International Study Group On the Relations Between
HISTORY and PEDAGOGY of MATHEMATICS

NEWSLETTER

No. 10   October 1985

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address changes to the Editor.

This Newsletter may be entirely or partially duplicated
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material.

Calendar

Meetings with HPM components are highlighted.

1986 January 9-11 . . . . New Orleans
Mathematical Association of America
(details inside)

1986 Mar 31-Apr 5 . . . . Washington, D.C
National Council of Teachers of
Mathematics (details inside

1986 August 3-11 . . . . . Berkeley, Calif
International Congress of Mathematicians
(details in next issue)

1988 July 27-Aug 3 . . . . Budapest
International Commission on Mathematics
Education (ICME 6). Contact: A.G. Howson,
Secy. ICMI, Univ Southhampton, Centre
for Mathematics Education, Southampton,
SO9 5NH, U.K. HPM will participate; watch
for details.

From the Editor

Make plans to attend the International Congress of Mathematicians next August (1986) at Berkeley, California, and meet and talk to HPM colleagues. A session is being planned by Ubiratan D'Ambrosio, co-chairman of HPM. More information should be in the next issue of the *Newsletter*. Our activities will be coordinated with those of the International Commission on Mathematical Instruction.

Many readers of this *Newsletter* are in contact with Bruce Meserve. Professor Meserve, who retired from The University of Vermont, has recently moved to Tennessee. The postal service cannot be relied on to forward correspondence for more than a few months, so make a note of his new address to avoid disappointment: Bruce E. Meserve, P.O. Box 327, Pleasant Hill, Tennessee 38578.

Small changes continue to be made in the *Newsletter* which we hope will make it possible to continue distributing it at minimal costs and, therefore, at no cost to you. For American readers, the *Newsletter* is now mailed at a much lower postage rate, which saves the mathematics department of Ball State University more than half on postage. Cost reducing tactics are essential since our mailing list continues to grow apace.

Encouraging and supportive messages are more frequently directed to the Editor, confirming our feeling that the *Newsletter* serves a genuine professional need. This brings up a question which seems to be asked frequently of late: should HPM consider converting the *Newsletter* to a journal format that would print refereed articles? Such a change would clearly be a major new direction for HPM and it can not be undertaken without the widest possible support. These points favor it: there is increasing interest in using history in the mathematics classroom, meetings and conference sessions on history and teaching are always well attended, there is no journal that specifically has a mandate to speak particularly to the interest of applying history to the teaching of mathematics, and there is a backlog in journals which now carry articles on teaching and history. A major objection is the fact that support for this *Newsletter* and HPM will not convert to the same level of

support for a journal which would charge a subscription fee.

This issue is bound to be discussed more and more in the future, and you are encouraged to make your views known. Is there room for another journal? Is there enough quality work being done in this area to supply a journal with material? Would you support such a journal by subscribing? by referreeing articles? by submitting materials for publication? Would your institution's library subscribe? If ever there was an issue that should be discussed in the *Newsletter*, this surely must be it. Make your views known by sending them to the Editor for publication. ☐

Plan to Attend the International Congress

HPM will meet at the International Congress of Mathematicians 1986, which will be held 3-11 August at the University of California-Berkeley. The parent organization of HPM, the International Commission on Mathematical Instruction (ICMI), has organized a session, and HPM will coordinate its meeting within this time period.

Requests for the First Announcement for the Congress may be directed to Hope Daly, ICM-86, American Mathematical Society, P.O. Box 6887, Providence, Rhode Island 02940, U.S.A. (phone 401/272-9500). The Second Announcement, which provides detailed descriptions of the conference activities, will be available soon. Further information about HPM activities in particular will be announced in the *Newsletter*. ☐

American Section of HPM Will Meet Twice in 1986

Meetings of the Americas Section of HPM are planned in conjunction with the annual meetings of three major mathematics organizations. For the first time, the group plans to meet as a part of the Joint Meetings of the American Mathematical Society and Mathematical Association of America, 9-11 January 1986, in New Orleans. A session has been scheduled for Friday, January 10th, from 3:15 to 4:15 pm. A part of this time will be devoted to discussing a preliminary version of a historical module on the quadratic equation. This module

is designed to provide the teacher with all the material necessary to present the quadratic equation in a historical context. When in final form, it will be made available for general distribution.

