International Study Group on the Relations Between
HISTORY and PEDAGOGY of MATHEMATICS
NEWSLETTER

An Affiliate of the International Commission on Mathematical Instruction

No. 49 March 2002

Message from our Chairperson

To the members of HPM,
I hope that our Newsletter is reaching all the people involved and/or interested in the subject of HPM and also that it answers your expectations. We have now new regional contacts: thanks to all of them.

I'm looking back to the first issue and I'm checking which of the promises I wrote in my address have been kept. Things have changed a bit because I miss the wise presence of John and I now have new responsibilities in my academic work, nevertheless I would like to look at the positive things:

- The newsletter is appearing regularly. About this I have to say to Peter "Thanks for existing". Without our editor Peter Ransom this enterprise would not be possible. As you know the numeration of the issues does not include the number 45 (the editor explained the reason). As researcher in the field of mathematical journals I'm happy to offer matter of study and disputes to the researchers of 22nd century onwards about the 'missing' issue.

- Once again I ask you to send contributions, pieces of information, suggestions. In particular we like to know if there are any local initiatives (conferences, seminars) on the subject about which we are concerned. We need to know things in advance in order to inform our readers.

- As announced in the newsletter in 2002 there are conferences (in mathematics education and in history of mathematics) where HPM members will participate (among others: Morocco conference and Abel conference in June, Crete conference in July). This will offer occasions for meetings to replace the European Summer University that was not possible to organise. The proceedings of all these conferences will offer a document on how research in our field is proceeding.

- The Newsletter is not enough to make strong and fruitful contacts among researchers. We are working to have our own site. I heartily thank Karen Dee Michalowicz who managed to host us in the HPM America web site, which is now again alive.

- I would like to have a logo for our Group; thus I launch among the readers a logo competition. It has to be simple enough for the computer to cope. An idea could be to use ancient letters H, P, M appearing in old books.

Fulvia Furinghetti

Logo competition

Send your designs to Peter Ransom (contact details above) to arrive before 14 June 2002. He will then process it and forward it to Fulvia. Original artwork, jpeg or gif is acceptable.
The prize for the winning design is either a bottle of good red wine (Oltrepò Pavese, Northern Italy) bottled by Fulvia (though the winner has to come to take the bottle in Genoa!) or a mystery book prize.

Scarves and Jackets

The HPM Meeting held in Taipei in August 2000, sparked off a train of events for me that I am pleased to be able to share through the newsletter.

At the Taipei Meeting I wanted to emphasis a particular set of points from my research on mathematically gifted young people in New Zealand, that seemed to me to be important in showing ways in which more of us could develop our instincts to express ourselves mathematically. These young people had different senses of the aesthetic, different aptitudes and skills, different understandings of which areas of mathematics were interesting, and different school experiences. They paid attention to detail and they used all their senses to notice, understand, appreciate, teach, know, use, experiment, think, learn, and apply their mathematical thinking not only in mathematics but in all their other pursuits as well. They made things that reflected their skills and aesthetic senses rather than always depending on writing as their method for expressing the theories, conjectures and calculations that interested them.

The more I thought about how to emphasis these points effectively, the less conventional overheads seemed appropriate. And the more I became reluctant to prepare conventional overheads, the more a different set of stories came to mind. Generally they were stories that reminded me first, that some patterns that would be hard to write down in conventional notation are there nonetheless all around world in three dimensions, achieved and able to be appreciated; and second, that many of us have told stories in conference presentations that show that students who were bored with mathematics and its 'secret' formulae, came alive when they began themselves to make examples and models.

This gave me the idea of making 'substitute overheads'. I realised that what I was saying could be said through the making of garments that valued patterns and colours and enabled a visual exposition to accompany the verbal. I set myself a problem to answer, "Take any garment and a bundle of scraps and make something that describes a mathematical idea and leads to a discussion of its history", and went to Taipei with eight purpose-created jackets and scarves folded in among my notes. I was genuinely impressed by the response to my 'substitute overheads' of those who came to my presentation, and I could not resist saying this to several people when I came home.

One of these people happened to tell the story to a local art dealer and, intrigued, he suggested I might like to show him what I had done. My ensuing visit ended with his offering me a two-week "solo artist's exhibition" at his gallery. So eight months after the Taipei Meeting, the original collection of eight scarves and jackets had been expanded to thirty, and I had developed a way of writing about each item so that verbal explanation and visual image could hang in the Gallery side by side. The exhibition attracted over 350 visitors in the fortnight. Adults who claimed to have no knowledge of mathematics found themselves working out number sequences, thinking through theorems, talking about whether or not mathematics was a philosophy and art rather than the set of skills and rules they had previously assumed it to be. There were reviews in both a local and a national newspaper. Later in the year a ten-minute slot on my 'maths-art' and me was included in a nationally shown TV arts programme, and that gave me the opportunity to organise another exhibition.

Chinese violets

While I am, of course, personally delighted that a conference presentation can turn so easily into art and exhibitions, I am even more delighted to have stumbled upon another way of interesting people in basic mathematics, its history, its usefulness for thinking, writing and visualizing as well as for calculating, estimating and understanding, and its ability to cross cultural boundaries and educational limitations. I make no apology for mixing colours, observed details, logical processing, whimsical illusions, natural interconnections, and historical and cultural understandings for it seems to capture people's imagination in a way very similar to that described in many papers given at HPM Meetings, and it enables brief hints to be given of mathematical ideas that can be followed up as chosen by individuals. There is nothing

particularly complex in the mathematics that I am able to portray by this method of presentation, but neither is there anything particularly complex in the mathematics that large numbers of school children (and therefore, presumably, adults) are unable to understand, according to many reports.

Computer graphics have reminded us of the advantages of using colour and shape and change and fluidity to capture the imagination, illuminate problems, and improve the learning processes through a 'hands-on' approach to understanding basic mathematical ideas. It would be sad not to use the knowledge we have gained from modern technology as a reason for revitalising the use of old creative skills and technologies as well as the new. Thus, I plan to continue to have exhibitions and sell the scarves-and-their-stories whenever I can, so that they go to places where they will encourage people to acclaim the ideas that underpinned the attitudes of the students in my original research, namely, that basic mathematical concepts are fun to use and talk about, that lots of mathematical information is present in the world around us, and that ideas inspired by mathematical thinking are easily made a part of many sociable conversations.

