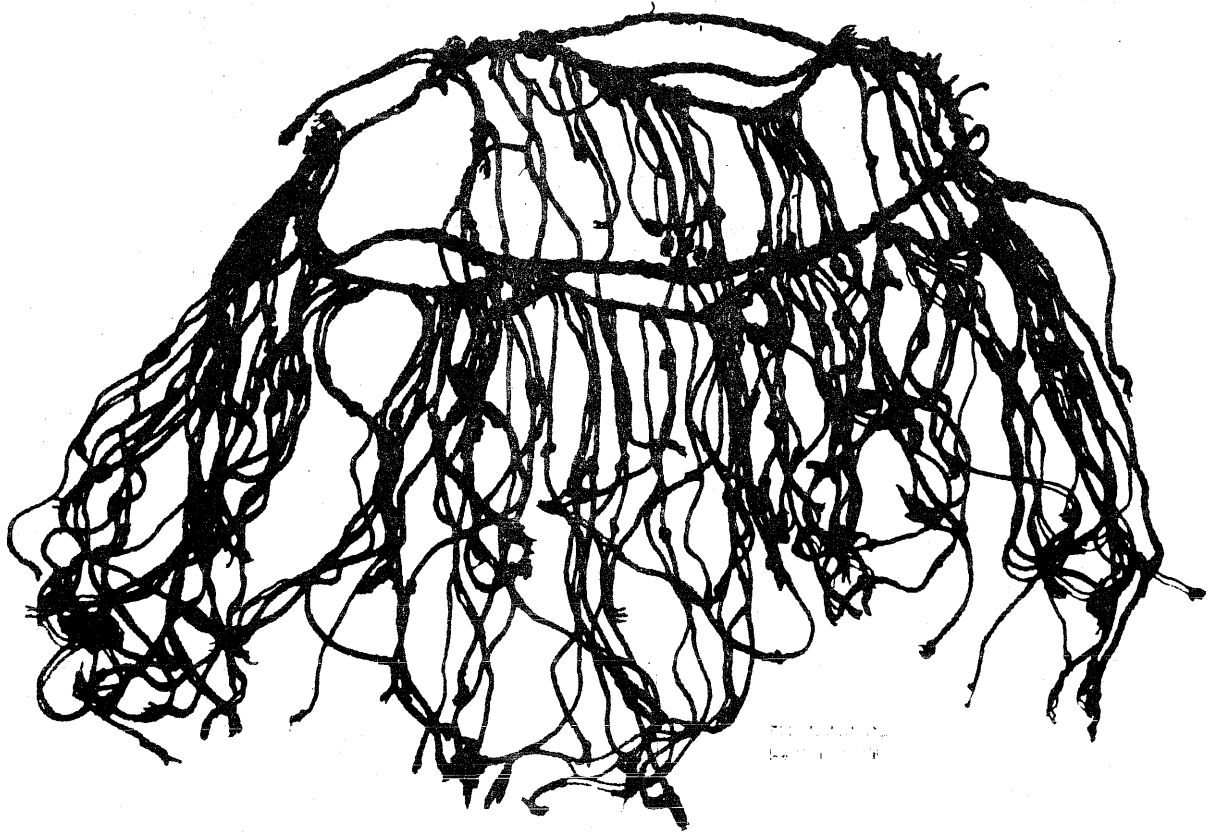
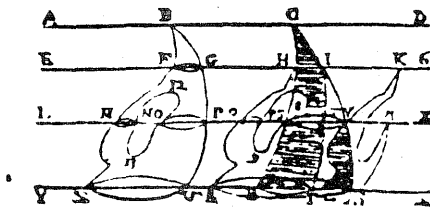


BULLETIN CSHPM/SCHPM



A Peruvian Quipu

numéro 10, janvier 1990
number 10, January 1990
ISSN 0835-5924



Canadian Society for History
and Philosophy of Mathematics
Société canadienne d'histoire et
de philosophie des mathématiques

The Bulletin is an informal medium whose aim is to inform members of the CSHPM\SCHPM, and others interested in the history and philosophy of mathematics, of happenings, meetings, current research work, publications etc. and to provide a place where one can present tidbits, historical problems, quotations etc. which do not find a place in more formal media.

