

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

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Calendar

- 1992 December 27-30 Washington
Annual meeting of the History of Science Society. Sessions of interest to readers of this Newsletter include a round table discussion of "Critical Problems in the History of Mathematics" at 4:00 on December 28 and "The History of American Mathematics" at 9:00 on December 29. There will also be a luncheon in honor of the 20th anniversary of *Historia Mathematica* on December 29. For information on the luncheon, contact Joseph Dauben, Graduate Center, City Uni-

versity of New York, 33 West 42nd St., New York, NY 10036 or by fax at 212-642-2642 or by email at jdx@cunyvm1.gc.cuny.edu. For information about HSS, contact Michael M. Sokal, Executive Secretary, 35 Dean St., Worcester, MA 01609, U.S.A.

- 1993 January 13-16 San Antonio
Joint Annual Meeting of the American Mathematical Society and the Mathematical Association of America. There will again be a Special Session in the History of Mathematics organized by Victor J. Katz (address on first page) and Tom Archibald (Acadia University, Wolfville, Nova Scotia B0P 1X0, CANADA).
- 1993 March 31-April 3 Seattle
Annual meeting of the Americas Section of HPM in connection with the annual meeting of the National Council of Teachers of Mathematics. (See inside for more details.)
- 1993 May 30-June 1 Ottawa
Annual meeting of the Canadian Society for History and Philosophy of Mathematics. Contact M. A. Malik (address on first page) for information about the society. (See inside for more details.)
- 1993 July 19-23 Montpellier
First European Summer University on the History of Mathematics, organized by Evelyn Barbin, Françoise Lalande, and Yves Nouaze. (See inside for more details.)
- 1993, August 2-6 Munich
Second Gauss Symposium, which includes international conferences on A. Mathematics and Theoretical Physics; B. Statistical Sciences; C. Computing and Information; D. Medical Mathematics and Physics. Within Conference A there are sections on Mathematical Education, chaired by Lisa Hefendehl-Hebeker (Lehrstuhl für Didaktik der Mathematik, Universität Augsburg, Universitätsstraße 10, W-8900 Augsburg.

GERMANY), and on History of Mathematics, chaired by Ivo Schneider (Institut für Geschichte der Naturwissenschaften, Ludwig-Maximilians-Universität, Deutsches Museum, Postfach 26012, W-8000 München 26, GERMANY). A further section on Education is planned within Conference D. For general information on the Symposium, please contact Rudolf Fritsch (Mathematisches Institut, Ludwig-Maximilians-Universität, Theresienstraße 39, W-8000 München 2, GERMANY) or Gauss Institute (McMaster University, P.O. Box 56, Hamilton, Ontario L8S 1C0, CANADA).

- 1993 August 22-29 Zaragoza
Nineteenth International Congress of History of Science. The Congress will consist of Symposia, which will address themes of special interest, Scientific Sections devoted to the various branches and periods of the history of science and technology, and Poster Sessions. The Director of the Program Committee is Prof. Jean Dhombres, Centre National de la Recherche Scientifique, Unité no. 21, 49 rue Mirabeau, F-75016 Paris, FRANCE. Contact either Prof. Dhombres or the Congress Office, Facultad de Ciencias (Matemáticas), Ciudad Universitaria, E-50009 Zaragoza, SPAIN; phone (76) 357-180; fax (76) 565-852; e-mail ichs@cc.unizar.es.
- 1993 August 26-27 Tokyo
Second International Conference on Cultural History of Mathematics. (See inside for more details.)
- 1994 October Newcastle, Australia
Third Australian History of Mathematics Conference. Details will be forthcoming at a later date.

From the Chair

John Fauvel

Those of us fortunate enough to be in Canada this summer were able to appreciate just how

far the HPM movement has come in its first twenty years. From its beginnings at the 1972 ICME-2 in Exeter, England, our international study group has grown until it could mount a conference of 150 people from 25 countries with 69 talks. And that was only at the 'satellite' meeting in Toronto! At ICME-7 in Quebec the following week, the historical groups and talks permeated the programme and formed a significant theme of the congress in plenary lectures. Over the past twenty years, many more teachers have begun to have an interest in the history of mathematics and a desire to use it in their mathematics teaching. This development of interest and awareness is due both to the continued efforts of many people and because the cause is right. Once the enrichment and empowerment provided by history is glimpsed, there is no turning back.

