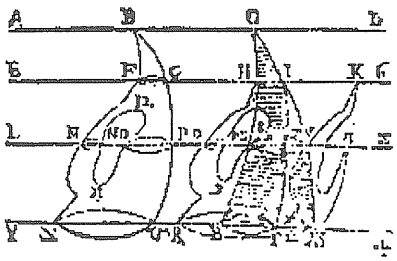
BULLETIN
CSHPM/SCHPM

November/novembre 1999 Number/le numéro 25

WHAT'S INSIDE



Canadian Society for History and Philosophy of Mathematics

Société canadienne d'histoire et de philosophie des mathématiques

ISSN 0835-5924

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: **Jim Tattersall**, Mathematics Department, Providence College, Providence, RI 02918, USA, <tat@providence.edu>
Vice-President: **Jacques Lefebvre**, Dept des Mathématiques, Université de Qubéc à Montréal, CP 8888, Succ. Centre-Ville, Montréal, PQ H3C 3P8, Canada, <lefebvre.jacques@uqam.ca>
Secretary: **Glen Van Brummelen**, Bennington College, Bennington, VT 05201 <gvanbrum@bennington.edu>
Treasurer: **Robert Thomas**, Dept. of Applied Mathematics, University of Manitoba, Winnipeg, MB R3T 2N2, Canada <thomas@cc.umanitoba.ca>

Members of Council:

Rebecca Adams, Mathematics Department, Vanguard Univ., 55 Fair Drive, Costa Mesa, CA 92626, USA, <radams@sccu.edu>
John Fauvel, Faculty of Mathematics, Open University, Milton Keynes MK7 6AA, UK, <J.G.Fauvel@open.ac.uk>
Craig Fraser, Institute for the History and Philosophy of Science and Technology, Victoria College, University of Toronto, Toronto ON M5S 1K7, Canada, <cfraser@chass.utoronto.ca>
Alexander Jones, Department of Classics, University of Toronto, 97 St. George Street, Toronto, ON M5S 2E8, <ajones@chass.utoronto.ca>

The Society's Web page, designed and maintained by Glen Van Brummelen, is at <www.kingsu.ab.ca/~glen/cshpm/home.htm>

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

NOTE OF APPRECIATION

Before Hardy Grant is allowed entirely to escape from the limelight of his editorship of this publication, he will have to receive at least some bouquets (despite his inclination to profess an allergy to them). In the course of his term in office, Hardy worked wonders in procuring articles from contributors not always eager to be in that category. As one of his victims, I can admit that his combination of flattery and expression of interest was persuasive. That sort of assiduousness found its reward in filling the pages of the bulletin with a variety of subjects and approaches.

In addition to his eliciting contributions from others, Hardy also displayed a deft touch in his own contributions, one to which his successor makes no pretense. His breadth of reading came bubbling up in a stream of utterances that were recognizably familiar without being trite. He followed Pope's characterization of true wit as "Nature to advantage dressed: What oft was thought but ne ' er so well expressed."

In the time now at his disposal as a result of handing over the reins of the bulletin, Hardy will doubtless be running a multinational corporation, studying for both the priesthood and the rabbinate, and setting records for the triple jump. Even if he may take a while to get around to some of those tasks, he is certainly engaged in bringing together some of his thoughts and writings on mathematics and culture that will benefit those who have not had the chance to hear him speak on the combination. We hope that he will find the pages of the bulletin a home for some of his work and suspect that he will rapidly recover from the homesickness for editorship as deadlines draw near.
Tom Drucker seconded by Sharon Kunoff

The Joint CSHPM/BSHM Meeting from a British Standpoint

The following perspective on the joint BSHM-CSHPM/SCHPM meeting in Toronto in July was written for the BSHM and appears here by courtesy of the newsletter's editor, John Fauvel

Muriel Seltman

Two years ago at the Joint Meeting held at Oriel College, Oxford, our Canadian friends promised a similar meeting in Canada. We looked forward to this for two years and in July of this year five of us came to Toronto from the U.K. to a meeting that was enormously worth waiting for.

I have a sister and family living in Toronto, so Canada was not a new experience. I must say first that the meeting was typically Canadian: cool, laid back, rather quiet and unhurried, but running smoothly and apparently effortlessly. We all appreciated the work that this must have involved for Craig Fraser and his team of efficient, friendly helpers who kept everything going.

It was certainly a packed programme. The organisation into mornings on the History of Applied Mathematics and two quite varied simultaneous sessions in the afternoon worked extremely well. The breadth of subjects covered and the high standard of the papers presented (with respect to both content and delivery) was appreciated by all of us (and by other participants, to judge by comments made to us in the course of the conference).

I thought that there was a great deal to be said for having the visit to the Stillman Drake Collection of rare mathematical books on the Wednesday afternoon, before the conference really began, as any other arrangement would have eaten into conference time and probably would have prevented some who wanted to give talks from delivering them. The only problem with the visit to the Fisher Rare Book Library was the one which you would expect: much too little time for a proper browse. I myself hope to have a really long visit to the collection when I come to Toronto some time in the future.

That was Wednesday afternoon. I must say that the Wednesday evening party at Craig's place was a very good idea indeed and provided a relaxed way into the meeting where we could renew old friendships and make new ones and new arrivals could drift in at any time and join in. Many thanks from all of us to Craig for making his home available.

As things progressed from Thursday onwards, one could only wonder at the variety of the content and illuminating new viewpoints with which we were greeted. The Canadian society includes philosophy, which allows for the possibility of reflection upon the history. This raises the question of whether the British empiricist tradition has not imposed certain undesirable limits upon our fields of interest in the BSHM.

I must congratulate you all, on behalf of us all, on the domestic arrangements. A seemingly minor but very welcome provision was the iced drinks available in the many breaks between talks. With such a dense programme the breaks were helpful. Despite these and despite the heavy programme, everything very impressively ran on time, which was due to a firm insistence on time-limits, which I was told is a feature of the CSHPM.

I am supposed to be giving *British impressions*, so it might be inappropriate to say thank you for Robin Wilson's entertainment. However, not all the participants in this were from the U.K., so I will say what a fitting conclusion it made to the Friday evening. What I must unashamedly express appreciation for was the positively sumptuous banquet, again beautifully arranged and organised. Smooth-running organisation is a feature of Canadian life (in my experience) and these four days were no exception. It was a very good and profitable time for all of us.