** NOTE** Roger Herz-Fischler will be on sabbatical leave in 1989-1990 and so material should be sent to his home address, as follows, and not to Carleton University. Also please note the new suffix for the electronic mail address.

Roger Herz-Fischler
340 Second Ave.
Ottawa, Ontario, K1S-2J2.
home tel. (613) 563-0350
Electronic mail address: ROGERH-F@CARLETON.CA

The preferred method is via electronic mail because it renders retyping unnecessary and avoids mail delays of up to plus infinity. The second best method is to send an IBM compatible diskette (unformatted = ASCII), via the mail. The mention of these methods should not however discourage those writing with quill and ink, à la Babylonian or by other methods. It would be appreciated if those submitting more than simple news items would send it them in final typed form so that the text can be reproduced as is.

CSHPM/SCHPM

The society is international in outlook and membership. Its purpose is to unite scholars who are interested in the history and philosophy of mathematics.

Annual dues are \$15 (\$US 11).

If a subscription to Historia Mathematica (the official journal of the society) is desired the additional cost is \$29.50 (\$US 22) i.e. a total of \$44.50 (\$US 33). A subscription to Historia Mathematica via CSHPM represents a considerable saving over the usual cost.

Remittances should be sent to:

M.A. Malik,
Department of Mathematics, Concordia University,
7141 Sherbrooke Ouest, Montréal, Québec, H4B-1R6
tel. (514)848-3232
Electronic mail address: MAMALIK@CONU1.CA

Kindly include your electronic mail address if you have one.

** NOTE** Professor Malik is on sabbatical during the fall term so that a response might be delayed.

ANNUAL MEETING

University of Victoria

May 31, June 1 1990

Joint Session with the

Canadian Mathematics Education Study Group

History and Pedagogy / Histoire et Pédagogie

Talks/Conférences: General Session - Francine Abeles, Kean College, Union, New Jersey, USA 07083.

E-MAIL: CPSFO1@TURBO.Kean.EDU (lower/upper case important).

Talks/Conférences: Talks/Conférences: General Session Special General Session - Victor Katz, University of the District of Columbia, 4200 Connecticut Avenue N.W., Washington, D.C., USA 20008.

APOLOGY: In issue no. 8 of the Bulletin I used the masculine possessive adjective and pronoun in connection with Professor Ivica Martinovic. I apologize for this and ask the readers not to include the mistake in their list of blatant sexism (three of the nine "current interest" articles have been by women), but rather to a lack of knowledge of Yugoslavian proper names. - Roger H-F.

COVER

The cover shows seven small quipus tied together. (In the collection of the Peabody Museum, Cambridge, Mass). In general, a quipu can contain as few as three or as many as 2000 cords. The photograph was supplied by Marcia Ascher of Ithaca college who is well known for her work in "ethnomathematics" and in particular her book Code of the Quipus which combines, in a very readable style, non-trivial mathematics with a fascinating description of the cultural context of quipus. Another article on the quipus appeared in Annals of the History of Computing 11(1984), 76-80. Readers of Historia Mathematica will have seen her 1988 article "Graphs in Cultures: A Study in Ethnomathematics" (other articles are mentioned in her "Current Work" article below). In addition to the purely research aspects of ethnomathematics professor Ascher is interested in the pedagogical aspects and she discussed her views in an article in Historia Mathematica 11 (1984), 76-80. Because of her work Marcia Ascher was invited (one does not apply!) to spend the year 1987-1988 as a scholar in residence at the Getty Center for the History of Art and the Humanities in Santa Monica, California.

CURRENT WORK AND INTERESTS

My graduate education and early work was in applied mathematics, in particular in numerical analysis. I am married to an archeologist/anthropologist and because we enjoyed doing some combined work, I developed an interest in relating mathematics to questions arising from archeology and anthropology. Primarily involved were computational and statistical techniques until, in about 1967, we started an investigation of an Inca artifact that itself was said to be numerical or somehow mathematical. This evolved into a more extensive and interesting study than I had anticipated and led to my current major interest in the mathematical ideas of traditional culture.

