International Study Group on the Relations Between the HISTORY and PEDAGOGY of MATHEMATICS
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On the special issue of the Mediterranean Journal for research in Mathematics Education

Volume 3, number 1-2, 2004 (double issue) of the *Mediterranean Journal for research in Mathematics Education* is a special issue based on the papers presented in the Topic Study Group 17 (TSG 17) *The role of history of mathematics in mathematics education* of ICME 10 (Copenhagen 2004). It is edited by M-K. Siu and C. Tzanakis. Following the original suggestions by the Chair of the International Program Committee of ICME 10, the organizing team[1] of this TSG thought that it would be possible and fruitful to have a special volume based on the presentations in this group. The idea has been approved by the Editor of the *Mediterranean Journal for Research in Mathematics Education* published in English by the Cyprus Mathematical Society. Papers have been submitted and were reviewed and this Special Issue is a collection of the edited and revised version of 10 out of the 13 papers presented in TSG 17.

The aim of TSG 17 was to provide a forum for participants to share their teaching ideas and classroom experience in connection with the history of mathematics, in the spirit of the 10th ICMI (*International Commission on Mathematical Instruction*) Study on the role of the history of mathematics in the learning and teaching of mathematics, which led to the publication in 2000 of *History in Mathematics Education: The ICMI Study*, edited by John Fauvel and Jan van Maanen, and to learn about work that has been done since then.

Introducing a *historical dimension in mathematics education* involves three different areas: *mathematics*, *history* and *didactics*. Implicit to the papers collected in this special issue is the key issue, *viz* to find and elaborate on a harmonious, balanced and effective interrelationship among these three scientific areas in a way that is enlightening and fruitful in mathematics education. The papers approach this key issue in different ways, focusing on at least one of the following four points:

(i) To consider in detail *epistemological issues* relevant to the relations between mathematics, history, mathematics education and other disciplines, which although long-standing, still remain at least partially unsettled.

(ii) To enrich *teachers' education* at all levels, both by introducing courses in (particular aspects of) the history of mathematics and its relation to other disciplines, and by letting them become acquainted with historically inspired material that can be, or has been used in the classroom.

(iii) To construct and develop appropriate relevant *didactical material*,

[1] A. Elidrissi (Morocco), S. Kaijser (Sweden), L. Radford (Canada), M-K. Siu (China, co-chair) and C. Tzanakis (Greece, co-chair).

which can either be used directly in the classroom or constitute resource material for mathematics teacher.

(iv) To present *particular example**s*** and the underlying rationale, as an illustration of how history may contribute to the improvement of mathematics teaching in one way or another -- by exciting the students' interest, enriching their view of mathematics, or deepening their awareness of what mathematics really is.

The following papers are included in this special issue:

Epistemological Issues

- Fulvia Furinghetti, History and mathematics education: A look around the world with particular reference to Italy
- Giorgio T. Bagni, Prime numbers are infinitely many: Four proofs from history for mathematics education
- Konstantina Zormbala & Constantinos Tzanakis, The concept of the plane in Geometry: Elements of the historical evolution inherent in modern views

Teachers' Education

- Guillermina Waldegg, Problem solving, collaborative learning and history of mathematics: Experiences in training in-service teachers
- Marita Barabash & Raisa Guberman-Glebov, Learning-and-Teaching Project in the History of Mathematics for pre-service Teachers: Educational and Multiculteral enrichment of their academic curriculum.

Didactical Material

- Daina Taimina, *History of mathematics in digital kinematic mechanism collection*
- James Tattersall, & Shawnee L. McMurran, *Using the Educational Times in the classroom*
- Richard J. Charette, *Integrating the history of mathematics in the teaching of mathematics: A Possible Link Between Pythagoras and King Tut*

Particular Examples

- Chun-Ip Fung, *How history fuels teaching for mathematising: Some personal reflections*
- Michel Helfgott, *Two examples from the natural sciences and their relationship to the history and pedagogy of mathematics*

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For more information on the *Mediterranean Journal for Research in Mathematics Education*: A. Gagatsis, Editor-in-Chief, P.O. Box 20537, 1678 Nicosia, Cyprus, e-mail: gagatsis@ucy.ac.cy

Constantinos Tzanakis, Greece

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László Filep in memoriam

László Filep died, from a heart attack during a lecture in Budapest, on November 19, 2004 at the age of 63.

Filep worked at Nyíregyházi Fõiskola in the eastern part of Hungary. As a mathematician his field was fuzzy algebra but his real interest was in the history of mathematics. As a student of Arpad Szabo he had an interest in pre-Euclidean Greek mathematics and in particular in his last international lecture (at the HPM conference in Uppsala in July 2004) he spoke about *Irrationality and Approximation of* $\sqrt{2}$ *and* $\sqrt{3}$ *in Greek mathematics*. He was however also very interested in the more recent history and in particular he wrote in both Hungarian and English about several important Hungarian mathematicians, such as Lajos Dávid, Gyula (Julius) Farkas and Gyula (Julius) Pál.

At the time of his death he was planning a memorial conference for the two brothers Riesz, Frigyes (Fredrick) and Marcel. His hope was that this conference would take place in Lund (Sweden) in 2006. That would

have been 120 years after the birth of Marcel, 80 years after the appointment of Marcel as professor in Lund, and 50 years after the death of Frigyes.

Laszlo Filep was a very energetic man and he put his heart and soul into everything he did. We miss him deeply.

Sten Kajser

Work in progress

We encourage young researchers in fields related to *HPM* to send us a brief description of their work in progress or a brief description of their dissertation.

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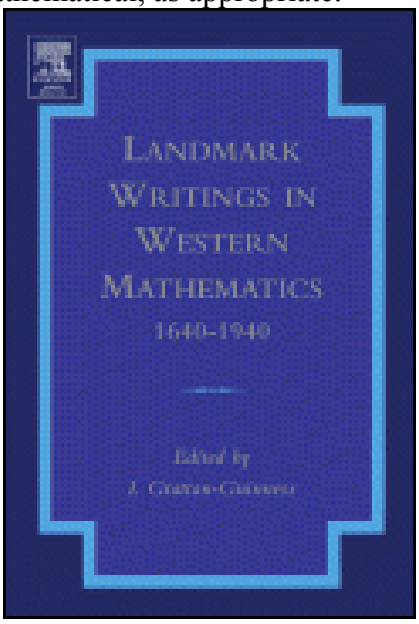
Book reviews

Landmark Writings in Western Mathematics 1640–1940

Grattan-Guinness (editor), Cooke, Corry, Crépel, Guicciardini (co-editors) Elsevier Press, 2005

The reviewer of this volume is faced with a daunting task. Not only because of its size of over 1000 pages, but also because of the enormous range of topics – fifteen broad areas of mathematics are identified. The chief editor Ivor Grattan-Guiness, and a team of associate editors, have selected over eighty landmark writings in mathematics and invited seventy-seven articles from outstanding scholars in the field. Each chosen work is a mathematical writing (the term covers short pieces as well as full-length books) recognized as having made a significant contribution to the broad field of mathematics, and also as having proved seminal for further mathematical activity. The volume is not an attempt to be a 'source book' of extracts from the writings of earlier mathematicians, though some articles do contain short extracts from the original, but rather an evaluation of the contribution the writing made. Each article helpfully begins with detailed information about the original publication as well as information about translations and where an edition of the work may now be obtained. In every case we are told something about the context – biographical, historical, social, scientific and mathematical, as appropriate.



