

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

AN AFFILIATE OF THE INTERNATIONAL COMMISSION ON MATHEMATICS INSTRUCTION

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mail: nmabm@cunyvm.edu. (See inside for more
details.)

1997 March 23-26 São Paulo
Encontro Luso-Brasileiro de História de Matemática
(Portuguese-Brazilian Meeting on the History of
Mathematics. HPM will be represented in sessions.
Those interested can contact Sergio Nobre (Av. 24,
1515 C.P. 178, Dep. Mat. UNESP, Rio Claro SP,
Brasil, or via E-mail sernobre@rcb000.uesp.ansp.br).

1997 April 18 Minneapolis
The *HPM Americas Section Meeting* will be held in
conjunction with the National Council of Teachers of
Mathematics meeting. The program chair is Erica
Voolich. (244 Summer St., Sommerville, MA 02142,
or via E-mail voolich@meol.mass.edu.) (See inside for
more details).

1997 June 6-8 St John's, Newfoundland
*The annual meeting of the Canadian Society for
History and Philosophy of Mathematics* will be held
this year at Memorial University of Newfoundland, St
John's, Newfoundland, from June 6 to June 8. The
conference makes a wonderful excuse to visit
Newfoundland, but anyone traveling there in June
should book early since it is not a tourist mecca and so
it is not served by infinitely many flights. The special
theme of the meeting is Mathematics and Science. The
invited speaker is Ruediger Thiele of the University of
Leipzig. Contributed papers are welcome; abstracts
should be sent to the program chair, Tom Drucker,
304 South Hanover Street, Carlisle, PA 17013; tel:
717-243-1331. Deadline: March 1, 1997. Further
information: Glen van Brummelen (Secretary/
Treasurer); E-mail: gvanbrun@kingsu.ab.ca; tel: 403-

Calendar

1997 March 14 and March 21 New York
The CUNY Mathematics Discussion Group (CMDG)
is sponsoring a conference entitled *The History of
Mathematics/Science and its Uses in Teaching: A
Multicultural Approach*. This conference is being
hosted at the Borough of Manhattan Community
College (BMCC) from 12 noon to 5:00 p.m. on
Friday March 14 and 21, 1997. Contact person:
Nkechi Agwu, Borough of Manhattan Community

465-3500; fax: 403-465-3534 The organization website is: <http://www.kingsu.ab.ca/~glen/eshipm/home.htm>.

1997 June 21 - 24 Calgary
Conference of the International History, Philosophy & Science Teaching Group. (See inside for more details.)

1997 July 25 - 30 Liège, Belgium
Twentieth International Congress of the History of Science. The main theme of the congress will be Science, Technology and Industry. HPM will contribute sessions. Those interested can contact Sergio Nobre (Av. 24, 1515 C.P. 178, Dep. Mat. UNESP, Rio Claro SP, Brazil or via E-mail sernobre@rcb000.uesp.ansp.br). For general information, contact *XXth International Congress of History of Science Congress Office*, Centre d'Histoire des Sciences et des Techniques, Université de Liège, Avenue des Tilleuls 15, B-4000 Liège, BELGIUM; tel: 3241669479; fax: 3241669547.

1998 August 17-21 Chungbuk
 The first *ICMI-East Asia Regional Conference on Mathematics Education* (ICMI-EARCOME 1) will be held at the Korea National University of Education, Republic of Korea, from August 17 through August 21, 1998. The themes of ICMI-EARCOME 1 are: Technology and Mathematics Education, Comparative Study on Mathematics Education, History and Pedagogy of Mathematics, Mathematics and Society, Mathematics Education in Primary School, Secondary School and University, Teacher Training, Gifted Education. the program will include Invited Lectures, working Groups and Topic Groups. In each Group, keynote speeches and paper presentation will be given. Abstracts and recommendations will also be proposed. Exhibitions of textbooks, computer softwares and other types of material are being planned as well. The conference languages will be English and Korean. But all oral presentations in Korean will be translated into English. For more information about ICMI-EARCOME 1 please contact: Professor Hyunyoung Shin, Department of Mathematics Education, 363-791, Korea; tel: 82-431-230-3721; fax: 82-431-233-3256; E-mail: shin@knuccc-sun.knu.ac.kr.

1999 May 30- June 4 Manila, Philippines
8th Southeast Conference on Mathematics Education (SEACME-8). The theme is: Mathematics for the 21st century. (See inside for more details.)

From the Editor
 Gerard Buskes

First of all, thank you for all the good wishes, E-mail messages and mail that you have sent me since the previous newsletter, 39.

The project to put all the old newsletters on the World Wide Web is off to a good start. I have collected (thank you, Jim Tattersall!) old HPM Newsletters, but still lack numbers 1 through 7, 9 and 10. Anyone, who has any of these missing copies, please contact me. The University of Mississippi via its Associates Fund has donated a scanner; scanning of the Newsletters will start soon and I hope to have the website operational by April.

Finally, I would like to invite contributions by writers who describe the local situation of HPM in their country. Ubiratan D'Ambrosio will start this series with *News from Brazil*.

From the Chair
 Jan van Maanen

This Newsletter publishes an important document. Yes, I know, any document in the HPM Newsletter is important. Maybe, we should even adjust our definition of "important" (if we have one):
 [dialogue]

A: Is it in the HPM Newsletter?

B: No, I do not think so ...

A: Then it is not important.