President's Message (Fall 1999)

It was a wonderful experience to see so many members at the annual meeting this past summer. The meeting was held jointly with the British Society for History of Mathematics in July at the University of Toronto. Craig Fraser with able assistance of Lydia Scratch, Gordon Baker, Muna Salloum, Bo Klintberg, and John Anderson from the Institute for the History and Philosophy of Science and Technology at Victoria University organized and oversaw all aspects of the meeting. Craig and his group received well-deserved kudos from all of us in attendance. On Friday evening we were treated to a dramatic performance of Robin Wilson's "The Mathematics of Lewis Carroll" starring June Barrow-Green, Florence Fasanelli, Fred Rickey, Adrian Rice, John Earle, and of course Robin himself. There was audience participation and a good time was had by all. The scientific sessions were diverse and well attended. Among the invited speakers were George Molland, Alexander Jones, Benno van Dalen, Ivo Schneider, Jesper Lutzen, Tom Archibald, Amy Dahan-Dalmedico, and David Aubin. In addition, there were a number of excellent presentations in the general contributed paper session.

Next summer we meet jointly (for the first time) with the Canadian Mathematical Society at McMaster University in Hamilton, Ontario. The theme for the special session, organized by Tom Archibald, is "History of Mathematics at the Dawn of a New Millennium". Pat Allaire, Queensborough Community College, and Rob Bradley, Adelphi University, are organizing the general contributed paper sessions. Greg Moore will be handling the local arrangements at McMaster.

In this interim between CSHPM annual meetings, I would like to call your attention to a meeting this winter replete with sessions on the history of mathematics. Namely, the AMS-MAA-SIAM Joint meeting in Washington, D.C., January 19-22, 2000. Karen Parshall will be give an invited address on"Looking Back: An Historian's Perspective on American Mathematics". Florence Fasanelli, Fred Rickey, and Victor Katz are organizing an MAA contributed paper session on the use of history in the teaching of mathematics. Ron Calinger is organizing four sessions. In the first I.M. James of Oxford will speak on "Why Study the History of Mathematics." In the second, Revel Netz of Stanford and Edith Sylla of North Carolina State will speak on "Archimedes in Ancient and Modern Translation: In Memoriam to Wilbur Knorr.". The third session will feature Michael Monastyrsky of the Institute of History of Science and Technology in Moscow and David Roberts of the National Museum of American History who will discuss "Composing the History of Twentieth Century Mathematics." In the last session, William Aspray of the Computer Research Association will discuss "Mathematics, Computers, and Calculating Instruments." Karen Parshall and David Zitarelli are organizing a joint AMS-MAA session on History of Mathematics. Robin Wilson will moderate a video presentation on the evolution of the four-color theorem. In addition, Robin will guide us through a history of the past 1000 years with postage stamps in his session on "Stamping Through the Millennium." There is an AMS session on the history of topology organized by Jack Morava and a joint session in Memory of Gian Carlo Rota organized by Richard Stanley and Rodica Simon.

I want to again extend my congratulations to Tom Drucker who will replace Hardy Grant as coeditor of the CSHPM Bulletin, to Robert Thomas who will replace Glen Van Brummelen as Treasurer, and to Michael Kinyon and Steve Shore who will replace me as editor of the CSHPM Proceedings. My sincere thanks to Hardy and Glen for their expertise many years of devoted service in the positions they are relinquishing. I also want to thank Sharon Kunoff, Craig Fraser, and Robert Thomas for agreeing to serve on the Nominating Committee to put forward candidates for next summer's election of officers.

Since my last message, I have spoken on the history of mathematics at the Maryland-District of Columbia-Virginia Section of the Mathematical Association of America meeting at James Madison University in Harrisonburg, Virginia in April and at an American Mathematical Society Eastern Section Meeting here in Rhode Island in October. In May, I along with several other CSHPM members attended a marvelous rewarding conference on "The Evolution of an International Mathematical Community 1800-1945" organized by Karen Parshall held at the University of Virginia. I met and was able to talk with several of you at the Mathematical Association of America Mathfest held in Providence this summer. In August I attend a meeting of the National Academy of Science's Mathematics Education Science Board in Woods Hole on Cape Cod. In October, I visited the mathematics departments at the University of Michigan at Ann Arbor, the University of Wisconsin at Madison, the University of California at Los Angeles, and St. Mary's College in South Bend, Indiana. While not my primary goal, I take such opportunities to promote the history of mathematics every chance I get. I look forward to seeing some of you in D.C. in January and in McMaster this summer.

CALL FOR PAPERS

This year the CSHPM will meet at the MATH 2000 meeting, in honour of World Mathematical Year. The meeting will be held at McMaster University in Hamilton, Ontario from June 10th to 13th. Other participating Societies include the Canadian Mathematical Society, the Canadian Applied and Industrial Mathematics Society, the Canadian Operational Research Society, and the Canadian Symposium on Fluid Dynamics.

The title of our special session will be **History of Mathematics at the Dawn of a New Millennium**. Members are invited to present papers to the special session or to the general session on any subject related to the history of mathematics, its use in the teaching of mathematics, the philosophy of mathematics, or a related topic. All (non-invited) talks will be of 30 minutes duration. Since the McMaster Library is home to the Russell archives, papers on Bertrand Russell and his mathematical career are particularly welcome.

Please send your title and abstract by March 1, 2000 to for the special session to: Prof. Thomas Archibald, Dept. of Mathematics Acadia Univ., Wolfville, NS B0P 1X0, Canada, Fax: (902) 542 1454, E-mail: <tom.archibald@acadiau.ca> and for the general session to: Prof. Pat Allaire, Dept. of Mathematics, Queensborough Comm. Coll., Bayside, NY 11364, USA, Fax: (718) 631-6290, E-mail: Rob Bradley, Adelphi Univ., <bradley@adelphi.edu>.

TOWARD A THEORY OF INFINITESIMALS 1870-1900: A VIEW FROM GEOMETRY

Francine F. Abeles

In the evolution of the calculus into a rigorous theory infinitesimals were removed from the limiting process. By substituting the static epsilon-delta definition for the dynamic component of continuous motion, taking the limit of an expression containing the infinitesimal dx involves only a variable dx whose limit is zero taking on nonzero values. Such a variable need not be distinguished from any other variable. Among other benefits, banishing infinitesimals eliminated the nonlinear versus linear inconsistency Leibniz had introduced in his notion of the continuum: two quantities can be considered equal if they differ by an infinitely small amount relative to themselves (nonlinearity), while the laws of arithmetic apply to both infinitesimal and finite quantities (linearity).

The development of the real number system in the 1870's and the linearity of this system guaranteed by the Archimedean axiom made the very existence of an infinitesimal—a number considered as a bounded continuous length of a straight line smaller than any arbitrarily small finite number—impossible. The usual interpretation of the Archimedean axiom is that, for any segments AB and CD, there is a finite natural number n such that if CD is chosen as the unit of length, the length of AB is at most n times CD. If we reverse the roles of AB and CD, then with AB as the unit of length, the length of CD must be at least 1/n times AB, requiring that once a segment is chosen as a unit of length, no other segment can be infinitely small with respect to that unit. Hence, infinitesimal numbers are prohibited in a geometry that employs the Archimedean axiom. Euclid had excluded infinitely large and infinitely small magnitudes, tacitly assuming in Book V that magnitudes obey the Archimedean axiom. (He does not explicitly use the axiom until Book X, when he needs it to help establish the criterion for the incommensurability of two magnitudes.)

