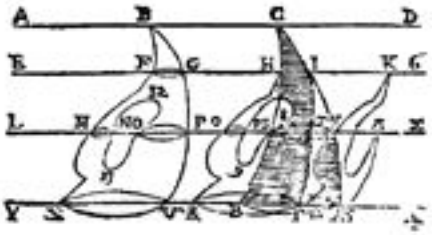
BULLETIN

CSHPM  SCHPM

May/Mai 2003 Number/le numéro 32

WHAT'S INSIDE

President's Message[Len Berggren] ..... page 2

Articles

Note on Fauvel[BSHM] ..... page 2
Call for Papers[Adrian Rice] ..... page 4
Short Course[HomSIGMAA] ..... page 5
Joint 2004 Meeting[Tom Drucker] ..... page 6
Limerick on Euler[Kim Plofker] ..... page 7
Trees of Fibonacci[Barnabas Hughes] ..... page 10
Site for 2005 Meeting[Tom Drucker] ..... page 13

Reports

From the Council ..... page 3
From the Archivist ..... page 4
From the Web Master ..... page 5
Financial Statement ..... page 4
From the Representative to CHFFS ..... page 2
Schedule 2003 Meeting in Halifax ..... page 7

Canadian Society for History of Mathematics
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: **Len Berggren**, Math Department, Simon Fraser University, Burnaby, BC V5A 1S6, CA, Berggren@sfu.ca
Vice-President: **Robert Bradley**, Adelphi University, Garden City, NY 11530, USA, bradley@adelphi.edu
Secretary: **Pat Allaire**, Dept. of Math., Queensborough C.C., Bayside, NY 11364 USA, pallaire@qcc.cuny.edu
Treasurer: **Roger Godard**, Kingston, ON K7M 1Y6, CA, godard-r@rmc.ca
Archivist: **Amy Shell-Gellasch**, CMR 415, Box 3161, APO AE 09114, USA, amy.shellgellasch@us.army.mil

Members of Council

Amy Ackerberg-Hastings, Rockville, MD 20851, USA, aackerbe@erols.com
Hardy Grant, Ottawa, ON K2A 2J8, CA, hgrant@freenet.carleton.ca
Israel Kleiner, Dep. of Mathematics and Statistics, York University, Toronto, ON M3J 1P3, CA, kleiner@rogers.com
Adrian Rice, Randolph-Macon College, Dept. of Mathematics, Ashland, VA 23005, USA, arice4@psu.edu

The Society's Web Page (www.chspm.org) is maintained by **Robert Bradley**, Adelphi University, Garden City, NY 11530, USA

The proceedings of the Annual Meeting are edited by **Antonella Cuppilari**, School of Science, Penn State Erie, The Behrend College, Erie, PA 16563, USA, axc5@iusb.edu

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

President's Message

You will see elsewhere in this issue the rich scholarly fare our membership enjoyed at the recent annual meeting in Halifax. A special thanks has to go to Chris Baltus, Tom Archibald, and Daryn Lehoux who put together such a stimulating program and handled the local arrangements so skillfully.

As you know, I have been trying, during the past year, to build closer ties with the Canadian Mathematical Society, and at its AGM our membership approved the idea of the our exchanging observers at the meetings of their governing bodies. In keeping with this, Tom Archibald represented us at the CMS Board meetings in mid-June, and he has informed me that the CMS Board approved a motion that our president (or a delegate) be invited to attend CMS Board meetings. I will now write to the CMS, accepting this invitation, and, on behalf of our Council, will extend a similar invitation to them.

As you may also remember from my previous report, Tom Archibald and I had discussions last December with the CMS about our meeting occasionally with them. There is no fixed ratio that must hold at all times, but over the long run something like one in three meetings being joint with the CMS seems about right. Of course we will be meeting in Cambridge, England next year, with the BSHM, so 2004 is not an option. When we discussed the possibility of a joint meeting with the CMS in Victoria in the summer of 2005 there were concerns expressed about Victoria being somewhat remote for many of our members and that it

would mean our not meeting at the University of Western Ontario when the CFHSS is meeting there, the UWO being home to a number of speakers in the philosophy of math sessions at our meetings.

However, the news that the CMS has changed the venue of its summer 2005 meeting from Victoria to Waterloo, means that a joint-meeting with the CMS in 2005 would be easily accessible to our members from UWO and, indeed, to all our members from Ontario, Quebec, and the eastern and central United States. I regret that this would mean that we will not be meeting at UWO when the CFHSS does, but I believe that joint meetings with the CMS represents a chance for us to make history and philosophy of mathematics a part of the consciousness of working mathematicians in Canada. This can only benefit our society, both in terms of membership and visibility, and I hope that the philosophers of mathematics in particular would welcome the chance to show working mathematicians the many interesting and important issues their discipline discusses. I hope that all members will support this initiative.