[end of dialogue; A and B stay where they are: at both ends of their line-segment]

In this newsletter you will find the Discussion Document (DD) for the ICMI-Study that will be devoted to the relation between History and Pedagogy of Mathematics, or, as the ICMI executive committee has stated it, *The Role of the History of Mathematics in the Teaching and Learning of Mathematics*. After a great variety of activities in the last ten years (publications, congresses and conferences, summer universities and institutes, books and articles) HPM is now about to systematically review its field of work. Details will be explained in the DD. What I want to add here is my hope that the results of this study will be of great value to all of us. The final result is that all over the world colleagues will speak (and have already spoken, since I am writing this after the HIMED '97 meeting in Sheffield) about what they think is important in HPM. The DD suggests a series of topics to focus on, but anything that is relevant can and should be put forward. The final result, as I see it, is

a publication that will inspire teachers and researchers to further improve the teaching of mathematics, and that can make a firm statement in the direction of those mathematicians who still believe that mathematics has nothing to do with history.

I invite you to read the DD and to join the discussion.

All good wishes for 1997!

Discussion Document for an ICMI Study 1997-2000
John Fauvel, Open University
Isa van Maanen, University of Groningen

In recent years there has been growing interest in the role of history of mathematics in improving the teaching and learning of mathematics. Educators throughout the world have been formulating and conducting research on the use of history of mathematics in mathematics education. Some of the results of this research have been communicated at meetings of interested organizations, and through papers in various journals.

A research programme is beginning to emerge from many places over the globe. Such a programme involves a consolidated critical bibliography of work that has been done, and a programme for developing a deeper understanding of the factors involved in the relations between history and pedagogy of mathematics, in different areas of mathematics, and with pupils at different stages and with different environments and backgrounds. It also involves the identification and spreading of information and good practice in learning and teaching situations.

ICMI, The International Commission on Mathematics Instruction, has set up a Study on this topic to report back in time to form part of the agenda at the next International Congress in Mathematics Education (ICME) in Japan in the year 2000. The present document sketches some of the concerns to be addressed in the ICMI Study, in the hope that many people across the world will wish to contribute to the international discussions and the growing understandings reached in and about this area.

It is hoped that this discussion document will lead to a number of responses and intimations of interest in contributing to the Study. It will be followed by an invited conference (to be held in France in April 1998), from which a publication will be prepared to appear by the year 2000. The next section of the present document surveys the questions to be addressed. Your views are solicited both on the questions and on how to take the issues forward as implied in the commentary.

SOME RESEARCH QUESTIONS

The overall intention is to study the role of history of mathematics, in its many dimensions at all the levels of the educational system: in its relations to the teaching and the learning of mathematics as well as with regard to teacher training and in educational research. History of mathematics as a component of the teaching of mathematics is, as any educational project, directed towards more or less explicit expectations in terms of (better) learning of some mathematics. Research on the use of history of mathematics in teaching is thus an important part of research in mathematical education. To study such a large and multi-faceted theme we propose to analyze it in a number of (inter-related) questions which together will give insight into the whole process. The order in which the questions are put down here carries no implication about their relative importance or significance.

1. HOW DOES THE EDUCATIONAL LEVEL OF THE LEARNER BEAR UPON THE ROLE OF HISTORY OF MATHEMATICS?

The way history of mathematics can be used, and the rationale for its use, may vary according to the educational level of the class: children at elementary school and students at university (for example) do have different needs and possibilities. Questions arise about the ways in which history can address these differences. This may, again be reflected in different training needs for teachers at these levels. (To speak about the "use" of the history of mathematics may seem to presuppose that the history of mathematics is something external to mathematics. This assumption would not be universally agreed, however.)

2. AT WHAT LEVEL DOES HISTORY OF MATHEMATICS AS A TAUGHT SUBJECT BECOME RELEVANT?

In analyzing the role of history of mathematics, it is important to distinguish issues around using history of mathematics in a situation whose immediate purpose is the teaching of mathematics, from teaching the history of mathematics as such, in a course or a shorter session. It could be that courses in the history of mathematics, and its classroom use, should be included in a teacher training curriculum (see question 3). There also is a third area, related but separate, namely the history of mathematics education, which is a rather different kind of history.

3. WHAT ARE THE PARTICULAR FUNCTIONS OF A HISTORY OF MATHEMATICS COURSE OR COMPONENT FOR TEACHERS?

History of mathematics may play an especially important role in the training of future teachers, and also teachers undergoing in-service training. There are a number of reasons for including a historical component in such training, including the promotion of enthusiasm for mathematics, enabling trainees to see pupils differently, and to develop skills of reading, library use and expository writing which can be neglected in mathematics courses. It may be useful here to distinguish the training needs for primary, secondary and higher levels (see question 1).

A related issue is what kind of history of mathematics is appropriate in teacher training and why: for example, it could be that the history of the foundations of mathematics and ideas of rigor and proof are especially important for future secondary and tertiary teachers. (This issue is also relevant for other categories than future teachers, and is picked up again in question 5).

4. WHAT IS THE RELATION BETWEEN HISTORIANS OF MATHEMATICS AND THOSE WHOSE MAIN CONCERN IS IN USING HISTORY OF MATHEMATICS IN MATHEMATICS EDUCATION?