There will be an exhibition at the 2nd International Conference on the Teaching of Mathematics in Crete in the first week of July. Since the time of the Taipei Meeting, a small group of us have discussed the possibility of a book emerging from this whole idea, a book that is a sort of mathematical anthology for children, parents and teachers, a word-and-picture 'pleasure garden' of associated ideas based on the responses of people who see the exhibitions or buy a scarf and through that are drawn to tell what appeals to them about an item, ways they have used that mathematical idea, or what they know of its history and of similar expressions of relationships used in other cultures. If anyone is interested, or able, to organise an exhibition in the northern hemisphere in the weeks following mid July, 2002, I should be pleased if they were to get in touch with me by email at

cdaniel@maths.otago.ac.nz

Coralie Daniel
Otago, New Zealand

The unfurling fern that finds expression in New Zealand in the koru is a symbol used in many places in the world to express ideas of continuity, new life and replacement.

A symbol similar to that of the koru can be seen in artwork of the descendants of the earliest settlers in Taiwan.

By the time I arrived home from the conference in Taiwan in August, thoughts of the unfurling fern frond, the conference discussions on ways in which concepts and symbols of infinity turn up in cultures all around the world, and the orange and green colours of the flight attendants' uniforms on EvaAir (the national airline of Taiwan) were all strong in my mind.

Here they are mixed together to suggest as many antipodal links as you can see, for example, a Fibonacci number sequence, EvaAir, ferns and koru: all concepts that link people and their cultures around the world.

Report on the Future of the Teaching and Learning of Algebra

In early December 2001 the 12th ICMI Study Conference on *The Future of the Teaching and Learning of Algebra* met at the University of Melbourne, Australia. One of the working groups of the conference was devoted to the history of algebra. Each of the members submitted a paper, the contents of which will eventually be worked into the published study. I report here, however, on the papers as submitted.

Stephen Campbell, of the University of California, Irvine, USA wrote on *Number Theory and the Transition from Arithmetic to Algebra: Connecting History and Psychology*. He notes that number theory is generally viewed in two ways, as a generalization of whole number arithmetic and as a specialized part of algebra. As such, it is now virtually missing in the teaching of secondary mathematics. He argues, however, that because of its central position between arithmetic and algebra, and because historically it played an important role in the transition between the two subjects, it should play a more central role in education at the secondary level. He suggests that research should be done to test the use of number theoretic ideas as a psychological gateway for learners moving from arithmetic to algebra (*This paper is also mentioned on page 7 of the Newsletter*).

Fulvia Furinghetti, of the University of Genoa, Italy, in collaboration with Annamaria Somaglia of the Liceo Scientifico of Genoa, submitted a paper on *The Method of Analysis as a common thread in the History of Algebra: reflections for teaching*. They described the outline of a course for in-service teachers on the teaching of algebra. Among the critical points stressed in this course, especially by the use of original sources, were symbolism, the relation between arithmetic and algebra, the relation between geometry and algebra, giving meaning to manipulation, and, as a general theme, the obstacle of formalism. To pick the original sources to discuss, they used as a thread the method of analysis, following this through the algebraic work of Diophantus, al-Khwarizmi, and Viète.

Aurora Gallardo, of CINVESTAV-IPN, Mexico, dealt with *George Peacock and a Historical Approach to School Algebra*. The author notes that in a recent research project on the introduction of negative numbers, the conclusion was reached that all the machinery necessary for calculations with negative numbers was present long ago. The crucial step, however, was the acceptance of negative numbers as "real" objects. The author then analyzes Peacock's *Treatise on Algebra* (1845), especially as he explains the non-existence of negative numbers in arithmetical algebra and their necessity in symbolical algebra. The question is then raised as to whether Peacock's analysis may still be useful in today's teaching.

Victor Katz, of the University of the District of Columbia, Washington, D.C., USA, discussed *Using the History of Algebra in Teaching Algebra*. He presented an outline of the history of algebra from ancient times to the nineteenth century, including Islamic algebra, Medieval and Renaissance algebra in Europe, and the development of symbolism in the seventeenth century. At each stage, he emphasized the importance of certain historical ideas in the teaching of algebra today. In particular, he emphasized that there should be a clear focus in algebra teaching, based on the solution of equations. And the fact that the solution of equations from earliest times was based on geometrical ideas means that it may well be useful to use these ideas in the teaching of algebra today.

Israel Kleiner, of York University, Toronto, Ontario, Canada, presented *A Historically Focused Course in Abstract Algebra*. He outlined a course designed for an in-service program of mathematics teachers. This course is based on the study of certain problems – their basic solutions, the abstractions to which these solutions led, and how the solutions to the original problem usually led to solutions of other, often more important, problems.

The leaders of the History of Mathematics working group were Luis Puig, of the University of Valencia, Spain, and Teresa Rojano, of the Research Center in Advanced Studies, Mexico. A full report on the results of the working group will appear in a later issue of this Newsletter.

Victor Katz
Washington, U.S.A.

Reviews

In you would like to be involved in reviewing books or magazines for this section, please send your contact details and area(s) of interest to the editor who will forward books or magazines for review as and when they become available.

If you wish for a book to be reviewed, please send it to the editor who will arrange for it to be reviewed.

History and Epistemology in mathematical Education From play school to university

Proceedings of the *Third European Summer University* held in Louvain-la-Neuve (15/07/1999-18/07/1999) and Leuven (18/07/1999-21/07/1999).

In 1999 the *Third European Summer University* took place in Louvain-la-Neuve and in Leuven (Belgium), after being held for the first time in Montpellier (France, 1993) and the second time in Braga (Portugal, 1996).

Since the very beginning the *European Summer University* turned out to be a highly qualified place for meeting, comparison, study and international debate on the *history and epistemology in mathematical education*.
The Proceedings, which have been quite rightly published in memory of unforgettable John Fauvel, lately deceased, are gathered in two volumes of about 950 pages altogether.

The first volume contains the texts of
• 5 **plenary lectures** by Evelyn Barbin (*Figures et lettres mathématiques: nécessité visuelle et nécessité discursive*), John Fauvel (*Can mathematics education learn from history?*), Marjolein Kool (*Arithmetic in the Low Countries up to 1600: trade, tradition, terminology*), Nicolas Rouche (*La géometrie et la nature des choses*), Constantinos Tzanakis (*Mathematical Physics and "Physical Mathematics": A historical approach to didactical aspects of their relation*);
• 26 **lectures**;
while the second one contains a summary of
• 31 **workshops**.