In the final three decades of the nineteenth century, the role of the Archimedean axiom in relation to the other axioms for the continuum of real numbers began to be studied closely by many mathematicians, including Paul du Bois-Reymond, who constructed the first non-Archimedean ordered system, Otto Stolz, Giuseppe Veronese, Rodolfo Bettazzi, Tullio Levi-Civita, Charles S. Peirce, and Charles L. Dodgson. Veronese, in particular, was motivated by the question of the existence of straight line segments not satisfying the Archimedean axiom. He was interested in the existence of inifinitely small segments, angles, and areas in a geometry using a non-Archimedean complete ordered field. He first wrote about these ideas in 1889, and two years later his book, Fondamenti di Geometria, containing the earliest example of a non-Archimedean ordered field, was published. Veronese was able to show that the Archimedean axiom can be separated from the other continuum axioms. His construction of a non-Archimedean totally ordered field, however, was flawed, and was completed by his student Levi-Civita several years later.

The discovery of the non-Euclidean geometries earlier in the century focused attention on the behavior of parallel lines at infinity. For example, if a hyperbolic right triangle contains an angle of zero degrees, its hypotenuse and one side are asymptotic straight lines. The importance of the Archimedean axiom in this respect was not established until 1900 when Max Dehn showed that in a hyperbolic geometry he called semi-Euclidean the Archimedean axiom necessarily does not hold. A few years later David Hilbert demonstrated the

existence of a non-Archimedean geometry by constructing a non-Archimedean ordered field.

Charles Dodgson, who was interested in tightening Euclid's parallel postulate, began to work on infinitesimals in 1885. Throughout the Appendices of *Curiosa Mathematica, Part I: A New Theory of Parallels* (1888), hereafter CMI, perhaps the least known of his serious books on a mathematical topic, Dodgson set down his ideas about infinitesimals. He believed they were numbers that were needed to distinguish among numbers that seemed to be equal but were not really equal. He thought that the number system should include both infinite and infinitesimal numbers obeying the same laws as finite real numbers. Dodgson needed a way of apprehending the behavior of straight lines at infinity, but his method of constructing two linear magnitudes not obeying the Archimedean axiom is flawed. He understood that measurement in a non-Euclidean (hyperbolic) geometry depended on the denial of the Archimedean axiom:

'given a Line and a Point not on it, a whole "pencil" of Lines may be drawn, through the Point, and not meeting the given Line...After drawing one such Line the others [will] make with it angles which are *infinitely small fracions of a right angle.*' [CMI, p. 51]

CMI is the earliest publication linking the necessity of a number system containing infinite and infinitesimal numbers (in which the Archimedean axiom cannot hold) with a (non-Euclidean) geometry that includes infinitely large and small magnitudes. Dodgson used the Archimedean axiom to prove the Euclidean parallel postulate—a pair of lines unequally inclined to a given transversal will intersect—is true for finite magnitudes by restricting the scope of the axiom to a finite angular defect only. [CMI, 3rd ed., pp. 28-9]

Since the time of Euclid, concerns about magnitudes and number have been important in the foundations of mathematics. In the last three decades of the nineteenth century, particularly, there were significant results that contributed greatly to our understanding of infinitesimal numbers and their role in geometry. Further attention to little-known work can cast light on how these results were expressed geometrically.

REFERENCES

Abeles, Francine F. *The Mathematical Pamphlet of Charles Lutwidge Dodgson and Related Pieces.* New York: LCSNA, 1994.

_____. Closed Form of the Euclidean Parallel Postulate. *Festschrift on History of Mathematics in Honor of Boris Rosenfeld's 80th Birthday.* J.P. Hogendijk et al, eds. Forthcoming.

Bell, John. Infinitesimals, *Synthese* 75 (1988), 285-315.

Bonola, Roberto. *Non-Euclidean Geometry.* New York: Dover, 1955.

De Morgan, Augustus. On the Early History of Infinitesimals in England, *Philosophical Magazine and Journal of Science,* 4th Series. 4/26 (1852), 321-30.

Dodgson, Charles L. Curiosa Mathematica, Part I. A New Theory of Parallels. London: Macmillan, 1888. Third edition, 1890.

_____. On Geometrical infinities and infinitesimals. Unpublished Manuscript dated March 20, 1885: item 3, packet 10. Morris L. Parrish Collection, Princeton University Library.

Earman, John. Infinities, Infinitesimals, and Indivisibles: The Leibnizian Labyrinth, *Studia Leibnitiana* VII/2 (1975), 236-51.

_____. Hahn's UBER DIE NICH-TARCHIMEDISCHEN GROSSENSYSTEME and the Development of the Modern Theory of Magnitudes and Numbers to Measure Them.

Essays on the Development of the Foundations of Mathematics Jaakko Hintikka, ed. Dordrecht/ Boston/London: Kluwer, 1995, 165-213.

Fisher, Gordon. The Infinite and Infinitesimal Quantities of du Bois-Reymond and Their Reception. *Archive for the History of Exact Sciences* 24/2 (1981), 101-163.

_____. Veronese's Non-Archimedean Linear Continuum, *Real Numbers, Generalizations of the Reals, and Theories of Continua.* Philip Ehrlich, ed. Dordrecht/Boston/London: Kluwer, 1994, 107-45.

Greenberg, Marvin J. *Euclidean and Non-Euclidean Geometries: Development and History.* San Francisco: Freeman, 1974.

Heath, Sir Thomas L., ed. *The Thirteen Books of Euclid's Elements*, 3 volumes, 2nd ed. New York: Dover, 1956.

Horvath, Miklos. The Problem of Infinitesimal Small Quantities in the Leibnizian Mathematics, *Studia Leibnitiana*, supp. 22, 1982, 149-157.

Klein, Felix. *Elementary mathematics From an Advanced Standpoint. Geometry.* New York: Macmillan, 1939.

Knorr, Wilbur. La Croix des Mathématiciens: The Euclidean Theory of Irrational Lines, *Bulletin (New Series) of the AMS* 9/1 (1983), 41-69.

_____. *The Evolution of the Euclidean Elements.* Dordrecht/Boston: D. Reidel, 1975.

Laugwitz, Detlef. Tullio Levi-Civita's Work on NonArchimedean Structures. *Accademia Nazionale dei Lincei. Atti dei Convegni Lincei* 8 (1975), 297-312.