Of course, what happens at international conferences is just a shadowy reflection of what happens in mathematics classrooms around the world, the projection on the cave's wall. And financial considerations preclude the attendance of some of those who would most benefit and have most to contribute. But for those who do manage to find means to travel, these conferences provide an unrivalled opportunity for teachers and researchers to come together and share ideas and experiences, in order to return home reinvigorated and freshly inspired to share with pupils and students, at whatever level, approaches and ideas that have worked for others.

So it is good to know that a series of major international HPM conferences are planned for the next few years. The main event next summer is the first European Summer University, to be held at Montpellier, France from 19-23 July, 1993. In April of the following year, it is hoped that the British Society for the History of Mathematics will be holding another in their series of international conferences, HIMED 94. In 1995, there will be an international HPM conference in Cairns, Australia. Then in summer, 1996 there is ICME-8, at Seville in Spain, and we shall be holding a satellite meeting nearby (possibly in

Portugal). Details of all these meetings, and the other more local meetings to which everyone is also very welcome, will be brought to your attention, as soon as they are known, in the pages of this Newsletter.

Our development and progress over the past 20 years is due to the dedicated work of very many individuals, building upon the efforts of Leo Rogers and Phil Jones in the early years. There are too many to mention by name, but it will be very clear, just from looking at all the names on the front page of this Newsletter, what a large number of people all round the world are involved, in many and various capacities. These people, and those whose names have appeared in these roles in past years, have been dedicating time and effort to share with others their feeling for history of mathematics as a means to encourage understanding of mathematics and its cultural significance.

We are particularly grateful to those who have served on the HPM Advisory Board for the past four years. One way in which HPM remains fresh and lively is in encouraging people of energy and goodwill to serve a four-year term, and then to make way for a fresh cadre. We hope that in turn the new Advisory Board will not only be lending their advice and help to the chair and the editor about HPM matters worldwide, but will also be promoting HPM activities in their regions and, in particular, will be looking out for other people of drive and energy who might join the Advisory Board in due course. To all who have served in this way in the past four years, we say Thank you — and to their successors a big Welcome!

I must say an explicit word, though, about my predecessor. My first task as HPM chair, indeed, is to thank Florence Fasanelli very much for all she has done for us in the past four years, culminating in the superb organisation of the Canadian conferences. Her hard work behind the scenes has led to some very important developments which are still in progress: the possibility of mounting an ICMH study and the publishing of this summer's main HPM talks are but two of the projects which she has played the major

part in moving towards realization. I am very glad she is willing to continue to lend her energies to promoting the HPM cause; her continued advice, contacts, and organisational abilities will be invaluable to her successor, and, indeed, to the whole international study group. Thank you, Florrie.

Finally, I draw attention to the newsletter in your hand. The HPM Newsletter continues to fulfil a crucial role of informing and keeping in touch people around the world. For very many readers, the Newsletter is the main source of information about the activities of others in this field. In an important sense, HPM is its newsletter, and the role of its editor is therefore pivotal. We are very fortunate to have in Victor Katz an editor of such calm efficiency — an especially important quality once you realise how many other projects in the textbook, teaching, lecturing, and organisational areas he has on the go at the same time! — and we are fortunate, too, in the generosity of the University of the District of Columbia, and especially the Dean of the College of Physical Sciences, Philip Brach, who continues to provide funds for the printing and mailing of the Newsletter.

I would encourage everyone to write in to Victor with news, views, things read, experiences you want to share, things that have worked for you, reflections upon the use (or, indeed, misuse) of history, reports of conferences attended, and basically anything that you enjoy reading when others write. Or indeed, please just write in to say how the Newsletter can best be of help to you. We are particularly interested in experiences involving ethnomathematics and the use of history in mathematics teaching around the world. I look forward to meeting many readers of the Newsletter over the next four years, and in the meantime wish you well in your activities, whether teaching or research or both.

From the Editor

Victor J. Katz

I want to thank our new chair, John Fauvel,

for his kind words and also to emphasize that to improve the impact of the Newsletter, we need your contributions. As you will note, in this issue is an article by a school teacher showing how she has used the history of mathematics in her own classes. I would like such an article in each issue, so please write in with a brief account of your own experiences in using history.

Our meeting in Toronto in August was a great success due to the participation of so many people. Naturally, with so much going on at the meeting, each attendee had a different version of the meeting. Therefore, I decided to present in this issue two such versions. If you were there, these will alert you to some talks that you missed. If you could not attend, these will encourage you to try to attend one of the upcoming HPM meetings.