The choice of dates means that the collection begins at the time of the development of what would be recognized as mathematics in modern form and ends at the beginning of the Second World War and, as the editor points out, just before a massive expansion in published mathematics that could not be fitted into this volume. The volume begins with Descartes' *Géométrie* of 1637, which not only introduces an algebraic treatment of curves, but also looks and feels like algebraic notation as we now know it, and ends with the two volume *Grundlagen der Mathematik* of Hilbert and Bernays (1934, 1939) which was a milestone in the development of mathematical logic.

Along the way we meet Wallis, Huygens, Leibniz and Newton, of course, Jakob and Daniel Bernoulli, MacLaurin, Euler, Gauss and Cauchy. The beginning of a modern treatment of algebraic structures comes with Abel, Grassmann's *Ausdehnungslehre* and the fall-out from Hamilton's lectures on quaternions, but there is no article on Galois' *mémoire*, presumably because its import was not realised until some time after its appearance. The application of mathematics to problems arising in the physical world is evident with Heaviside's and Maxwell's work on electricity, Poincaré's famous three-body

problem, Lorentz on electron theory and Volterra's work on the dynamics of animal populations. The growth of the use of statistics in the 19th century became more rigorously established with Pearson's 1900 paper on the Chi squared goodness of fit test and Fisher's 1925 book on statistical methods is given a place because of its wealth of applications to biology and because the author is recognized as the father of modern statistics. Another modern application of mathematics lay in the growing study of mathematics related to social and life sciences, represented here by Stanley Jevons's *Political Economy*.

Some of the writings celebrated in this volume are there, not so much because they contained original mathematical work, but for their presentation of a coherent theory of a topic and for the widespread reception of the work. Fisher's statistics book was one of these, but so was Weber's standard *Lehrbuch der Algebra*, van der Waerden's *Moderne Algebra* and the two books on topology by Seifert and Threlfall (1934) and Alexandroff and Hopf (1935). These books, and others, are here because, to use the editor's phrase, they could be said to have 'made waves'.

It is pleasing to note, for this reviewer at least, the presence of two books of a rather different character. There is D'Arcy Thomson's *On Growth and Form*, a rather unorthodox book with persuasive illustrations to show morphological transformations of animals, the transition between two different types of fish, for example. This is one of those books that appeal to the mathematically curious bystander, and there's nothing wrong with that. Also in this category is the book on recreational mathematics by Rouse Ball which, drawing on a long history, collects and categorizes problems, many of which are by no means trivial. This is another of those 'making waves' books, which went through twelve editions.

With such a wide range of topics and such a large number of contributors the editors and publisher are faced with problems of style and consistency of presentation. Having agreed the basic shape for each article, no attempt has been made to impose a house style. This was a wise decision, even if it results in a mixture of British and US English and some other idiosyncrasies. But the publisher is to be congratulated on a pleasing textual style and lay-out which itself lends uniformity to the whole work and offers real pleasure in turning the pages.

How is this volume likely to be used? It is hardly the intention of the editors to have the reader work sequentially through the volume. Although the writings have been reported chronologically and not grouped by subject, there are useful references in each article to related articles and, additionally, the editor provides a table listing the articles according to non-disjoint mathematical topics – Geometries, Calculus, Number Theory, Dynamics, etc. This would allow the reader interested in, say astronomy, to look up five relevant articles. I also see the volume being useful to the mathematician or mathematics teacher who wonders, say, what exactly was Newton's *Principia* and why was it such a *cause celèbre*? It may also serve as a starting point for further study since each article has its own short indicative bibliography.

Finally, reading several articles one after the other, the reader has the impression of being present at one of those international conferences where a sequence of speakers, each with their differing personalities and accents tells us about a work and its author, whom the speaker has come to know. (There is a nice personal touch in the closing remarks by A. W. F. Edwards writing about the statistician R. A. Fisher whom he had indeed known at Cambridge.) The result is a very human as well as authoritative volume. It will surely prove to be a valuable work of reference for many years. Perhaps the publisher can be persuaded to provide us with a second volume treating those mathematical writings that did not quite get in this time.

Chris Weeks, *Devon, UK*

The full table of contents can be found at http://www.elsevier.com/wps/find/bookdescription.cws_home/704586/description

Raciocínios e Métodos da Tradição Matemática Árabe

Dias, I.C. & Sousa, H. I. (Coord. e Act.) (2004): Lisboa: Associação de Professores de Matemática (A.P.M.).

Since there are scarce texts written in Portuguese about the Arabian mathematics history and even scarcer classroom materials concerning the issue, this brochure may be useful for the mathematics teachers in Portuguese speaking countries. It includes two translated texts, the first one by Ahmed Djebbar about the geometrical reasoning in the Arabian tradition (9^{th} to 15^{th} centuries) and the second one by Ezzaim Laabid – about some methods that were and could still be used instead of equations algebraic resolution. Both texts can be read in French in *Le Raisonnement Géométrique Enseignement et Apprentissage* (Actes du colloque international organizé par l'ENS de Marrakech du 28 au 30 Mai 1997). The brochure also includes two classroom practical activities (middle school) based on specific methods described in the texts. The brochure can be purchased and more information can be found at apm@apm.pt the site of The Portuguese Association of Mathematics Teachers (A.P.M.).

Isabel Cristina Dias, Helena Isabel Sousa

The views expressed in this section are the views of the reviewers and may not necessarily be those of the *HPM* Advisory Board.

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Ph.D. theses

Mathematics Teachers' Professional Development: Integrating History of Mathematics into Teaching

Yi-Wen Su,
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Ph.D. Thesis in HPM (Department of Mathematics, National Taiwan Normal University, Taipei, Taiwan, February, 2005) under the supervision of Wann-Sheng Horng & Fou-Lai Lin.

There has been a growing interest in adopting the historical approach in mathematics teaching since the 1970s. How can history play an effective role in improving the teaching and learning of mathematics? Teachers who are concerned about HPM would have regarded this as a primary goal. If we extend the pedagogical concern to initiating more mathematics teachers in applying the history of mathematics into their teaching, we believe that this would be beneficial not only to students but to teachers themselves as well. Teachers' education is very important. So we must know well what the impact of the history of mathematics is on the development of mathematics teachers. In order to deal with the above questions, we undertook one school-based research during a two-year period, from August of 2002 to July of 2004. A community of teaching practices in terms of HPM was developed in one of the Taipei municipal senior high school. By way of collaborative action research, we observed participating teachers' process of transformation in which they adjusted and melt the history of mathematics and mathematics knowledge by means of interpretation and teaching. Therefore, in this thesis, I attempt to answer the following two questions:

1. What are the strategies for teacher's professional development on HPM approach on the school-centered base?

2. And what are the changes of these participating mathematics teachers under this HPM approach?

The research was conducted in a partnership among three teachers, T_1, T_2, T_3 and the researcher herself (hereafter abbreviated participants). In the light of the HPM, the participants went through three phases of professional development. They learned to search for primary sources, to read related articles and to engage in critical discussions, which includes practices from both Western and Eastern methods of

teaching in order to design and create HPM worksheets. They were encouraged to write down their reflections to make public their private ideas. Apparently their reflective narration could fortify knowledge, make their innovative works accessible to others, and go on to enhance their professional knowledge. We believe that, through this kind of professional practice, the participants can increase their personal and professional knowledge, which in turn contribute to their teaching.

The strategies the participants adopted are: reading a lot of articles about mathematics teaching, designing HPM worksheets including the logical aspect of mathematical knowledge, the historical aspect of mathematical knowledge and the aspect of student's cognition. Finally, the researcher suggests a Teacher's Model for Professional Development in terms of HPM, which can explain the practices of these teachers through the process. In this model, teachers enter the hermeneutic circle, say C_1, to look into the ideas of the editors of textbooks, the mathematics knowledge and the contents of textbooks. Then they enter another hermeneutic circle, say C_2, to learn the ancient mathematicians' ideas, mathematical objects, and mathematical theories. After the teachers interpret the essence of C_1 and C_2 by themselves they then start to teach. In practice, we can characterize in six different manners, the teachers' use of the history of mathematics in the classroom: isolation, addition, introduction, execution, integration, and decision-making. In the end, the researcher suggests that "optimization" to be the goal for future development of the teachers.