Len Berggren

From the Representative to CFHSS

I am the representative to the CFHSS (formerly HSSFC) from the CSHPM because I am in Ottawa and that is where its meeting is held every November. Its report will probably be coming to all the officers eventually, or at least to the president of every society.

I just want to report to you that essentially nothing happened that affected our society (according to what I saw at the meeting on November 23 & 24).

The one thing that the CFHSS was interested in (at this meeting as with all past meetings) was how much money it can receive from the government of Canada. This is always a problem because it is competing with NSERC.

Two things of note: (1) The CFHSS is working on a web system, which eventually may help its societies; (2) It is looking for contributions of between $500 and $5000 over 5 years.

Ed Cohen

Note on Fauvel

The British Society for the History of Mathematics last year published an extended 92-page special edition of its Newsletter celebrating the life of the late John Fauvel. It contains articles about work inspired by, or carried out with, John, an obituary by Jeremy Gray, and some of the many tributes sent in by John's friends around the world. The authors include Florence Fasanelli, David E. Zitarelli, Jan van Maanen, David Fowler, Alex Craik, Jackie Stedall, Jeremy Gray, Chris Weeks, Neil Bibby and Steve Russ. There are many illustrations, some in colour. A contents list for the Newsletter can be found as newsletter.html#n45 in the directory /bshm at http://www.dcs.warwick.ac.uk

If any of John's friends in this society would like a copy of this Newsletter it is available in return for a donation of 10 pounds sterling (currently just over 16 US dollars) to cover our administrative and postage charges. We can accept payment by Visa, Mastercard, Eurocard, Delta, Diners Card, American Express or by sterling cheque -

please send to the address below, or contact me for further details.

Tony Mann,
School of Computing and
Mathematical Sciences
University of Greenwich
Maritime Greenwich University Campus
Old Royal Naval College
Park Row, Greenwich, London SE10 9LS
E-mail: A.Mann@gre.ac.uk

Call for Papers

The Third Joint Meeting of the Canadian Society for History and Philosophy of Mathematics and the British Society for the History of Mathematics will be held at Clare College, Cambridge from Friday, July 9 to Sunday, July 11, 2004. Further information will be available in due course.

Members are invited to present papers on any subject relating to the history of mathematics, its use in the teaching of mathematics, the philosophy of mathematics, or a related topic.

Please send your title and abstract to:

Professor Adrian Rice
Department of Mathematics
Randolph-Macon College
Ashland, VA 23005-5505
U.S.A.
Tel: (804) 752-7230
Fax: (804) 752-7231
E-mail: arice4@rmc.edu

From the Council - De l'exécutif

In Toronto, the Treasurer provided a notice of motion to amend the Constitution to permit the Executive Council to determine which two of its members are to be signing officers. The formal wording of the motion appears below.

Motion. That clause VI 2 (signing officers) be replaced by: The Executive Council is empowered to choose among its members two persons, each of whom once so designated is authorized to act for and in the name of the Society in all pecuniary transactions with any insured financial institution.

The reason for this is that the persons named now in the constitution are not necessarily resident in Canada, an inconvenience.

While I'm at it, I also propose another.

Motion. That clause VI 1 (fiscal year) be changed to reflect practice for ever: The fiscal year of the Society shall be from January 1 to December 31.

À Toronto, le trésorier a présenté un avis de motion pour amender la constitution pour permettre au conseil exécutif de déterminer lesquels deux de ses membres sont les officiers signataires. La rédaction formelle de la motion apparaît ci-bas :

Motion. Que la clause VI.2 (officiers signataires) soit remplacée par : le conseil exécutif a le pouvoir de choisir parmi ses membres deux personnes, chacune d'elles, une fois désignée, est autorisée à agir pour et au nom de la Société dans toutes les transactions pécuniaires avec n'importe quelle institution financière assurée. La raison de ceci est que les personnes nommées maintenant dans la constitution ne sont pas nécessairement résidant au Canada, un inconvénient.

Tant que j'y suis, je propose une autre mo-

tion.

Motion. Que la clause VI.1 (année fiscale) soit changée pour refléter la pratique pour toujours. L'année fiscale de la Société sera de 1 janvier au 31 décembre.

Financial Statement

The following financial statement covers the period 1/1/2002 through 12/31/2002.The numbers are in Canadian dollars. A conversion factor of 1.6 has been used to convert American dollars into Canadian ones.