As in the past the Americas Section of HPM will meet immediately preceding the annual meeting of the National Council of Teachers of Mathematics. This will 31 March to 2 April 1986 and the meeting promises to be very special. A variety of activities have been planned which take advantage of the unique resources available in the U.S. capital. There will also be sessions for papers and classroom modules. Further information may be obtained from the Americas Section Chair, Professor V. Frederick Rickey, Department of Mathematics and Statistics, Bowling Green State University, Bowling Green, Ohio 43403. ☐

Indian Journal for History of Mathematics

The Indian Society for History of Mathematics since 1979 has published its *Bulletin* entitled *Ganita Bhāratī*. It contains research articles and papers, reviews, news and reports, and dissertation abstracts on the history of mathematics. As an international journal with an international editorial board, it solicits contributions covering all periods and countries. It is published quarterly in English, German, French, Sanskrit, and Hindi. The Editor is Dr. R.C. Gupta, Birla Institute of Technology, Mesra — 835 215 (Ranchi), India.

The Society promotes research, teaching, and education in history of mathematics through its annual conferences and its seminars/symposia organized around the works of ancient, medieval and modern mathematicians. All members of the Society receive a free copy of its publications.

Annual subscription rates for *Ganita Bhāratī* are $50 (U.S.) for institutions, whereas members of the Society receive a subscription with their memberships, which are $25 (U.S.) per year. Further information on business matters may be obtained by writing to the Managing Editor of the journal and Treasurer of the Society, Dr. Man Mohan, Department of Mathematics, Ramjas College, University of Delhi, Delhi — 110007, India. [Information supplied

by R.C. Gupta.]   ☐

Didactics of Mathematics in Orléans

The fourth École d'Été de Didactique des Mathématiques will be held 30 June — 12 July 1986 in Orléans, France. The school is intended for persons interested in developments in research in mathematics and computer science education. The themes will be (a) the transmission of concepts and experiences concerning the didactics of mathematics, (b) the teaching of mathematics in college, (c) the assistance given to the didactics of mathematics by the history of mathematics and the history of its teaching, and (d) the didactics of information science and the use of information science in the teaching of mathematics. The activities of the school will include courses, workshops, and seminars. The number of participants is limited to 120. The cost of the session will be about 2300 French francs (registration fee plus complete accommodations). To preregister and obtain further information, write R. Douady, I.R.E.M. Paris 7, 2 Place Jussieu, 75005 Paris, France. [Information Dr Charles Parish from the Journal for Reserch in Mathematics Education (Nov 1985), p. 392.] ☐

Making Modules in a History Class

Creating modules for use in the mathematics classroom has been a central activity in the history of mathematics classes recently offered at Ball State University. Students, who are current or prospective teachers of mathematics, construct self-contained units in which a mathematical topic is presented from a historical point of view. These modules consist of a historical survey of the topic, lesson plans, demonstration materials, bulletin board diagrams and portraits, an annotated bibliography for teachers who wish further information, and an annotated bibliography of sources suitable for students.

The topics chosen by the students in the history course have included regular polyhedra, golden section, calendar, mathematical astronomy, numeration, negative numbers, imaginary numbers, quadratic equation, Mayan mathematics, calculating aids, to mention a few. In addition to being a survey of the history of mathematics up to the

seventeenth century, the course also teaches research techniques. A principal objective is to introduce the student to methods of finding information about the history of mathematics in periodical literature. Creating historical modules has provided an excellent opportunity to teach these techniques and at the same time produce something that each student, as a teacher, can use in her or his classroom. Further information about the course can be obtained by writing to the instructor, Charles V. Jones, Ball State University, Muncie, Indiana 47306, U.S.A.　□

History of Mathematics at the Indian Science Congress, 1985

(R.C. Gupta—) A symposium on history of mathematics was held 3-8 January 1985 in conjunction with the 72nd Indian Science Congress at Lucknow University, which is celebrating its seventy-fifth anniversary jubilee. The history of mathematics symposium was convened on 5 January in the Department of Mathematics and Astronomy by W.H. Abdi (National Institute of Science, Technology and Development Studies, Lucknow) and S.R. Sinha (University of Allahabad). S.I. Husain (Aligarh Muslim University) chaired the symposium, assisted by M.K. Singal (Meerut University).