By the end of the two-year project, it is obviously that the participants have enhanced their professional expertise in terms of the HPM in following ways, namely, 1) they can begin to write popular mathematics articles; 2) they are more reflective into their teaching than ever; 3) they are able to integrate their mathematics knowledge into a broad picture; and 4) they start to care about the students' thinking. As a conclusion, this thesis suggests that an HPM approach can do to help mathematics teacher's professional development in an efficient way.

Perception, transmission and function of science in middle Byzantine era and the Quadrivium of 1008 *[in Greek]*

Dr. Gianna Katsiampoura,
Department of Sociology, Panteion University of Social and Political Science, Athens, Greece, 2004

The PHD Thesis entitled *Perception, transmission and function of science in middle Byzantine era and the Quadrivium of 1008* has as its objective a presentation, as clearly as possible, of the scientific researches and of the general perception of mathematical sciences[*] in the middle Byzantine era, in the area of Byzantine Empire. Thematic axes of the Thesis are the Education on mathematic sciences, a sector that constituted the superior educational stage in Byzantium, the perception of science as a result thereof and the particular text to be used for the teaching of mathematical sciences, the *Efsynopton syntagma is tas tessaras mathematicas epistimas [Consise treatise on the four mathematical sciences]*. This text, written in 1008 by an unknown writer and been in use until many centuries later, knew wide circulation after the proliferation of typography, considered widely to be the work of Michael Psellus. This text, the first complete handbook on the teaching of the four mathematical sciences, i.e. arithmetic, geometry, music and astronomy, drafted in the Byzantine period, is considered as product of Michael Psellus era, and consequently its study is connected with a number of questions directly or indirectly related to him. But apart from that, the writing of an instructive handbook forms part of the general educational system of a specific society, and is therefore directly related to that society, aiming to correspond to its expectations,

[*] The term *Mathematical Sciences* in the Byzantine era stands for a part of the exact sciences. We use the direct translation "mathematical sciences" instead of "mathematics", as the scope of the former is wider. Accordingly we do not use the term "exact sciences", as its scope is much wider compared to the scope of the Byzantine term "mathematic sciences".

needs, its cognitive level and sovereign ideology. Accordingly, it provides information on the (cognitive charge that is offered), as well as on what is considered as essential knowledge for the members of the specific society. Finally, the handbook in question can function as a reflection of the perception of science in Byzantium of that era.

The Thesis is divided in three chapters, following a general introduction. The introduction brings in an overall presentation of the relevant questions and the determination of the examined period of time and its particularities: middle-Byzantine era, with a focus on the 11th century, time of writing of the handbook. In the introduction is explained why the specific handbook was chosen, and which are the objectives and the axes of the Thesis. Also, certain difficulties concerning the Thesis are presented, for example the deficiency of sources and the restricted secondary bibliography on the history of thought and sciences in the era under examination.

In the first chapter, entitled "The education in Byzantium", following a presentation of the different periods to be assessed, the institutional framework of superior education is examined, as well as the organization and structure of the educational system through its historical course. The term "educational system" is used abusively fault certain more operational. In this chapter the following subjects are dealt with: the Byzantines' perception of education, as it has been formed in the beginning of 11th century; the specific needs that the educational system was required to cover; the institutions providing education, and their character: economic and social position, as well as the public to which the education was addressed. Accordingly, this chapter comprises the following paragraphs: Organization of education in the four periods in which the era under examination is divided, teachers' and students' profile, position of women in Byzantine education. The discussion is supported as much as possible by primary sources, allowing for the conclusive remarks to be more validly argued.

The objective of the second chapter, entitled "Mathematical sciences in Byzantium", is the presentation of the scientific discussion in the same era, the main axis of investigation being Byzantines' perception of mathematical sciences and their use. To this effect, the historical and scientific background, as appearing in the beginning of 11th century is examined. This background consisted of influences from later Antiquity and from the scientific tradition of Arabs, the latter being developing the Greek tradition at the same time. Accordingly, the content of sciences, according to Byzantines' perception is examined, as well as their role and use, in connection with their ideology, after the predominance of Christianity as official religion and her limits. This chapter is divided in specific paragraphs, where the sciences and pseudo-sciences are presented: astronomy and astrology, arithmetics and arithmology, geometry. In this chapter there is also a paragraph concerning the opinion of the *Fathers of Church*, as representatives of the new religion that partly shapes the intellectual frame of that era, on sciences and scientific reason. Finally, there is a paragraph about the opinion of other populations on the scientific discussion in Byzantium.

In the third and last chapter, the Quadriviun (*Efsynopton Syntagma*) is scrutinised. The presentation is organized in multiple axes. In the beginning, the role of Quadrivium as method of teaching in the medieval education, as well as its role in the history of science is presented, both in the West and the East. To that effect, the information rescued by those who they were taught the sciences is examined. Then, the Thesis deals with the history of this particular text, from its drafting until modern times, when it is printed in multiple copies, as a work of Michael Psellus. This distribution is very interesting, as it provides an overview of Byzantine science, in the evolution of which the text contributed. Then, the Thesis is focused on the context. The text is written in modern Greek, following the publication from J. L. Heiseberg, in 1929, in Copenhagen. The annotation/scrutiny of the content follows, with very concrete questions that the text

itself poses. Following an extensive analysis of the sources, we support the opinion that the Quadrivium was written by an unknown writer. There follows a report on the differences between this work and its sources and the particular differences are interpreted in relation with the particular era. The final part of the Thesis undertakes to present the personality of the writer, as it appears from the study of the text.

Quatro visões iluministas sobre a educação matemática: Diderot, d'Alembert, Condillac e Condorcet

[Four views in Mathematics Mathematics Education from the Enlightenment Age: Diderot, d'Alembert, Condillac and Condorcet]

Dr. Maria Laura Magalhães Gomes
UNICAMP, Campinas, Brazil, 2003

[Ph.D. Director: Antonio Miguel,
Jury: Gert Schubring, Roberto Romano, João Bosco Pitombeira, Dario Fiorentini]

The French Revolution also effected to make Mathematics the methodologically leading discipline in the systems of science and education in France. This turn was decisively prepared by eminent French philosophers. The thesis focuses on elucidating the perspectives on Mathematics Education by four authors of eighteenth century French Enlightenment, on Diderot, d'Alembert, Condillac, and Condorcet.

The perspectives of these philosophers on Mathematics Education are organised into four chapters, each being devoted to one of them, highlighting and treating his core themes and arguments. Diderot's main ideas on the topic aim at the political significance of Mathematical Education, whereas for d'Alembert, the central aspect is the epistemology of Mathematics. Condillac's priority is on the evolving cognitive framework. Finally, the chapter on Condorcet shows his decisive role in introducing Mathematics Education within public instruction.

The thesis's initial and final chapters characterize the context of mathematics education in France during in the eighteenth century before the French Revolution, and in the Post-Enlightenment stage, from Condorcet's demise to the Restoration of the Monarchy.

The thesis will be published as a book by Editora da UNICAMP, Campinas, Brazil, in 2005.

* * *

Have you read these?

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Schuppener , G. and Macak, K.: *Stanislav Vydra (1741-1804) Zwischen Elementarmathematik und nationaler Wiedergeburt* [Between elementary mathematics and national reconstruction] Leipzig University Press 2004.