Finally, you will notice an advertisement at the end of this issue. It was accepted with some hesitation, but the funds that it provided helped to enable all expenses of the Toronto meeting to be met without calling on the personal funds of the organizers. The advertisement will also run in the next Newsletter. Let me know your reaction to a policy of permitting some advertising.

HPM in Toronto

Françoise Lalonde

Toronto est une très grande ville (3,500,000 habitants), sur le lac Ontario, très proche d'ici, puisque située seulement à 750 km de Québec. L'air y est pur et léger, sauf quand il pleut. Pour se faire une idée du centre ville, il suffit de songer aux tours de la Défense à Paris, à ceci près, et ce n'est pas rien, qu'à ras de terre la vie y serait normale: rues, piétons, commerces, vélos, feux de circulation, voitures, terrasses de café... mais ni chevaux ni vaches et il n'est plus nécessaire, comme au siècle dernier, d'entourer les bâtiments de grilles afin que les pelouses ne soient pas broutées.

Le campus universitaire est plaisamment et commodément situé au centre ville et beaucoup d'écureuils y ont élu domicile (quels sont les ef-

fectifs respectifs des populations "écureuils" et "étudiants" en période scolaire?)

Certes, nous sommes logés puritainement, pas de lavabo dans les chambres, et pas de glace au-dessus des lavabos dans les lointaines salles d'ablutions collectives: la coquetterie est répréhensible et nous n'avons rien à cacher. Par contre, nous sommes gargantuesquement nourris dans un lieu grandiose: un vrai-faux réfectoire de fausse abbaye néo-gothique qui abrite la vraie Victoria University in the University of Toronto. Trois jours de ce régime ne suffiront pas à nous rendre obèses, mais les Français auront trouvé quelques petits sujets annexes de râleries, ce qui leur fait visiblement plaisir!

Va pour le polonais d'ailleurs! Comme le suggère la carte de débarquement à remplir en arrivant, un voyage au Canada, c'est comme un mariage: pour le plaisir ou pour affaires, il faut cocher l'une des deux cases, à l'exclusion de toute autre motivation (mais il n'est pas interdit aux petits malins de cocher les deux bien sûr).

Si donc, le corps est un peu négligé-pas de soirée dansante, mais un dîner "classieux" arrosé d'un vin blanc suave appelé "Partager", l'esprit, lui, est l'objet de toutes les attentions souhaitables. Les journées sont bien remplies. Après les conférences plénières, les communications se succèdent trois par trois de demi-heure en demi-heure, à peine interrompues par les pauses-café, qui permettent de souffler à la centaine de participants au colloque venus de vingt-cinq pays différents. Ces pauses sont nécessaires, on s'y congratule, on s'y félicite, on s'y fait part réciproquement de l'intérêt pris à telle ou telle intervention et on y échange idées, documents et accessoirement adresses.

Une pause nettement plus longue (une demi-journée) permettra à tout ce petit monde de découvrir les impressionnantes chutes du Niagara, et même, le soir venu, de les admirer illuminées, en technicolor, sous le disque rond de la pleine lune (le syndicat d'initiatives local fait bien les choses!).

Mais trêve de plaisanteries et d'esprit facile: nous sommes très bien accueillis et nous pou-

vous prendre connaissance des travaux des uns et des autres en histoire et pédagogie des mathématiques à divers niveaux d'enseignement de différents pays; des questions de fond sont soulevées en séances plénières et beaucoup de points de vue circulent: le colloque remplit donc son rôle d'information et d'échanges.

HPM in Toronto

Costel Harnas:

A delayed plane deposited me in Toronto in the early hours of the day the conference was starting, with no apparent accommodation. Fortunately, the man on the desk at Victoria College must have been concierge at Cantor's 'Hotel Infinity' in his previous incarnation, for he found me a room, despite the computer's protestations that there were none, so that I could snatch a few hours' sleep before the busy three-day programme began at 8:30 am.

After Israel Kleiner's opening talk on *A history of mathematics course for teachers*, we broke into the general format of the conference: a succession of shorter talks, reconvening at intervals for an address to the whole group. Around 130 people attended altogether, and such was the response from those wishing to present papers that at any one time there were three of these smaller sessions taking place in parallel, making a total of around sixty talks! In order to fit them all in, it was necessary to have a time limit of 30 minutes, a valuable constraint which contributed to the air of brisk efficiency. I was impressed by the programme booklet which gave an abstract of each talk, together with the speaker's address and various numbers for contact in this electronic age. The whole conference was very well organised by a strong team consisting of HPM chair Florence Fasanelli, Victor Katz (editor of the HPM Newsletter), Craig Fraser, and Israel Kleiner — after HIMED 92 I now know what a lot of energy and activity behind the scenes is necessary to ensure a smooth seamless conference!