	$ Can.
Credits	
dues/subscr.	17482.55
HSSFC travel grant	3480.00
Interest	113.90
May fund	60.00
TOTAL	21326.45
May fund	60.00
Debits	
Travel	3497.42
IHPST	1000
HSSFC (Laval)	453.20
HSSFC	1940
Printing	3785.52
HSSFC Dues	935.84
Archives	328.68
HM	5410.82
PM	3019.20
CSHPS	260
BSHM	0
Postage	51.65
guest Speaker	0
TOTAL	20682.33
NET	644.12
Balance	5178.11
May fund	60.00
Bonds May Fund	3058

Some Comments

This year, we had a small surplus because the expenses for a guest speaker were negligible.

The Society had 264 members in 2002. 23 members were affiliated to CSHPS. 49 members were also affiliated to BSHM. 79 members ordered the conference proceedings. 46 persons attended the annual meeting in Toronto, 104 members subscribed to Historia Mathematica, and 94 subscribed to Philosophia Mathematica. We had members from the following countries: Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Canada, China, Costa Rica, Denmark, France, Germany, Iceland, Israel, Italy, Japan, Malta, Mexico, Portugal, Spain, Sweden, Taiwan, UK, USA, Zimbabwe, with a strong and most welcome representation from the US. Due to this worldwide representation, we may wonder if our foreign members are willing to promote our Society in their respective countries, and we would like to get input from them about their own national societies. One asset of our society is the conference proceedings, and we would like to increase our sells.

We are pleased that the Federation of Social Sciences and Humanities renewed the travel grant, although it seems to stay a fixed amount of money, which does not take the inflation rate into account. In 2002, we have been able to reimburse totally requests about expenses for our members expenses. However the priority for the reimbursement must go to new members and particularly to young attendants.

Finally, I would like to thank very warmly our former treasurer, Prof. Robert Thomas, for his precious help, and the secretary of the Society, Prof. Patricia Allaire, for the enormous amount of work she did for us.

Roger Godard, Treasurer

From the Web Master

Rob Bradley has been continuing to work on the Society web page and wished to mention a couple of new items appearing there. First, the Call for Papers and the announcement of the 2004 meeting in Cambridge can be found on the site. In addition, the electronic addresses of current members can also be found there in updated form. Rob would welcome ideas for further alterations or improvements of the web site, which will become an increasingly useful way for distributing information to the membership.

He also has returned to an issue that has come up on previous occasions and surfaced at Halifax as well. It would be possible to set up a list serve for the CSHPM if there is interest in having one. (There is currently such an electronic list for the Council of the society for discussing business between meetings.) The question is whether there would be enough traffic on such a list (distinct from what is on, say, the Historia Matematica list) to justify Rob's efforts in creating it. If you feel that such a list would be an important contribution to the society's purposes, please let Rob know. He could also give you a summary of some of his earlier columns in this Bulletin on other lists devoted to the subject.

Joint 2004 Meeting in Cambridge

Thanks to the efforts of Adrian Rice of the CSHPM and John Earle of the BSHM, we have a meeting to which to look forward next year in Cambridge (England, not Massachusetts or Ontario). The last occasion on which there was a joint meeting in England of the two groups, the Canadian society also had a meeting at home (in Newfoundland). The result was divided loyalties, as some speakers found the attractions of Oxford legitimately hard to resist and others complained about the low turnout for their talks after having travelled as far east in Canada as one could go. As a result of these considerations, the meeting in Halifax decided that the meeting with the BSHM in Cambridge would be the only annual meeting for the CSHPM in 2004.

This leaves some issues, especially about travel support, unresolved. It seems likely that there will not be money available on the same scale for a meeting in England as there has been for meetings in Canada. The Executive Council of the CSHPM will be pursuing various avenues for funding but there is also the hope that those who are able to make their plans early may be able to take advantage of some less expensive options for travel.

John Earle was able to arrange quite an affordable rate for our accommodations and meals at Clare College, where the joint meeting is to be held. He is also trying to make the accommodations flexible for those who might wish to prolong their stay in either direction or to make something of a family trip out of it. If you are thinking of either of these options, you might wish to get in touch with John (c.j.earle@exeter.ac.uk) promptly to enable him to figure out what is the best bargain available.

The Call for Papers for the meeting can be found elsewhere in this issue and is also on the CSHPM web site. It was the hope of those gathered in Halifax that the society would be well represented on the banks of the Cam next year, both on the pro-

gramme and in the audience. In the many years since Sherlock Holmes described Cambridge as 'this inhospitable town', it has made progress. The mathematical heritage of Cambridge is well attested, and we shall have the opportunity to study its development in situ.