In reading the Proceedings, what immediately strikes the reader is the extraordinary wealth and variety of themes, together with the profundity of analysis and the topicality of didactic suggestions which seem to point to some sort of universal, cross-cultural difficulties met by teachers from different countries and cultures.

It is not by sheer chance that introducing his **plenary lecture** *Can mathematics education learn from history?*, John Fauvel wrote: "I'm drawing today particularly on the British experience because that's what I know best, but I would like to think any ideas and insights we may be able to glean from the situation are transferable elsewhere and make sense in other national contexts too"; whereas later on, he ironically urges the teachers to take on an almost political view of their being teachers: "One thing we can learn from international gatherings, such as the *European Summer University*, is how we foot-soldiers in the educational trenches can learn to control our officer class, the politicians, better"; finally, he passes on to examine rapidly what contributions England got from other countries, such as Danes, French, Italians, Dutch, Portuguese, Swiss, Belgians, and what, in turn, she can contribute to them.

This give-and-take is indeed the *fil rouge*, the *thin line* running through and enlivening the *European Summer University*, and the Proceedings themselves.
Another feature worth noting is the fact that they all harmonize on the concepts of "word" and "vision".
For instance, Evelyn Barbin states she intends "d'examiner, a partir de texte historiques, quelques visuels du texte mathématiques". In fact, "Un texte mathématique est un texte qui se lit, où se tient un discours, mais le texte mathématique est aussi un texte qui se regarde, où des traces sur le papier demandent et font compréhension, qu'il s'agissent de figures géométriques, de lettres ou de symboles".
Therefore in order to understand it is essential to see, then to touch, to experience, to travel, to know as Marjolein Kool writes: "During the Middles Ages merchants went along the houses with their basket with goods….They needed to change money in many different ways, because each city had its own money system…. The job of the merchant and his calculations became more and more complicated…Many arithmetic books were written in the vernacular…"
Here is an excellent example of investigation into a historical setting, which though pertaining to Holland, can be quite similar to other European countries in the Middle Ages; in short, it can provide useful ideas to integrate into a serious teaching proposal.

Nicolas Rouche resumes the geometrical discourse by pointing out how "les déterminismes géométriques reconnus dans l'action (par exemple le dessin aux instruments) fournissent des inférences, dont les premières sont évidentes, relèvent de "la lumière naturelle". Et celles-ci

ensuite se combinent en inférences non évidentes, en preuves discoursives."

Finally, Constantinos Tzanakis, using an effective, chiastic play on words - Mathematical Physics *vs* Physical Mathematics – describes a few excellent and very deep concepts in which he analyses the subtle and seminal links between mathematics and physics. Moreover, he offers a concrete and very detailed teaching experience, the Bernoulli's 'brachistochrone problem'
Some of the themes dealt with in the plenary lectures appear to be tackled by other authors from different standpoints in the numerous lectures that occupy most of vol. 1. Generally speaking, geometry seems to prevail in constant, lucky revival, as compared to the recent past; other topics are present such as mathematical analysis, applied mathematics to physics and economics, chaos theory, stochastic processes and arithmetic, the Queen of mathematics, according to Gauss. Also in this case the reader will realise how often, more or less overtly, stress is laid on the language – reporting and dramatising, for instance – being of vital importance to mathematics epistemology and education.

The second volume is entirely devoted to the **workshops**, and consequently it appears to be more didactic in its connotation. A few works in this volume are particularly rich in **annexes**, which is a feature worth noting.
Also in this book there is a wide range of topics and teachers will find a mine of ready-to-use information, suggestions and useful ideas for classroom teaching.

The proceedings of the third European Summer University
held in Louvain-La-Neuve, Leuven (1999)
have been just published. They cost 30 Euros.
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In conclusion, the Proceedings of the *Third European Summer University* are no doubt a very useful, almost indispensable tool for anyone willing to follow the international debate on the themes of epistemology and history of mathematics, in a teaching perspective. At any rate, the two volumes, which are also rich in lovely pictures, are excellent and interesting to read and offer opportunity to stimulate useful discussion among teachers.

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Giuliano Testa
Vicenza - Italy

Gerdes, P., *Geometry from Africa: Mathematical and educational explorations*
The Mathematical Association of America, 1999, Pp 210 (1999) ISBN 0-88385-715-4

Reviewed by John D. Barrow (Director Millennium Mathematics Project, Cambridge University) for PLUS Magazine (June 2001). This beautifully illustrated book by the world's leading authority on African mathematics provides us with a wide-ranging introduction to mathematical intuition in sub-Saharan African cultures.
The full review can be found at
http://plus.maths.org/issue15/reviews/book2/

Paulus Gerdes
Maputo, Mozambique

Have you read these?

This section contains references to books or articles that may be of interest to all those concerned with the history of mathematics. Please send details with complete bibliographic information to the editor for inclusion in future issues.

The 12th ICMI Study was held in Melbourne from 9 to 14 December 2001. The theme was *The future of the teaching and learning of algebra*. One of the working groups was devoted to the history of algebra. A comment on the papers published in the *Proceedings* can be found on page 4. Here we focus on other aspects emerging from reading the Proceedings, which concern the HPM group. I have noticed that in some papers there is what we can call an 'incidental presence' of history. By this I mean that the papers do not assume the use of history as an hypothesis of work, nevertheless history appears as a means to carry out the research or the work in classroom. In the following there are some examples of what I mean taken from: H. Chick, K. Stacey, J. Vincent & J. Vincent (editors), *Proceedings of the ICMI Study 'The teaching and learning of algebra*, 2001 (Melbourne).

- Kidron, I., 'Teaching Euler's algebraic methods in a calculus laboratory', v.2, 368-375.

The analysis of the contribution of the Computer Algebra System is made starting from the chapter on the development of functions in infinite series in the Euler's book *Introductio in Analysin infinitorum*.

- Mason, J., 'On the use and abuse of word problems for moving from arithmetic to algebra', v.2, 430-437.

