung in the Physics and Mathematics Faculty conference room where meetings of the Society were held.⁴ Following the death of Vasilii Iakovlevich Tsinger (1836-1907), another president, in February of 1907, the Society decided to hang portraits of all of the deceased presidents of the Society including Tsinger in their meeting room.⁵ In the archives, one finds a set of correspondence demonstrating that, in order to hang these portraits in their meeting hall at the university in Moscow, the society needed to request permission from at least the Minister of (See **Moscow P. 13**)

Moscow (Cont. From P. 12.)

Public Education in St. Petersburg and possibly, the Tsar himself.⁶ Here is an excerpt from one letter of the series:

[From the Superintendent of the Moscow Educational District to the Rector of Moscow University]

His Lordship, the Minister of Public Education, based upon the statement from the proposal of the 31st of December, 1908 (No. 33348), makes it known that on the basis of HIS IMPERIAL MAJESTY'S command of the 5th of December 1881, he has decided to place the portrait of the late Professor N. D. Brashman in the hall of the new building belonging to the Physics and Mathematics Faculty of the IMPERIAL Moscow University.

[Signed] Superintendent Zhdanov⁷

This is a glimpse of one of the great weaknesses of the centralized bureaucracy in Russia. Simple decisions required the permission of high-level officials. Perhaps, in this case, there was fear that portraits of inappropriate people might be hung in public places. Regardless, it is an example of some of the bureaucratic red tape faced by science and scientific societies in Russia.

Throughout the period from 1907 to 1914, the membership of the Moscow Mathematical Society continued to grow. The number of Russian and foreign members increased and its connections and exchanges with other scientific institutions both foreign and domestic were also strengthened. There were now, in 1913, ninety-one members and twenty-three foreign members.⁸ This was a high point for the society in the pre-Stalin era. Yet political changes and global events, primarily the beginning of World War I, conspired to bring

political pressures to bear on the Society that were believed to be harmful to its overall mission.

For the Moscow Mathematical Society, evidence for increasing political pressure on science began at the meeting of the Society on January 20, 1915. At this meeting, an order from the Rector of Moscow University was read. The order, dated December 22, 1914, commanded scientific societies to expel all German, Austrian, and Turkish members, those scientists from countries with which Russia was at war. The command was tabled at the meeting so the Society and its leadership could frame a proper response⁹. At the next meeting, the Society reported the following resolution on the order to the Rector:

Resolved: Having attached a list of all foreign members in accordance with this project, the Society responds, that amongst the active members participating in the activities of the Society, there are no foreign subjects and that insofar as the foreign members listed, the Society notes that it does not have the ability to differentiate its membership by nationality, not having the corresponding data.¹⁰

The reply to the order suggests that the Society at the very least sidestepped its spirit because more than half of the foreign membership of the Society was listed as being from cities in either the German or the Austrian Empire¹¹. By claiming not to have collected information on the nationalities of its foreign members, the leaders of the Society were apparently suggesting that they could not determine if any of the society's members living in Austria and Germany were actually Austrian or German. Perhaps, one can imagine them suggesting, those members might be Polish or Czech by nationality but living in the German or Austrian Empire and thus, they should not be expelled under this rather explicit edict. In a manner befitting a society of lawyers, this loophole was exploited to avoid expelling foreign members. Such an act would have severed very

important ties between the Russian and German mathematics communities. While the Rector's order, undoubtedly passed on from higher in the government, was a part of the general anti-German feelings that swept through those nations opposing Germany, the mathematicians of the Society clearly felt that the war would eventually end and they would still need contacts in Germany, one of the centers for mathematics in Europe at the time. These contacts were, after all, friends and colleagues. Also, Russian mathematicians still needed to go abroad to receive advanced mathematical training. Severing these ties would severely damage the future of Russian mathematics. So, they used every loophole to protect this future. Fortunately, there seemed to have been no repercussions from this small resistance to Russian state authority.

Throughout the period from 1905 and 1921, the Moscow Mathematical Society faced two problems common to Tsarist Era science. As a government sponsored organization, it faced its share of red tape as it dealt with a centralized bureaucracy. Also, although not important enough to draw significant attention, it did face its share of political pressure. Ironically, and perhaps surprisingly, once the society reregistered with the new Bolshevik government in 1922, it did not face significant ideological or political pressure until 1928 with the beginnings of Stalinization. Eventually, in 1930, politicized graduate students chaffing under the tutelage of the old guard mathematicians seized and reorganized the Moscow Mathematical Society around Stalinist values.