Skovsmose, Ole: *Travelling Through Education: Uncertainty, Mathematics, Responsibility*, SENSEPublishers, [in Print]
[This is a personal notebook from a conceptual travel. But, in a different sense, it also represents a report on traveling. The main part of the manuscript was written in Brazil, Denmark and England, whilst notes have also been inspired by visits to other countries. So, the book not only represents conceptual travel, it also reflects seasons of real traveling.

In Part 1, the book comments on the critical position of mathematics education, and also indicates some concerns of critical mathematics education. Part 2 comments on mathematics in action, and considers the discussion of mathematics as an applied discipline in the contexts of technology, management, engineering, economics, etc. In Part 3, the book comments on mathematics and science in general. These comments are then generalized into a discussion of 'reason' and of the 'apparatus of reason'. Finally, Part 4 returns to the discussion of mathematics education, and comments on notions that could become 'sensitive' to the critical position of mathematics education.
Ole Skovsmose is also traveling between different academic fields. He touches upon mathematics and mathematics education, the philosophy of mathematics, technology and science, as well as sociological issues, glancing over issues such as globalization, ghettoizing, learning society, and risk society.
Traveling with the author, the reader will become aware of connections between many of these different issues.
This very personal and warm academic book should inspire anyone active in the field of mathematics education or education in general.]

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* * *

Have you been here?

CERME 4, Fourth Congress of the European Society for Research in Mathematics Education, 17 - 21 February 2005 in Sant Feliu de Guíxols, Spain
Accepted papers: http://cerme4.crm.es/5.htm

5th European Summer University on the History and Epistemology in Mathematics Education (ESU-5)
http://web.pedf.cuni.cz/kmdm/esu5/
More information on the ESU-5 and the previous ESU can also be found in the *HPM Newsletter* No 58, pp. 27-30.

Newsletter of European Mathematical Society, Archive
http://www.emis.de/newsletter/

Bibliography of Mathematical Cognition
http://www.cse.buffalo.edu/~ag33/MathCognitionBib.html

Mathematical Connections, *"Exploring the Interplay Between Mathematics and the Humanities"*
http://www.aug.edu/dvskel/

The Mathematics Education into the 21st Century Project, including information on the Malaysia, Egypt, Jordan, Australia, Sicily, Brno and Ciechocinek Conferences
http://math.unipa.it/~grim/21project.htm

On Conceptual Change
http://www.earli.org/about/sigs/3

The Euler Society

http://home.adelphi.edu/~bradley/EulerSociety/

Homepage of Prof. Michael S. Mahoney

http://www.princeton.edu/~mike/

La galerie de portraits des mathématiciens

http://trucsmaths.free.fr/images/matheux/matheux_complet.htm

Teaching With Original Historical Sources In Mathematics

http://emmy.nmsu.edu/~history/

Ethnomathematics on the Web

http://www.rpi.edu/%7Eeglash/isgem.dir/links.htm

Mathematical Laboratory

http://www.museo.unimo.it/labmat/usa1.htm

Links for the History of Mathematics

http://www.math.muni.cz/~sisma/history/internet.html

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

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

The HPM-Americas web site is
www.hpm-americas.org

AMUCHMA newsletter on the history of mathematics in Africa can be found at
www.math.buffalo.edu/mad/AMU/amuchma_online.html

History and Epistemology for the Teaching of Mathematics has been activated at the address:
www.syllogismos.it

Iris Gulikers' website (a unit for schools on surveying):
http://members.home.nl/gulikgulikers/WiskundePagina.htm

Convergence - where mathematics, history and teaching interact, [A Magazine of the Mathematical Association of America]
http://convergence.mathdl.org/convergence/1/

La Matematica in Italia (1800-1950), [Il Giardino di Archimede,
Un museo per la matematica]
http://www.math.unifi.it/matematicaitaliana/

Euclid in several languages are available at www.euclides.org

The HPM History by Florence Fasanelli is at http://www.clab.edc.uoc.gr/HPM/HPMhistory.PDF

ICMI is at http://www.mathunion.org/ICMI/

The editors welcome information about other sites.

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Notices

Additions to History of Mathematics, Religious Traditions and Mathematics Education

In the Newsletter 58, we started a bibliographical survey on this issue. Here are some additions to the list. We invite further additions.

Grattan-Guiness, I.: Christianity and Mathematics: kinds of link, and the rare occurrences after 1750, *Physis*, new series 38 (2001), 467-500.

From S. Probst, Germany:

Roman catholic tradition

Kasparová, Jaroslava & Macák, Karel: *Utilitas matheseos: Jezuitská matematika v Klementinu; (1602 - 1773) = Utilitas matheseos: Jesuit mathematics in the Clementinum; [vydáno u príležitosti výstavy poradané v listopadu 2002 v Zrcadlové kapli Klementina]*, Praha: Národní Knihovna CR, 2002
Krayer, Albert: *Mathematik im Studienplan der Jesuiten: die Vorlesung von Otto Cattenius an der Universität Mainz (1610/11)*, Stuttgart: Steiner, 1991
Schuppener, Georg & Macák, Karel: *Prager Jesuiten-Mathematik von 1600 bis 1740*, Leipzig: Leipziger Universitätsverl., 2002

Protestant tradition

Koetsier, Teun & Bergmans, Luc: *Mathematics and the Divine. A Historical Study*, ELSEVIER, 2005
[Description:
Mathematics and the Divine seem to correspond to diametrically opposed tendencies of the human mind. Does the mathematician not seek what is precisely defined, and do the objects intended by the mystic and the theologian not lie beyond definition? Is mathematics not Man's search for a measure, and isn't the Divine that which is immeasurable? The present book shows that the domains of mathematics and the Divine, which may seem so radically separated, have throughout history and across cultures, proved to be intimately related. Religious activities such as the building of temples, the telling of ritual stories or the drawing of enigmatic figures all display distinct mathematical features. Major philosophical systems dealing with the Absolute and theological speculations focusing on our knowledge of the Ultimate have been based on or inspired by mathematics. A series of chapters by an international team of experts highlighting key figures, schools and trains of thought is presented here. Chinese number mysticism, the views of Pythagoras and Plato and their followers, Nicholas of Cusa's theological geometry, Spinozism and intuitionism as a philosophy of mathematics are treated side by side among many other themes in an attempt at creating a global view on the relation of mathematics and Man's quest for the Absolute in the course of history.
Contents:
Introduction 1. Ho Peng-Yoke, Chinese Number Mysticism 2. Kim Plofker, Derivation and Revelation: the Legitimacy of Mathematical Models in Indian Cosmology 3. Reviel Netz, The Pythagoreans 4. Ian Mueller, Mathematics and the Divine in Plato 5. Jean-Francois Mattei, Nicomachus of Gerasa and the Divine Arithmetical Ladder 6. Dominic J. O'Meara, Geometry and the Divine in Proclus 7. Marie-Pierre Terrien, Religious Architecture and Mathematics during Late Antiquity 8. David A. King, The Sacred Geography of Islam 9. Faith Wallis, 'Number Mystique' in early medieval computus texts 10. Maurice-Ruben Hayoun, Is the Divine Universe Divisible 11. Charles Lohr, Mathematics and the Divine: Ramon Lull 12. Hugue Garcia, Christian Gnosis 13. Edith Dudley Sylla, Swester Katrei and Gregory of Rimini: Angels, God and Mathematics in the Fourteenth Century 14. Jean-Michel Counet, Mathematics and the Divine in Nicholas of Cusa 15. Teun Koetsier and Karin Reich, Michael Stifel and his Numerology 16. Ivo Schneider, Between Rosicrucians and Kabbala - the Mathematics of the Biblical Numbers of Johannes Faulhaber 17. Eberhard Knobloch, Mathematics and the Divine: Athanasius Kircher 18. Volker R. Remmert, Galileo,