Professor Sinha's opening remarks, drawing attention to a similar symposium held ten years before at Delhi, outlined major activities in India in history of mathematics during the decade, including the Indian Society for History of Mathematics. He described his own work on Sanskrit texts on the construction of *kundas* (ceremonial pits). A program of speakers followed.

S.P. Arya (Maitreyi College, Delhi) 'History of topology': general topology from Fréchet (1906) through Riesz (1909), Weyl (1914), Hausdorff (1914), and Kuratovski (1922), with a discussion of landmarks and major problems. P. Achuthan (I.I.T., Madras) 'On the development of rational (Padé) approximants': Traced optimization and approximation techniques from 19th century, in particular Padé approximants which are related to continued fractions and analytic functions; mentioned salient milestones in their growth and development, including Indian contributions. A.K. Chakravarty (M.R.

College, Mahishadal) 'The myth of *Krittikas*' Problems of interpreting terminology in a pre-Aryan age astronomical tradition from countries around latitude 25°, passed down to Brahmanic literature unchanged and without verification. R.C. Gupta (B.I.T., Mesra, Ranchi) 'Some euqlization problems from the *Bakhshālī Manuscript*' Described types of problems in manuscript, including some new light on the reported *bhrānti* (confusion) regarding the *sūtra* (rule). R.S. Lal (D.A.V. College, Siwan) 'Extraction of square root in ancient Hindu mathematics' The oldest Hindu term, *mūla*, for square root occurs in the *Anuyogadvārā sūtra*, a Jaina canonical text dating from 100 B.C.; Brahmagupta used the term *pada*. The Hindu method of finding the square root numerically was described. Yukio Ohashi (Research Scholar, Lucknow) 'Mathematical astronomy of *mKhas pa dga' byed*' First Tibetan treatise on mathematical astronomy (A.D. 1358) by Bu-ston, based on Sanskrit *Kālacakra-tantra* (ca. 10th century); last chapter is devoted to word numerals. M.S. Rangachari (Ramanujan Inst., Madras) and the late C.T. Rajagopal (Madras) 'On medieval Kerala mathematics' Describes possibility that infinite trigonometric series, earlier identified in the 16th century *Tantrasangraha-vyākhyā*, may have been known to medieval Keralite mathematicians before the time of the original text of *Tantrasangraha*. S.A. Rizvi (Senior Research Fellow, NISTDS, Lucknow) 'Arithmetical ratio of diameter to circumference of a circle with special reference to *Jāme'-i-Bahādur Khānī*' An interesting method of finding a value for π (3.141590) given by JaunpūrI in this 1833 treatise. A.R. Singal (Meerut) 'A brief history of computers' Traced the evolution of the computer from man's fingers to modern computers. Professor Abdi made some closing remarks.

Separate from this symposium, two other talks of interest were presented. R.S.L. Srivastava (I.I.T., Kanpur) 'A history of mathematics in Hindi verse' A poem composed by the presenter. D.N. Verma (I.I.F.R., Bombay) '19th century invariant theory as progenitor of the contemporary representation theory' How the study of invariant theory provides a new clearer understanding of representation theory of symmetric groups.