It presents an interesting list of word problems going across the history of mankind, with comments from the educational point of view. It is always striking for me to realise the persistence of certain problems and certain style of teaching (for a historical overview see also the paper of S. Hariki, A historia dos problemas-narrativas published in the *Proceedings of Braga HPM* satellite meeting in 1996, p.373-380 of the second volume).

- Rojano, T. & Sutherland, R., 'Arithmetic world - Algebraic world', in H. Chick, K. Stacey, J. Vincent & J. Vincent (editors), *Proceedings of the ICMI Study 'The teaching and learning of algebra'*, v.2, 515-522.

The author uses the method of analysis/synthesis to study the passage from arithmetic to algebra through word problems and using spreadsheets.

- Siu, M.-K., 'Why it is difficult to teach abstract algebra?', v.2, 541-547.

The author's reflections on the difficulties in teaching abstract algebra are based on historical considerations on history of algebra, as well as the presentation in ancient treatise in Eastern and Western culture.

- Smith, N. C. & Davis, G., 'Implications of the history of algebra for teaching early algebra', v.2, 548-555.

As the authors say in the introduction the paper tries to highlight certain historical aspects of algebra for teaching early algebra, which are crucial to our present perception of the nature of algebra and algebraic thinking. Viète, Descartes, Lagrange, Peacock are among the inspiring authors of their study.

Van Ameron, B.: 2000, 'Learning from history to solve equations', in M. van den Heuvel-Panhuizen (editor), *Proceedings of PME 24* (Utrecht), v.I, 232-239.

The aim of the paper is to investigate which didactical means enable students to make a smooth transition from arithmetic to early algebra. Specifically, the students compare the 'invention' of algebra from an historical perspective with possibilities of 're-invention' (in the Freudenthal sense). Word or story problems taken from Babylonian, Egyptian, Chinese and Western early algebra provide problems situated in every day life, mathematical riddles and recreational problems.

- Campbell, S. R.: 2001, 'Number Theory and the transition from arithmetic to algebra: connecting history and psychology', v.1, 147-154.

The author takes the basic assumption that number theory may have a central role to play in helping learners make the transition from arithmetic to algebra and that phenomenology provides one way of discerning and establishing meaningful connections between historical and psychological developments in mathematical thinking.

In the conference CIEAEM 51 the main theme was "Cultural diversity in mathematics (education)", and the *Sub-theme I* was "Looking back, moving forward". The Proceedings of the conference (Editors A. Ahmed, H. Williams & J. M. Kraemer, Horwood Publishing, Chichester, 2000) report the following articles, which are focussed on the history of mathematics.

Cerquetti-Aberkane, F., 'Les textes historiques authentiques comme déclencheur de l'activité mathématique et scientifique en primaire', 61-66.
Evans, W., Black, J. & Stewart, M., 'Studying the history of mathematics by decoding original writings', 67-71.
Fried, M. N., 'Some difficulties in incorporating history of mathematics in teacher-training', 73-78.
Gellert, U., 'Historic examples as a mean to become critical', 79-85.
Linardakis, P., 'L'évolution historique des notions trigonométrique et son influence sur l'enseignement de la trigonométrie d'aujourd'hui', 88-94.

Fulvia Furinghetti
Genoa, Italy

Heyde, C. C. & Seneta, E. (editors), *Statisticians of the Centuries*. Springer, New York, Berlin, etc., 2001. Pp xii + 500; DM96·19, US$34·95 ISBN 0-387-95283-7
This collection contains biographies, with portraits, of 103 individuals (17th to 20th century) contributed by 75 writers drawn from across the world.

Maor, E., *e: The story of a Number*. Universities Press (India) Ltd., Hyderabad, 2001. Pp xiv + 227; Rs. 175/- (for sale in South Asia)
A comprehensive book about e, the base of natural logarithms.

Joseph, G. G., *The Crest of the Peacock. Non-European Roots of Mathematics*. Penguin, 2000. Pp xviii + 454; UK£9·99
A reprint with additional material. The added "Reflections" cover pp349-423.

Balachandra Rao, S, *Indian Mathematics and Astronomy: some Landmarks*. Jnana Deep Publication, Bangalore, 2000. Pp 11 + 263; Rs 130/-, US$ 15

Kapur, J. N., *The truth about Swamiji's Vedic Mathematics*, Mathematical Sciences Trust Society, New Delhi, 2000. Ppvii + 138; Rs 125/-

Parameswaran, S., *The Golden Age of Indian Mathematics*, Swadeshi Science Movement, Kochi, 1998. Pp xiv + 185; Rs 42/-

Damodar Jha (editor), *Maitrayaniya Sulba-sutra*, Hoshiarpur, 2001. Pp xix +59; Rs 80/-
The Sanskrit text of this new work is accompanied by Sanskrit commentary by Sarikara. The Sulba Sutras are the oldest geometrical handbooks of India. About a dozen such works are known. Only half of them are available in print.

Scriba, C. J. & Schreiber, P. *5000 Jahre Geometrie. Geschichte, Kulturen, Menschen*, Springer Verlag, Berlin, Heidelberg etc., 2000. Pp xiii + 596; DM 69
This profusely illustrated cultural history of 5000 years of geometry (from antiquity to the 20th century) is an excellent book on the subject. It should be translated into other languages.

Venkatesha Murthy, *Glimpses of the mathematics from Sanskrit works*. Rashtruya Sanskrit Vidyapeetha, Tirupati, 2000. Pp52.
A booklet giving a few mathematical rules.

Jagannadha Reddy, R. S., *Propositions on the exact value of π and three famous unsolved problems*, Chittoor, Andhra Pradesh, 2001. Pp iv + 112

Gupta, R. C., 'Some important mathematical methods as conceived in ancient India'. *Souvenir of the World Sanskrit Conference*, New Delhi, 2001, Pp 51-62
The methods covered in this paper are the Rule of Three, iteration, and averaging.

Sarasvati, T. A., 'Sanskrit and mathematics'. *Ibid.*, Pp 63-78
A survey of mathematical formulas from ancient Indian works in arithmetic, algebra, geometry, trigonometry and series.
Rai, R. A., 'Brahmagupta's works and their influence in and outside India'. *Ibid.*, Pp 122-128
The works were translated into Arabic in the 8th century.