_____.On the Historical Development of Infinitesimal Mathematics: Part 2, *Amer. Math. Monthly* 104 (1997), 654-63.

Rosenfeld, B.A. *A History of Non-Euclidean Geometry.* New York/.../Tokyo: Springer, 1988.
Stillwell, John. *Sources of Hyperbolic Geometry.* American Mathematical Society, London Mathematical Society, 1996.

Veronese, Giuseppe. On Non-Archimedean Geometry, *Real Numbers, Generalizations of the Reals, and Theories of Continua.* Philip Ehrlich, ed. Dordrecht/Boston/London: Kluwer, 1994, 169-187.

Fran Abeles' principal interests besides history are in computer science and mathematical logic, with special emphasis on the work of Charles Dodgson. She mainly teaches computer science courses at Kean University in New Jersey. This semester she is happily teaching a graduate course on the history of mathematics with an emphasis on the rise of computational algorithms.

The Frederick V. Pohle Colloquium Series on the History of Mathematics

Pat Allaire and Rob Bradley are co-organizers of the second year of The Frederick V. Pohle Colloquium Series on the History of Mathematics at Adelphi University, Garden City, NY. The series is named in memory of Fred Pohle, late professor of math at Adelphi, who had a great interest in the history of mathematics.

Speakers earlier this year were Fred Rickey and Harold Edwards. Upcoming speakers and dates follow. (All talks are on Wednesdays at 4:00 pm, preceded by coffee at 3:30 pm, and followed by dinner at a local restaurant.)

Dec. 1, 1999, **Florence Fasanelli**, "The History of 19th Century Mathematics and its Influence on 20th Century Art"
Feb. 2, 2000, **Tom Drucker,** "The Tide of Rigor in the 19th Century"
March 1, **Jim Tattersall**, "Mathematical Vignettes from Cambridge University"
April 5, **Eleanor Robson**
May 3, **Dave Zitarelli**

For titles and abstracts as they become available or for travel directions, contact Pat at <praqb@cunyvm.cuny.edu> or Rob at: <bradley @enigma.adelphi.edu>.

MINUTES OF THE ANNUAL GENERAL MEETING OF THE CSHPM/SCHPM

July 16, 1999 *Toronto, Ontario*

HSSFC Visit: Dr. Michael Owen, Vice-President of Research Dissemination of the HSSFC spoke to us about the HSSFC Congress at Sherbrooke and SSHRC funding. He noted that the Learneds Congress in 2001 will be held at Université Laval in Québec City and in 2002 at Ryerson Polytechnic University in Toronto.

Minutes of the 1998 Annual General Meeting: The minutes were approved.

Secretary-Treasurer's Report: Glen Van Brummelen reported on the financial situation, which is stable, and the membership, which continues to rise.

Motion: To approve the 1998 financial statement. **Approved.**

Motion: To increase reciprocity membership dues for CSHPS members wishing to join the CSHPM from $5 to $10. (A similar motion was passed by the CSHPS.) **Approved.**

President's Report: Jim Tattersall thanked a number of people and organizations for supporting the Society:
*Craig Fraser and his staff: Lydia Scratch, Gordon Baker, Muna Salloun, Bo Klintberg and John Anderson for handling all arrangements for the meeting
*the Institute for History of Science and Technology and Victoria University for the use of their facilities
*the trustees of the E. P. May Fund for their generosity
*the Social Sciences and Humanities Research Council for their continued support of travel grants
*Louis Charbonneau for acting as Jim's representative at the Canadian National Committee (CNC) meeting at the HSSFC Congress in Sherbrooke
*Hardy Grant and Sharon Kunoff for the marvelous job they do on the CSHPM/SCHPM Bulletin
*Rebecca Adams for her report on membership policies of similar organizations for the Executive Committee
*Alexander Jones, Alasdair Urqhart, Craig Fraser, John Earl, Israel Kleiner, June Barrow-Green, Tom Archibald, and Hardy Grant for chairing sessions
*Robert Thomas, Jacques Lefebvre, Glen Van Brumelen, Rebecca Adams, John Fauvel, Alexander Jones, Craig Fraser, members of the Executive Committee for their wisdom and advice
*Providence College for their help publishing and mailing the CSHPM/SCHPM Proceedings
*King's University College for hosting our web site
*Michael Kinyon and Steve Shore of Indiana University at South Bend for agreeing to edit the CSHPM/SCHPM Proceedings beginning with Volume 13
*Tom Drucker for agreeing to assume the responsibility of coeditor of the CSHPM/SCHPM Bulletin beginning with the next issue
*Glen Van Brummelen who was always there when Jim needed help and information.

Other items: The Nominating Committee for next year's elections will consists of Craig Fraser (chair), Robert Thomas, and Sharon Kunoff. The names of candidates nominated by the committee will appear in the fall issue of the *Bulletin*.

The possibility of a joint meeting with the BSHM was raised, as was the possibility of a conflict with the First International Congress of History of Science in the New Millennium in Mexico City, July 8-14, 2001.

***Proceedings* Editor's report:** Jim Tattersall reported that 182 copies were mailed out as of July 1, 1999 (86 to the U.S.A., 50 to Canada; 18 to the U.K., and 28 dispersed to Argentina, Australia, Belgium, Bosnia, Brazil, France, Germany, Iceland, Italy, Japan, Mexico, and Portugal.) In printing about 10% of the copies were incorrectly processed. As a result, Providence College agreed to absorb all printing and mailing costs for the 1998 *Proceedings*.

Bulletin Editors' report: (Hardy Grant, Sharon Kunoff) Hardy asked for contributions to various sections of the *Bulletin*, and noted with thanks that Tom Drucker will be replacing him as co-editor.

Annual Meeting in 2000: The President reported that the CSHPM/SCHPM Annual Meeting in 2000 will be joint with the Canadian Mathematical Society at McMaster University in Hamilton, Ontario, June 10-13, 2000, as part of the celebration of World Mathematics Year. Following our meeting there will be a Fields Symposium organized by Bill Langford at The Fields Institute in Toronto. A special CMS/CSHPM/SCHPM session on the History of Mathematics at the Dawn of a New Millennium will be organized by Tom Archibald of Acadia University. The CSHPM/SCHPM contributed paper sessions will be organized by Patricia Allaire of Queensborough/CUNY and Rob Bradley of Adelphi University.

Annual Meeting in 2001: The Annual Meeting in 2001 will occur in conjunction with the Learned Societies Congress at the Université Laval in Québec City, May 24-26.

Election of Treasurer: The Executive Committee nominated Robert Thomas to fill the one year remaining in Glen Van Brummelen's term as Treasurer. There were no nominations from the floor and the Secretary was directed to cast one ballot for Robert Thomas.

Constitutional Changes:Motion: to adopt the following Constitutional changes:

*the inclusion of *Bulletin* and *Proceedings* editors as ex-officio members of the Council; and replacement procedures for Council members; in particular:
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)], and four other members of the Society.