At 9:20 am I found myself listening to Anne

Boye's *Interdisciplinary approach in history of mathematics for the classroom* — in French, which is not my strongest language, but Anne's energy and enthusiasm were evident in any language. Her talk described work done with a group of 16-year-olds on themes such as Leibniz and his contemporaries, or the C18 topographic map of France, bringing together a team which included teachers of French, Latin, art, history, and a research assistant. We hear much talk in Britain about multidisciplinary approaches to teaching, but here was a vivid example of its actually taking place in France. She described how the students were presented with copies of source material, including old map(ping)s of France, and these immediately aroused interest and stimulated the subsequent discussion. Material is available from Anne at Lycée Grand Air, Av. du Bois d'amour, 44500 La Baule, FRANCE.

In the next timeslot I made a beeline for a session run by another Frenchwoman, Joëlle Delattre, whose subject, *Polemics in geometry and astronomy by the ancient Greeks*, related to a workshop I was to be part of at ICME the following week. This kind of cross-fertilization is what conferences are for, I began to see, and I saw too her excitement in venturing into relatively unfamiliar texts such as, here, by Theon of Smyrna.

Although by now my French was warming up, I next opted for a session in English (well, Australian). Kevin Reed gave a well-constructed talk on *Using other number systems to foster the understanding of our own*. He managed to be original, entertaining and genuinely stimulating in that area we maths teachers sometimes dread, of working with children in different base systems.

The next talk addressed the education of older students. Helena Pycior (USA) spoke on *Mathematical literature is less than mathematics, mathematical literature is more than mathematics*. I hadn't realized that there is a substantial body of writing which incorporates mathematical themes or methods in some way: for instance, in *Brothers Karamazov* Dostoevsky

discusses the theological implications of non-Euclidean geometry. Her reading list ranged from Jonathan Swift's *Modest Proposal* of 1729 to William Boyd's *Brazzaville Beach* which came out two years ago.

In the afternoon, we heard a most interesting talk from Robert Kanigel, author of the recent biography of Ramanujan, *The Man Who Knew Infinity*. This provoked a lively discussion, and a particularly memorable and moving intervention about Hardy's effectiveness in academic politics from Lee Lorch, himself a most distinguished campaigner for truth, justice, and an academic world free from racial and other prejudice.

I then attended a joint presentation by Pat Gabriel, Sylvia Lazarnick, and Sandra Williamson, a good opportunity to discover what real teachers are doing in *Teaching the history of mathematics at the high school level*, using a variety of media and techniques. Their abstract gave no hint of the most entertaining and stimulating of these techniques, which was stripping off multiple layerings of mathematical T-shirts in a sort of 'HPM dance of the seven veils', (to which I'm happy to be adding by sending a HIMED-92 T-shirt).

Man-Keung Siu gave a thought-provoking survey of *Mathematics education in ancient China*. Here was a different view of mathematics. Where the subject was studied solely for its utilitarian functions, the status of the mathematician was extremely low. The actual comparisons given made us laugh, but then I thought of those places in the world where anti-intellectual waves have swept, with devastating results...

Another talk centered on ancient times was John Fauvel's *Plimpton 322 in the classroom*. Plimpton 322 is not, in fact, an old telephone number, but the modern name of a Babylonian tablet, and John masterfully took us through the different levels at which it can be used today, from young children making their own versions using clay, to older students deciphering the numbers and teasing out a meaning. The facsimile of the tablet which he'd brought along would be a useful addition to the artifacts of any

mathematics classroom.

The following day began with a talk to the assembled conference from a former chair of HPM, the Brazilian educator Ubiratan D'Ambrosio. The laid-back title *Historiographical approach to the history of mathematics* did not at all prepare me for the remarkable inspiration of his talk. Ubi has done a lot of work in the area of ethnomathematics, and this approach is still one that we have much to learn from.

One of the following shorter sessions was Peter Bero (Bratislava) on *The influence of wine barrels on the teaching of mathematics*. He described how Kepler's work on volumes of revolution proved to be a stimulus for 16-year-old pupils. I had a chance to look at the stunningly-illustrated book from which a chapter had been invitingly translated as a handout for delegates — it would be good if the whole book could be made available. Anyone out there read Czech?