The Incas had no writing system in the sense we generally use the term. All of their records were kept on spatial arrays of colored knotted cords called quipus. Only about 500 quipus exist in museums and private collections throughout the world. To even begin any analysis, it was necessary to examine the quipus first-hand and count, measure, and systematically record whatever might conceivably be significant. Looking at the quipus individually and as a group, some cues of the symbolic system could be understood. Then, using those, the structure or format of the data on some specific quipus could be identified. Finally, within that structure, the data itself could be analyzed for internal relationships. Code of the Quipus: A Study in Media, Mathematics and Culture (University of Michigan Press, 1981) describes the logical-numerical system of the quipus as well as their cultural context and the place of the quipumaker in Inca society. (Details of some 220 quipus were published separately for present or future interested scholars.)

As this study progressed, I had to rethink many of my ideas about mathematics and its relationship to culture. I also became increasingly aware that our histories of mathematics often ignore or misrepresent traditional peoples. In order to expand that history to include traditional peoples, it is necessary to recognize that their mathematical ideas will be found in contexts appropriate to their cultures and that the mode of expression of any idea will also depend on the culture. Rather than the usual sources used by historians, studies of these ideas must be informed by the work of ethnologists, culture historians and linguists. (These thoughts are elaborated in "Ethnomathematics," Hist. of Science 24(1986), 125-144). I began to seek ethnographic descriptions involving numbers, logic, or spatial configuration in which sufficiently specific data is available so that I could combine analysis of structure with evidence that the people themselves are concerned with the structure. The sand tracing tradition of the Malekula in Oceania is one such case. The tradition evidences an idea which falls within what Westerners call Graph Theory and associated with it are other geometric and topological ideas. The result of this study and a companion paper on sand tracings in some African cultures are in Hist. Mathematica 1988 and Archive for Hist. of Exact Sciences, 1988. (For additional examples, see "Mu Torere: analysis of a Maori game," Math. Mag. 60(1987), 90-100 and "A river crossing problem in cross-cultural perspective," Math. Mag., to appear.)

I am currently working on a general book on mathematical ideas in traditional cultures. Writing should be completed by the end of this year and it is to be published by Wadsworth. As a professor in an undergraduate college, I teach mostly calculus type courses but, about once every third or fourth semester, I teach a course which draws upon and develops along with the interests described above.

1988 ANNUAL MEETING

Université Laval, May 29, 1989

[The following minutes are based on a submission by the secretary A. Malik together with comments by L. Berggren and R. Herz-Fischler]

1. The meeting started at 17:10 with approximately 30 participants with the president Len Berggren presiding.
2. The minutes of the May 30, 1988 meeting held at the University of Windsor were approved.
3. Wesley Stevens has been appointed as a member of the International Commission of History of Mathematics.
4. The meeting approved Len Berggren as the representative to the Canadian Federation of the Humanities.
5. The Notice of Motion from the 1988 re a change of name of the society was dropped.
6. The Secretary - Treasurer A. Malik recommended that the CSHPM not proceed with any joint membership agreement.
7. The Secretary - Treasurer A. Malik presented the financial report. [reproduced in this Bulletin].
8. The Secretary - Treasurer A. Malik that there is a \$1700 term deposit in the Kenneth May Fund.
9. The meeting considered the proposal that the Proceedings of the Annual Meeting be published every year and distributed among members of the CSHPM. In view of the additional expenses involved, the meeting asked the Treasurer to make a recommendation to the next Annual Meeting regarding the necessity of an increase in membership dues.