The Symposium and the special lectures clearly indicate the growing popularity in India of the history of mathematics, especially among the professional mathematicians (instead of linguists and historians). This new awareness of the usefulness of history of mathematics among Indian mathematicians is especially gratifying and incorporating it into teaching programmes should be encouraged. [Professor Gupta is at the Birla Institute of Technology and is editor of Ganita-Bhāratī.]　□

Distribute This Newsletter To Your Group

The HPM *Newsletter* is distributed to the members of the Canadian Society For History and Philosophy of Mathematics/Société Canadienne d'Histoire et des Philosophie des Mathématique. It is available for distribution to your organization or group, as well. There are usually three issues per year (October, February, and May), and there is no copyright on the material in the *Newsletter*.

Contact the Editor and you will be provided with a master copy of the Newsletter by first class mail at the time it is composed for publishing. You may then duplicate it in any manner convenient for your purposes.　□

Ethnomathematics Group Formed

Many HPM participants will be interested in a recently formed group, the International Study Group on Ethnomathematics (ISGEm). Formed at last year's annual meeting of the National Council of Teachers of Mathematics (NCTM) in San Antonio, it plans to meet in conjunction with the 1986 NCTM meeting in Washington, D.C. A newsletter is available by sending $5 to Gloria Gilmer, Director, Math Teaching & Learning Center, Coppin State College, 2500 West North Ave., Baltimore, Maryland 21216, U.S.A.

HPM Sister Organization Meets

(Abraham Arcavi—) The seventh annual meeting of the North American Chapter of the International Study Group for the Psychology of Mathematics Education (PME) was held in Columbus, Ohio, 2-5 October 1985. PME is a study group under the auspices of the

International Commission on Mathematical Instruction, as is HPM.

The papers presented at this conference reflected the diversity of interests which have developed since the organization was founded in Karlsruhe a decade ago. Where cognitive studies have dominated past conferences, this conference demonstrated the importance of other areas of psychology, as well. Papers reported on studies focusing on variables from the affective domain, on attitudes, on the relationships among content related beliefs and mathematical behaviour, and on new theories concerning the relationships between physiological variables and learning. More than a dozen papers reported on aspects of the use of computers in instruction, both for teaching traditional topics and for teaching thinking skills. An increasing number of papers focused on methodological issues. In this diversity of research approaches, the most common theme underlying the presentations was problem solving which has been a continuing topic of concern in the conferences.

A proceedings of the meeting is available, edited by Suzanne K. Damarin, Ohio State University, 29 W. Woodruff Avenue, Columbus, Ohio 43210. The next meeting of the North American chapter will be 25-27 September 1986 at Michigan State University (contact: Prof. Glenda Lappan, Dept of Mathematics, Michigan Stae Univ, East Lansing, Michigan 48824-1027). The international group meets in 1986 in London, England, 20-26 July (contact: Prof Celia Hoyles, Institute of Education, University of London, 20 Bedford Way, London WC1H 0AL) and in 1987 in Montréal (contact: Jacques C. Bergeson, Fac. Science de l'Education, Succ "A", C.P. 6203, Université de Montréal, Montréal, Québec H3C 3T3, Canada). [Partly from the PME Proceedings. Dr Arcavi recently completed his doctorate at the Weizmann Institute of Science in Israel and is currently a post-doctoral fellow at Ball State University in Indiana.]　□

Symposium On the Relevance Of the History of Mathematics In India

(R.C. Gupta —) A symposium entitled "Relevance and Importance of History of Mathematics in Present Times in India" was held 23-26 March 1985, at Allahabad University, supported by a

grant from the University Grants Commission, New Delhi. The event coincided with celebrations commemorating the twenty-fifth anniversary of the Allahabad Mathematical Society. (The sixth annual conference of the Indian Society for History of Mathematics was scheduled concurrently, but was postponed at the last hour.) The anniversary celebration was inaugurated by a talk by Professor T. Pati (Univ of Allahabad), touching on the history of mathematics and on the problem of pure versus applied mathematics. The conference chairman, Professor U.M. Singh, President of the Allahabad Mathematical Society, gave a detailed talk surveying various aspects of mathematical education and research in India.