After giving my talk, *Do you need to know how it works?* — on the introduction of the slide rule, the ensuing argument between William Oughtred and Richard Delamain, and the perennial lessons for introducing new technology into classrooms — I went to hear George Booker (Australia) make clear for me why the teaching of fractions is so difficult. In *Origins of fraction ideas: implications for teaching*, he explained how cultures had different approaches to dealing with fraction ideas. Here was a case where a study of the past illuminated the present.

At the next plenary, Frank Swetz (USA) spoke about how Chinese mathematics, after a number of early accomplishments, faltered and stagnated; his offered explanations for this drew upon the concept of social pressures on the development, learning, and practice of mathematics. After that, we went to Niagara Falls for the afternoon.

The last official day of HPM began with Victor Katz giving a lecture to the conference on *Combinatorics in Medieval Islamic and Jewish Mathematics*. The material was completely new to me — I was unaware that combinatorics had a pre-history to Pascal! The earliest questions asked

ven about the possible arrangements of letters of the alphabet, which inspired both Jewish and Islamic work on this subject. Back here in England where I teach in a multi-ethnic school, I've used this story as an introduction to a piece of "investigative work" with a group of pupils. I've found that it has a natural appeal for the children.

Next, I had opportunity to talk with Dorothy Goldberg, from the U.S., who has been involved in injecting an historical theme into an international studies program. This involved students and teachers travelling to another country and visiting places associated with the history of mathematics. She reported on the '80's trips to England, which took in the Royal Society, the Science Museum and so on, and similarly for the current visits to Paris. I admired the creativity displayed in finding reasons for visiting some of the locations — it certainly sounded like an experience to broaden the mind.

Eduardo Veloso gave a workshop on a particular area of personal interest to me when he described the way Portuguese navigators used astronomical navigation in the latter half of the fifteenth century. He spoke of how this proved to be of interest to present day school pupils. Next, Jim Kiernan, a high school teacher in Brooklyn, did a session centering on the *Problem of points*, using it to illustrate how mathematical knowledge is not always the result of a single brilliant idea but derives sometimes from a cumulative process of successes and failures.

In the afternoon, Evelyne Barbin described thoroughly the work of IREM — a new book has been published, which I'm sure most practising teachers in the field will want to get. I then attended a workshop by Lawrence Shirley. The title in the brochure used the word "lively" in describing the type of history of maths course he is working on at his University in Maryland for would-be teachers. It applied to his talk! He entered the room at one point with a sheet thrown over himself as a toga; he gave an account of other techniques he had successfully used in arousing interest in his students.

Then, being interested in graphical calculators, I went along to watch Daniel Otero link solutions to the old Greek problems of the trisection of the angle, and so on, to the modern TI-81, giving me plenty of food for thought. Jan van Maanen then gave one of his customary witty, entertaining, and thorough talks — on how *New mathematics may profit from old methods*. I then had a chance to find out more about early Islamic maths when I listened to Mohini Mohamed describe Al-Khwarizmi's method in teaching quadratic equations. Finally, from the last sessions I chose one given by A. Hitchcock on *Dramatising the birth and formation of math concepts*. As the name suggests, we had an entertainment, for he had written short pieces which were performed by members of the audience. This was thoroughly enjoyable, not just because I had a chance to act, but because it genuinely stimulated a keen interest in following the ideas that were being thrashed out.

Final thoughts: The conference program was very clear with a good design, giving details of how to contact speakers. The half hour format may have been a little less than some people wanted, but it was the only way to accommodate most of those who wished to give a session. And lastly, thanks to Florence Fasanelli, Craig Fraser, Israel Kleiner, and Victor Katz for organising it all.

Mathematicians of the Month

Gloria Sanck

Learning to value mathematics is a vital educational goal of the *Curriculum and Evaluation Standards* of the NCTM: "Students should have numerous and varied experiences related to the cultural, historical, and scientific evolution of mathematics so that they can appreciate the role of mathematics in the development of our contemporary society and explore relationships among mathematics and the disciplines it serves: the physical and life sciences, the social sciences, and the humanities."

Students work most effectively if they are in-

terested in the subject at hand. The history of mathematics is rich with anecdotes about mathematicians that can generate interest in topics being studied in the classroom. A historical perspective can enrich the teaching of mathematics in the intermediate and upper elementary grades.

Unfortunately, however, many mathematics teachers are so involved with the routine of presenting subject matter that they lack the necessary time and energy to search for motivational material. By frequently using historical items to introduce and supplement topics in the classroom, teachers can make mathematics come alive for the students.