Sen, S. N., 'Scientific works in Sanskrit translated into foreign languages and vice-versa in the 18th and 19th centuries A.D.'. *Ibid.*, Pp 129-151

Kripanath Sinha, 'Mathematics from Vedic Samhitas'. *Ganita Bharati*, **Vol. 22** (2000), 1-10
Numeration, fractions, sequences etc. as found in the oldest Indian works (2000-500 B.C.)

Parmanand Singh, 'The *Ganita Kaumudi* of Narayana Pandita (A.D. 1356), Chapters V - XII (English translation with notes)'. *Ibid.*, Pp 19-85
Presents the first translation of the best work on Ancient Indian mathematics. Chapters I, II, III were translated in *Ganita Bharati*, **Vol. 20**, and IV in *Ganita Bharati*, **Vol. 21**.

Kumbhojkar, H. V., 'A myth of Sisyphus: A glance at 'isms' in mathematics'. (being the 7th Endowment Lecture on History of Mathematics. *Souvenir of Joint AMII and MGAM Conference*, Pune, 2000, Pp 1-8
No 'ism' has been able to solve all the problems related to absolute certainty.

Gupta, R. C., 'History of Mathematics in India', *Students' Britannica: India*, **Vol. 6** (Select Essays), Pp 321-334
Contains highlights from antiquity to modern times.

Gupta, R. C., 'Something is better than nothing'. *Ganita Chandrika*, **Vol. 2** (2001), Issue 3, Pp 22-25
About the widespread surveyor's formula $\{(a + c)/2\}\{(b + d)/2\}$ for the area of a quadrangular field used since the remotest time. Otherwise the

exact area cannot be found from given four sides *a*, *b*, *c*, *d* (which are not enough to fix or define a quadrilateral uniquely).

Gupta, R. C., 'Addition and the subtraction theorems for the sine and cosine in medieval India'. *Indian Journal of Mathematics Education* (Delhi), Vol. 19, No. 2 (April 2000), Pp 15-29
On various Indian proofs for the usual formulas for sin(A±B) and cos(A±B).

R. C. Gupta
Jhansi, India

In memory of a great scholar

Mr. Abu al-Qasim Qurbani, a pioneer researcher and author in the history and pedagogy of mathematics in Iran passed away on 21 November 2001,at the age of 90. He knew Arabic, English, French, and German, in addition to his mother language (Persian). He was a very honest, humble, and pleasant man, always ready to encourage and help others. His works are important both for the amount of new information and for their excellent underlying methodology. He was a mathematics teacher and he lived in Geneva (Switzerland) from 1962 to 1966 for official academic work. This opportunity enabled him to have access to the most important European sources in history of mathematics besides his deep knowledge of Eastern sources.

Apart from numerous articles on history of mathematics which appeared in Iranian journals, he had published 68 books among which 10 titles were in the field of history of mathematics in Iran and other countries of the Islamic civilisation. The rest were high school mathematical textbooks (composed jointly with Mr. Hassan Saffari) and books about high school mathematics. He had received the Iranian Yearbook Award four times. An English translation of one of his works *A short history of mathematics in Iran, from ninth to seventh centuries* was published in Iran in 1973 in limited number by Sharif (ex-Aryamehr) University of Technology. His Persian book on the life and works of the Islamic period mathematicians is internationally known as one of the most complete and up-to-date works in the field. He has composed precious monographs on the life and works of some Iranian mathematicians as Biruni, Buzjani, Nasawi, Kashani (al-Kashi), and Farisi.

He had lost his eyesight in the last years of his life, and I had the honour to be one of the few disciples who visited him regularly. I learned much about history of mathematics from his writings and much about methodology by working with him. But above all, he was an excellent sample of a scholar bound to morals, for many of his disciples.
There was a plan to offer him an honorary PhD. for his noticeable scientific heritage, in December 2001. But his death changed that plan to memorial gatherings which were held for him in Tehran and Isfahan (Iran).

There is no doubt that not only for appearance of a similar figure, but also for a sufficient appreciation of the importance of his work, we should still wait.

Mohammad Bagheri
Tehran, Iran

Mathematics teachers conference in India

The 36th annual conference of the Association of Mathematics Teachers in India (AMTI) was held in Cochin, Kerala State on December 27 to 29, 2001. It was inaugurated by the Cochin University of Science and Technology (CUSAT) vice-chancellor who pointed out the significant role played by mathematics in the development of society and civilisation in this space era of science and technology.
Prof. R. C. Gupta (AMTI President) whose lecture contained a survey of Some new studies and findings regarding ancient Indian

mathematics to about AD 1000 delivered the Presidential Address.
After a short tea break, Prof. George G. Joseph (University of Manchester, UK) gave the AMTI (R. C. Gupta) Endowment Lecture on History of Mathematics. His theme was *The Enormity of Zero*. Two other regularly held memorial lectures (named after past presidents of AMTI) were as follows.
E. Krishman (University College, Trivandrum) delivered the A. Narasinya Rao memorial lecture. He spoke on *Some thoughts on the teaching of geometry*. He said that, historically, geometry started as a purely practical science to aid land survey and slowly evolved into a theoretical science of abstract shapes.
Anand Parthasarathy (former scientist, DRDO) gave the P. L. Bhatnagar memorial lecture. His theme was *Tapping the Internet: online resources for mathematics research and technology*. A sheet containing 20 useful web sites in mathematics (from across the world) was made available to the audience.
Topics of some other lectures/papers were
• *Some problems from number theory* by V. K. Krushnan, St Thomas College, Trichur)
• *Fascinating numbers* by T. S. Ramakrishna, Ramanujan Mathematics Academy, Ramachandrapuram.
• *Renovative and renaissant concepts in the teaching of mathematics* by M. Kotiswara Rao.
• *Recreative mathematics* by T. S. V. S. S. Murty.
There was a quiz session for students and a mathemagic show by S. A. Rahim, director of the Mathemagic Society of India, Bangalore.
A printed souvenir of the conference was distributed. It contained the programme, list of participants, Presidential Address, summaries of talks and papers, and general information.

R. C. Gupta
Jhansi, India

Have you been here?

The British Society for the History of Mathematics web site at
www.dcs.warwick.ac.uk/bshm/
has many links to related sites.