*policies for the replacement of Council members who resign before the end of their terms:
Article IV, Section 6: A vacancy in the office of the President shall be filled by the Vice-President. [A vacancy in any of the offices of Vice-President, Secretary, or Treasurer shall be filled by appointment by the Executive Council, such appointments expiring at the close of the next meeting of the Society, at which meeting any office so temporarily filled and any vacancy among the four elected members of the Council shall be filled by election using the procedure outlined in Article IV, Section 3 and Section 4 if time permits. The membership shall be notified of vacancies.]

Approved.

New Business:

The Treasurer was directed to look into obtaining charitable status for the Society, in conjunction with the CSHPS's efforts in this direction.

The outgoing Treasurer (Glen Van Brummelen) was thanked for his service to the Society over the past five years.

The meeting was adjourned.

Glen Van Brummelen, Secretary; Jim Tattersall, President

MINUTES OF THE EXECUTIVE COUNCIL MEETING OF THE CSHPM/SCHPM

July 15, 1999 *Toronto, Ontario*

Minutes of the 1998 Executive Council Meeting: approved.

Agenda of the Annual General Meeting: Glen Van Brummelen, the Secretary-Treasurer, reported the financial and membership information to be communicated to members at the AGM. It was noted that our HSSFC dues will increase next year, since our membership has been increasing. Various questions of administrative procedure for the AGM were raised and resolved.

Annual General Meetings in 2000 and 2001: The 2000 meeting will take place in Hamilton in conjunction with the Canadian Mathematical Society's meeting in honour of World Mathematical Year 2000. In 2001 we will return to the Learneds (Laval University, Québec). Jim Tattersall reported that he requested the dates May 24-26.

Nominating Committee: This year's nominating committee will consist of Robert Thomas, Craig Fraser, and Sharon Kunoff.

Other Meetings: We heard Louis Charbonneau's report as representative of the CSHPM at the Canadian National Committee (CNC) at the HSSFC meeting in Sherbrooke. We discussed the possibility of a CSHPM representative at the History of Science Congress in Warsaw, Aug. 20-25, and decided to ask Robert Thomas, if he is already going.

SSHRC Travel Subsidy: Glen Van Brummelen reported that our SSHRC travel subsidy is intended for travel costs for members attending the annual meeting, and that no connection with the Learneds Congress is required.

Report on Membership Restrictions (Rebecca Adams): When the requirement of nomination by two members for a new member to join the Society was abolished last year, Rebecca was asked to survey other societies to find out how other societies deal with the possibility of disruptions during meetings. The results: none of the 31 societies that responded require new members to be nominated by existing members. Virtually no societies have formal policies to deal with disruptions; they are often dealt with on an *ad hoc* basis.

Charitable Status for the Society: It was agreed to recommend to the AGM that the new Treasurer be asked to look into pursuing charitable organization status for the Society, in conjunction with a similar move currently underway by the CSHPS.

Reciprocal Membership Rates with CSHPS: The CSHPS has proposed that the reciprocal membership rates between our Societies be increased from $5 to $10. It was agreed to make a motion to this effect at the AGM.

Glen Van Brummelen, Secretary

CANADIAN MATHEMATICS SOCIETY WINTER MEETING

There will be a special session on history of mathematics at the winter meeting of the Canadian Mathematical Society in Montreal, December 11-13. Speakers -- several of them CSHPM members -- include Tom Archibald (Acadia), Ed Barbeau (Toronto), Len Berggren (Simon Fraser), Louis Charbonneau (UQAM), Chongs Suh Chun (Athabasca), Florin Diacu (Victoria), Hardy Grant (York), Minoru Hasegawa (Lakehead), Jacques Lefebvre (UQAM), Gregory Moore (McMaster), Richard O'Lander (St. John's), Dana Schlomiuk (Montreal), Ronald Sklar (St. John's), Viena Statsna (Calgary), George Styan (McGill), and Peter Zvengrow (Calgary). More information is available at www.camel.math.ca/CMS/Events/.

BOOK REVIEWS

Reviewed by **Edward L. Cohen**, Dept. of Math. & Stats., University of Ottawa, Ottawa Canada ON K1N 6N5 <ECOHEN@UOTTAWA.CA>

It seems that with the year 2000 CE approaching, books on the calendar are popping up like mushrooms. In the last issue one of these was reviewed by Peter L. Griffiths, namely, *The Calendar* by David Ewing Duncan, Fourth Estate, London, 1998. Two more books, quite interesting and entertaining, also came out in 1998. I plan to give a short review of each. These books are *Mapping Time: The Calendar and its History* by E.G. Richards, Oxford University Press, 438 pages [ISBN 0 19 850413 6] and another book by David Ewing Duncan called *Calendar: Humanity's Epic Struggle to Determine a True and Accurate Year*, Avon Books, Inc., New York, 10019, 266 pages [ISBN 0 380 97528 9].

E.G. Richards, *Mapping Time.*

This is a lengthy book whose author, a one-time computer programmer, writes a history of the calendar. It has four parts: The Calendar in Theory, The Calendars of the World, Calendar Conversions, and Easter. The first part deals with general aspects of the calendar including the scientific astronomical facts based on the behaviour of the sun and moon. I feel that some of this 123 page section could be left out without affecting the overall tenor of the book. The last chapter of this section mentions modern reform of the Gregorian calendar (especially pages 112-123; see Cohen [1] for other information on this aspect). Then Richards tries to cover most of the calendars that you have ever heard of, and some that you probably have not. Among the latter are East Asian, obscure European, and several Hindu ones. He also gives 16 calculational algorithms, some to convert from one calendar to another. He mentions Zellor's [sic] congruence as well as Lewis Carroll's method to calculate the day of the week (see Cohen [2] also). The early history of Easter, the golden number, epacts, and dominical letters are studied. This is a more detailed book on calendars than either of those by Duncan. It is an exhaustive, valuable and rich tome with an excellent bibliography.

David Ewing Duncan, *Calendar: Humanity's Epic Struggle to Determine a True and Accurate Year.*

I do not as yet have the Duncan book reviewed in the previous issue, but this book seems to be quite similar to the one from that review. An example of the similarity would be that St. Linus and St. Cletus are mentioned on page 143 of the book already reviewed and mentioned on page 105 in this book. Both books seem to start with the problems confronting Roger Bacon. Thereafter, this book goes chronologically from the Egyptian calendar through the Caesar calendar, spends some time on the Nicaean council, Constantine, Dionysius Exiguus, Bede, Charlemagne, Robert Grosseteste, Roger Bacon, Clement IV, Jean de Meurs, Clement VI, Copernicus, Indian and Arabic influences, etc., and leads up to the gregorian or civil calendar that we use today. Most of the aforementioned figures of eminence are discussed with Easter in mind because of the difficulty in placing the date for it. The lunar nature of Easter as well as the wrong length of the year that Caesar adopted were the main reasons that so much effort was expended. A large bibliography gives a somewhat random collection.