An approach that has proved highly successful has been to have students study the lives and discoveries of mathematicians. By researching mathematicians' lives, students gain some understanding of the development of mathematics within the history of the time. Students also learn that mathematicians are individuals with different interests, experiences, hardships, and human qualities.

Each month during the school year a list consisting of mathematicians whose birthdays occur during that month is posted. The students are expected to make a choice of one mathematician every month. A student may work individually or in a small group. Each month, a mathematician is selected to be investigated from among those born during the month. A mathematician might be chosen by more than one person. In this event a summer-month mathematician may be selected in order to avoid duplications. The teacher should be prepared not only to try to encourage distribution of choices but also to be able to suggest one or more topics related to the mathematician and some activity that is appropriate for the grade level.

The teacher gives the following directions to the students responsible for this month's mathematician:

1. Prepare for the class a written report, a puppet show, a shadow play, or any other means that brings out interesting information about the

life of this mathematician - for instance, early childhood experiences, education, important influences, and contributions to the world of mathematics.

2. In addition to your presentation, plan an activity related to the mathematician's area of study that involves the entire class, either as a whole or in small groups. Ask for any assistance you need in getting started and arrange for necessary equipment. With the teacher's help, lead the class in your activity at the conclusion of your presentation.

The teacher makes prior arrangements with school and local librarians to have appropriate reference books available for the students to assist them in gathering information and preparing their activities. During scheduled class meetings, study time is given. In the course of this allotted time, students are permitted to go to the school library to obtain information, to work individually or in small groups, or to seek assistance from their teacher. The students make arrangements after school on their own time if additional time is needed for further exploration. A date is set each month for the work to be presented. The discussion following each presentation should tie together threads common to the mathematicians studied.

The following questions, adapted to the level of the students, can be used to guide their investigations and to give focus to the discussions of the entire class:

- What historical events occurred during the life of this mathematician?
- What was this person's education?
- What problems arose during that education?
- What was the educational environment in this person's home?
- Among the family, friends, and the mathematical community of the time, who supported and who opposed the person?
- Against what obstacles did this individual struggle?

- What were the major contributions of the mathematician?

It is hoped that in adapting the mathematician of the month approach to their own classes, intermediate and upper elementary school teachers can help their students learn to value the mathematics they are studying.

For further information, examples of students' work, and a bibliography, contact Dr. Sanok at Packanack Lake School, 190 Oakwood Drive, Wayne, NJ 07470, U.S.A.

First European Summer University on the History of Mathematics

The IREM (Institutes of Research into Mathematics Education) are pleased to announce the first European Summer University on the History of Mathematics to be held from 19-23 July, 1993 in Montpellier, France. For twenty years now, there has been a growing interest in research into the relation between history of mathematics and mathematics education. At an international level, the International Group on the Relations between History and Pedagogy of Mathematics (HPM) exists in order to foster communication among those working in this field.

Historical research can provide meaning to the concepts and knowledge taught, and help us understand students' learning difficulties. It also provides an opportunity for placing mathematics within a cultural context. A number of texts now aim at introducing a historical perspective in the teaching of mathematics. Moreover, the integration of history into the teaching of the sciences avoids an ethnocentric view of education. This idea forms the basis of work in ethnomathematics which is aimed at developing a multicultural curriculum.

The Summer University is intended for teachers of mathematics from schools, colleges, and universities, as well as teachers of philosophy, history, and the physical sciences, and those engaged in research into the history of mathematics

and science. The official languages of the Summer University will be French and English.

The work of the Summer University will be organized around the following themes:

- The historical construction of mathematical knowledge.
- Introducing a historical perspective into the teaching of mathematics.
- The relationship between mathematics education and the culture in which it occurs - including the history of mathematics education.
- Epistemology and its relationship to didactics and pedagogy.
- History of mathematics in initial teacher training and in in-service courses.
- Mediterranean mathematics.
- Ethnomathematics.

The programme committee has been drawn from a wide range of European universities or other organisations. The committee members are: Gertrudes Amara (Escola Superior de Educaçao, Portugal), Rudolf Bkouche (IREM of Lille, France), John Fauvel (Open University, U.K.), Fluvia Furinghetti (University of Genoa, Italy), Mariano Hormigon (University of Saragossa, Spain), Nikos Kastanis (University of Thessalonika, Greece), Jean-Claude Pont (University of Geneva, Switzerland), Gert Schubring (University of Bielefeld, Germany), Jan van Maanen (University of Utrecht, Netherlands), and Nicolas Rouche (University of Louvain la Neuve, Belgium).