The Italian Society of History of Mathematics web site at
www.dm.unito.it/sism/index.html

The HPM-Americas web site is up and going again after being dormant during 2001. The new web site is
www.hpm-americas.org
Andrew Kupasrimonkol, the 14 year old algebra student of Karen Dee Michalowicz, USA, is the webmaster for the web site. Andrew is a gifted student of technology, as well as mathematics and science. Not only did he set up and edit the new web site using the former HPM web page, he also has volunteered to maintain the web site until he teaches Ms. Michalowicz how to maintain the web site herself.
Many thanks to Andrew!
The HPM satellite meeting in connection with the Copenhagen ICME-10 in 2004 is planned for Uppsala with Sten Kaijser as the local person in charge. You can find out more about ICME-10 and register for the first announcement now at
www.ICME-10.dk

Bengt, Sten and Otto Bekken have some plans for this Abel Year 2002. For the activities elsewhere in Norway during 2002 visit
www.math.uio.no/2002

You can find information about the new Abel prize at
www.math.uio.no/abel.html
and about the Abel bicentennial conference at
www.math.uio.no/abel

The editor would welcome information about other sites.

Announcements of events

Mulla 'Abd al-'AliBirjandi

26 May - 28 May 2002,
Birjand, Iran

A memorial conference for Mulla 'Abd al-'Ali Birjandi, an Iranian 16th century astronomer and mathematician, will be held in Birjand University, Iran.

For more information, you may contact
Dr. A.-A. Puyan (tel. no.: +98-21-2234 718).
Postal address: P.O. Box 79, Birjand, IRAN

History of Arab Mathematics

30 May - 2 June 2002
Marrakech, Morocco

Introduction

L'organisation d'un colloque international périodique sur l'histoire des mathématiques arabes est d'ores et déjà une coutume. Six colloques ont déjà été organisés : Algérie en 1986, Tunisie en 1988, Algérie en 1990, Maroc en 1992, Tunisie 1994 et Algérie 2000.

Ces colloques ont toujours été un espace pour renforcer l'intérêt pour l'histoire des mathématiques arabes en tant que phase fondamentale dans l'histoire générale des mathématiques. Outre le fait qu'ils permettent la rencontre entre des chercheurs et des spécialistes de différents pays, ces colloques constituent une opportunité pour diffuser et faire connaître les travaux réalisés sur l'histoire des mathématiques arabes. Notamment à travers :

- la découverte, l'édition et la traduction de manuscrits importants

- la mise en valeur de la relation entre les mathématiques et les besoins sociaux et religieux de la société

- l'identification des traditions d'enseignement des mathématiques dans la civilisation arabo-islamique

- la mise en relief des liens entre mathématiques et les autres domaines de la connaissance

- la mise en évidence des contributions de l'Occident musulman, Grand Maghreb et Andalus, dans la construction de l'édifice mathématique.

C'est dans la continuité de cette tradition que le Groupe de Recherche En Didactique de l'Informatique et des Mathématiques (GREDIM) de l'Ecole Normale Supérieure de Marrakech organise le 7e colloque maghrébin sur l'histoire des mathématiques arabes du 30 mai au 02 juin 2002.

Par ailleurs, en plus des résultats au niveau de la recherche, ces colloques contribuent à la prise de conscience du rôle pédagogique de l'histoire des mathématiques en tant qu'outil de formation et d'enseignement. Dans le but de renforcer cette tendance, le comité d'organisation s'est permis d'adjoindre aux thèmes étudiés dans les colloques précédents une session sur l'utilisation de l'histoire des mathématiques dans leur enseignement pour ce 7e colloque.

31 octobre 2001: Date limite d'inscription
30 novembre 2001: Date limite d'envoi des résumés des communications
31 décembre 2001: Notification de l'acceptation ou de refus de la communication
01 mars 2002 : Diffusion du programme
15 avril 2002: Envoi des textes des communication
30 mai -02 juin 2002: Tenue du 7e colloque maghrébin sur l'histoire des mathématiques arabes

Conditions de participation

1. les communications doivent être originales et n'ont jamais fait l'objet de publication

2. le règlement des frais de participations qui valent 300 dirhams. Ces frais couvrent :

- l'hébergement du 29/05/2002 soir au 03/06/2002 matin.

- les repas du matin et de midi durant la période du colloque

- les actes du colloque

3. Le comité d'organisation fait des démarches auprès des organismes nationaux et internationaux pour l'obtention de subventions lui permettant la prise en charge (totale ou partielle) de voyage des participants qui présentent une communication.

Langues du colloque
Les résumés et les interventions peuvent être présentés dans l'une des langues suivantes : Arabe, Français, Anglais

Thèmes du colloque
1. Mathématiques
- Algèbre
- Géométrie
- Arithmétique
- Théorie des nombres
- Analyse combinatoire
- Trigonométrie

2. Astronomie
- Modèles planétaires
- Tables astronomiques
- Sciences du temps
- Instruments astronomiques

3. Mathématiques Appliquées
- Sciences d'héritages
- Architecture
- Optique
- Mécanique d'agréments ou utilitaires
- Astrologie
- Musique

4. Mathématiques et société
- Les manuels mathématiques
- Les infrastructures de l'enseignement
- Mathématiques et environnement culturel et idéologique
- Mathématiques et philosophie
- L'héritage mathématique pré-islamique
- La transmission des mathématiques arabes
- Mathématiques et classification des sciences

5. Session sur l'utilisation de l'histoire des mathématiques dans l'enseignement
- Rôle de l'histoire des mathématiques dans leur enseignement

- Histoire des mathématiques et formation
- Histoire des mathématiques et construction/analyse de concepts
- Histoire des mathématiques et résolution de problèmes
- Histoire des mathématiques et recherche en didactique

Correspondance :
Adresse pour courrier postal:
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ENS , B.P 2400, Marrakech, Maroc
e-mail comhisma7@ensma.ac.ma
Site ensma.ac.ma/comhisma7 (en construction)

History and Pedagogy of Mathematics in the 7th Maghrebian symposium on the History of Arabic Mathematics

30 May - 2 June 2002
Marrakech, Morocco

The 7th Maghrebian Symposium on the History of Arabic Mathematics, will be held at Marrakech, Morocco, from 30 May to 2 June 2002. A special session, organized with the collaboration of the HPM group, will be reserved to the history and pedagogy of mathematics.
For details translate the French text above.