God and Mathematics 19. Andre Charrak, The Mathematical Model of Creation According to Kepler 20. Jean-Marie Nicolle, The Mathematical Analogy in the Proof of God's Existence by Descartes 21. Donald Adamson, Pascal's Views on Mathematics and the Divine 22. Ger Harmsen, Spinoza and the Geometrical Method of Proof 23. Philip Beeley and Siegmund Probst, John Wallis (1616-1703): Mathematician and Divine 24. Kees de Pater, Newton and the Ocean of Truth 25. Herbert Breger, Leibniz: Mathematics and the Divine 26. Wolfgang Breidert, Berkeley's Defence of the Infinite God in Contrast to the Infinite in Mathematics 27. Ruediger Thiele, Leonhard Euler and the Divine 28. Ruediger Thiele, Georg Cantor and the Divine 29. Luc Bergmans, Gerrit Mannoury and his Fellow Significians on Mathematics and Mysticism 30. Teun Koetsier, Arthur Schopenhauer and L. E. J. Brouwer: A Comparison 31. Sergei S. Demidov and Charles E. Ford, On the Road to a Unified View: Priest Pavel Florensky - Theologian, Philosopher and Scientist 32. Francois De Gandt, Husserl and Impossible Numbers: a Sceptical Experience 33. Bruno Pinchard, Symbol and Space According to Rene Guenon 34. Teun Koetsier, Eddington: Science and the Unseen World 35. Albert van der Schoot, The Divined Proportion]

Probst, Siegmund: Infinity and creation: the origin of the controversy between Thomas Hobbes and the Savilian professors Seth Ward and John Wallis, *British J. Hist. Sci.* **26** (90, 3) (1993), 271-279

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Problématique-Two Questions on the History of the concept of Function

The concept of function is undoubtedly occupying a crucial place in modern mathematical culture. Consequently, there is a great interest in its epistemological, historical and didactical penetrations in the nature, the character, the development and the understanding of function and of functional way of thinking.[2]

The relevant studies are generally limited in the narrow mathematical context[3], giving no light to the pragmatic aspect of function.

The eminent philosopher Ernst Cassirer (1874-1945) has repeatedly hinted, in his work, the relation between function and physical law.[4] The didactician Michael Otte has also pointed out that connection.[5] So, the following question evokes:

Which have been the interactions of the concept of function and physical law in the history of scientific thinking?

Bibliographical guide

D'Agostino, S.: From Rational Numbers to Dirac's Bra and Ket: Symbolic Representation of Physical Laws, *Physics in Perspective*, 4, 2002, pp. 216-229.

Jahnke, H.N.: A Genetic Approach to Proof, http://cerme4.crm.es/Papers%20definitius/4/jahnke.pdf

Lützen, J.: Between Rigor and applications. Developments in the Concept of function in Mathematical Analysis, in *Nye, M.J. (ed.): The Modern Physical and Mathematical Sciences, Vol. 5 of The Cambridge History of Science,* Cambridge Univ. Press, 2003, pp. 468-487.

Markovits, Z., Eylon, B.-S. & Bruckheimer, M.: Function Today and Yesterday, *For the Learning of Mathematics*, 6(2), 1986, pp. 18-24, 28.

Monna, A. F.: The Concept of Function in the 19th and 20th Century in Particular with Regard to Discussion between Baire, Borel and Lebesgue, *Archive for History of Exact Sciences*, 9, 1972, pp. 57-84.

Ravetz, J.: The Representation of Physical Quantities in Eighteenth-Century Mathematical Physics, *Isis,* 52, 1961, pp. 7-20.

Roche, J.J.: *The Mathematics of Measurement. A Critical History*, The Athlone Press, 1998.

Youschkevitch, A.P.: The Concept of Function up to the Middle of the 19th Century, *Archive for History of Exact Scinces,* 16(1), 1976, pp. 37-85.

[2] Harel, G. and Dubinsky, E. (eds.): *The Concept of Function. Aspects of Epistemology and Pedagogy*, Mathematical Association of America, 1992.

[3] Kleiner, I.: Functions: Historical and Pedagogical Aspects, *Science & Education*, 2(2), 1993, pp. 183-209.

[4] Cassirer, E.: *Substance and Function and Einstein's Theory of Relativity*, Dover Publ., 1953, p. 267. Cassirer, E.: *The Problem of Knowledge*, Yale Univ. Press, 1978, p. 90.

[5] Otte, M.: Funktion, *Europäische Enzyklopädie zu Philosophie und Wissenschaften,* H.J. Sandkühler(Hrsg.), Bd.2, Hamburg 1990, pp. 211-214.

Zilsel, E.: The Genesis of the Concept of Physical Law, *Philosophical Review*, 51, 1942, pp. 245-274.

That historical problématique evokes the following didactic question:

In which way the historical understanding of the interaction between the function and physical law can help the didactic cohesion of mathematical education and the culture of physics?

Bibliographical guide

Nägerl, H. and Provost, J.P.: The Mathematical Concept of Funcion and the Physical Concept of a Resistance, in *Steiner, H.-G (ed.).: Co-Operation Between Science Teachers and Mathematics Teachers*, Materialien und Studien Band 16, Institut für Didaktik der Mathematik der Universität Bielefeld, 1979, pp. 131-145.

McGlone, C. and Nieberle, G.M.: Using Hooke's Law to Explore Linear Function, *Mathematics Teacher*, 93(5), 2000, pp.391-398.

N. Kastanis, Greece

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Prospectus and Call for Papers

This is to launch a new journal, the first journal devoted to the history of mathematics teaching:

INTERNATIONAL JOURNAL FOR THE HISTORY OF MATHEMATICS TEACHING.

The rousing success of the Topic Study Group 29, *The History of Learning and Teaching Mathematics,* at the International Congress on Mathematics Education in Copenhagen in 2004, demonstrated the need for a permanent and stable international forum for scholarly research in history of mathematics teaching. TSG 29's impact as the first international forum with a focus on mathematics education history continues to reverberate; and thus we feel confident that an international journal devoted to the history of mathematics teaching, complementary to journals in mathematics education, mathematics, and the history of mathematics, will be of substantial interest to educators, policymakers, researchers, historians, and mathematicians.

The major aim of the *International Journal for the History of Mathematics Teaching* is to provide mathematics teaching and mathematics education with its *memory,* in order to reveal the insights achieved in earlier periods (ranging from Ancient time to the late 20th century) and to unravel the fallacies of past events (e.g., reform euphoria). This journal will inform mathematics educators and others about political, social, and cultural constraints (as evidenced by historical events, processes, and periods) in order to improve mathematics instruction. In doing so, the journal aims to overcome disconnected national, cultural, and social histories and to contribute to establishing common themes and characteristics of the development of mathematics instruction in many cultures, differentiating between what constitutes national specificities or particularities and what may be indicative of global trends. Moreover, given the intimate relationship between dissemination and production of new and/or enhanced mathematical knowledge, theoretical reflections on the function of teaching will contribute greatly to understanding concrete and practical forms of the relationships.

The *Journal* welcomes approaches which extend beyond a descriptive seriation of administrative decrees, curricula, etc., and rather situate the development of mathematics teaching within the history of mathematics and the educational, social, and political history of a region, country, or countries. Topics to be published in the *Journal* may range from the transmission of theory and practice from other countries and the impact of modernization on teaching practices within a particular country to the aspects of teaching practice, use of textbooks, teachers' associations, and journals, and the cultural role of mathematics and teacher education policy.