This question focuses on the professional base from which practitioners emerge, and relates to the social fabric of today's mathematics education community, as well as to issues about the nature of history. There are, gratifyingly, a number of leading historians of mathematics with an interest in educational issues, as there are leading mathematicians and mathematics educators with an interest in history. But as well as minor misapprehensions of the nature of the others' activities, there may be deeper tensions and conflicting aims which it is important to bring to the surface. For example, historians may underestimate the difficulty of transmuted the historical knowledge of the teacher into a productive classroom activity for the learner. It is important that historians and mathematics educators work co-operatively, since historical learning and classroom experience at the appropriate level do not always co-exist in the same person.

5. SHOULD DIFFERENT PARTS OF THE CURRICULUM INVOLVE HISTORY OF MATHEMATICS IN A DIFFERENT WAY?

Already, research is taking place to

investigate the particularities of the role of history in the teaching of algebra, compared with the role of history in the teaching of geometry. Different parts of the syllabus make reference, of course, to different aspects of the history of mathematics, and it may be that different mixes of use are relevant. Looking at the curriculum in a broad way, we may note that the histories of computing, of statistics, of core "pure" mathematics and of the interactions between mathematics and the world are all different pursuits.

Even for the design of the curriculum, historical knowledge may be valuable. A survey of trends in research, for example, (bearing in mind that history extends into the future) could lead to suggestions for new topics to be taught.

6. DOES THE EXPERIENCE OF LEARNING AND TEACHING MATHEMATICS IN DIFFERENT PARTS OF THE WORLD, OR CULTURAL GROUPS IN LOCAL CONTEXTS, MAKE DIFFERENT DEMANDS ON THE HISTORY OF MATHEMATICS?

A historical dimension to mathematics learning helps bring out two contrary perceptions in a dialectical way. One is, that mathematical developments take place within cultural contexts and it is valid to speak of Islamic mathematics, Greek mathematics and so on, as developments whose style is characteristic of the generating culture. The antithesis to this is the realization that all human cultures have given rise to mathematical developments which are now the heritage of everyone; this therefore acts against a narrow ethnocentric view within the educational system.

The study should explore the benefit to learners of realizing both that they have a local heritage from their direct ancestors -in the way in which Moslem children in countries where they are in a minority are known to derive pride and strength from learning about Islamic mathematical achievements- but also that every culture in the world has contributed to the knowledge and experience base made available to today's learners.

There are many detailed studies of the interplay between history of mathematics and culture in educational contexts throughout the world, notably in Brazil, the Maghreb, Mozambique, China, Portugal etc., which could be drawn upon in analyzing and responding to this question.

7. WHAT ROLE CAN HISTORY OF MATHEMATICS PLAY IN SUPPORTING SPECIAL EDUCATIONAL NEEDS?

The experience of teachers with responsibility

for a wide variety of special educational needs is that history of mathematics can empower the students and valuably support the learning process. Among such areas are experiences with mature students, with students attending numeracy classes, with students in particular apprenticeship situations, with hitherto low-attaining students, with gifted students, and with students whose special needs arise from handicaps. Here the many different experiences need to be researched, their particular features drawn out, and an account provided in an overall framework of analysis and

8. WHAT ARE THE RELATIONS BETWEEN THE ROLE OR ROLES WE ATTRIBUTE TO HISTORY AND THE WAYS OF INTRODUCING OR USING IT IN EDUCATION?

This question has been the focus of considerable attention over recent decades. Every time someone reports on a classroom experience of using history and what it achieved, they have been offering a response to this question, understanding. Thus a search of the literature is a fundamental part of researching the response to this question.

The question also involves a listing of ways of introducing or incorporating a historical dimension: for example anecdotal, broad outline, content, dramatic. Then one would draw attention to the range of educational aims served by each mode of incorporation: the way that historical anecdotes are intended to change the image of mathematics and humanize it, for example. Or, again, the way that mathematics is not, historically, a relentless surge of progress, but can be a study in twists, turns, false paths and dead-ends both humanizes the subject and helps learners towards a more realistic appreciation of their own endeavors.

There are rich issues for discussion and research in, for example, the use of primary sources in mathematics classrooms at appropriate levels.

This question is a very broad one that could involve a large number of people: it may be wise to distinguish the taxonomic question, i.e. the range of different classroom aims and modes of activity, from the further exploration of each issue.

9. WHAT ARE THE CONSEQUENCES FOR CLASSROOM ORGANIZATION AND PRACTICE?

The consequences of integrating history are far-reaching. In particular, there are wider opportunities for modes of assessment. Assessment can be broadened to develop different skills (such as

writing and project activity), and consequences for students' interest and enjoyment have been noted. Teachers may well need practical guidance and support both in fresh areas of assessment, and in aspects of classroom organization. This in turn may have consequences for teacher training as well as curriculum design.

10. HOW CAN HISTORY OF MATHEMATICS BE USEFUL FOR THE MATHEMATICS EDUCATION RESEARCHER?

This question provides an opportunity for the exploration of the relations between the subject of this study and researchers in the mathematical education community (whose aims are, in turn, to provide insights into the processes of learning and teaching). One example is the use of history of mathematics to help both teacher and learner understand and overcome epistemological breaks in the development of mathematical understanding. A constructive critical analysis of the view that "ontogeny recapitulates phylogeny", i.e. that the development of an individual's mathematical understanding follows the historical development of mathematical ideas, may be appropriate. Another example is the research on the development of mathematical concepts. In this case the researcher applies history as possible "looking glasses" on the mechanisms that put mathematical thought into motion. Such combinations of historical and psychological perspective deserve serious attention.