End Notes

1. Based on an estimate from Appendix B of Paul Buckingham, "A History of the Moscow Mathematical Society, 1861-1931: Mathematics as a Scientific, Moral, and Economic Tool in the Context of a Late-Developing Society," (Ph.D. Thesis, Bowling Green State University, 1998), 271-286.

2. Appendix E in Buckingham, 289. *Matematicheskii sbornik* [Mathematics

Symposium]

3. The society was to hold an extraordinary meeting to elect Zhukovskii in October but the political unrest of the Revolution of 1905 forced the cancellation of the meeting.

4. Protokol, November 7, 1906, *Matematicheskii sbornik*, v. 26, n. 4, (1908).

5. Nikolai Dmitrievich Brashman (1796-1866), Avgust Iul'evich Davidov (1823-1885), Tsinger, and Bugaev.

6. The series is found in TsIAM F. 418, Op. 86, D. 571. L. 1 is a copy of the request in the Journal of the University Council. L. 2 is a letter from the Dean of the Physics Mathematics Faculty to the Rector. L. 4 is the response from the Superintendent to the Rector (see citation below). F. 418, Op. 85, D. 552 contains files from the Dean to the Rector (L.1-2), from the rector to the Superintendent (L. 3), from the Superintendent to the Rector (L. 4) and from the Rector to the Dean (L. 5).

7. TsIAM F. 418, Op. 86, D. 571. L. 4. Dated January 9, 1909.

8. Based on membership data at the beginning of *Matematicheskii sbornik*, v. 29, n. 1, (1913) and Buckingham, Appendix B.

9. Protokol, January 20, 1915, *Matematicheskii sbornik*, v. 29, n. 4, (1916). Possibly, the tabling of this resolution is a ploy to delay implementing the order so that the society could find a way to circumvent it.

10. Protokol, February 19, 1915, *Matematicheskii sbornik*, v. 29, n. 4, (1916).

11. Of twenty-one foreign members listed in *Matematicheskii sbornik*, v. 29, n. 1, (1913), the same volume in which the minutes containing this order are published, the following foreign members were listed as living and working in Germany: Walther Franz Anton von Dyck (Munich), Paul Albert Gorden (Erlangen), Friedrich Emil Prym (Wurtzburg),
(See **Moscow P. 18**)

WEB REVIEW: *The History of Mathematics*:

www.maths.tcd.ie/pub/HistMath

Rob Bradley

When I inherited the CSHPM website from its creator, Glen Van Brummelen, it came with a healthy collection of links to history of math resources on the World Wide Web. Among my favorites is David Wilkins' site (<http://www.maths.tcd.ie/pub/HistMath/>). Since this site was new to me a few months ago, I asked Glen whether it had already been reviewed in the pages of this newsletter, and how old he thought it was. Glen told me that it had not yet been reviewed, and that it's "almost as old as the web itself."

Indeed, I emailed David Wilkins and he confirms that his site, *The History of Mathematics*, dates back to October 1994. How old is the web? Well, 1994 was the year of the first International WWW conference. The official release of Mosaic, the first multi-platform web browser, was in late 1993. Lest you get the wrong impression, though, the site is constantly being updated, with changes to the Hamilton section, for example, made just a few weeks ago.

David Wilkins' site is primarily an archival site, with an extensive collection of the writings of Berkeley, Hamilton, and Riemann, as well as material by Newton, Boole, and Cantor. In addition, there are substantial excerpts from Rouse Ball's book *A Short Account of the History of Mathematics*, and an impressive collection of links to resources on the World Wide Web.

The Rouse Ball section is the oldest portion of the site, and Wilkins is no longer actively maintaining it. It is also the most trafficked part of the site: Wilkins reports a lot of hits from schoolchildren apparently writing reports on Newton, Descartes, Fermat and others. In this portion of his site, he has limited himself to the "Third Period" of Rouse Ball's narrative, and largely limited himself to the biographies therein.

This neatly circumvents the issues surrounding the changes in the scholarly assessment of ancient and medieval mathematics that have taken since the book was written in 1908. Nevertheless, it makes for some very entertaining surfing in waters of modern mathematics from Descartes to Babbage.

Of much greater scholarly interest will be the sections devoted to Berkeley, Hamilton and the others. The choice of these two Trinity College scholars is not coincidental, Wilkins being himself a Lecturer in Mathematics at Trinity. The Berkeley section includes the full text of *The Analyst*, Berkeley's challenge to Newton and his followers, as well two sequels, the essay *A Treatise Concerning the Principles of Human Knowledge*, and links to other works by Berkeley published on other websites. Those works transcribed by Wilkins himself are available in HTML format, as well as TeX and Postscript. Many of the later additions on the site are additionally available in PDF format.