The primary focus of the journal will be the learning and teaching of mathematics in schools (primary and secondary grades as

well as their functional equivalents), and hence the training of teachers for this instruction. Moreover, the institutional history of mathematics in higher education may be considered. All historical time periods and all cultures and nations are considered.

The journal will publish three types of papers:

- research articles (in general up to 15-20 pages), as refereed publications,
- notes (up to 5 pages), and
- book reviews (2 to 3 pages).

Initially, we are planning to have two issues per year. The first issue should appear by Spring 2006. The Journal is planned to be published at Teachers College, Columbia University (New York/USA).

Call for papers

For an initial submission to the journal one hard copy and a diskette with the manuscript saved in rich text format should be mailed to Alexander Karp, IJHMT, Program in Mathematics, Box 210, Teachers College, Columbia University, 525 West 120th Street, New York, NY, 10027, USA. Another copy of the manuscript (with all figures and tables) saved as a Microsoft Word document should be e-mailed as an attachment to ijhmteaching@yahoo.com

Authors intending to publish a paper in the first issue should submit it by October, 15th. All papers should be written in English, typed double-spaced, and must conform to the style specified in the Publication Manual of the American Psychological Association (5th ed). Research articles should be submitted with the author's name, affiliation, address, and e-mail address on a separate page to ensure anonymity in the reviewing process and should begin with an abstract of about 100 words on a separate page. Figures should be submitted in a camera-ready form.

Editorial board

Comments from colleagues

Les mathématiques ont un rapport à leur enseignement plus étroit qu'aucune autre science, et aussi un rapport à leur histoire qu'il est bon de réactiver sans cesse. Il y a de la matière pour l'histoire de leur enseignement, et cette histoire peut intéresser beaucoup de monde. Donc, bonne chance pour la revue !

Mathematics has a closer relationship to its instruction than any other science, as well as a relationship to its history, which it is good to renew constantly. There are materials on the history of mathematics education, and this history can interest many people. So good luck for the new journal!

Jean-Pierre Kahane
(former President of the *Société Mathématique de France* and ICMI President)

The history of mathematics teaching goes back to the dawn of civilization and early efforts to provide education. Some educators would argue that as a social phenomenon, mathematics originates in teaching: It comes into existence when and only when its developer tries to teach it to someone else. The scholarly study of the history of mathematics teaching across societies and over time, however, is a relatively recent phenomenon. The new journal offers mathematics educators an attractive, convenient venue in which to recognize that scholarship.

Jeremy Kilpatrick
(member of the U.S. Mathematical Sciences Education Board)

It is always a pleasure to offer congratulations and wish a new journal well, especially one that promises to add considerably to the growing circle of those with a serious interest in history of mathematics. If it is to thrive it deserves the support of mathematicians, historians of mathematics, and educators alike. The history of mathematics teaching is as old as mathematics itself, and whether self-taught or learned at the feet of a master, from books, in a classroom, at a college or university, mathematics and teaching have always had an intimate and symbiotic relationship. This new journal, for the first time, will serve to investigate this subject in a serious and professional way. As a former editor of *Historia Mathematica*, I know full-well the challenges in store for any new journal and its editors. In the years ahead, may the *International Journal for the History of Mathematics Teaching* soon establish itself as an essential resource for everyone interested in the teaching of mathematics and the broad historical spectrum of cultures and disciplines within which it has been studied and advanced, from antiquity to the present.

Joseph W. Dauben
(former Chair of the International Commission on the History of Mathematics)

Gert Schubring, Germany

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Serbian Mathematics Culture of the 19th century

Background

Serbia, in the heart of the Balkans, has since the 14th century been de-facto a divided country, most of which was under the rule of the Ottoman Empire, but whose northern parts had been under the rule and influence of the Hungarians, and later Austro-Hungarian Empire.

Serbian mathematics education had also developed under these two main spheres of influence but also having Serbian Orthodox Priests as a driving force behind the somewhat late coming of Enlightenment to this geographic area. In the north (Vojvodina) educational institutions had developed under the influence and through the support of the Austro-Hungarian Empire, and in Serbia proper (mainly in Belgrade and Kragujevac) they developed despite the Ottoman influence and amid the striving for independence by the Serbs.

The beginnings, 1717-1863

Although the first primary school in Vojvodina (northern part of Serbia) was opened in 1717 in Sombor, no books on mathematics appeared until Vasilije Damjanovic (1734-1792) published in 1767 *Nova Serbskaja Aritmetika (The New Serbian Arithmetic)*, which was at the same time the first book on mathematics, published in Serbian language.

By 1800 there were two elementary schools in Belgrade, but the First Serbian Uprising against the Ottomans (1804-1813) led to the foundation of many more such schools throughout Serbia proper, and the founding of the first Great (equivalent to High) School of Belgrade in 1808.

By this time, the first teacher training school (*Norma*) was already functioning in Sombor (Vojvodina). *Norma* was founded in 1778 by Avram Mrazovic (1756-1826), son of a Serbian Orthodox priest educated in Pesta and Vienna. Maria Teresa (1717-1780), Austro-Hungarian Empress, nominated Mrazovic as the chief of the developing educational institutions in Sombor, which was at the time the seat of Serbian culture in the north.

In Serbia proper the Great School of Belgrade was led by Ivan Jugovic, (1772-1813) one of the most educated Serbs at the time, who was also the school's first teacher. Jugovic was a protégé of Dositej Obradovic (1742-1811) the first Serbian writer, and the teacher of the son of Karadjordje (1762-1817) who led the First Uprising in 1804.

Ivan Jugovic (1772-1813)

The requirements for enrolment in the High School were a knowledge of reading, writing, and some arithmetic. According to Jugovic's plan, the education in the Great School was to last for three years and the following subjects were studied: general history, general geography with drawing, statistics, mathematics, composition, German language, common prayers, state and criminal law, moral instruction, church singing, fencing, and training with rifles. Jugovic taught mathematics and was apparently a skilful mathematics teacher, especially in fractions.

After the collapse of the first uprising in 1813, Turkish rule was re-established over Serbia proper and most of the schools were closed. In northern Serbia however, the above described developments continued, with *Norma* working throughout this period.

In 1829 Russia forced the Treaty of Adrianople upon the Ottoman sultan, who had to grant Serbian autonomy under the pressure from the Russians, and to recognise Milos Obrenovic (1780-1860) as hereditary prince. Except for garrisons in Belgrade and other fortresses, the Turks evacuated Serbia. In two Sultan's *Hatt-I-Sherif* (the sultan's solemn decress which were implemented first in 1830 for Belgrade and then in 1833 expanding the same rights to the rest of the country), Serbia was proclaimed a suzerain principality with Milos Obrenovic as hereditary prince. A Metropolitante of Serbia was established in Belgrade, autonomous from the Patriarch of Constantinople. Russia's status as the guarantor of Serbia's autonomy was also recognised by this document.

Prior to 1830 Serbia had 16 town schools and several village schools. In the period from 1835 to 1836, 26 elementary schools were opened at the state expense. The Great School of Belgrade, being closed in 1813, was reopened in 1830. Report from 1833 indicates that the school was developing after the 'gymnasium' model, although at this time it still had only one teacher. In 1833 the school was transferred to Kragujevac, where in 1835 it was further modelled into a gymnasium having gained four grades and four teachers, and offering mathematics as a subject in the first three grades.

Some of the teachers in all of these schools were educated in Norma in Sombor, but a new teacher training college was needed for wider and more organised education of teachers in Serbia proper. For a short while, from December 1837 to June 1838, a Military Academy operated initially in Pozarevac, then Belgrade and finally Kragujevac. Stefan Krkalovic, a former officer in the Austro-Hungarian army, was its director and teacher of advanced mathematics. This marked the first reference to advanced mathematics in the history of Serbian culture, and is significant as marking of a triumph of Austro-Hungarian influence over the cultural strife and educational developments that began almost a century earlier.