The symposium on the history of mathematics began on the second day with observations by the chairman of the session, Dr S.R. Sinha (Allahabad Univ), on the expanding interest in the history of mathematics which he had observed over the past decade. (Three weeks after this session, April 15, Professor Sinha died during the night of a heart attack. He was born in 1931 and had actively served the mathematics community throughout his career. At his death, he was Academic Secretary of the Indian Mathematical Society.) This was followed by a short talk by Professor Parmanandji, a retired history professor from Allahabad University, who advocated history to make every subject more interesting and useful.

The main speaker of the session was R.C. Gupta (Ranchi) who, taking J.W.L. Glaisher's oft quoted words, "no subject looses more than mathematics by any attempt to dissociate it from its history", developed the theme for India in particular. Because India has a rich and continuous mathematical tradition of 5000 years, its educators and institutions should be taking advantage of the new material and sources coming to light which are rapidly changing the view of the history of world mathematics. Especially when viewed in the context of India's efforts to catch the developed countries in various fields and disciplines, the neglect of the study of history of mathematics would be a missed opportunity; without a knowledge of history of mathematics due credit for discoveries and inventions could not be given or misplaced credits corrected,

or even minor matters would not be explained; e.g., the origin of terms like 'sine', *karna* ('ear') for hypotenuse, *trijyā* for radius, or concepts like 'third diagonal' of a (cyclic) quadrilateral', and the like.

K.P. Singh (Varanasi) emphasized the importance of history in mathematics education since it provides the most thrilling part. He identified the history of mathematics with the history of geometry and sketched a history of geometry from Ahmes papyrus to 19th century non-euclidean geometry. M.C. Chaki (Calcutta) spoke on "Development of geometry in India in the 19th century", also the title of a research project on which he is working funded by the Indian National Science Academy, New Delhi. His talk focused on the work of Asutosh Mookerjee (1864-1924). S.A. Paramhans (Simla) spoke on "Scope of history of mathematics in India in the present era" and R.S. Lal (Siwan) delivered the paper "Swami Bharati Krishna Tirthaji and his novel method of factorization."

In the March 25th session, P. Jha (Supaul) read his paper on "Bhāshkara's works in Mithilā", and P. Singh (Haripur) on "Permutations, combinations, and other selected topics in Sanskrit prosody" in which he claimed that Narāyana Pandita stated the binomial theorem for any positive integral index in 1356.

There followed a discussion of history of mathematics courses and syllabi especially for students in India. S.R. Sinha outlined a syllabi for all levels from high school to post graduate courses; G. Singh (Arrah), B.L. Sharma (Allahabad), M.C. Chaki (Calcutta) and T. Pati expressed their views, but a need for more consideration precluded any final conclusions.

During the three day anniversary celebration, a symposium on "Mathematics in India by AD 2001" was scheduled among the other sessions. Frequently in these talks, references to the history of mathematics in India during the past eighty years was used as a basis for predicting the kind of mathematics likely to be studied at the turn of the century. [Professor Gupta is at the Birla Institute of Technology, Ranchi, and is editor of Canita-Bhārati.] ☐

Curriculum Survey Material Available

Mathematics Information Systems has surveyed several series of mathematics texts used in the United States and tabulated the use of 1900 elementary and secondary key terms. This information is stored on micro-computer disks and is presented in a scope and sequence format. The disks, called "Comparer" (volumes 1.1 and 1.2), are for the Apple II series or compatible computers, and reports can be produced on most printers. The disks are available in English, French and Spanish with an 18 page user's manual (manual in English only — $25 per volume). The information is also available in a trilingual book version ($75).

Comparer might be used in the context of HPM activities, where it is judged important to follow the trend in textbook writing in developing classroom materials. For example, a quick scan of the tables shows that 'field', 'group', and 'Zeno's Paradoxes' have been little used in the K-8 American curriculum during the last decade, while 'base systems', 'Euclidean algorithm', and 'sieve of Eratosthenes' are on no decline in usage. On the other hand, 'mental arithmetic' and 'rounding numbers' are on the rise. More information can be found; e.g., 'rounding': the term does not appear in two 1972 series published by Harcourt, Brace, Jovanovich and D.C. Heath, but does appear in series published in 1978 and subsequently by other publishers (it is in the grades 3 through 8 material). (More details are reported in the sample sent to the Editor.)