Tom Drucker

From the Archivist

I'd like to thank everyone who donated or offered to donate proceedings and programs. I now have a full set of each. The table of contents for each proceedings as well as the program and abstracts from the meetings can be accessed off of the society web page. Also, in working towards a history of the society, I am encouraging members, especially long time ones, to write down there memories and stories. For more info contact me at

amy.shellgellasch@us.army.mil

or by snail-mail

Amy Shell-Gellasch
CMR 415
Box 3161
APO AE 09114

Amy Shell-Gellasch

Limerick on Euler

Here are the transcription and translation of a Sanskrit limerick on Euler:

āsīd gaṇako raśadeśe
ādityaniveṣasya meṣe
gaṇitaṃ nibudhya
sa tam ākhyadeva
tadvighnajiti śrigaṇeśe

There was a mathematician in the land of Raśa [Russia]; having comprehended the calculation of the entrance of the sun into the sign Aries, he just explained that, [with] the Lord Gaṇeśa [as] his remover of obstacles.

Kim Plofker

Final Schedule for the 2003 Meeting, Dalhousie University, Halifax, Nova Scotia

DAY 1 - Friday May 30, 2003

(8:15 AM) Welcome by Len Berggren, president of CSHPM/SCHPM

(8:30 - 10:45) Mathematical Boundaries: Issues in the Foundations of Mathematics [Joint with CSHPS][1]

Session Chair: Alain Bernard (CSHPS)

(8:30) Thomas Drucker (CSHPM): *Beyond the Axioms: Plato and Brouwer as Critics of Mathematical Practice*
(8:57) Yvon Gauthier (CSHPS): *Complete Induction and Infinite Descent are not the Same. Why?*
(9:24) Janet Folina (CSHPM/CSHPS): *Bolzano and the Nature of Mathematical Proofs*
(9:51) Derek Brown (CSHPS): *Meaning and Rigorization*
(10:18) Jean-Louis Hudry(CSHPS): *Smooth Infinitesimals and Mathematical Continuity*
(10:45) Break

[1] Joint session is supported by a grant from Canadian Federation for the Humanities and Social Sciences, Aid for Interdisciplinary Outreach 2003

(11:00 - Noon) Topics in Mathematics History

Session Chair: Kim Plofker

(11:00) Sorin Costreie: *Leibniz's Account of Infinity and His Philosophy of Mathematics*
(11:30) George Gheverghese Joseph: *Medieval Kerala Mathematics: The Possibility of its Transmission to Europe*

(Noon - 1:50 PM) Lunch and Executive Committee Meeting

(1:50 - 5:40) Mathematics into Modern Times

Session Chairs: Isreal Kleiner / Hardy Grant
(1:50) Leo Creedon: *Robert Murphy and the Creation of Modern Algebra*
(2:20) Francine Abeles: *Henry J.S. Smith's Work on Prime Numbers*
(2:50) Erwin Kreyszig: *Curves and Their Influence on the Development of Mathematics*
(3:20) Break
(3:40) Lawrence D'Antonio: *The Beh_ Edd_n Problem*
(4:10) Jasbir Chahal: *Euclidean Algorithm - from Euclid to Galois and Kronecker*
(4:40) Roger Godard: *Kolmogorov, 1933, and after*

(Early Friday Evening) Presidents Reception

DAY 2: Saturday May 31, 2003

8:00 11:00 AM Parallel Sessions

Session A: Psychology, Pedagogy and Technology

Session Chair: Christopher Baltus

(9:20) Robert Kalechofsky: *Metaphors and Errors*
(9:50) Bill Byers: *Can a Computer Do Mathematics?*
(10:20) Dennis Lomas: *A Common Type of Mathematical Intuition*

Session B: Philosophy of Mathematics

Session Chair: Thomas Drucker

(8:00) Gregory Lavers: *The Vagueness and Completeness of our Ordinary Notion of Mathematical Truth*
(8:30) Steven Bland: *Not to be Ruled-Out: A Defense of Wittgenstein's Views on Rule-Following and Mathematics*
(9:00) Elana Geller: *Why Indispensability is not a Problem for Arithmetical Fictionalism*
(9:30) Break
(9:50) David Laverty: *Tait On Abstraction*
(10:20) Diana Palmieri: *Frege and "Epistemology"*

(11 AM - Noon) Renaissance Mathematics

Session Chair Jim Tattersall

(11:00) David Bellhouse: *Decoding Cardanos Liber de Ludo Aleae*
(11:30) Hardy Grant: *The Mathematics of Nicholas Cusanus*

(Noon - 2 PM) Society Luncheon

(2 - 4:40) Ancient and Islamic Mathematics [Joint session with CSHPS]

Session Chair Daryn Lehoux

(2:00) Duncan Melville: *Poles and Walls in Mesopotamia and Egypt*
(2:30) Alain Bernard(CSHPS): *Why and How Was Proclus Commenting on Euclid?*
(3:00) Glen Van Brummelen: *Something Better than the Elements*
(3:30) Break
(3:50) Len Berggren: *Courtly Knowledge: Science and Royal Patronage in Tenth-Century Islam*
(4:20) Edward Cohen: *The Muhammadan Calendar*

(5 - 6) Problems in 19th Century Periodicals

Session Chair: Francine Abeles

(5:00) Patricia Allaire: *Probability Problems in Two Early American Mathematical Journals* [Joint work with Antonella Cupillari]
(5:30) Jim Tattersall: *Problems in the Educational Times* [Joint work with S. McMurran and F. Coughlin]

DAY 3 - Sunday June 1.