10. The next Annual Meeting will be held in Victoria with the themes of the special session being "History and Pedagogy". [Details are given in this Bulletin].
11. The results of the Election of Officers was as follows: president - Len Berggren; vice-president - Craig Fraser; Secretary - Treasurer - A. Malik; council (two years) - Charles Jones, Robert Thomas [Israel Kleiner and Roger Herz-Fischler are members until 1990].
12. Votes of thanks were given to: Tasoula Berggren for editing the Proceedings; Roland Eddy for his organizing of the present meeting; Craig Fraser for organizing the special session.
13. The meeting ended at approximately 17:40.

 INFORMATION FOR MEMBERS

1. The number of mailing stickers for this issue of the BULLETIN is 137. This represents a considerable increase over last year. Last fall the number of stickers was about 105. Although the number of mailing stickers is not identical to the number of members the following approximate counts from past membership lists may be of interest: 1977 - 156; 1981 - 110; 1984/85 - 85.
2. Copies of Proceedings of the Fourteenth Annual Meeting of SCHPM/SCHPM (Windsor, 1988) are available for \$5 from Tasoula Berggren, Department of Mathematics, Simon Fraser University, Burnaby, B.C., V5A 1S6.
3. David Wheeler [Mathematics Dept, Concordia University, Loyola Campus, 7141 Sherbrooke Street West, Montréal, H4B 1R6] has written that he will add names of Canadian members of the CSHPM to the mailing list (FREE!) of the HPM (International Study Group on the Relations Between History and Pedagogy of Mathematics) Newsletter. David is the editor of For the Learning of Mathematics and welcomes articles. Members living in the USA should write the editor of the HPM Newsletter, Victor Katz, Dept. Mathematics, Univ. of the District of Columbia, 4200 Connecticut Ave. N.W., Washington, D.C., USA 20008.
4. In the April 1988 Bulletin (number 8) the term "Association for Philosophy of Mathematics" was used. Irving Anellis has pointed out that this is the organizational name under which Philosophia Mathematica is published and that it is not a formal organization as such. The subscription to the journal is \$15 for everyone.

CONFERENCES/SEMINARS

The following talks were held last year at York University in the Seminar in History and Philosophy of Mathematics and Mathematics Education. For details contact Israel Kleiner.

J. Agassi (Philosophy, York) - "What is Mathematics".

J. Agassi (Philosophy, York) - "The Lakatosian Revolution".

Abe Shenitzer - "Diophantine equations and the Evolution of Algebra".

Jens Hoyrop (Roskilde) - "Medieval Islamic Mathematics".

Marvin Flashman (Humboldt State) - "Estimation and Differential Equations: Themes for a Sensible Calculus".

Ed Barbeau - "Newton's Method".

Israel Kleiner - "Rigor and Proof in Mathematics: A Historical Perspective".

James Stewart (McMaster) - "Problem Solving in the Mathematics Curriculum".

Hardy Grant (York) - "The Method of Analysis: Its History and Influence".

Trueman MacHenry (York) - "A Survey of Chinese Mathematics from Shang to Ming".

Emily Grosholz (Philosophy, Pennsylvania State) - "Descartes and Galileo: The Quantification of Time and Force".

Phil Piltch (York) - "Mathematics and Art - What is the Connection?".

John Fauvel (Open Univ.) - "How to Mathematicians Communicate? Euclid, Descartes, Record".

Enzo Gentile (Univ. Buenos Aires) - "Historical Aspects of the Algebraic Theory of Quadratic Forms".

Liliane Beaulieu a donné une conférence intitulée "Mathematics under Siege: Bourbaki during War and Occupation" dans le cadre du symposium "Les mathématiques et l'Etat" au Congrès International d'Histoire des Sciences en août. Le contenu de cet exposé est extrait de sa thèse sur les travaux de Borubaki entre 1934 et 1955.

On Tuesday, 8 August 1989, Dr. Fran Abeles, Professor of Mathematics and Coordinator of Graduate Studies in the Department of Mathematics and Computer Science delivered a paper at the XVIIIth International Congress of the History of Science - On Science and Political Order, at the Deutsches Museum in Munich. The paper covered aspects of Charles L. Dodgson's work that reflected the responsibility of a scientist to state and society. A highpoint of the conference was the reception given by the Minister of Education of the Federal Republic of Germany and the Senate of Hamburg.