These issues could be studied in teaching experiments in which the above questions are addressed, and also questions like: What is good for the learner? How do you know it is good for the learner? And so on. Even if a teaching experiment does not use history of mathematics explicitly, the elaboration of the teaching projects may have made use of the results of the history of mathematics. For instance, such a question as "is it good for the learner?" may be better understood in the light of history of mathematics. So the question here is: how can research in mathematics education profit from historical knowledge? The answer to this question might deal with themes such as the historical genesis of a concept and an epistemological analysis of the interplay between history and the teaching of a subject. Moreover, history of mathematics helps to understand the distance between the way in which concepts function in the mathematics community and the way they function in the school.

There also are fundamental questions about

the style and evaluation of research in this area. Different styles which have been used in the past range from anecdotal (in effect) to quasi-scientific surveys with questionnaires and statistical apparatus. A process of such complexity evidently calls for a research methodology of some sophistication. Fortunately, the wider mathematics community has been studying this problem for some time: it is indeed the subject of an earlier ICMI Study (What is research in mathematics education and what are its results?). So a group could be encouraged to draw upon the wider community experience and consider its application to our area of concern.

1.1. WHAT ARE THE NATIONAL EXPERIENCES OF INCORPORATING HISTORY OF MATHEMATICS IN NATIONAL CURRICULUM DOCUMENTS AND CENTRAL POLITICAL GUIDANCE?

This is not so much a question for discussion as a fairly straightforward empirical question, needing input from knowledgeable people in as many countries and states as possible. But of course it has policy implications too, and could lead to a sharing of experience among members of the community about how they have reached the policy-making level in their countries to influence the content or rhetoric of public documents. Perhaps this study could be carried on in parallel with the more discursive questions, organized by a small group who could put the results (as brief historical accounts of national curriculum change) on the WorldWideWeb as they are collected.

In some parts of the world a different relationship between history and mathematics may have been developed. For example, in Denmark and Sweden history of mathematics is regarded as an intrinsic part of the subject itself. There also are differences in styles of examination and assessment. If everyone with access to examples of such different approaches, from different countries and states, could pool their experience, it would be a most valuable input to the Study.

1.2. WHAT WORK HAS BEEN DONE ON THE AREA OF THIS STUDY IN THE PAST?

The answer is: quite a lot. But it is all over the place and needs to be gathered together and referenced analytically. A major annotated critical bibliographical study of the field, which may well take up a sizable proportion of the final publication, would be an enormously valuable contribution that the ICMI study could make. It should include a brief abstract of

each paper or piece of work included, and indications of the categories to which the work relates in an analytical index.

The organization of this sub-project will need to be different from the rest of the Study. It will need to be even more pro-active to achieve a useful result. A small group should perhaps take this in hand and work out how it can be achieved collaboratively. Some progress on such a bibliography is already in hand in various places, notably by Fred Rickey in the US and John Fauvel in the UK. This seems another place where work in progress could be available on the WorldWideWeb.

BIBLIOGRAPHY

Here are, as a small selection to start with, some of the places in which work on the above topics has appeared in recent years.

Calinger, Ronald (ed), *Vita Mathematica: Historical Research and Integration with Teaching*, Mathematical Association of America 1996.

Fauvel, John, (ed), *History in the Mathematics Classroom. The IREM Papers*, the Mathematical Association 1990 (translation from the French of papers by the Committee Inter-IREM, combined with classroom resources).

Fauvel, John (ed), For the learning of mathematics 11 no 2 (June 1991: special issue on using history of mathematics in the mathematics classroom).

Führer, Lutz (ed), *Mathematik lehren* 19 (December 1986: special issue entitled "Geschichte --- Geschichten").

IREM de Franche-Comte (coll. ed), *Contribution à une approche historique de l'enseignement des mathématiques*, Besançon 1996 (proceedings of the 6th Summer University, Besançon July 1995).

IREM de Montpellier (coll ed), *Histoire et épistémologie dans l'éducation mathématique*, Montpellier 1995 (proceedings of the first European Summer University, Montpellier August 1993)

McKlinzen, Nick (ed.), *The Mathematical Gazette* 76 no 475 (March 1992: Special Issue on using History of Mathematics in the Teaching of Mathematics).

Nobus, Sergio (ed.), *Meeting of the International*

Study Group on Relations Between History and Pedagogy of Mathematics, Blumenau/Brazil 25-27 July 1994.

Schoenebeck, Jürgen (ed.), *Mathematik Lehren* 47 (August 1991; Special Issue about "Historische Quellen für den Mathematikunterricht").

Swetz, Frank, et al. (Ed.), *Learn from the Masters*, Mathematical Association of America 1995.

Veloso, Eduardo (ed.), *História e Educação Matemática*, Proceedings/Actes/Actas, Braga/Lisbon 1996.

CALL FOR CONTRIBUTIONS

The ICMI Study on the role of the history of mathematics in the teaching and learning of mathematics will investigate the above questions over the next two years. The Study has three components: an invited study conference, related research activities, and a publication to appear in the ICMI Study series that will be based on the contributions to and outcomes of the conference and related research activities. The conference will be held in April 1998 in France. The major outcomes of the study will be published as an ICMI study in 1999 and presented at the International Congress of Mathematics Education in Japan in 2000.

The International Programme Committee (IPC) for the study invites members of the educational and historical communities to propose or submit contributions on specific questions, problems or issues stimulated by this discussion document no later than 1 October 1997 (but earlier if possible). Contributions in the form of research papers, discussion papers or shorter responses, may address questions raised above or questions that arise in response, or further issues relating to the content of the study. Contributions should be sent to the co-chairs (addresses below). Proposals for research that is on its way, or still to be carried out, are also welcome; questions should be carefully stated and a sketch of the outcome, if possible with reference to earlier and related studies, should be presented, if possible with reference to earlier and related studies. All such contributions will be regarded as input to the planning of the study conference.