For more information, contact Evelyne Barbin at the address on the front page or telephone her at (33) 1 49 40 36 40 or fax at (33) 1 49 40 36 36.

International Conference on Cultural History of Mathematics

The Second International Conference on Cultural History of Mathematics will be held at Nihon University of Medicine in Tokyo, Japan on

August 26-27, 1993. The Mathematics Education Society of Japan and the Three Universities of Mathematics Education Society have formed an executive committee and will be responsible for the organization of the conference. There will be lectures, symposia, panel discussion, presentation of recent reports, and exchange of information on the theme of the cultural history of mathematics. The theme will be interpreted in its broadest context. Further information can be obtained from Professor Shin Watanabe, Faculty of Marine Science and Technology, Tokai University, 3-20-1 Orito, Shimizu-shi, 424 JAPAN. Tel: 0543-34-0411 or 0543-48-3629; Fax: 0543-34-0862 or 0543-48-3629.

Canadian Society for History and Philosophy of Mathematics

The annual meeting of the CSHPM will be held from May 30 to June 1, 1993 at Carleton University, Ottawa, Ontario, Canada. There will be a special session on the philosophy of mathematics organized by R. S. D. Thomas, Applied Mathematics Department, University of Manitoba, Winnipeg, Manitoba R3T 2N2, Canada. The remainder of the program is being organized by G. R. van Brummelen, The King's College, 10766 9th St., Edmonton, Alberta T5H 2M1, Canada. Papers on all aspects of the history of mathematics, including its relations to pedagogy, are welcome. Abstracts should be sent to Professor van Brummelen by the end of February.

Americas Section of HPM

The annual meeting of the Americas Section of HPM will be held as usual in conjunction with the annual meeting of the National Council of Teachers of Mathematics from March 31 to April 3, 1993 in Seattle, Washington. The exact times and dates of the HPM session have not been decided, but will be announced in time for the next Newsletter. If you wish to make a presentation, please send your abstract to Erica Voolich, 344 Summer St., Somerville, MA 02142.

Historical Connections in Mathematics

AIMS Education Foundation has recently published *Historical Connections in Mathematics: Resources for Using History of Mathematics in the Classroom*, by Wilbert and Luetta Reimer. This book is a collection of resources to help teachers increase interest and deepen understanding of mathematics by placing it in historical and human context. The collection includes biographical information, famous quotations, fascinating anecdotes, and more than 30 illustrations from the lives of ten mathematicians: Pythagoras, Archimedes, Napier, Galileo, Fermat, Pascal, Newton, Euler, Gauss, and Germain. Each chapter includes an attractive $8\frac{1}{2}$ by 11 inch portrait of the mathematician and five or six ready-to-use classroom activities related to the work of the mathematician. These reproducible activity sheets invite students to participate in critical thinking, pattern recognition, hands-on learning experiences, and a variety of problem solving techniques.

The book, appropriate for grades 4-10, offers creative suggestions for integrating math history into teaching and for making linkages with other disciplines such as science and language arts. Complete solutions to the activity sheets and a useful list of references are included. The Reimers, both professors at Fresno Pacific College, Fresno, California, are also the authors of *Mathematicians are People, Too*, published by Dale Seymour Publications in 1990. *Historical Connections* is available for \$12.95 (U.S.) from AIMS Education Foundation, P.O. Box 8120, Fresno, CA 93747. Tel: 209-255-4094; Fax: 209-255-6396.

The British Sundial Society

Interest in sundials has increased greatly in recent years, and there are several very active study groups in Europe. In 1989 the British Sundial Society was founded with the following objectives:

- to promote the science and art of gnomics and the knowledge of all types of sundial.
- to catalogue the dials which still exist in the British Isles and research their history.
- to advise on the preservation and the restoration of old sundials and the construction of new ones.
- to publish and circulate to members periodically, a Bulletin or Journal containing original articles, reports from other societies, news and other items of interest to members.

All these objectives can be closely linked with history of mathematics as many mathematicians have had an interest in, or contributed to, the art of dialing (e.g. Newton, Digges, Regiomontanus, etc.). The membership is currently over 400 from the U.K. and overseas. The journal, published 3 or 4 times a year (each of about 40 pages, A4 size), is intended to cater to both the expert and beginner. It contains a wealth of mathematics and history connected with the subject.