On Friday, 8 September 1989, Dr. Fran Abeles delivered a paper at the Charles S. Peirce Sesquicentennial International Congress, at Harvard University in Cambridge. The paper dealt with some of Dodgson's work in logic and its connection with Peirce's existential graphs. She will expand the paper for inclusion in a volume of selected proceedings to be published in 1990 - 91. While in Cambridge, Dr. Abeles took the opportunity to work with rare manuscript material in the Houghton Library of Harvard University.

CSHPM/SCHPM

FINANCIAL STATEMENT (JANUARY 1- DECEMBER 31, 1988)

Presented at the Annual Meeting

Université de Laval

Credit

Balance	1476.54
SSHRC Administrative Grant	1361.00
SSHRC Travel Grant	1189.00
Membership dues	4569.30
Bank Interest	26.15
Total	8621.99

Debit

Travel subsidy	2182.35
Historia Mathem. dues	1485.64
CFH (1987 & 1988)	840.00
1988 Windsor Meeting exp.	969.98
Bulletin	841.90
Sec.help	500.00
Misc.(postage,supplies,tel.etc.)	170.12
	6989.99

Balance

1632 CR.

JOINT SESSION ON HISTORY AND PEDAGOGY
AT
VICTORIA MEETING

Joel Hillel of Concordia is responsible for the Newsletter of the Canadian Mathematics Education Study Group. He will be putting out a Newsletter in November. For details on the CMESG and their meeting at Victoria please contact him. Address: Department of Mathematics, Concordia University, Loyola Campus, 7141 Sherbrooke Street West, Montréal, Québec, H4B-1R6. E-Mail: JHILLEL@CONU1

**CONCORDIA
UNIVERSITY**



Department of Mathematics

May 24, 1989

To whom it may concern

I have examined the account book of the Canadian Society for the History and Philosophy of Mathematics held by Dr.M.A. Malik, Secretary/Treasurer of the Society and found it in order to the financial report of the year ending December 31, 1988.

A handwritten signature in cursive script, appearing to read 'Joel Hillel', written in dark ink.

Dr.J. Hillel
Professor

ARCHIVES / REIMPRESSIONS

The papers of Pierre Simon Laplace have been acquired by the Bancroft Library of the University of California at Berkeley.

Material relating to the late logician Jean van Heijenoort (1912 - 1986) has been donated by Irving Anellis to the van Heijenoort collection of the Archives of American Mathematics at the University of Texas.

Les éditions ACL est une nouvelle maison se spécialisant dans les réimpressions des grands textes mathématiques. Adresse: BP 40, 75221, Paris, Cedex 05. Parmi les titres déjà parus sont des oeuvres par Stevin, de l'Hopital, Euler, Cauchy, Condorcet, Varignon ainsi que Encyclopédie Méthodique - Mathématiques réédition, avec additions, de l'Encyclopédie de Diderot.

CONDORCET

-

MOYENS
D'APPRENDRE
A COMPTER SÛREMENT
ET AVEC FACILITÉ



ART, CULTURE, LECTURE - ÉDITIONS

JOURNALS AND ORGANIZATIONS

The Institute for Research in Classical Philosophy and Science is a non-profit educational corporation established in late 1983 by a group of educators and scholars at various academic institutions in Canada, Europe, and the United States. Its primary purpose is to enhance higher education and to promote research in both the sciences and the humanities, by supporting scholarly study concerning the history of the interaction between science and its humanistic interpretation in the various societies and language groups constituting western culture. In general, the Institute supports scholarly research in classical philosophy and science up to the seventeenth century, which marks the beginning of the modern era.

To meet this goal the Institute facilitates the dissemination of research and promotes cooperation between scholars in those disciplines that traditionally touch on these subjects. There are several means by which the Institute accomplishes this purpose. In addition to sponsoring international conferences and other forms of scholarly communication, the Institute has established a program of publication that includes bibliographies, translations, monographs, and thematic collections of essays.