The members of the International Programme Committee are Abraham Arcavi (Israel), Evelyne Barbin (France), Jean-Luc Dorier (France), Florence Fasanelli (USA), John Fauvel (UK, co-chair),

Alejandro Garcíadiego (Mexico), Ewa Lakoma (Poland), Jan van Maanen (Netherlands, co-chair), Mogens Niss (Denmark) and Man-Keung Siu (Hong Kong)

This document was prepared by John Fauvel and Jan van Maanen with the help of Abraham Arcavi, Evelyne Barbin, Alphonse Buccino, Ron Calinger, Jean-Luc Dorier, Florence Fasanelli, Alejandro Garcíadiego, Torkil Helede, Victor Katz, Manfred Kronfeller, Reinhard Laubenbacher, David Robertson, Anna Sfard, and Daniela Struppa.

Contributions should be sent to the co-chairs at the following addresses.

John Fauvel, Mathematics Faculty, The Open University, Milton Keynes MK7 6AA, England UK. (j.g.fauvel@open.ac.uk)

Jan van Maanen, Department of Mathematics, University of Groningen, PO Box 800, 9700 AV Groningen, The Netherlands (maanen@math.rug.nl)

Perils and Pleasures of the Internet
Bob Sullivan

Report of a panel discussion at the Braga Meeting, 29 July 1996.

The session was chaired by Jan van Maanen (maanen@rug.nl) who began by asking the audience a few questions on its experience of the Internet and the WWW: most of the 30 or so participants had some knowledge of such technology and used it fairly often. Indeed, all except 5 of them had sent an e-mail in July: 12 were subscribed to one or more discussion lists, with 9 of them being on Rickey's math-history-list; and about 15 use information on services such as WWW (e.g. to get information about the Braga conference) as well as on-line library catalogues. Each member of the panel (John Fauvel, Eleanor Robson, Fred Rickey and Jaime Carvalho e Silva) then spoke briefly about issues related to the technology and, after each of these, the panelists and audience added further comments.

J. JAIME CARVALHO E SILVA (MATHEMATICS DEPARTMENT, UNIVERSITY OF COIMBRA, PORTUGAL) SPOKE ON "E-MAIL".

He stressed the need to use spelling and

grammar carefully, and to avoid rash conclusions and abusive language: i.e. he felt the sheer speed and ease of using E-mail were making people more careless in following standard conventions of communication and debate. Conversely, the vast quantity of E-mails (many of them unsolicited and badly written) forced recipients to rapidly assimilate and interpret information, to the point where mistakes could occur. On the other hand, it is now very easy to send well-composed documents in any format as an E-mail attachment to one or more people simultaneously across the world.

PANEL COMMENTS:

Fred Rickey (FR) noted that it was important to check at the start what computer keys did and in particular to be careful when using the reply button (e.g. without due care, a hastily written message could be circulated to a wider audience than intended); and he warned people to beware of the lack of privacy on the network (e.g. E-mails are backed up at the nodes in the network and, in theory, they could be read by people other than the intended recipient). John Fauvel (JF) remarked that the practice of "nesting" E-mails (i.e. quoting from an earlier E-mail, and from an e-mail quoted within that E-mail, and so on) often caused an E-mail message to become unduly long, thereby hindering the process of rapid and concise communication. And Eleanor Robson (ER) commented that one of the joys of E-mail was its facility to keep you up-to-date, even when you are away from home and forced to use less familiar technology in another country.

AUDIENCE COMMENTS:

The "user-friendliness" of E-mail depends to a large extent on the software and the protocol being used locally (Eudora was recommended). But it also depends on whether problems with the underlying system are addressed and solved by computer experts: in the meantime, we should learn and practice an unwritten code of behavior for E-mail usage.

2. FRED RICKEY (BOWLING GREEN STATE UNIVERSITY, BOWLING GREEN OH, USA) SPOKE ON "E-MAIL LISTS".

The E-mail List is an efficient method for one person to send information to many people simultaneously, and for each person on the list to receive responses from other individuals on the list. It requires one person to create a program on one computer, which then reacts to a message it receives

by forwarding that message to everyone on the list. For example to get on a list for history of mathematics, you can send an E-mail to <major-domo@maa.org> with the one-line message <subscribe math-history-list>. The program then replies, saying you have been admitted to the list and that you can leave it by sending a specific E-mail with a specific command (it is important to retain this reply, since otherwise it can be difficult to get off a list once you are on it).

Such lists can be "open" (accessible to all) or "closed" (restricted to a specific audience); and each of these can be "moderated" (controlled and edited) by the list originator: the math-history-list is open and unmoderated. They should be established by computer experts, otherwise major accidents can occur (e.g. computers can start sending each other the same messages, over and over again).

When on a list, you should exercise care in sending messages to the list: e.g. avoid the word "help" in a message (the program may interpret this as meaning that you want help in using the list, rather than help in finding historical data) or other words like "subscribe" and "unsubscribe"; and avoid posting unnecessary messages to the whole list (they may be more appropriate to one individual on the list); and ensure your messages are really newsworthy (state the main point concisely at the start - so readers can decide whether it is related to their interests and react accordingly - and include fuller details at the end). Sometimes, a list can provide a high-quality answer to a well-founded question but it can also produce lots of junk mail (especially if people write incessantly to the list about their pet subject).