The section on William Rowan Hamilton is the most extensive piece of the website. Wilkins claims that, with the exception of two books, everything published by Hamilton during his own lifetime is included in four formats (TeX, DVI, Postscript and PDF) on-line at his site, for a total of some 1200 pages in each format. The articles are indexed chronologically, as well as thematically, with brief abstracts of the papers supplied by Wilkins on the thematic pages.

Of necessity, all of the material on Wilkins' site is in the public domain. Therefore, for example, he has not included any of Hamilton's unpublished manuscripts, which appeared for the first time in the Cambridge University Press's *Mathematical Papers of William Rowan Hamilton*, whose fourth and final volume is due to be released any day now.

Plans for the future include a broader treatment of the history of mathematics in Ireland, which will likely include further development of the
(See **Web Review P. 18**)

"The Princeton Mathematics Community in the 1930s: An Oral History Project" Now On-Line

The decade of the 1930s at Princeton has had far reaching consequences for mathematics in America. Important advances in game theory, modern topology, linear programming, mathematical statistics and computing had their origins then in a remarkable community of mathematicians whose influence spread across the continent through their students and successive generations.

John Nash, a Nobel prize winner in economics for his early work in game theory (1994), was a student of Albert Tucker ("prisoner's dilemma"), himself a student of Solomon Lefschetz, a key figure in modern topology (a term coined by Lefschetz). Tucker in turn had been greatly influenced by John von Neumann's early studies of game theory. John Tukey, "considered to be one of the most important contributors to modern statistics," inventor of the terms "bit" and "software", had also been a student in that era. John von Neumann also had enormous influence on the development of computing, as did Alonzo Church through his abstract lambda-calculus which later became the foundation for the computer language LISP, also making major contributions to recursion theory and mathematical logic. Of the students of Church, John Kemeny, was the coinventor of the computer language BASIC and of time-sharing, while Stephen Kleene also contributed to recursion theory and computability and Alan Turing, famous for his "Turing machine" did fundamental work in computability. Von Neumann actually shared a half position with his close Hungarian friend Eugene Wigner, who won the Nobel Prize in Physics in 1963. Abe Taub, a student of H.P. Robertson who also worked with Veblen and von Neumann and learned his geometry from Eisenhart, carried on the relativity tradition of that era as a physicist with a mathematics degree.

Veblen, Eisenhart, Lefschetz, Weyl, Alexander, von Neumann, Wigner, Robertson, Church, and

then two towering figures of twentieth century science, Einstein and Gödel, were among the faculty during this decade when the Institute for Advanced Studies was conceived, founded and housed together for 6 years with the Princeton University Mathematics Department in a new university building built sparing no expense to foster a truly mathematical community in memory of Henry Fine. Their students were the generation which contributed to the oral history project of Al Tucker in 1984 in an attempt to salvage what memories were still left forty-five years later after World War II brought this era to a close.

Encouraged by a fellow Princetonian and historian of science Charles Gillispie, with the help of historian of science William Aspray and then grad student Rik Nebeker, they compiled 45 taped interviews which were then transcribed and indexed, but only a few paper copies were then produced in 1985, available to the public only at the Princeton University Math-Physics Fine Hall Library, the Charles Babbage Institute (Center for the History of Computing) at the University of Minnesota, and American Philosophical Society in Philadelphia.

These were accidentally discovered in 1999 by myself, Villanova University Professor Robert Jantzen, Abe Taub's last graduate student in physics at UC Berkeley (1978), while inquiring about materials that the Princeton University Fine Hall library might have on Taub and Eisenhart, not long before Abe's death that year. Another accidental coincidence through the Fine Hall library staff led to a meeting with Gillispie, at which time I suggested that the Oral History Project should be made available on the web and enhanced with background materials. It was clear that the only way to get this done was to do it myself, so I undertook a long and tedious volunteer project of scanning and web formatting the project, and finding supporting materials in an amateur effort to provide some context for the project. This came on line in September, 2000 at <http://www.princeton.edu/mudd/math> at the Seeley G. Mudd Manuscript Library of Princeton University.

The interviews reveal the personalities of these famous names, and the atmosphere of the community of mathematicians which existed during that decade. They should be of interest to anyone who is curious about how great minds work, and what kind of people lie behind the work that made them famous.