(9 - 10) Maritime Mathematics: Contributed Papers

Session Chair: Tom Archibald

(9:00) Amy Ackerberg-Hastings: *Jeremiah Day and Navigation Instruction at Yale*
(9:30) Kim Plofker: *The Astrolabe in India*
(10:00) Break

(10:20 - 11:15) The Kenneth O. May Lecture

Jim Bennett (Museum of the History of Science, Oxford University): *Geometry, instruments and navigation: agendas for research, 1500-1800*

(11:20 -12:10) Invited Speaker

Lesley Cormack (University of Alberta): *The Grounde of Artes: Robert Recorde and the role of the Muscovy Company in an English mathematical Renaissance*

(12:10 - 1:55) Lunch

(1:55 - 2:25) General Session Contributed Paper

Session Chair Amy Ackerberg-Hastings

(1:55) Joel Silverberg: *Higher Mathematics Education In the United States: The Role of the Academy in the Years following the War for Independence*

(2:30 - 5:20) Euler: Special and General Session Contributed Papers

Session Chair: Roger Godard

(2:30) Ed Sandifer: *Euler Rows the Boat*

(3:00) Israel Kleiner: *Aspects of Euler's Number-Theoretic Work*

(3:30) Break

(3:50) Robert Bradley: *The Curious Case of the Bird's Beak*

(4:20) John Glaus: *Leonhard Euler and His Friends*

(4:50) Christopher Baltus: *The Bernoulli-Euler Proof of the Fundamental Theorem of Algebra*

The Trees of Fibonacci

In Recognition of the 800th Anniversary of Liber Abbaci

Few are the mathematicians who have not heard of the problem of Fibonacci's rabbits. Fewer still are those who know about his "Arboreal Rules." In the middle of Chapter 12 of *Liber Abbaci*,[1] Fibonacci poses and solves five problems about the length of trees, the total length being from roots to tree top and upward. Each solution becomes a model for solving other problems involving fractions. He calls these *The Rules of Trees (secundum regulas arborum).* What I offer are a translation of each problem, a synopsis of its solution, and a symbolic representation of the rule, followed by further examples from *Liber Abbaci.* A cross section of a tree, both below and above ground level, is helpful in visualizing the problems, all involving fractions which refer to the length of the trees, the unit of measure being the width of one's palm.

[1]Boncompagni, B. (ed. 1857), *Il Liber Abbaci di Leonardo Pisano*, Vol. I of *Scritti di Leonardo Pisano Matematico del secolo decimoterzo* (Rome: Tipografia delle Scienze Matematiche e Fisiche), 173-75; in L.E. Sigler (ed. trans.), *Fibonacci's Liber Abaci* (NY: Springer Verlag), 268-278. Chapter and page references here and below are to Boncompagni's edition; translations are mine.

Rule I "Seven twelfths of a tree, which is 21 palms, are under the earth. What is the length of the tree? Be mindful that the tree is divided into 12 equal parts." The solution is by direct proportion, $7 : 12 = 21 : x$, the last being the length of the tree equal to 36 palms. To generalize: let q be the assumed length of the tree (12), p the given parts (7) of the assumed length, a the given real partial length (21), and x the unknown real length. So, a plausible formula is

Rule I $\frac{p}{q} = \frac{a}{x}$

Rule II "Seven twelfths of a tree are under the earth, and the rest of which is above the earth is 21 palms. Make twelfths of the tree, and there are twelve equal parts. Of these discard 7. The remaining 5 parts equal 21 palms. Hence, 5 parts are to 21 as 12 parts are to the length." This is an obvious variation on Rule I, which may be symbolized as

Rule II $\frac{q}{q} - \frac{p}{q} = \frac{a}{x}$

Rule III "Suppose you were to say that having added $\frac{7}{12}$ of the tree to the tree, its length would be 38. By what was shown for the second rule, you will see the tree to be 12 of which you take 7 to be added to the 12 to make 19." And so the problem is solved by the proportion $19 : 12 = 38 : x$. Symbolically,