Please direct requests for further information and queries about specific proposals to: Dr. Alan C. Bowen, Institute for Research in Classical Philosophy and Science, 1314 Browning Road Pittsburgh, PA 15206-1736, USA.; tel: (412) 362-3572; BITNET: acbowen@pittvms.

A new international journal Modern Logic is being planned. The aim is to publish 4 issues per year with the probable cost being US\$10 -15 per issue. It will contain historical studies and surveys in the fields of mathematical logic, set theory and foundations of mathematics. For details please contact the editor: Irving Anellis, 110 McDonald Drive, #8-B, Ames, Iowa, USA 50010-3470.

Ganita-Bharati has just completed a decade of publication and volume 10 (1988), p.1 contained a congratulatory message from Len Berggren of the CSHPM. Subscriptions (US\$25) should be addressed to: Dr. Man Mohan, Dept. of Mathematics, Ramjas College, Delhi University, Delhi - 110 007, India. Editorial enquiries should be addressed to: Dr. R.C. Gupta (editor), B.I.T., P.O. Mesra, Ranchi - 835 215, India.

The journal Ancient Philosophy is a journal for ancient philosophy and sciences. It publishes two issues per year of approximately 150 pages each. Papers on topics in the history and philosophy of the classical mathematical sciences are welcome. Address queries to the editor: Professor Ronald M. Polansky, Department of Philosophy, Duquesne University, Pittsburgh, Penn., USA, 15282.

CITATIONS/QUOTATIONS

"On March 19th, 1857, Stokes wrote to his young lady: 'I have been doing what I guess you won't let me do when we are married, sitting up till 3 o'clock in the morning fighting hard against a mathematical difficulty.'" - from J. Heading, An Introduction to Phrase-Integral Methods, London, Methuen, 1962, p.4. [submitted by Sharon Kunoff].

"Some peoples say that too much rigour leads to rigor mortis" - Israel Kleiner, CSHPM Annual Meeting, Laval, 1989. [recueilli par R. H-F]

"La Mathématique nous montre et elle nous offre un éclatant exemple combien nous pouvons aller loin. Encouragé par une telle preuve de la force de la raison la passion d'aller plus loin ne voit pas de limite." - Kant, 1783. Cité dans Jean Dhombres, "Bošković aux prises avec le calcul différentiel: art nouveau des inégalités et pratiques anciennes", version préliminaire.

"Mathematics, like philosophy, is virtually inseparable from its history. The central concepts, the problems to be studied, and the way the theories are organized are all inextricably associated with the names and work of the authors who first advanced them." - H. Edwards. [submitted by Israel Kleiner]

"Nothing is more important than to see the sources of invention which are, in my opinion, more interesting than the inventions themselves." - Leibniz, [submitted by Israel Kleiner]

"The third main and most welcome superiority of Bottazzini comes from his avoiding the main pitfall of preceding historians of mathematics, old and recent, with apparently [M. Kline, Mathematical Thought from Ancient to Modern Times] as the sole exception, namely, their tacit smug assurance that advances in 'pure' mathematics are to be found only in works on 'pure' mathematics." - C. Truesdell, [Review of U. Bottazzini, The Higher Calculus: A History of Real and Complex Analysis from Euler to Weierstrass], Archives Internationales d'Histoire des Sciences, 38, no. 120, (1988), 125-137, p. 125.

"Analysis (bija) is certainly the innate intellect assisted by the various symbols (varṇa), which, for the instruction of duller intellects, has been expounded by the ancient sages who enlighten mathematicians as the sun irradiates the lotus; that has now taken the name algebra (bījaganita)." - Bhāskara II (c. 1150), cited by B. Datta and A. Singh, History of Hindu Mathematics, Bombay, Asia Publishing House, 1938, part II, p.1

"One of the ways to help make computer science respectable is to show that it is deeply rooted in history, not just a short-lived phenomenon." - Donald Knuth, "Ancient Babylonian Algorithms", Communications of the Association of Computing Machinery, 15(1972), 671-677; 19(1976), 108.