REFERENCES

Cohen, E.L., *A Short History of Gregorian Calendar Reform*, Proceedings of the CSHPM, vol. 10, 102-116.

Cohen, E.L., *Gregorian Dates*, Proceedings of the CSHPM, vol. 8, 343-351.

HOW I LEARNED TO LOVE THE HISTORY OF MATHEMATICS ...

In the last issue of the Bulletin *we printed several several mini autobiographies on the above topic. Reader response was good so we decided to continue the series. If you would like to submit a similar piece for the next issue, we would be happy to print it.*

Israel Kleiner

It was 1973. I was on sabbatical at the Technion in Israel. The "Yom Kippur" war started several weeks after I had arrived from Toronto. The mood in the country was somber. I picked up Bell's *Men of Mathematics* as "bedtime reading". I loved it, and looked for more of Bell's writings. His *The Development of Mathematics* was next. I loved that, too. I was sold on the history of mathematics—so much so that I wrote to the then Chair of our department asking to teach, on my return from sabbatical, a course in the history of mathematics in our newly established in-service MA Programme for Teachers. What chutzpah! Luckily, the Chair agreed.

Several times during my years at York I offered to teach courses outside my area of specialty because I wanted to learn the subject. That was also the case for the history of math course. Selfish, indeed. The students, unfortunately, served as guinea pigs. But I believe I did a better job when I taught the course a second time. To prepare myself that first time, I also read Boyer's *History of Mathematics* and his *The History of the Calculus and its Conceptual Development*. I especially liked the latter book. Kline's *Mathematics in Western Culture* was also on my 1973-74 reading list. It was an eye opener. For the first time I learned of the various areas of culture on which mathematics impinges.

I hope I will not be blacklisted by the community of historians of mathematics for having thought so highly of Bell's books. Over the years I've come to realize, of course, that they ought to be read with considerable caution when it comes to historical facts. But I would recommend them even today—with appropriate forewarning—to aspiring students of the subject. For they are beautifully written and inspiring (*my* opinion, of course), and they stir the reader's imagination.

I am not a professional historian of mathematics, but I have undoubtedly become a better teacher of mathematics because of my continued interest in its history. It has shed light on my understanding and appreciation of mathematics, and I try to pass this on to my students. So I advocate wholeheartedly that teachers of mathematics acquire at least some knowledge of the history of their subject.

But we have to find ways of getting them "hooked" on it. To this end, interesting (hopefully inspiring) "popularizations" of the history of mathematics fill an important need. By all means let us tell the readers that these are first approximations to "the truth". But let us also keep in mind that we must *convince* them that it is worth their while to take a serious interest in the history of mathematics.

I was lucky at York to have colleagues (and old-time CSHPM members) Hardy Grant and Abe Shenitzer who shared my

enthusiasm for the history of mathematics and for what it can do for our students. With the support also of longstanding CSHPM members Trueman MacHenry and Martin Muldoon we have managed to convince our colleagues in the mathematics department to mount several historically focussed courses: Mathematics in the History of Culture, Famous Problems in Mathematics (both junior-level courses), History of Mathematics (a course for seniors), and History of Mathematics for Teachers (the graduate course in our in-service programme which I mentioned earlier). I am confident that our students have benefited from these offerings.

Thomas Drucker

As a child, I was taken to the Museum of Science and Industry in Chicago by my grandparents on a number of occasions. The sight there of the IBM chart of the history of mathematics inspired me to try to jot down some of the details as a way of preserving them in my memory. In a similar way, the Time-Life volume on mathematics included a certain amount of history and I read the volume often enough to commit some of the text to memory. It's not surprising that when I was in high school Constance Reid's volumes could exercise an attraction thanks to their combination of history and mathematics.

When I arrived at Princeton, one of the first courses that I took was in Mediaeval Latin. The instructor assigned us the task of working on a project on material of our choice and recommended my consulting Michael S. Mahoney in the Program in the History and Philosophy of Science. Mike is as much to be blamed as anyone for the amount of time I subsequently devoted to the history of mathematics, as he not only guided me through a mediaeval Latin manuscript that semester as an introduction to the history of mediaeval mathematics, but he was also willing to offer a student-initiated seminar on the general history of mathematics. On my leaving Princeton with a mathematics degree he recommended the University of Toronto and Kenneth O. May as a way to continue my interest in the history of the subject. From there my work in history of mathematics has had plenty of ups and downs, but the fascination of the historical dimension has remained. One can be a Platonist with regard to mathematics itself and yet be intrigued by how humans have come to their understanding of the subject.

Sylvia Svitak

I have always liked the word serendipity and it has been a gift in many aspects of my life – no more so than in events that led me to mathematics and its history.

I remember so vividly a remark by a nun at the parochial school I attended who told my mother that I was too inquisitive – *too curious* was the phrase she used. Those cruelly negative words had power to destroy my craving to learn but serendipity stepped in to bring wonderful mentors into my life who would also lead me to a love of things scientific and mathematical. Primary among those mentors was Wayne Gallagher, a very special chemistry and physics teacher at my high school who encouraged me to go on to college, who inspired me to major in

chemistry, and who taught me how to know and appreciate the sciences through mathematics. At the time I entered Niagara University, Wayne was hired there as a chemistry professor and I was again happy to be in his classes. At the same time Frank Higman made learning calculus exciting, challenging, and rewarding. I'm sure I disappointed Wayne by deciding to turn from chemistry to mathematics for graduate study, but he was partly responsible for my decision. Through his masterful way of using mathematics to demonstrate concepts and solve problems in physics and chemistry he made me keenly aware of the power of mathematics to inform the sciences. I wanted to know more about mathematics so I could know more about everything else.

There would be thirteen years before I would return to graduate studies. There were obvious reasons, among them the fact that most of my time during that period was taken up raising our three children. I had also developed a keen interest in psychology and it was luring me away from mathematics. Serendipity intervened when a friend asked for my help with the problem sets he was assigned in a graduate mathematics course that was part of his doctoral program in chemistry. It was exciting to be doing mathematics again and my friend convinced me to return to graduate school, not for psychology but for mathematics.

I had hoped to do work in abstract algebra but my potential mentor left Adelphi just as I was ready to begin my research. Again serendipity stepped in and led me to Fred Pohle, mathematician, engineer, historian. He became my mentor for a dissertation that allowed me to combine my interests in mathematics and psychology through a historical study of factor analysis in statistics. He taught me the immense value of history and primary sources for understanding mathematical concepts and their true motivations. Fred was a mentor, colleague, and friend whom I admired for his generosity, his breadth of knowledge, and for his eagerness to share what he knew. It's been four years since his death and I still miss him greatly.