Rule III $\frac{q}{q} + \frac{p}{q} = \frac{a}{x}$

Rule IV "There is a tree from which $\frac{7}{12}$ has been taken. If what remains is added to the tree, it will rise to 51. What is sought is the size of the tree. Since its size is sought, let it be as 12 from which 7 is taken leaving 5. This added to 12 makes 17." Hence, a proportion is established $17 : 12 = 51 : x$. Thus,

Rule IV $(\frac{q}{q} - \frac{p}{q}) + \frac{q}{q} = \frac{a}{x}$

Rule V "A tree has been extended to $\frac{31}{20}$ of itself. After removing the (original) length of the tree from the enlargement, what remains if 33. Again the length of the tree is sought. Let it be 20, so that from $\frac{31}{20}$ we have 31. Now from this remove 20 leaving 11 which we associate with 33." The arranged proportion is 11 : 20 = 33 : x. In general,

Rule V $(\frac{q}{q} + \frac{p}{q}) - \frac{q}{q} = \frac{a}{x}$

As a good teacher, Leonardo puts his readers to work with five problems which exemplify, one by one, the five rules. Since he used Egyptian unit fractions extensively,[2] I have left all numbers in their printed form; for starters, $\frac{1}{6}\frac{1}{5}\frac{1}{4}\frac{1}{3}$ equals $\frac{57}{60}$. In all the examples, the text (as I translated it for the first example) reads as though he were assuming 60 as an auxiliary number which would lead him to the desired conclusion. Actually, he is simply adding the four fractions after having found their equivalent values as so many sixtieths. The five problems then follow.

1. "If you take $\frac{1}{6}\frac{1}{5}\frac{1}{4}\frac{1}{3}$ of a number, add the parts, and square the sum, you have the same number, that is the root of the number. Now what is it? Now from 60 whose parts are 10, 12, 15, and 20 and the sum is 57 the square of which is 3249, you ask: if 3249 arose from 60, what do you take to produce 60? So 60 times 60 is 3600 which you divide into 3249. The number you sought is $\frac{1}{19}\frac{2}{19}1$." In short, $\frac{3249}{3600}x^2 = x$ and $x = \frac{3600}{3249}$.

2. "Subtract from a number its $\frac{1}{6}\frac{1}{5}\frac{1}{4}\frac{1}{3}$. The square of the remainder is the number itself. The sum of the parts of, say, 60 is 57 which subtracted from 60 leaves 3." Hence $(\frac{3}{60}x)^2 = x$ and $x = 400$.

3. "Add the sum of $\frac{1}{6}\frac{1}{5}\frac{1}{4}\frac{1}{3}$ parts of a number to the number itself. The square of the sum is the number itself." Assume the number to be 60. Then the sum of the parts is 57 which added to 60 makes 117. Its square is 13689. Hence $(\frac{57}{60}x)^2 = x$ and $x = \frac{400}{1521}$ whose root is 2039 .

4. "If you add the remainder (3) to a number (60) having taken its $\frac{1}{6}\frac{1}{5}\frac{1}{4}\frac{1}{3}$ part, the square of the sum is the number itself." Hence $(\frac{63}{60}x)^2 = x$ and $x = \frac{400}{441}$.

5. "Subtract a number from $\frac{5}{6}\frac{4}{5}\frac{3}{4}\frac{2}{3}$ of its parts. Square the remainder and you have the number." Take the difference of 183 and 60, square it, and you have 15129. Hence, $\frac{15129}{3600}x^2 = x$ and $x = \frac{319}{4141}$.

In at least seven other problems[3] Fibonacci referred his reader to the Arboreal Rules with a phrase such as *per regulam secundi arboris*. One of these[4] illustrates a more complex use. "One person says to another, 'Give me 7 of your denars and I'll have 5 times as much as you have left.' The other says, 'You give me 5 of yours and I'll have 7 times as much as you have left.' The problem," writes Fibonacci, "is solved by the Rule of the Second Tree." With x and y as the moneys each has before the exchange, let us consider Leonardo's solution from a modern viewpoint with these equations:

1. $x + 7 = 5(y - 7)$
2. $y + 5 = 7(x - 5)$

Now (1) implies that the total $(x + y)$ consists of six equal parts, $(y - 7)$, and (2) implies that the total $(x + y)$ consists of eight

[2]For a short course in Fibonacci's unit fractions, see Dunton, M. & R. Grimm (1966), Fibonacci on Egyptian Fractions, *The Fibonacci Quarterly* 4:339-54.

[3]See Boncompagni pp. 188, 189, 190, 191, 198, 199, and 201.