The first Serbian Military Academy was short lived. It is not known whether this was a result of a Turkish objection; nevertheless it led to the founding of the first Lyceum in 1838 in Kragujevac, which marked the beginning of the undergraduate study of mathematics in Serbia. The first curriculum for the Lyceum included philosophy, general history, mathematics, natural law, European statistics, drawing, German, French Bible studies. The first teacher of mathematics and the first rector of the Lyceum was Atanasije Nikolic, who studied in the Austro-Hungarian town of Dur (where he studied philosophy), Vienna (where he studied artillery) and Pesta (engineering).

Atanasije Nikolic was a prolific author and an energetic leader of educational reform. While studying philosophy in Dur, Nikolic fell in love with mathematics but did not have the means to further finance his studies. A father of one of his pupils whom he tutored privately advised him that he would learn 'a lot of mathematics' if he enrolled in a military academy in Vienna, which is what he ended up doing. This eventually led him to finish an engineering degree in Pesta, which he completed in 1829. Nikolic undertook a number of successful engineering projects in Vojvodina and in 1838 was given a first chair of mathematics at the Lyceum. His first task was to write a textbook for the students, which he ardently set about doing, trying to translate mathematical terminology from Latin into vernacular Serbian.

Atanasije Nikolic

Nikolic's books became the first textbooks for teaching undergraduate mathematics in Serbia. The first one was *Algebra* published in 1839, and the second *Elementary geometry*, published in 1841.

In the next few decades the Serbian educational system and its handling of mathematics teaching were developing steadily. A law of 1844 prescribed the organizational structure of the educational system, along with the framework for its syllabus. It prescribed that a lower gymnasium was to have four grades with four professors and that gymnasium was to have six grades. Mathematics was taught at every stage of the lower and first four years of the gymnasium. Fifth and sixth grade of gymnasium were also to have algebra among other subjects.

In 1853 the first statutes of the Lyceum were published, bringing about many changes in the curriculum. Greater emphasis was then placed on the natural sciences by the introduction of physics and by the expansion of the teaching of mathematics, apart from arithmetic and algebra, to include geometry and trigonometry.

It is interesting to note that at this time a new Artillery School was established in Belgrade (around 1850). Mathematical education here was enriched to include not only mathematics (arithmetic and algebra) and geometry but also descriptive geometry. From there on things started to move pretty swiftly. In 1863 the Lyceum became the Superior School, and by 1865 Serbia possessed two classical Gymnasia, four lower Gymnasia and a secondary school for girls. Ten years later *Realschulen* or technical schools began to be established throughout the country.

1863-1873

In the 1863-1873 period natural sciences and mathematics were studied within the framework of the Faculty of Engineering of the Superior School. At the end of this decade however, the Faculty of Philosophy got a new section – Science and Mathematics, and so mathematics was once again taught in the Faculty of Philosophy. During the same decade Serbia was granted independence from the Ottomans and international recognition (1878).

Dimitrije Nesic (1836-1904)

This marks a major turning point for mathematics education in Serbia. At the time there was yet no prescribed qualification of

mathematics teacher (at any level) but a hierarchy of teaching mathematics begins to establish itself throughout the growing educational system.

When in 1873 the Lyceum became the Superior School, Dimitrije Nesic was its professor of Mathematics. Nesic finished lower gymnasium and gymnasium in Belgrade and attended the Lyceum for two years between 1853 and 1855. He went to continue his studies in mathematics at Vienna Polytechnic between 1855 and 1858 and then Karlsrue Polytechnic from 1858 to 1861. Nesic is famous for introducing the metric system to Serbia in 1873. He was a friend of Vuk Karadjic (1787-1864), the well-known Serbian linguist, writer, and educator during the first half of the 19th century, while he studied in Vienna 1855-1858, and so Nesic accordingly continued a tradition of trying to define and apply Serbian terminology to every and all mathematical concepts and processes.

Nesic taught lower and higher mathematics on various courses at the Superior School, which were attended by both students of the faculties of Philosophy and Technics. He wrote three textbooks for his courses: *Trigonometry* (1875), *Science of combinations* (1883) and *Algebraic Analysis I* and *II* (1883).

Another of the prominent Serbian mathematical educators from this period was Emilijan Josimovic (1823-1897). Josimovic studied at Vienna Polytechnic and became professor of the Belgrade Lyceum in 1845 and then professor of the Artilliery School in 1854. In 1869 he became professor of the Superior School and a rector of the same in 1874.

Josimovic published one of the first textbooks for the students of higher mathematics in Serbia, *Principles of Higher Mathematics* (1858). Apart from having an extremely successful career as professor of mathematics at the Superior School, Josimovic was also important for his work on translating the principles of Descriptive Geometry into Serbian language, and publishing a textbook for mathematics, architectural and engineering students *Principles of descriptive geometry and perspective* in 1874.

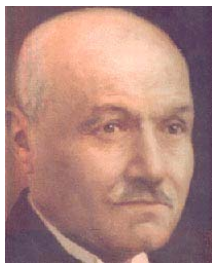
1873-1894

Nesic and Josimovic's example of being educated in the universities and schools outside of the country and coming back to teach at the Superior School and later the University of Belgrade continued for some time. First was Dimitrije Danic (1862-1932) who received his PhD in mathematics from the University of Jena in 1885 with a thesis on *Conforme Abbildung des elliptischen Paraboloids auf die Ebene*. Upon his return to Serbia he became a professor of mathematics at the Military Academy in Belgrade.

Bogdan Gavrilovic (1864-1947) similarly received his PhD in 1887 from the University of Budapest. His thesis was on *Construction of one-valued analytic functions.* He began his university career in Belgrade immediately upon his return from Budapest.

From 1893 mathematics syllabus at the Superior School developed to such a degree to contain more than mere algebra and geometry as it did at the beginning of the 1840s. It consisted of four years of learning, having subjects such as lower mathematics, higher mathematics, descriptive geometry, logic, history of philosophy, and rational mechanics.

In 1894, one of the most prominent Serbian mathematicians of all times, Mihailo Petrovic Alas, came back from having successfully completed his studies in Paris. He was born to a well-to-do family in Belgrade, where he finished the primary and secondary schooling. He completed a degree in natural sciences (mathematics) at the Superior School in 1889. The same year he went to Paris where, after a year of perfecting the language, he passed the entrance examination to the École Normale Supérieure, and where he stayed until 1894. During that time, he was awarded at the Faculty of Sciences in Paris, a mathematical 'licence' (1892), 'licence' in physics (1893), and the



Mihailo Petrovic (1868-1943)

doctorate in mathematics 1894. Petrovic's thesis was entitled *Sur les zéros et les infinis des intégrales des équations différentielles algébriques* (Paris, 1894). The examining commission consisted of Hermite, Picard and Painlevé.

Upon his return to Belgrade in 1894, Petrovic received a professorship at the Superior School. At the beginning of 1905, the School was discontinued and the University of Belgrade was founded with eight professorships, Petrovic having been appointed to the Chair in Mathematics. He remained in that position until his death in 1943.

Petrovic brought French influence to a territory, which until then knew mostly only of Austro-Hungarian and German mathematics. Although he was not the first doctoral student who studied mathematics in France, he certainly became the most influential one upon his return to the country.

By the end of the 19th century therefore, not only did Serbia become more unified culturally and educationally, but also the sphere of influence moved from Austro-Hungarian and Germanic to French intellectual and political circles.