Syposium themes
* Mathematics
* Astronomy
* Applied Mathematics
* Mathematics and Society
* History and Pedagogy of Mathematics
For more details, see or contact
www.ensma.ac.ma/comhisma7
e-mail: comhisma7@ensma.ac.ma

14ème Colloque INTER-IREM Épistémologie et Histoire des Mathématiques

31 mai - 1 juin 2002
IREM d'Orléans

Histoire des probabilités et des statistiques

Les probabilités et les statistiques apparaissent dans des contextes historiques, mathématiques et épistémologiques bien différents. Dans la genèse des probabilités, Pascal invente une géométrie du hasard qui traite rigoureusement de l'incertitude, puis Leibniz imagine une sorte de logique qui règle le poids des invraisemblances. Tandis que les calculs statistiques sur les impôts, la mortalité, les récoltes, les maladies, etc. sont encouragés par les gouvernements, comme moyens d'observation et d'aide à la décision. La statistique, comme son nom l'indique, traite des choses de l'État. Le Colloque inter-IREM d'Orléans se propose de traiter de la naissance et du développement des probabilités et des statistiques, mais aussi de s'intéresser à la rencontre de ces deux disciplines et à leurs rapports successifs dans l'histoire.
Le programme du Colloque inter-IREM comprendra des conférences plénières, des ateliers en parallèle s'appuyant sur la lecture de textes anciens ou sur une expérience d'enseignement, ainsi que des exposés en parallèle portant sur un point précis de l'histoire ou de l'épistémologie des probabilités et des statistiques.

Programme provisoire

Vendredi 31 mai

9h : ouverture du colloque

9h30-11h : *Sur l'histoire de l'enseignement des probabilités et des statistiques*
conférence de Norbert Meusnier, Université Paris 8

11h-11h30 : pause café

11h30-12h30 : 1ère série d'exposés en parallèle

E1 : *Etude d'un scénario d'introduction historique au calcul des probabilités*
Eric Butz, IREM de La Réunion

E2 : *Combien de temps vivrons-nous? Une correspondance des frères Huygens*
Bernard Parzysz, IUFM d'Orléans-Tours

E3 : *Statistique et modèles probabilistes de Fisher à Havelmoo*
Martin Zerner, RHESEIS, Université Paris 7

14h30-17h30 : 1ère série d'ateliers en parallèle

A1 : *La controverse antique sur les futurs contingents*
Joëlle Delattre, Université de Lille 3

A2 : *Tables de mortalité, tables de natalité*
Patrick Guyot et Frédéric Métin, IREM de Dijon, Henry Plane, IREM de Paris 7

A3 : *La démonstration de Jacques Bernoulli de son 'théorème d'or'*
Michel Henry, IREM de Besançon

A4 : *Huygens et ses lecteurs : le 5ème exercice*
Denis Lanier et Didier Trotoux, IREM de Basse Normandie

A5 : *Sur les traces du problème des partis* (titre à confirmer)
Norbert Meusnier, Université Paris 8

17h30 - 18h : pause

18h-19h : 2ème série d'exposés en parallèle

E4 : *Essai sur un problème de la doctrine des chances : Bayes et l'utilitarisme*
Jean-Pierre Cléro, Université de Rouen

E5 : *Les origines du calcul des probabilités*
Alain Desrosières, EHESS, Paris

E6 : *Cournot : statistique et raison des choses*
Thierry Martin, Université de Besançon

Samedi 1er Juin

9h-10h30 : *L'origine du calcul des probabilités entre 1650 et 1800*
conférence de Alain Desrosières, INSEE, Paris

10h30-11h : pause café

11h-12h30 : *L'usage de la théorie des erreurs en astronomie et en géodésie au 18ème siècle* (titre à confirmer)
conférence de Michel Armatte, Université Paris 9-Dauphine

14h30-17h30 : 2ème série d'ateliers en parallèle

A6 : (à confirmer) *sur une lettre de Quételet*
Michel Armatte, Université Paris 9-Dauphine

A7 : *Naissance de la théorie des erreurs*
Marie-Françoise Jozeau, IREM Paris 7

A8 : *La loi de Gauss, ou loi normale, ou Loi de Laplace, ou loi de Laplace-Gauss*
Xavier Lefort, IREM des Pays de Loire

A9 : *La théorie analytique des probabilités de Laplace*
Jean-Pierre Lubet, IREM de Lille

A10 : *Statistique descriptive et statistique théorique*
Martin Zerner, RHESEIS, Université Paris 7

17h30- 18h30 : réunion de la Commission inter-IREM

Les inscriptions doivent être faites *avant le 23 février* auprès de l'IREM d'Orléans. Adresse postale : Université d'Orléans, BP 6759, 45067 Orléans Cedex 2.
Téléphone : 02 38 41 71 90
Adresse électronique : irem@labomath.univ-orleans.fr

Abel Bicentennial Conference 2002

3-8 June 2002
Oslo

The year 2002 marks the bicentennial of the birth of Niels Henrik Abel, 1802-1829. The Norwegian Academy of Science and Letters, The Norwegian Mathematical Society and The Norwegian Mathematical Council with support from the International Mathematical Union and the European Mathematical Society, have taken the initiative to commemorate this event by inviting the international mathematical community to the Abel Bicentennial Conference 2002 to be held at the University of Oslo from Monday, June 3, to Saturday, June 8, 2002.

The Conference will present an overview of the mathematical heritage of Niels Henrik Abel and, based upon this heritage, identify new mathematical trends for the 21st century.
Check it out at
www.math.uio.no/abel/

2nd international conference on the teaching of mathematics (at the undergraduate level)

1-6 July 2002
Chersonisos, Crete, Greece,

Among the conferences themes there is "History of mathematics in curricula innovations". One of the 4 panels is titled "On the role of the history of mathematics in mathematics education" (The presentation of the panel is below). In this conference a section will be organized in collaboration with HPM. Also there will be a meeting of the members of HPM.

Panels "On the role of the history of mathematics in mathematics education"
In the recent years important works on the relationship between history and mathematics education have appeared: the proceedings of the European Summer University (held in 1993, 1996, and 1999), the two books originated by the satellite meeting of HPM (1996 editor R. Calinger, and 2000 editor V. Katz), the ICMI Study book edited by J. Fauvel and J. van Maanen. Journals for mathematics teachers have published special issues on the history of mathematics in mathematics teaching (e.g. *Mathematics in school* in 1998 and *Mathematics teacher* in 2000). The re-born newsletter of HPM (International Study Group on the Relations between History and Pedagogy of Mathematics) is becoming (we hope) a forum where piece of information and ideas are shared.