[4]Ibid., pp. 190-91.

equal parts $(x-5)$; namely, the fractional parts p, q which are left to each after handing over his required denars. It is this division of the total amount into six and eight parts, respectively, which the Second Arboreal Rule recommends. Symbolically,

3. $p = y - 7 = 16(x+y)$
4. $q = x - 5 = 18(x+y)$

By Rule II, both fractional parts are subtracted together from a hypothetical whole that represents $(x+y)$. For this Fibonacci wants a whole number answer; so, he uses the lowest common multiple (6,8) as the dividend/minuend. Consequently,

5. $p = \frac{1}{6}(24) = 4$
6. $q = \frac{1}{8}(24) = 3$
7. $24 - (3+4) = 17$

which corresponds to 12, the sum of the denars that were exchanged. With this information, Leonardo sets up his proportions:

8. $\frac{24}{17} = \frac{x+y}{12} \Rightarrow x + y = 16\frac{16}{17}$
9. $\frac{p}{3} = \frac{12}{17} \Rightarrow p = 2\frac{2}{17}$
10. $\frac{q}{4} = \frac{12}{17} \Rightarrow q = 2\frac{14}{17}$
11. $\therefore x = 5 + q = 7\frac{14}{17}, y = 7 + p = 9\frac{2}{17}$.

What we have looked at here is evidence of the kind of teaching Leonardo da Pisa espoused: prepare students with model solutions which can be applied in seemingly different, but actually quite similar, situations.

Barnabas Hughes, O.F.M.
California State University, Northridge

Short Course in Phoenix, AZ

At the joint AMS/MAA Winter Meeting in Phoenix, AZ, HomSIGMAA will offer a short course with the title *The History of Mathematical Technologies: Exploring the Material Culture of Mathematics*

Organizers: Amy Shell-Gellasch, (formerly of the) United States Military Academy, & Glen Van Brummelen, Bennington College

Abstract: This short course will explore the history, development, use and significance of various mathematical devices throughout history. Devices investigated will include: sun dials, linkages, navigational and surveying devices, early computing devices, and early computers. Presenters will bring in actual historical devices when possible.

List of Presenters:

- Len Berggren, Simon Fraser Univ.: sun dials
- James Evans, Univ. of Puget Sound: navigational devices (astrolabes, sextants, etc.)
- David Weil, Computer Museum of America: early computing devices
- Ed Sandifer, Western Connecticut State Univ.: Fourier coefficient calculators.
- Daina Taimina,Cornell Univ.: kinematic models and linkages
- Peggy Kidwell, Smithsonian Museum of American History: mathematical devices at World's Fairs.

HomSIGMAA will also organize a contributed papers session on the teaching of history of mathematics courses. Papers can address courses at all levels and types, from general history courses for educators

to topic specific courses for majors. Special consideration will be given to papers that present ideas on how to organize and develop history of mathematics courses. Other topic such as ideas for units or web usage will be considered. To submit an abstract, please contact the organizers:

Joel Haack*
University of Northern Iowa
Joel.Haack@uni.edu

Amy Shell-Gellasch
CMR 415, Box 3161
APO AE 09114, USA
amy.shellgellasch@us.army.mil

Finally, the HOM SIGMAA executive council is pleased to announce the inauguration of will our first annual guest lecture. Peggy Kidwell and Amy Ackerberg-Hastings will present "Making Sense of Your Department's Material Culture." In this talk you will learn how to identify, understand, and arrange mathematical objects and books you might find in your department. In many cases, math professors don't need to leave their home institutions to "explore the material culture of mathematics." Historic models, devices, and books may be tucked away in the drawers and closets of their own departments.

For more information, please go to the HOM SIGMAA website, accessible from the MAA website, or contact Amy Shell-Gellasch at amy.shellgellasch@us.army.mil

Site for CSHPM 2005 Annual Meeting

At the meeting in Halifax, there was some discussion of the location for the annual meeting of the Society for 2005. In view of some lack of consensus, a motion was approved for the Executive Council to solicit the opinions of the membership (including those who had not been present in Halifax) and to make a decision about the site by the end of the summer. This note is designed to serve as that solicitation.

The two alternatives before the meeting were to meet with the Learneds at the University of Western Ontario or to meet with the Canadian Mathematical Society. The location of the latter meeting has been confirmed by Tom Archibald as Waterloo, Ontario. As a result, geography should not play much of a role in deciding between the two sites.

Elsewhere in this issue, President Berggren describes the general sense of the group in Halifax that further meetings with the Canadian Mathematical Society (following up on the meeting at McMaster) were for the benefit of both organizations. As he notes, there was no formula offered or approved for how often the two groups should meet together, but he pushed for as early a date as possible. Approval of joint meetings in principle is not nearly so effective as setting up a date for a joint meeting in practice.