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Trifunovic, Dragan. *Dimitrije Nesic, zora srpske matematike*. Arhimedes, Belgrade 1996.

Nikos Kastanis, Snezana Lawrence

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Call for Papers

16th Novembertagung on the History of Mathematics

Paris - 4th - 6th November 2005

The 16th *Novembertagung* on the History of Mathematics will take place on Friday 4th, Saturday 5th and Sunday 6th November 2005 in Paris, at the Ecole Normale Supérieur, 45 rue d'Ulm.

The *Novembertagung* is an annual international event, started in 1990, which brings together young philosophers and historians of mathematics. The conference provides an opportunity to give a presentation in a relaxed and friendly atmosphere and is open to all young researchers. Students who are just starting their projects are very welcome.

Information about the organisation of this conference will be regularly updated on the site: http://irist.u-strasbg.fr/nov2005/

Presentations are limited to 20 minutes so that there is enough time left for discussion. A blackboard, an overhead projector and a beamer will be available.

The deadline for proposals is **31st July 2005**. Initially, it is not necessary to send an abstract. A title (even if it is provisional) will be enough.

To send your proposals or make an enquiry, please contact:

Frédéric Brechenmacher: flaibbrec1@noos.fr
Amirouche Moktefi: amirouche.moktefi@gersulp.u-strasbg.fr
Organising Committee:
Frédéric Brechenmacher, Jean Delcourt, Matthieu Husson, Guillaume Jouve, Brendan Larvor, Juliette Leloup, Sébastien Maronne, Amirouche Moktefi, Norbert Verdier, Elodie Vieille Blanchard.

* * *

Announcements of events

The 22nd International Congress of History of Science

24-30 July 2005
Beijing, China
Congress Website:
For more information, se HPM Newsletter 58.
http://2005bj.ihns.ac.cn

The 1st International Conference on History of Exact Sciences along the Silk Road

July 31-August 3, 2005-02-17
Xian, China
For more information, se HPM Newsletter 58.
http://mainpage.nwu.edu.cn/unit/usks/8yhytze.htm

6th International Symposium on the History of Mathematics and Mathematical Education using Chinese Characters (ISHME)

August 4-7, 2005
Tokyo, Japan
For more information, se HPM Newsletter 58.
http://history.lib.tsinghua.edu.cn/bulletin/6th_Ishme.htm

The Euler 2005 Conference

August 7-10, 2005
Portsmouth, RI, USA

The theme of the conference will be the life and work of Leonhard Euler during the 1760s. For more information, see http://www.EulerSociety.org/

Mathematical Textbooks: History, Production and Influence

September 24-25, 2005
Oxford, UK
A joint meeting of the Oxford University Department for Continuing Education and the BSHM.
Rewley House Organiser: Raymond Flood
BSHM Organisers: Jackie Stedall, June Barrow-Green (j.e.barrow-green@open.ac.uk)
Further details will be available in due course.

The first Iranian workshop on the history of mathematics

October 12-15, 2005
Zirab, Iran

Held by the Iranian Mathematical Society and Shahid Beheshti University.The major items to be discussed are as follows:

- History of arithmetic
- History of geometry
- History of algebra
- History of astronomy
- History of optics
- History of mathematical entertainments and enigmas

The workshop will be held in Persian for a limited number of participants. For more

information contact Dr. M.-GH. Vahidi at the Mathematics Faculty of Shahid Beheshti University (Tehran).

Mohammad Bagheri, Iran

8th International Conference of The Mathematics Education into the 21st Century Project "Reform, Revolution and Paradigm Shifts in Mathematics Education"

November 25-December 1, 2005

In Cooperation with the Universiti Teknologi Malaysia (UTM)
Hotel Eden Garden, Johor Bharu, Malaysia,
Preliminary Announcement and Call for Papers
The Mathematics Education into the 21st Century Project has just completed its seventh successful international conference in Poland, following conferences in Egypt, Jordan, Poland, Australia, Sicily and the Czech Republic. Our next conference will be in Johor Bharu, in the very south of Malaysia, and very close to Singapore. The Chairman of the Local Organising Committee is Professor Noor Azlan Ahmad Zanzali, of the Faculty of Education, Universiti Teknologi Malaysia (UTM) who will be our local sponsors.
The conference will open with a Welcome Reception on Friday, November 25th and concludes after lunch on December 1st. The title of our conference is "Reform, Revolution and Paradigm Shifts in Mathematics Education". Papers are invited on all *innovative aspects* of evolutionary/revolutionary changes in Mathematics Education, past and future. For further conference details please email arogerson@vsg.edu.au.
The conference excursion will be to the unique historic city of Malacca. Side tours and trips can be arranged to other places in South East Asia and Australia/New Zealand. There will be an additional social programme for accompanying persons.

Alan Rogerson

Third International Conference on Ethnomathematics

February 12-16, 2006
Auckland, New Zealand.
Further information will be available soon.
http://www.math.auckland.ac.nz/Barton/PRELIM_ICEM.htm

Espace Mathématique Francophone : Colloque EMF 2006

May 26-31, 2006
Québec, Canada
(For information in English, see Newsletter 58.)
Theme General : L'enseignement des mathématiques face aux défis de l'école et des communautés
26-31 Mai 2006, Université de Sherbrooke (Quebec, Canada)
Ce colloque a lieu tous les trois ans depuis 2000. Les deux premiers se sont tenus a Grenoble, France (2000) et Tozeur, Tunisie (2003). Ces rencontres, reconnues comme colloques régionaux par ICMI, ont pour objet d'explorer les problèmes actuels importants dans l'enseignement des mathématiques a tous les niveaux, et, grâce à la prise en compte de la diversité culturelle existante, de favoriser l'émergence d'une communauté francophone dans l'enseignement mathématique. Les colloques EMF s'adressent a tous ceux qui s'impliquent dans l'enseignement des mathématiques (mathématiciens, chercheurs en didactique, enseignants de mathématiques de tous niveaux). La langue officielle est le français.
Il y aura 8 groupes de travail thématique. Le thème du groupe 3 est l'intégration des dimensions historique et culturelle des mathématiques dans leur enseignement. Ce groupe est coordonné par Mahdi Abdeljaouad (Tunisie), Abdellah El Idrissi (Maroc), Louise Poirier (Quebec)
Pour plus d'information, visitez le site *EMF 2006* http://emf2006.educ.usherbrooke.ca/
Contact: emf2006@usherbrooke.ca

Anne-Michel Pajus, France

5th European Summer University on the history and epistemology in mathematics education

July, 2007
Prague, Czech Republic
For more information, see Newsletter 58 or http://www.pedf.cuni.cz/kmdm.

ICME-11

July 6-13, 2008
Monterrey, Mexico
ICME-11 will take place in Monterrey (Mexico), at the "CINTERMEX", the convention centre of the city. There is the tradition to organize the Satellite meeting of HPM in sites 'close' to the venue of ICME: for example, in 1992 ICME was in Quebec city and the Satellite meeting was in Toronto (both in Canada), in 1996 ICME was in Sevilla (Spain) and the Satellite meeting in Braga (Portugal), in 2000 ICME was in Tokyo/Makuhari (Japan) and the Satellite meeting in Taipei (Taiwan), in 2004 ICME is in Copenhagen (Denmark) and the Satellite meeting in Uppsala (Sweden). We encourage the members of HPM to submit proposals for the organization of the Satellite meeting of ICME-11.

* * *

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The views expressed in this Newsletter may not necessarily be those of the HPM Advisory Board.

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http://www.mathedu-jp.org/hpm/index.htm

Items for the Newsletter should be sent to the editors, preferably by email (see addresses below).

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