If *Newsletter* readers are interested in specific areas, contact Jim Kelly at Mathematical Information Systems, P.O. Box 146, Evanston, Illinois 60204. ☐

Frank Swetz's Article Wins Award For the Mathematics Teacher

The *Mathematics Teacher* has been recognized by the Educational Press Association of America for 'Distinguished Achievement' in the category of learned article, for having published "Seeking relevance? Try the history of mathematics", by Frank Swetz, in the January 1984 issue. [See "Have You Read?" in *Newsletter* No. 6.]Professor Swetz has a long standing interest in the history of mathematics, as well as in Chinese mathematics.

He is professor of mathematics and education at Pennsylvania State University. We extend our heartiest congratulations to Professor Swetz and to the *Mathematics Teacher*. ☐

Report From ICMI

Bulletin No. 18 (June 1985) of the International Commission on Mathematical Instruction (ICMI) reports several items that may be of interest to *Newsletter* readers. For 1983-1986, the Executive Committee is President: J.-P. Kahane, Univ de Paris-Sud, Centre d'Orsay, Mathématique — Bâtiment 425, 91405 Orsay Cédex, France; Vice Presidents: B. Christiansen, Royal Danish School of Educational Studies, Dept of Mathematics, Emdrupvej 115B, DK-2400 Copenhagen NV, Denmark; Z. Semadeni, Instytut Matematyczny, Polskiej Akademii Nauk, ul. Sniadeckich 8, 00-950 Warszawa, Poland; Secretary: A.G. Howson, Univ of Southampton, Centre for Mathematics Education, Southampton, SO9 5NH, United Kingdom; Members: B.F. Nebres, Mathematical Society of the Philippines, c/o Ateneo de Manila Univ, P.O. Box 154, Manila, Republic of the Philippines; M.F. Newman, Dept of Mathematics, Institute of Advanced Studies, Australian National Univ, P.O. Box 4, Canberra, ACT 2600, Australia; H.O. Pollak, Bell Communications Research, Inc., Morris Research and Engineering Center, Room 2Q-386, 435 South Street, Morristown, New Jersey 07960, U.S.A.; Past President: H. Whitney, Institute for Advance Study, Princeton, New Jersey 08540, U.S.A.; Ex-Officio Members: J. Moser, President of IMU, Eidgenössische Technische Hochschule, E.T.H. Centrum-Mathematik, CH-8092 Aurich, Switzerland; O. Lehto, Secretary of IMU, Univ of Helsinki, Dept of Mathematics, Hallituskatu 15, 00100 Helsinki 10, Finland; H. Hogbe-Nland, IMU Representative at CTS-ICSU, Univ de Bordeaux – 1, UER d'Informatique et de Mathématiques, 351 Cours de la Libération, 33405 Talence, France.

The International program committee for ICME 5 in Budapest is A. Császár, Chairman (János Bolyai Mathematical Society, Budapest, Anker Koz 1-3, 1. 111., H-1061, Hungary), D. Broomes (School of Education, Univ of the West Indies, Cave Hill Campus, P.O. Box 64, Bridgetown, Barbados, West Indies), Mme. C. Comiti (Institut de Formation des Maîtres, Univ de Grenoble I – BP 68, 3 8402 St Martin d'Hères

Cőram Franco), H. Fugita (Dept of Mathematics, Faculty of Science, Univ of Tokyo, Hongo, Tokyo, 113 Japan), Shirley Hill (309 Education School, Univ of Missouri-Kansas City, Kansas City, Missouri 65208, U.S.A.), M.F. Newman (Mathematics, IAS, Australian National Univ, B.P.O. Box 4, Canberra 2601, Australia), S.M. Nikol'skii (Steklov Mathematical Institute, ul. Vavilova 42, Moscow 117966, GSP - 1, USSR), H. Pulleroy (Istituto di didattica, Univ Salesiana, Piazza Ateneo Salesiano, 1, I-00139 Roma, Italy), J. Somossi (Szeged, Aprilis 4, Utja 6, Hungary), David Wheeler (Dept of Mathematics, Concordia Univ, Loyola Campus, 7171 Sherbrooke Street West, Montréal, Québec H4B 1R6, Canada), and ex-officio A.G. Howson.