There were various concerns about not meeting with the Learneds advanced in Halifax, but the president points to one of them in his remarks. The single biggest contingent of speakers at our meetings (not just in philosophy of mathematics, but sometimes altogether) has come from the University of Western Ontario. This editor expressed the worry that our not meeting with the Learneds in the year that it was actually at London might be easily read as ingratitude. On the other hand, we have no direct evidence that deciding in favour of Waterloo would be so taken.

At any rate, the Council has undertaken

to make a decision in accordance with the schedule laid down in Halifax. If you have feelings one way or the other about the relative merits of meeting with the Canadian Mathematical Society at the University of Waterloo and meeting with the Learneds at the University of Western Ontario, please communicate them to a member of the Executive Council (addresses of various sorts on page 2). The fall issue of the Bulletin will include the decision taken by the Council after benefitting from your contributions to the discussion.

Tom Drucker

New Members

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

Marcus Emmanuel Barnes
Mount Albert ON
Canada
mbarnes@neptune.on.ca

Virginia Buchanan
Hiram College
Hiram OH
US

Sorin Costreie
Talbot College
University of Western Ontario
London ON Canaa

Jim Cross
University of Melbourne
Victoria, Australia
jimc@mundoe.maths.mu.oz.au

Michel Guillerault
Grenoble, France
Michel.Guillerault@imag.Fr

David Ireland
Princeton University Press
Woodstock, Oxon U.K.
direland@pupress.co.uk

Gregory Lavers
University of Western Ontario
London ON
Canada
glavers@uwo.ca

Ivica Martinovic
Dubrovnik, Croatia
ivica.martinovic@du.tel.hr

Nubuo Miura
Kobe, Japan
miuranob@kobe-u.ac.jp

Diana Palmieri
University of Western Ontario
London ON Canada
dpalmier@uwo.ca
http://ww.theatheist.com

J. D. Phillips
Wabash College
Crawfordsville IN
USA
phillipj@wabash.edu

Gabriela R. Sanchis
Elizabethtown College
Elizabethtown PA
USA

Joel Silverberg
Providence RI
USA

Maryam Vulis
Queensborough Community College,
CUNY, Bayside NY
USA
mwatkb@aol.com

Linda Winton
Market Rasen
Lincs U.K.

lindajohn.winton @tesco.net

From the Editor

This is the revised version of the spring Bulletin and will have to stand the judgement of posterity. The device of a temporary issue (such as was distributed in Halifax at the annual meeting) is not one to be recommended. On the other hand, the meeting was able to consider with more legitimacy the motions originally proposed by Robert Thomas the year before. For making this possible, Daryn Lehoux deserves especial thanks for adding the task of temporary production editor to the other chores more standardly assigned to the local organizer. We are grateful to Barnabas Hughes for allowing us to print his tribute to Fibonacci in honour of the 801st anniversary of the Liber Abaci, when he had submitted it in plenty of time for the octocentenary. Roger Godard kindly translated the motions to amend the constitution passed in Halifax. Finally, if Kim Plofker was able to produce the Sanskrit limerick on Euler while in North America, we can hardly wait to see what her time in South Asia will bring to light..

Despite the fact that this issue is now appearing after the annual meeting in Halifax, it is not intended to be a full report on that meeting. Those items would normally appear in the fall issue of the Bulletin following the meeting, and there is no intention of making the life of the archivist more challenging by including some further chronological irregularities. The editors' intention is to produce the fall 2003 issue of the Bulletin in November 2003, thereby adhering distinctly more to the calendar than was true of the last issue. As a result, we shall be soliciting material for the next issue to arrive by the middle of October. A modest amount of tardiness will not be impossible to deal with, but we are determined that the next issue will not come out after the Fall.

The only items of especial importance to be introduced as a result of the annual meeting are a few points about the annual meetings for 2004 and 2005. There are separate articles on both of these, and there is a factor of timeliness about responses by readers. One of the interesting features of the Maritime Museum in Halifax was the chance to learn more about the life of Samuel Cunard, an individual greatly involved in the transportation of travellers between the Old World and the New a century ago. Those of us who found the atmosphere at this year's annual meeting invigorating are bound to be looking forward to carrying our discussions on in Cambridge, even if the Cunard lines may not be carrying most of us to the meeting there.

About the Bulletin

The *Bulletin* is published each May and November, and is co-edited by Tom Drucker (druckert@mail.uww.edu) and Eisso Atzema (atzema@math.umaine.edu). Material without a byline or other attribution has been written by the editors. Les pages sont chaleureusement ouvertes aux textes soumis en français. Comment and suggestions are welcome, and can be directed to either of the editors; submissions should be sent to Tom Drucker and Eisso Atzema at the above e-mail address, or by snail mail to Tom Drucker, Department of Mathematical and Computer Sciences, University of Wisconsin–Whitewater, Whitewater, WI 53190.