PANEL COMMENTS:

JF stated that his department had separate E-mail accounts to distinguish between "list" and "private" messages (this can be done more easily with the commercial version of Eudora via a "filter" which automatically transfers some messages to a separate mailbox). ER felt it was important to have a system on your computer for doing this since you can be flooded with unwanted e-mails from someone who finds your E-mail address and your academic interests.

AUDIENCE COMMENTS:

Someone should publicize guidelines on what constitutes good behavior on the network (FR plans to add these to his WWW homepage), otherwise discussion on a list can become trivial and non-academic, even abusive. Although it is natural for an

English-speaking originator of a list to expect all contributors to that list to communicate in English, some attempt should be made to advertise non-English lists of a similar kind.

3. ELEANOR ROBSON (ORIENTAL LANGUAGES, UNIVERSITY OF OXFORD) SPOKE ON "WWW".

Rather than speaking about the technical side of mounting one's own homepage on the web, ER raised questions concerning the use and reliability of the vast amount of information available on the web. Unlike for printed journals and books, almost nothing on the web is edited or refereed (although some reviews of web pages have started to appear: see an article by John Fauvel in BSHM Newsletter vol 30, Autumn 1995, pp59-62, and its references; and an essay article by Jon Agar entitled *History of Science on the World Wide Web*, *Brit. J. Hist of Science*, vol 29, 1996, pp 223-227). Also plagiarism is now easier than ever before: students can quickly locate and copy ideas and articles from web pages with questionable authority. Such pages often provide little in the way of verifiable information and, in some cases, they disappear or change their address, making it impossible to check a student's citation of such pages. Likewise, although it is helpful to put preprints of your work on a homepage, that practice can be dangerous since the ideas they contain can be stolen or superseded before you have the chance to publish them in scholarly journals.

4. JOHN FAUVEL (MATHEMATICS, OPEN UNIVERSITY, MILTON KEYNES, UK) SPOKE ON "QUALITY ON WWW".

The web is a source of very useful information which used to be almost inaccessible: e.g. the history of Science Museum in Oxford mounts excellent pages concerning its exhibitions, thereby making its material available to researchers across the world. But the information on the web can differ greatly in its quality and its impact: e.g., the University of St. Andrews web page on biographies of mathematicians may well be based on fact, but the sources of those facts are not given and it gives the overall impression that history of mathematics consists of disconnected notes with little depth. The onus is therefore on us, as teachers, to tell students what is expected of them, and to present the subject in the best possible light. Indeed, it would be an interesting activity to have students compare the contents of a WWW page to published material.

AUDIENCE COMMENTS:

The onus is also on the reader of web pages to critically assess whether the information they contain is good, bad, or indifferent. Unfortunately, however, students do not have the knowledge and experience to be so discerning in what they read. Perhaps, therefore, one of the well-regarded pages (like ER's) should point at other respectable pages (like the one for BSHM: <http://www.dcs.warwick.ac.uk/dcs/bshmi>; see BSHM Newsletter 31 (1996) pp 60-61) as well as up-to-date conference announcements (like the one provided for HEM-Braga), and warn people about the rest.

On the other hand, there is a need to popularize history and mathematics, and for that we need a balance between trivial anecdotes and research studies: i.e. someone should produce printed documents and/or web pages that give well-written "teacher-friendly" accounts of historical information as back-ups for lower-level classroom use. At the same time, it may be possible to create a "sub-WWW" consisting of pages that would undergo some independent assessment. Whatever happens, be wary of spectacular web pages since inherent quality is far more important than overall appearance. And consider creating your own web page: it could contain details of your history courses and interests, your use of history in standard mathematics classes, and history projects completed by your students.

CONCLUSION:

Although most time had been devoted to the "perils" of the Internet (and there are many), there is no doubt that the "pleasures" are just as significant: at the very least, it enables rapid and cheap communication between remote sites, as well as access to a vast warehouse (the world) of information.

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News from Brazil

Ubiratan D'Ambrosio

From 23 to 26 March 1997 the *II Encontro Luso Brasileiro de História da Matemática* and *II Seminário Nacional de História da Matemática* will take place in Águas de São Pedro, 150 km north of São Paulo.

The joint meeting will bring together

Historians of mathematics from Portugal and Brazil and other participants to discuss topics of common interest. The *I Encontro Luso Brasileiro de História da Matemática* took place in 1993 in Coimbra, Portugal.

The meeting will focus on the work and personality of Antonio Aniceto Monteiro, a Portuguese mathematician who had a strong influence in Argentina and Brazil in the fifties.

Invited speakers from abroad include from Portugal: Elza Amaral, Alfredo Pereira Gomes, José Morgado, Luis Saralva and Jaime Carvalho e Silva; from Argentina: Roberto Cignoli and Luis Monteiro; from England: Ivar Grattan-Guinness and Eduardo Ortiz; from Germany: Gert Schubring. Further information: See Calendar on front page.

A new corrected printing of the *Proceedings of the HPM Meeting in Blumenau, Brazil, 25-27 July 1994*, will soon be available.

The VI *Seminário de História da Ciência e da Tecnologia* will take place in Rio de Janeiro, 4 to 7 June 1997. There will be special sessions on the History of Mathematics. Further information: VI SNHC, Elizabeth de M. Villela Freitas, Museo de Astronomia e Ciências Afins, Rua General Bruce 586, 20921-030 Rio de Janeiro, RJ, Brazil.