An international seminar under the auspices of ICMI on "School mathematics in the 1990s", is planned for early 1986 in Kuwait. The meeting will be under the patronage of the Kuwait Ministry of Education and the Foundation of the Advancement of Sciences. A discussion document (entitled as the seminar) was published as a supplement to Bulletin No. 18.

The proceedings of the ICMI-ISME regional conference on mathematical education held in Tokyo, October 1983, have been published. The theme of the conference was "School mathematics in and for changing societies". The volume of Proceedings is over 500 pages and was published by the Japan Society of Mathematical Education, 2-1-3, Zoshigaya, Toshima-ku, Tokyo, 171 Japan.

A monograph entitled "Towards Mathematical Maturity: Some European Comparisons" by D.A. Quadling, examines mathematics teaching in the senior classes of schools in seven European countries. Copies are available from the Publications Officer, Cambridge Institute of Education, Shaftesbury Rd, Cambridge CB2 2BX, United Kingdom. The price is £4.50 (overseas orders should be paid in sterling by Bankord Draft drawn on a London bank).

The ICMI Bulletin is edited by Keith Hirst and Geoffrey Howson and available through the Secretariat, Centre for Mathematics Education, University of Southampton, Southampton, SO9 5NH, United Kingdom.

Canadian Historians of Mathematics Meeting

(*John Berry*—) The annual meeting of the Canadian Society for History and Philosophy of Mathematics/Société Canadienne d'Histoire et de Philosophie des Mathématique was held at the Université de Montréal, June 2-4, 1985. The following papers were presented: Erwin Kreyszig (Carleton Univ) "On the history of functional analysis"; Craig Fraser (Univ of Toronto) "J.L. Lagrange and the equations of the calculus of variations"; William Aspray (Charles Babbage Institute, Univ of Minnesota) "The Princeton Oral History Project"; Roger Cooke (Univ of Vermont) "Joseph Perott, Sonya Kovalevskaya, and Clark University"; V. Frederick Rickey (Bowling Green State Univ) "W.E. Story of Hopkins and Clark"; J.L. Berggren (Simon Fraser Univ) "Ancient optics in light of a new Arabic manuscript"; Israel Kleiner (York Univ) "Evolution of the function concept"; Albert Lewis (Bertrand Russell Editorial Project, McMaster Univ) "Bertrand Russell as a mathematician"; David Wheeler (Concordia Univ) "Some aspects of the relations between philosophy and pedagogy of mathematics"; Givanna Cifoletti (Princeton Univ) "Kepler's philosophy of mathematics: 'De Quantatibus' "; Louis Charbonneau (Univ Québec a Montréal) Workshop: "Pictorial material in the classroom"; Francine Vinette (Univ Waterloo) "In search of mesoamerican geometry"; Victor J. Katz (Univ of District of Columbia) "Precalculus and calculus: a historical approach to teaching"; Liliane Beaulieu (Univ de Montréal) "Bourbaki and Bourbakis in twenty years of American mathematical publications (1935 - 1964). A citation analysis". (Professor Berry is member of the Executive Board of the HPM Americas Section and of the faculty of the University of Manitoba.)

Cryptology Offers Historical Material

Cryptologia, a scholarly journal of cryptology established in 1977, carries articles on history. The advertisement sheet lists titles of articles through 1984, and in the list are such historical items as "The earliest use of a dot cipher", "The Enigma —historical perspectives [2 parts]", "A catalogue of historical interest [2 parts]", "The early work on computers at Bletchley", "A new source for historians:

Yardley's seized manuscripts", among others.

The yearly subscription rates (in U.S. dollars) are $28 for U.S. subscriptions, $36 for non-U.S. subscriptions, and $60 for air mail non-U.S. rates. Write to Cryptologia, Rose Hulman Institute of Technology, Terre Haute, Indiana 47803, U.S.A.   □

Have You Read?