Perhaps the most important reason it took me thirteen years to come back to mathematics is because serendipity had arranged for me to meet my dear friend and colleague, Sharon Kunoff, who in turn introduced me to CSHPM.

And so it is that I now know my intellectual pursuits were meant to be mathematics and its history.

Nominating Committee Report

Your nominating committee consisting of Sharon Kunoff, chair, Craig Fraser and Robert Thomas has been working hard to generate a slate of officers and councillors to present to the membership for a vote at the annual general meeting in June 2000. We will consider suggestions from the membership. Please make sure that anyone recommended has agreed to serve if nominated. Names can be sent to the committee by email to <cshpm@cwpost.liu.edu> or by post to Sharon Kunoff, 9 Melissa Lane, Old Bethpage, NY 11804 U.S.A. We expect our slate to be sent to the membership sometime in early January 2000.

THE GENEALOGY PROJECT FOR MATHEMATICIANS

(A project of Pat Allaire, Steve Butcher and Harry Coonce)

Aristotle is generally conceded to be the original scholar to define various subsets of Intellectual inquiry. Indeed, as we all know, he not only distinguished among such basic areas as logic, metaphysics, epistemology and, natural philosophy (a.k.a. science) but he offered reasoned opinions in each of these areas. Now, we ask, what credentials did Aristotle possess in order to publish so brazenly in so many subject areas? Well, the answer, of course, is: Aristotle had studied at The Academy. Moreover, not only did Aristotle study at The Academy, he studied under Plato. And who might Plato have been? His credentials included the claim that he was a student of Socrates!

Moving forward a couple millennia such comments are still a part of our world. Does one ever introduce Riemann without mentioning he was a student of Gauss or read about Albert W. Tucker without his relationship to Solomon Lefschetz being acknowledged? Seldom if ever, we think. Understanding who studied under whom and who is/was a mentor of whom are essential components of intellectual history. Furthermore, in order to understand what Thomas S. Kuhn called shifts in paradigms, it is frequently invaluable to know the academic heritage of the scholars involved. It is with these ideas in mind that the effort which we now call The Genealogy Project for Mathematicians was initiated, seeking to document the mentor-student relationship for as many current members of the mathematical community as we can. Moreover, we then try to find the advisors of the advisors. The recurrence is obvious. As we obtain this information we are making it available on the World Wide Web at the following URL: http://Hcoonce.math.mankato.msus.edu.

As of late September, we have almost 30,000 names available through this web site, which has been written up in The Chronicle Of Higher Education and Science Magazine, and is a Scout Report selection. The project is very much a work in progress or, in the language of the web: The site is still under construction. It shall remain in that status in the foreseeable future. The long-term goal, however, is the following: A user requests a given mathematician. The response is a display, which shows the name of the individual, the university where his terminal degree was earned, the date of that degree, the title of the dissertation and indicates his advisor and all of his doctoral students with links to each of these other individuals. This project might be similar to a huge jigsaw puzzle where one does not have all the pieces in the beginning but, as time goes by, more and more pieces are obtained and new connections are established. However, more data is desperately needed.

Please visit the web site, and see if your Ph.D. school has furnished data for this project. If such is not the case, please try to help us obtain the records from that institution. Or, perhaps you'd like a t-shirt displaying your mathematical ancestry? See the web site for information on how to obtain one.

WEB REVIEW: *DONATE YOUR COMPUTER'S DOWNTIME TO MAKING MATHEMATICS HISTORY: THE GREAT INTERNET MERSENNE PRIMES SEARCH*

www.mersenne.org

Glen Van Brummelen

Computing technology makes its presence felt in the mathematics community more strongly each year. The tools we use to attack problems today would be almost unrecognizable to a mathematician in 1980. Areas of potential research previously inaccessible due to computational barriers are now among the hottest and most funded subjects. The "monster functions" discovered in the early 20th century are today part of chaos theory. The study of prime numbers, once a topic that typified the pureness of mathematics, now finds practical applications in cryptography, and those with the biggest, fastest computers are at an advantage.

Some feats, such as the computation of billions of digits of π, have little direct value in themselves, either in a practical sense or toward the development of pure mathematics. Nevertheless, developments in algorithms and theory, resulting from the honing of computational strategies, have taken mathematics in new and unexpected directions. Sometimes, even in pure mathematics, the race itself bears more fruit than the prize at the finish line.

One of the most glamorous contests today is the search for ever-larger prime numbers. For various reasons, the most likely place to seek out a very large prime number is the sequence of Mersenne primes. These numbers, named for Marin Mersenne, are of the form $2^p - 1$, where p is itself prime. Early writers conjectured, incorrectly, that all such numbers were prime; in fact, $2^{11} - 1$ is already composite. Mersenne was the first to assert that $2^p - 1$ is prime for certain values of p greater than 37 (in particular, 67, 127, and 257; of these numbers, only $p = 127$ actually produces a prime number)

The computational power required to check the primality of large numbers, even with modern advances, is overwhelming, and until recently only those with supercomputers at their disposal could challenge for the record. However, as personal computers increase exponentially in their capabilities but only marginally in the uses to which many of them are put, most newer PC's today are idle most of the time, awaiting user input. A staggering amount of computer power is wasted on your desk each second, for instance, as you type a memo. Over 90% of your machine's power is channeled into an idle cycle, regardless of how fast you type. The power in the sheer number of the mostly idle processors in PC's around the world dwarfs by a factor of more than 1000 the most powerful computer in existence today.

George Woltman, a retired programmer in Florida, decided to tap into this ocean of potential processing speed. His program can be installed on any personal computer connected to the Internet. A central server doles out candidates for Mersenne primes to each computer running the program. Unnoticed by the user, the PC works in the background whenever it would

otherwise be idle, attempting to factor its possible Mersenne prime or performing a Lehmer primality test.

Woltman's success has been phenomenal. The Great Internet Mersenne Prime Search (GIMPS), since its inception, has established new records for the largest known prime number four times. The latest giant prime, $2^{6,972,593}-1$, discovered this past June, contains 2,098,960 digits and eclipses the previous record-holder (also discovered by GIMPS), $2^{3,021,377}-1$, which had a relatively puny 909,526 digits. (You may see a decimal expansion of this number at ftp://entropia.com/gimps/prime4.txt, but be patient: the file is over 2 Mb.) Nayan Hajratwala, the user whose PC discovered this huge prime number, won $50,000 for his PC's efforts and has earned a small piece of mathematical history.

You can contribute the untapped potential of your PC to this cause; simply visit www.mersenne.org and download the small application. It has no discernible effect on the efficiency of your computer's other tasks, and is a painless means of contributing to an exciting mathematical venture. You'll also be testing your machine for hardware defects: GIMPS has identified a number of flaws in participating computers, and parts of GIMPS are used by Intel to test Pentium II and Pentium Pro processors before shipping.