Membership for 1992/93 is 15 pounds for individuals, 20 pounds for families, and 25 pounds for corporate members, and runs from 1st May. Members joining later in the year receive all communications issued since May. For an application form, please write to Robert Sylvester, Barncroft, Grizebeck, Kirkby-in-Furness, Cumbria, LA17 7XJ, U.K.

If anyone has pictures of sundials from anywhere in the world and would like to share them with the society, please mail either photographs or transparencies to Peter Ransom, 12 Annaside Mews, Leadgate, Consett, Co. Durham DH8 5HL, U.K. Peter Ransom can also be reached by phone at 0661 832486 or by fax at 0661 832859.

Mathematical Connections

A new journal entitled *Mathematical Connections* has recently appeared, edited by Keith Luoma and Steve Whittle, Augusta College, Developmental Studies Department, Augusta, GA 30619, U.S.A. The purposes of the journal are

- to promote research in the history and philosophy of mathematics, and to encourage its use in the classroom;
- to promote mathematical research in those disciplines traditionally perceived as non-mathematical, especially the humanities;
- to provide a forum where scholars can interact with one another.

In order to achieve these goals, the journal seeks articles, book reviews, announcements, and inquiries to the readership. In particular, since *Mathematical Connections* seeks to provide a forum for promoting the interplay between mathematics and the humanities, articles are sought dealing with the relationship of mathematics to art, anthropology, history, literature, philosophy, music, and religion. For more information, contact the editors at the address above or telephone them at 404-737-1685.

Mathematics Teachers Journals

Journals for mathematics teachers appear regularly in many countries. These journals often have articles dealing with the use of history in the teaching of mathematics. Those of you who read the relevant languages should therefore be aware of these publications. Two of these have recently come to the attention of the editor:

Nämnaaren: Tidskrift för matematikundervisning. This Swedish journal is edited by Göran Emanuelsson, Bo Rosén, Ronnie Ryding, and Klara Gustafsson. Information can be obtained by writing to Nämnaaren, Box 101, 431 26 Mölndal, SWEDEN.

Journal for Teachers of Mathematics (in Hebrew). This Israeli journal is edited by Anna Sfard and Hannah Perl. Information can be obtained by writing to the Amos de-Shalit Science Teaching Center, Hebrew University of Jerusalem, 91904 Jerusalem, ISRAEL.

Both journals welcome articles as well as subscriptions.

Have You Read?

Ronald Calinger, ed.

This column welcomes references from across the history or pedagogy of mathematics, as well as other works with sections that have potential for encouraging and motivating students to learn mathematics better or that enrich courses. Please send citations with complete bibliographic information to the section editor c/o Department of History, Catholic University of America, Washington, D.C. 20064, U.S.A.

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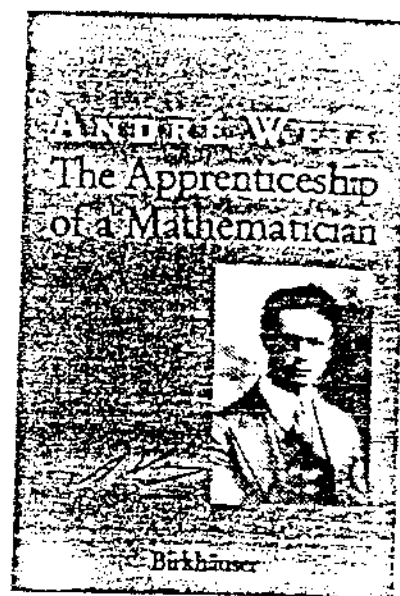


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André Weil

The Apprenticeship of a Mathematician

The author, a mathematician whose horizons have never been limited to mathematics, recalls a career that led him to numerous continents: to Italy and Germany first of all; then to India where he lived and taught at a critical time in the history of that country, and where he met with Gandhi and Jawaharlal Nehru; to Russia when Stalinism seemed to be waning only to then rise up again with increased ferocity; to Princeton, the modern "clearing house" of mathematical ideas, called at times a mathematician's paradise; to a prison in Finland where, taken for Soviet spy, he narrowly escaped execution; to France, where he was convicted for dodging his military obligations (the draft) and where, in the prison of Rouen, he had time to write one of his best mathematical works; to England, where he lived through the Battle of London before returning to France and then moving on to the United States; and finally to Brasil, scene of the last of his vicissitudes, before returning permanently to the United States. Through these often picturesque episodes, the destiny of a mathematician is unfolded, of which perhaps the most salient event was his participation in the foundation of the Bourbaki Group, an *auteur collectif* of a treatise that has long since become a classic.



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