The CESIMA: Centro "Simões Mathias" de Estudos em História da Ciência has now moved to the campus of the Pontifical Catholic University of Sao Paulo. The Center promotes conferences, research and other activities in History of science and technology. Among recent speakers are Allen G. Debus, Daniel Garber, Yvonne Dold-Samplonius. The Center also produces CD-ROMs of the collection of its archives. Address: CESIMA, PUC-SP, Rua Marquês de Paranaguá 111, 01303-050 São Paulo, SP, Brazil; tel: (011) 256.1622; email: cesimahc@exatas.pucsp.br.

CUNY Mathematics Discussion Group Conference, March 14 and 21

The following papers will be presented March 14:

The Roots of Mathematics: A Worldwide Story by Victor Katz

Ethnomathematics by Maria Reid

Reading and Writing for ESL Science Majors by Gloria Silverstein

Using History to Enrich a Liberal Arts Course for Students with a Weak Elementary Algebra

Background by Pat Allaire

Proto Mathematical Forms Reflected in the Igbo Calendar by Jon Ukaegbu

Galileo's Use of Rhetoric by George Ouwendijk
Summaria Compendiosa, 1556 The 1st Book of Mathematics Published in the Western Hemisphere in Mexico City by Ed Sandifer
Using Primary Material with Future Teacher Educators by Dan Chazan

What is happening to Mathematics? Observations in Historical Context by Al Buccino

March 21

The Impact of Culture, Geography, Politics, Economics and Social Structure on the Development of Mathematics by Toni Kasper

The Existence of Math and Science in Aspects of African History by Nicholas Otiaga

Leibniz's Binary System and the Chinese Changing Book by Yibao Xu

Arguments, Logic and Proof: From the Infinite to Infinitesimals by Joe Dauben

The Guggenheim Aeronautical Lab at Caltech and the development of the Rocket Motor by Benjamin Zibit

Cauchy's Calculus and Education by Barbara Lawrence

Incorporating Environmental History into the Teaching of Undergraduate Survey Courses in World Civilization: One Instructor's Thoughts and Experiences by Brian Bonhomme

History of Mathematics: For Liberal Arts Students, for Mathematics Majors, And As A Major by Bruce Chandler

Use of History in PreCalculus or High School Level Math by Agnes Tuska

The History of Computing by Richard Chorley

Americas Section of HPM meeting in Minneapolis, April 18, 1997
Victor Katz

The Americas Section of HPM will be meeting in Minneapolis on April 18 in connection with the annual NCTM meeting. The meeting will begin at 5:00 pm in room 212 AB of the Minneapolis Convention Center. The first hour and a half of the meeting will be devoted to a discussion of the Discussion Document on the ICM1 Study on History. Given that this document is just the beginning of a three-year process, which will eventually result in a book in the ICM1 Study Series, we want as many people as possible to contribute their ideas. So if you

will be in Minneapolis, please read the entire document elsewhere in this Newsletter. Then come to the meeting on April 18, prepared to give your input. A summary of that Minneapolis session will be forwarded to the chairs of the International Program Committee in charge of the Study. Even if you can't come to Minneapolis, please read the document and respond in writing to the address given there. After the discussion of the ICMI Study Document, we will have our usual program of talks followed by a short business meeting. Then we will adjourn for dinner and continue the conversation. I look forward to seeing many of you in Minneapolis. (Also see program below.)

IPMI meeting in Minneapolis, April 18, 1997, Program

Beatrice Lumpkin, *Ethnomathematics in the History of Mathematics: Two Examples from Ancient Egypt.*

Karen Dee Michalowicz, *Celebrating Native American Mathematics. The Anasazi, The Mayans and the Inca.*

Michael Miller, *Newton's Segmental Neusis of the regular Heptagon.*

Sohindar Sachdev, *Khayyam-Sacheri and Ibn-ul-Haythem-Lambert Quadrilaterals.*

Call for Papers for SEACME-8

This is an invitation to submit proposals for presentations at the SEACME-8 Conference. Research papers, demonstrations, reviews and project reports are welcome. Proposals for workshops and poster and materials exhibits are also accepted.

The conference will cover topics such as:

Mathematics content in elementary, secondary and tertiary level schools; Teaching approaches and methods for the next century; Assessment Methods. Mathematics for special groups; Mathematics in the workplace; Educational technology; Alternate delivery systems; Mathematical modeling.

The contact persons are Milagros Ibe, Chair and Catherine Visuro-Yu, Secretary.

All proposals should be sent to:

SEACME-8 Secretariat, Mathematics Department, Ateneo de Manila University, Loyola Heights, Quezon City 1108, P.O.Box 154, Manila 0917, Philippines.

Conference of the International History, Philosophy & Science Teaching Group

A conference of the International History, Philosophy and Science Teaching Group will be held June 21-24, 1997 in Calgary, Alberta, Canada. The Dean of the Faculty of Education, University of Calgary, Professor Ian Wards, will be the conference chair. The conference has been initiated by the North American region, but is not limited to it. All members of the International group and others, are invited to attend. Calgary, the site of the 1998 winter Olympics, is situated at the foot of the Canadian Rockies, near the mountain resort of Banff. The conference programme will include an optional visit to the Rockies.

The Program includes, amongst the following.