If your interests extend to other projects, you may join a search for twin primes www.cs.rpi.edu/research/twinp/, aid in the computation of the quadrillionth binary digit of π www.cecm.sfu.ca/projects/pihex/pihex.html, or help find Cunningham chains www.geocities.com/Area51/Portal/3360/. If your tastes run beyond mathematics, you may try SETI@home setiathome. ssl.berkeley.edu/, the largest of the Internet group research projects, an effort to find patterns in radio waves arriving from space that may indicate extraterrestrial intelligence.

My PC has been running the GIMPS program as I type this review, and so far it has determined that the number I've been given ($2^{10,859,239}-1$) has no factors below 2^{62}. Given the often-spoken truism that mathematicians do their best work before 35 years of age, GIMPS may be my best hope to earn a place in a future history of mathematics textbook. It's easier than proving Fermat's Last Theorem.

THE BRITISH SOCIETY FOR THE HISTORY OF MATHEMATICS

The British Society for the History of Mathematics will be holding its Christmas Luncheon meeting on Thursday 16 December 1999 Harkness Hall, Birkbeck College, Malet St, London WC1 H 0PD, U. K. Any members planning to be in London at that time can obtain further information from the BSHM web site *<http://www.dcs.warwick.ac.uk/bshm/>* or from J. V. Field, Department of History of Art, Birkbeck College, 43 Gordon Square, London WC1 H 0PD, U. K.; fax: 0171. 631.6107, fax and voice messages: 0171. 736.9198; email: <jv.field@hist-art.bbk. ac.uk>. Muriel Seltman will be among the afternoon speakers. Her topic will be *Thomas Harriot and the Solution of the Cubic*. Other speakers include David Gooding, Martin Kemp and Dennis Simms.

Song for Tom Harriot

Written by Michael Booth

(Submitted by Aditi Gowri <gowri@mail.utexas.edu>. Music is available from Michael at <booth@brandeis.edu>.)

Queen Elizabeth looked at a map of the world full of Latin & Greek esoterica
She wanted the banner of Britain unfurled on the far distant shore of America
She had news for the natives, whoever they were, & she needed somebody to carry it
But she couldn't spare Raleigh, her favorite Sir, so she settled for Mr. Tom Harriot.

The Queen needed someone who could steer by the sky to succeed in traversing the ocean
So Tom wrote to Kepler to find out all about the dynamics of planetary motion
He tracked the positions of Venus & Mars & the moon & Apollo's chariot
There was hardly a man ever studied the stars like the telescope-toting Tom Harriot.

He was just 24 when he waded ashore all covered in seaweed & sand
& he went with a few of the men in his crew for a look at the lay of the land
If you & I went down to Roanoke now we could stay in the Day's Inn or Marriot
But back then there wasn't a motel around, it was sleep on the ground for Tom Harriot.

They didn't know what they could eat of the plants & the animals living around them
They were living on scraps of whatever they'd brought & shellfish whenever they found them
They couldn't go down to the Safeway for food or requisition the camp commissariat
It was time to consult those who lived in the place & the man for the job was Tom Harriot

When he met the Algonquians he needed their help, but they didn't speak his native tongue
So he slowly learned theirs, what they called trees & bears, what they said in the songs that they sung
Before there was Custer or cavalry troops or the cowboy with pistol & lariat
One mild mannered math teacher stayed up late learning their legends & lore: that was Harriot

Well he wrote it all down, spent a year in their town, made some friends & was highly regarded
Needed volumes to hold all the things he'd been told by the time that the English departed
But when Tom put his stuff in a pile on the shore & got some of the sailors to ferry it
They got stuck on a sandbar & threw his books over & they lost the best work of Tom Harriot

And although we don't know what he learned in Virginia, his outlook was never the same
Spent the rest of his lifetime smoking & thinking & scribbling shapes with no name
The cosmos, he said, had no center -- his physics were modern, his math multivariate
And the fact that two people don't see the same rainbow was first pointed out by Tom Harriot
finis.

PERSONAL ITEMS

Hardy Grant is using the time he gained by resigning his editorship of this Bulletin to work on the 'Greek' chapter of a book which will sketch the history of the role and influence of mathematics in western culture. We are looking forward to seeing the fruits of his labour.

Robert Thomas has been assigned the task by his department (Mathemtics, Manitoba) of designing a course along the lines of mathematics as an aspect of western culture with the perhaps unusual proviso that half (or more) of the one-semester course must be devoted to actually teaching the mathematics referred to. The result is envisioned as being a cross between abridged versions of Hogben's *Mathematics for the Million* and Kline's *Mathematics in Western Culture*. Any help members can offer to do with textual material, web sites, syllabuses, experiences, or views on feasibility will be gratefully received, the sooner the better as a report is wanted by the end of the calendar year. Robert can be contacted at his university or by email at thomas@cc.UManitoba.CA

Glen Van Brummelen commenced a new position at Bennington College where he is *the* Mathermatics departement and says he is enjoying it immensely. He just finished his first issue as the new abstracts editor of Historia Mathematica (Feb. 2000 issue), taking over from David Zitarelli. His paper in Centaurus ("The Astronomical System in Musa ibn Nawbakht's Astrological Treatise, the Kitab al-Kamil", on which he talked at the CSHPM meeting last summer) just came out (Centaurus 41 (3), 1999, 213-243). On a more personal note his second child is due on Thanksgiving Day (in the U.S.) and so may have been born by the time members read this.

David E. Zitarelli of Temple University will offer a Chautauqua course on the history of mathematics in America on June 12-14, 2000, in Philadelphia. Officially titled The Coming of Age of Mathematics in America, the course will cover the development of mathematics in the United States, with an emphasis on the emergence of the research community, 1876-1900. There will also be a discussion of major contributions made before 1876, and an outline of the main features of the 20th century. The text will be K. Parshall & D. Rowe, *The Emergence of the American Mathematical Research Community: 1876-1900*, Washington, DC: American Mathematical Society, 1994.

Zitarelli has been at Temple University since receiving his Penn State Ph.D. in 1970. He was the abstracts editor of Historia Mathematica from 1988 to 1999. In April 1998 Karen Parshall and he organized an AMS special session on the history of mathematics in America, and he spoke on this subject at the summer 1999 joint meeting of the CSHPM/SCHPM and BSHM.

ABOUT THE BULLETIN

The *Bulletin* is published each May and November, and is co-edited by Tom Drucker <tld@globalim.com> and Sharon Kunoff <cshpm@cwpost.liu.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 either of the editors; submissions should be sent toThomas Drucker and Sharon Kunoff at the above e-mail addresses, or by post to Thomas Drucker, 304 South Hanover Street, Carlisle, PA 17013 U.S.A.