Readers are encouraged to submit contributions to "Have You Read?". References need not deal exclusively or explicitly with history in the mathematics classroom, but should have the potential for motivating or enriching. N.B. Supply complete bibliographic information: names of author(s); complete titles of books or of both the article and journal; for journals include both the volume and date; for books, edition, copyright date, publisher and place of publication. Accuracy in spelling and wording is critical. Please provide concise annotations whenever possible. —Ed.

Albers, Donald J., and G.L. Alexanderson, Editors. 1985 *Mathematical People: Profiles and Interviews* Boston/Basel: Birkhäuser.
    Twenty-Five interviews with contemporary mathematicians, many of which originally appeared in *College Mathematics Journal*.

Augarten, Stan 1984 *Bit By Bit. An Illustrated History of Computers* New York: Picknor & Fields.
    Attractively produced with color illustrations including portraits and artifacts.

Ifrah, George 1985 *From One to Zero: A Universal History of Numbers* New York: Viking Penguin Inc.
    A translation by Lovell Bair of the 1981 French edition, *Histoire universelle des chiffres*. An elementary treatment covering many numeration systems.

Kline, Morris 1985 *Mathematics and the Search for Knowledge* New York: Oxford Univ Press.
    How mathematics is involved in our understanding of the physical world from ancient times to the present.

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The Witch of Agnesi

(*Duane Deal*—) Maria Gaetana Agnesi (1718-1799) wrote *Instituzioni Analitiche* (1748) in the vernacular for the instruction of her younger brothers. It covers algebra, trigonometry, analytic geometry, calculus, and differential equations in two large volumes totaling over 1000 pages. It is one of the earliest calculus texts. John Colson, Lucasian Professor of Mathematics at Cambridge, learned Italian in his old age specifically to translate this very accessible textbook to English. His translation was complete in 1760 when he died but it was not published until 1801, in London.

A section of paragraph 238 is shown, wherein Agnesi gives the equation for a curve which she calls "la *Versiera*." The curve had been studied earlier by Fermat before 1666, and by Guido Grandi who, in 1718 in a commentary on Galileo, named it "*versorio*", meaning capable of moving in any direction (a reference to the mechanical definition of the curve). When Colson consulted his Italian dictionary, he found that the word meant "female hobgoblin" or "the devil's wife", which he translated as "witch". A portion of the same paragraph 238 from Colson's translation is also shown (with some nineteenth century reader's annotation "La Versiera"). Various writers have offered explanations of the term "witch". D.J. Struik (in his *Source Book in Mathematics, 1200-1800*) states "Some wit in England once translated it [vesiera] "witch" and the silly pun is still lovingly preserved in most of our textbooks in the English language." A calculus book (R.P. Agnew, *Calculus* 1962) offered this explanation: "The innocent graph of the equation . . . is called

the witch of Agnesi because Maria Gaetana Agnesi discovered a spooky ruler-and-compass method for constructing points on it."

Maria Agnesi is one of the earliest female mathematicians of note. She was the eldest of twenty-one children, it was her lot to bring up the other twenty children. Her father, a mathematics professor in Bologna, encouraged her intellectual and linguistic development, later organizing Sunday solons at which the teen-aged Maria discoursed with savants on logic, mechanics, mathematics, and other subjects in French, Latin, Greek, German, Spanish and Hebrew. 190 of these essays were published when she was twenty-one. She had already (at age nine) published a book advocating the education of women. At seventeen she she had written a commentary on l'Hôpital's *Conic Sections*, but it was not published. Pope Benedict XIV appointed her to the Faculty of the University of Bologna and the faculty senate accepted her, but there is no evidence that she ever taught.

Agnesi gradually ceased intellectual endeavors and spent the last twenty-eight years of her life as "visitor and director of women" at a home for the aged in Milan. She died at the home and was buried in a common grave. In this century, Milan has come to honor her, naming a street in her honor. [Professor Deal is on the faculty of Ball State University.] □