SUNDAY, JUNE 22

MORNING: Multi-media Applications to Science Teaching (Plenary)

AFTERNOON: A Dialogue on Approaches to the Teaching of Science and Mathematics; Constructivism: Historical Concepts and Theories: Science Education as Education for Freedom

MONDAY, JUNE 23

MORNING: Imagination in Science and Science Education (Plenary) followed by Sessions in Relation to the History and Philosophy of Science, Science in the Schools, Science and Mathematics Texts, Philosophy for Children

AFTERNOON: Issues in Mathematics Instruction, followed by Sessions in Mathematics Education, Science and the Arts (music, drama), Indigenous and Native Beliefs in Science, Magic and Science

TUESDAY, JUNE 24

MORNING: Science and Technology in Society: A Dialogue with History and Philosophy of Science (Plenary), followed by Sessions in Science and Technology, Computer Applications in the Teaching of Science, Science Literacy, Curriculum Issues and Applications

AFTERNOON: Medical Ethics in Science (Plenary), followed by various sessions.

CONTACT PERSON: Ms. Linda Lentz, Faculty of Education, University of Calgary, Calgary, Alberta, T2N1N4, CANADA; email: 180118@ucdasvm1.adm1n.ucalgary.ca or lentz@aes.ucalgary.ca.

Have You Read?

Ronald Calinger, ed.

This column seeks references from across the history and historiography of mathematics, the pedagogy of mathematics, and the sociology of mathematics. It also attempts to cite books or articles, containing sections on these subjects that have the potential for encouraging and motivating students, along with possibly improving the learning of mathematics and research in it, or that may enrich courses. Please send citations with complete bibliographic information to the section editor c/o Department of History, Catholic University of America, Washington, DC 20064, U.S.A.

Anderson, K.G., *Poincaré's Discovery of Homoclinic Points*, *Archive for History of Exact Sciences* 48 (1994): 133-147

Angelelli, Ignacio, *Sacheri's Postulate*, *Vivarium* 33 (1995): 98-111.

Ausejo, Elena and Hormigon, Mariano, eds., *Paradigms and Mathematics* (Madrid: Siglo XXI de Espana Editores, 1996).

Beeley, Philip, *Kontinuität and Mechanismus* (*Studia Leibnitiana Supplementa*, 30) (Stuttgart: Franz Steiner Verlag, 1996).

Bennett, Jim A., *The Measurers: A Flemish Image of Mathematics in the Sixteenth Century* (Oxford: Museum of the History of Science, 1995).

Bennett, Jim and Johnston, Stephen, *The Geometry of War, 1500-1750: Catalogue of the Exhibition* (Oxford: Museum of the History of Science, 1996).

Clawson, Calvin C., *The Mathematical Traveler* (New York: Plenum, 1994).

Cromwell, Peter R., *Kepler's Work on Polyhedra*, *The Mathematical Intelligencer* 17, 3 (1995): 23-33

Euler, Leonhard, *Commentationes Astronomicae Mechanicae et Astronomicae ad Physicum Cosmicam Perminentes*, Ed. By Eric J. Aiton (Leonhardi Euleri Opera Omnia, Series 2, Vol 31) (Basel: Birkhäuser, 1996).

Greenberg, John, *The Problem of the Earth's Shape*

from Newton to Clairaut (Cambridge: Cambridge university press 1995)

Heinzmann, Gerhard, *Zwischen Objektkonstruktion und Strukturanalyse: Zur Philosophie der Mathematik bei Jules Henri Poincaré* (*Studien zur Wissenschafts-, Sozial- und Bildungsgeschichte der Mathematik*, Vol 10) (Göttingen: Vandenhoeck & Ruprecht, 1996) (Submitted by Prof. Dr. H.G. Steiner).

McAllister, James W., *Beauty and Revolution in Science* (Ithaca, N.Y.: Cornell University Press, 1996).

Nye, Mary Jo; Richards, Joan; and Stuewer, Roger, eds., *The Invention of Physical Science: Intersection of Mathematics, Theology, and Natural Philosophy since the Seventeenth Century: Essays in Honor of Erwin N. Niebert* (Dordrecht, Kluwer, 1992).

Price, Michael H., *Mathematics for the multitude: A History of the Mathematical Association* (Leicester: Mathematical Association, 1994).

Sarason, Lisa T., *Gassendi's Ethics: Freedom in a Mechanistic Universe* (Ithaca, N.Y.: Cornell University Press, 1996).

Smith, A. Mark, *Ptolemy's theory of Visual Perception* (*Transactions of the American Philosophical Society*, Vol. 86, part 2) (Philadelphia: American Philosophical Society, 1996).

Stein, Sherman K., *Strength in Numbers: Discovering the Joy and Power of Mathematics in Everyday Life* (New York: John Wiley & Sons, 1996).

Sterrett, Andrew, ed., *101 Careers in Mathematics (Classroom Resource Materials)* (Washington, DC: Mathematical Association of America 1996).

White, Alvin, ed., *Humanistic Mathematics Network Journal #19, November 1996* (Claremont, Calif.: Harvey Mudd College).

Williams, J., *Mathematics and the Alloying of Coinage 1202-1700: Parts I and II*, *Annals of Science* 52 (1995): 213-263

Yeo, R., *Defining Science. William Whewell, Natural Knowledge, and Public Debate in Early Victorian Britain*, (Cambridge University Press, 1993)

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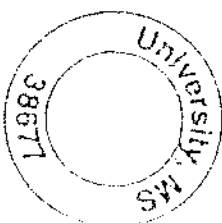
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