With my background in physics and relativity, I have little knowledge of the field of the history of mathematics, so I would appreciate help from more knowledgeable professionals in gathering further supporting documents to either include in the site or make reference to. Any suggestions that might improve the site are also welcomed, and its contents will be updated from time to time. Some of the supporting documents sketch the decade of the fifties, the students from which are now at about the ages that the remaining students from the thirties were in 1984. Sadly there seems to be little interest in continuing this oral history or in archiving materials to record the human relationships that fill in the history of the generations after the

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Establishment of an HM committee in Hungary

Submitted by László Filep

On the initiative of Katalin Munkácsy and László Filep, the János Bolyai Mathematical Society of Hungary has decided to form a standing committee for dealing with all matters concerning history of mathematics including its relation to pedagogy, i.e. to the teaching of mathematics. The committee wants to put special emphasis on the history of mathematics in Hungary, and to build up fruitful relations with sister committees in other countries, as well as with ICHM. Moreover, it intends to study the connections between history and pedagogy of mathematics

The board of the society asked 12 of its members to participate in the work of this HM Committee, and nominated Prof. Ákos Császár, member of the Hungarian Academy of Sciences to be chairman, and Katalin Munkácsy, associate prof. of the Teacher Training Faculty of Eötvös University of Budapest to be its secretary.

The committee held its inaugural meeting on October 4, 2000 in Budapest. Seven members were present, the chairman and secretary, as well as:

László Filep, College of Nyíregyháza,
István Gazda, Hungarian Science History
Institute,
Elemér Kiss, University of Tirgu Mures,
Romania,
Mihály Szalay, Eötvös University,
Tibor Weszely, University of Tirgu
Mures, Romania.

At the first meeting the committee discussed the following main topics:

1. Preparation of the celebration of coming anniversaries of noted Hungarian or Hungarian-born mathematicians, such as

bicentenary of the birth of János Bolyai;
25th anniversary of the death of László
Kalmár and Pál Turán;
50th anniversary of the death of Ottó Szász
and Pál Dienes;
centenary of the birth of Ábrahám Wald.

2. Activities concerning the worthy celebration of Bolyai-bicentenary. E. Kiss and T. Weszely took the responsibility for coordinating the events to be held in Romania and Hungary.

3. L. Filep informed the committee on the preparation of an English language book on the occasion of Hungary's millennium. The book gives an overview on the achievements of outstanding Hungarians both in science and humanities. The mathematical part is being written by L. Filep.

Moscow (Cont. from P. 14)

Karl Hermann Amandus Schwartz (Berlin), Paul Stackel (Kiel), Rudolf Mehmke (Stuttgart), and, in Göttingen, David Hilbert, Felix Klein, and Woldemar Voight. Robert Daublewsky von Sterneck worked in Vienna, the capital of the Austro-Hungarian Empire.

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Matematicheskii sbornik. Vol. 26. no. 4 (1908), Vol 29. no. 1 (1913), Vol. 29 no. 4. (1916)

Dr. Paul Buckingham is a historian of Russian and Soviet science in the Department of History/Political Science at the University of Saint Francis Fort Wayne IN 46818. He can be reached there or by email at <pbuckingham@sf.edu>. Much of the material in this paper was presented at the Midwest History of Mathematics conference in Kentucky in September.

The mathematician's patterns, like the painters or the poet's, must be beautiful: the ideas, like the colors or the words, must fit together in a harmonious way. Beauty is the first test. There is no permanent place in the world for ugly mathematics.

G. H. Hardy

Web Review (Cont. from P. 15)

section devoted to George Boole, and possibly further material from mid-nineteenth century Germany. This would be a welcome addition alongside the nearly complete collection of papers by Riemann already available.

David Wilkins says he does not "aim for encyclopaedic coverage of the History of Mathematics". However, he has succeeded admirably in providing the on-line community with an impressive depth of coverage in the writings of some pivotal figures in the subject that is our shared passion. You can find his site at the URL listed above, or by browsing to www.cshpm.org, selecting "Links" on the main menu, and then choosing "General Resources in the History of Mathematics".

See you in Québec May 25-27 2001

This year our Annual Meeting will be held in Québec City in conjunction with the 2001 Congress of the Social Sciences and Humanities. This will be the first time we are meeting with this group since 1998.

Our special session in on French Mathematics and will be chaired by Louis Charboneau. The general session will be under the leadership of Amy Ackenberg- Hastings and Adrian Rice.

A call for papers can be found on a flyer enclosed with this Bulletin. We expect to have some excellent talks. We are looking forward to seeing you all at Laval University. Québec City is a charming place and we are sure to have a wonderful time.

We would like to give you more information on things to do in the Québec City area in our Spring Bulletin. Anyone with intimate knowledge of the city is invited to submit an article.

The following have joined the Society since Spring 1999. The editors apologize for our negligence in not recognizing you sooner. A warm welcome to all!

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