These materials and the experiments carried out all over the world make possible to go further in the discussion about the role of the history of mathematics in mathematics teaching. In the recent discussions a word is appearing frequently: integration [of history in mathematics teaching].

Which ideas are behind this word? The main idea is that of using history as a mediator to pursue the objectives of mathematics education. This means to develop an analysis of these objectives together with the study of the concepts in history. This work has to be carried out by educators and historians in a collaborative way. Among the benefits we'll have from it there is the new perspective offered by history to consider students' difficulties in learning mathematics. To make teachers active actors in this process we need to give a convenient place to the history of mathematics in pre-service and in-service teacher education.

The Conference aims to bring together university teachers of mathematics committed to introducing innovative teaching methods and researchers in mathematics education. The conference plenary talks, panels, paper presentations and workshops will be centred on the following themes:

Educational research: Results of current research in mathematics education and the assessment of student learning. Access and equity.
Technology: Effective integration of computing technology (Calculators, Computer Algebra Systems, WWW resources) into the undergraduate curriculum
Innovative teaching methods: Innovative ways of teaching undergraduate mathematics, such as cooperative and collaborative teaching. Writing in mathematics; laboratory courses.
Curricula innovations: Revisions of specific courses and assessment of the results. History of mathematics; innovative applications; project driven curricula.
Preparation of teachers: Trends in teacher education. In-service teacher training. Changing needs of teachers.
Mathematics and other disciplines: The effects of changes in the teaching of mathematics on other fields and vice versa. The needs of client disciplines; interdisciplinary courses.
Distance learning: Distance learning technologies (networking, tele-education) for teaching and learning mathematics. Current hardware and software delivery media; educational materials. Visions for the future.

The invited speakers will be:
- Hyman Bass and Deborah Ball, University of Michigan, Ann Arbor, Michigan, USA
- Jean Pierre Bourguignon, Institut des Hautes Etudes Scientifiques, Bures-sur-Yvette, France
- Miguel De Guzman, Universidad Complutense de Madrid, Madrid, Spain
- Oh Nam Kwon, Ewha Women's University, Seoul, Korea
- Joanna Mamona-Downs, University of Macedonia, Thessaloniki, Greece
- Verdiana Masanja, University of Dar es-Salaam, Tanzania
- Alan H. Schoenfeld, University of California, Berkeley, California, USA
- Man Keung Siu, University of Hong Kong, China
- Dave Smith, Duke University, Durham, North Carolina, USA
- Tosun Terzioglu, Sabanci University, Istanbul, Turkey

The organisers of the Conference are
- Ignatios Vakalis (Capital University, USA, chair),
- Deborah Hughes Hallet (University of Arizona, USA),
- Christos Kourouniotis (University of Crete, Greece),
- Constantinos Tzanakis (University of Crete, Greece).

The deadline for electronic submission of abstracts for presentations at the Conference is 10 November 2001, and for early registration to the Conference 31 January 2002.

More information can be found on the web
http://www.math.uoc.gr/~ictm2
or by contacting
Ignatios Vakalis (ivakalis@capital.edu) or
Christos Kourouniotis (chrisk@math.uoc.gr).

information http://www.math.uoc.gr/~ictm2

In the conference a section will be organized in collaboration with HPM. Also there will be a meeting of the members of HPM.

Third International Conference on Mathematics Education and Cultural History of Mathematics in the Informatics Society

24-27 July 24 2002
Kyoto, Japan

The conference is composed of 6 sessions.
• Keynote plenary lectures
• Researches on mathematics education
• Researches on cultural history of mathematics and history of mathematics
• Researches on the role of informatics
• Celebrating the 80th birthday of Prof. Yokochi
• Forum on recent education in China

Any participant has a chance of presenting their work by oral presentation or distributing their paper at parallel sessions through the acceptance of the organising committee. The deadline for papers is November 30 2001

The official language of the conference is English.

For more information contact:

Masahiko Suzuki
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JAPAN 582-8582

The 5th International Symposium On the History of Mathematics and Mathematical Education Using Chinese Characters (ISHME5)

9-12 August 2002
Tianjin Normal University, Tianjin, China

Symposium themes are:
1) Mathematics of using Chinese characters: Transformation from traditional mathematics to modern mathematics
2) Studies on the history of mathematics of Korea and Viet Nam
3) Exchange and comparison between mathematics of using Chinese characters and mathematics of India and Arab
4) Mathematical education of using Chinese characters: A comparative approach.

For more information, contact:
Organizing Committee of the 5th ISHME
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e-mail: zelinxu@eyou.com
Website: duheng.qzone.com/ISHME

International Colloquium on the History of Mathematics

August 15-18 2002
Xi'an, China

The ICM-2002 (International Conference of Mathematicians) will be held in Beijing on August 20-28 2002. Some 30 satellite conferences on various topics of mathematics will be held outside Beijing. The Northwest University will hold such a conference on the History of Mathematics.

Topics
• Transmission and transformation of mathematics: east and west
• Mathematical thought on the 20th century
• Mathematics in China and neighboring countries and mathematics in Islamic countries
The official language of the conference is English or Chinese.
Contact: Anjing Qu, Jianjun Liu at
Centre for the History of Mathematics and Sciences, Northwest University, Xi'an 710069, P. R. China E-mail hs@nwu.edu.cn
Web site http://hismath.go.163.com

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Items for the Newsletter should be sent to the editor, preferably by email.

The Newsletter appears three times a year with the following deadlines for next year.

Deadline for material	Sent to distributors
14 June 2002	1 July 2002
15 October 2002	1 November 2002
12 February 2003	1 March 2003

The Newsletter is the communication of the International Study Group on the Relations between History and Pedagogy of Mathematics, an affiliate of the International Commission on Mathematical Instruction.

It is edited in the Faculty of Mathematics at The Mountbatten School and Language College, Romsey, SO51 5SY, UK, and printed and mailed courtesy of The Mountbatten School and Language College.

Please pass on news of the existence of this newsletter to any interested parties.