

# **ICMI**

## **Bulletin**

of the  
International Commission  
on  
Mathematical Instruction

**No. 34**

**June 1993**



**The International Commission on Mathematical Instruction**

**ICMI**

**Bulletin No. 34**

**June 1993**

Editor:  
Mogens Niss  
IMFUFA, Roskilde University  
P.O.Box 260, DK 4000 Roskilde  
DENMARK



**The International Commission on Mathematical Instruction**

**Executive Committee 1991-1994**

*President:*

**Miguel de GUZMAN,**  
Facultad de Ciencias Matemáticas, Universidad Complutense,  
28040 Madrid, SPAIN

*Vice-Presidents:*

**Jeremy KILPATRICK,**  
Department of Mathematics Education, University of Georgia,  
105 Aderhold Hall, Athens, GA 30602, USA

**LEE Peng Yee,**  
Department of Mathematics, National University of Singapore  
10 Kent Ridge Crescent, Singapore 0511, SINGAPORE

*Secretary:*

**Mogens NISS,**  
IMFUFA, Roskilde University,  
P.O. Box 260, DK-4000 Roskilde, DENMARK

*Members:*

**Yuri L. ERSHOV,**  
Rector, Novosibirsk State University,  
Pirogov St.2, 630090 Novosibirsk, RUSSIA

**Eduardo LUNA,**  
P.t. Barry University,  
Box 65, 11300 N.E. Second Avenue, Miami Shores, FL 33161, USA

**Anna SIERPINSKA,**  
p.t. Department of Mathematics and Statistics, Concordia University,  
7141 Sherbrooke St. W., Montréal, Québec H4B 1R6, CANADA

*Ex-Officio Members:*

**Jean-Pierre KAHANE,**  
Mathématique, Bâtiment 425, Université de Paris-Sud,  
Centre d'Orsay, F-91405 Orsay Cédex, FRANCE  
(Past President)

**J.H. van LINT,**

Rector Magnificus, Technische Universiteit Eindhoven,  
Den Dolech 2, P.O. Box 513, NL-5600 MB Eindhoven, The NETHERLANDS  
(Representative of IMU on ICSU/CTS)

**Jacques-Louis LIONS,**

Président, Collège de France,  
3 rue d'Ulm, F-75231 Paris Cédex 05, FRANCE  
(President of IMU)

**Jacob PALIS Jr.,**

IMPA, Estrada Dona Castorina, 110,  
22460 Rio de Janeiro, RJ, BRAZIL  
(Secretary of IMU)

**Legend:** IMU stands for *The International Mathematical Union*; ICSU stands for *The International Council of Scientific Unions*; CTS stands for *The Committee on the Teaching of Science* (of ICSU).

## Brief Report to the IMU on ICMI Activities in 1992

### 1. Organisation

In 1992 *Chile and Iceland* - both member states of the IMU - joined ICMI by appointing National Representatives. Chile, furthermore, established a national sub-commission, called ICMI-Chile.

The General Assembly of ICMI held its quadriennial meeting in conjunction with ICME-7 (Université Laval, Québec) on Tuesday 18 August, 1992. Minutes of the General Assembly were published in ICMI Bulletin, No. 33, December 1992. Also at ICME-7 the Executive Committee met in three long sessions.

ICMI continues to have three affiliated study groups, *HPM* (The International Study Group for the Relations Between the History and Pedagogy of Mathematics), *IOWME* (The International Organisation of Women and Mathematics Education), and *PME* (The International Group for the Psychology of Learning Mathematics). It has been decided that the World Federation of National Mathematical Competitions might become, if appropriate modifications of its status are made, an affiliated study group.

### 2. ICMEs

*ICME-7* (The 7th International Congress on Mathematical Education) was held at Université Laval, Québec, Canada, 17-23 August 1992. More than 3300 delegates from more than 75 countries participated in the congress which was a great success. The Canadian and international organisers deserve high praise and deep gratitude from the international mathematics education community in general and from ICMI in particular.

At its meeting in April 1991, in Barcelona, the Executive Committee decided to accept Spain's bid to host *ICME-8* in Sevilla in July/August 1996. The International Programme Committee - to be chaired by Professor Claudi Alsina, Barcelona - was appointed by the EC in August 1992.

The EC has not yet received any bids to host *ICME-9* in the year 2000. At least two countries are known to be considering to submit bids.

### 3. ICMI Studies

The emphasis on mounting and conducting so-called ICMI studies on crucial themes and issues in mathematics education was continued in 1992. The study conference on *Assessment in Mathematics Education and Its Effects* (Calonge, Spain, April 1991) has resulted in two books edited by Mogens Niss and published by Kluwer Academic Publishers by the end of 1992 (publication year 1993), *Investigations into Assessment in Mathematics Education* (270 pages) and *Cases of Assessment in Mathematics Education* (220 pages).

Plans of different stages for future studies exist. A study conference on *Gender and Mathematics Education* will be held in Höör, Sweden 7-12 October 1993. It is based

on a Discussion Document published officially in *l'Enseignement mathématique* 38, fasc. 1-2, janvier-juin 1992, pp 189-98 (as well as in the ICMI Bulletin, No. 32, 1992). A study on *What is Research in Mathematics Education and What are Its Results* is under planning. A Discussion Document was published in ICMI Bulletin, No. 33, December 1992, and will appear officially in *l'Enseignement mathématique*, presumably in the first issue of 1993. A study conference will be held in the spring of 1994. It is ICMI's intention to present the outcomes of this study at the International Congress of Mathematicians, Zürich, August 1994.

Initial plans for studies on *geometry* and on the *history of mathematics* exist as well.

#### **4. Regional Conferences**

Financial support was given by ICMI to SEACME 6 (The 6th South East Asian Conference on Mathematical Education). The Executive Committee has decided to also sponsor a regional conference to be held in Shanghai in August 1994. Further proposals for regional conferences are being considered by the EC.

#### **5. New initiatives**

With great pleasure and enthusiasm the Executive Committee of ICMI has been involved in IMU's preliminary plans for the *World Mathematical Year 2000*. ICMI looks forward to participating further in the planning and realisation of this remarkable set of activities.

In his Opening Address at ICME-7 (see ICMI Bulletin, No. 33, December 1992), Miguel de Guzmán, President of ICMI, on behalf of the ICMI EC focused on the needs for international solidarity in mathematics education and outlined a *Solidarity Programme* to accommodate these needs. This proposal received strong support by the General Assembly of ICMI.

As a first step in mounting such a programme the EC has decided to establish a *Solidarity Fund* based on private contributions by individuals, associations etc. The Fund is to be activated to support concrete initiatives and activities that may foster solidarity in mathematics education between well-defined quarters in developed and less developed countries. If and when the Solidarity Fund grows to a fair size it will be administered by a separate body. Until then funds will be in charge of a committee chaired by Professor Jean-Pierre Kahane, Past-President of ICMI and with administrative assistance from the ICMI Secretariat.

#### **6. ICMI Bulletins**

In 1992 ICMI Bulletins No. 32 (June) and 33 (December) were published under the editorship of the Secretary of ICMI.

**Mogens Niss**

15 February 1993



## ICMI Accounts 1992

### 1 January - 31 December

#### Swiss Franc Account:

<b>Income:</b>	
balance 1991	22.749,67
IMU (Schedule A: Administration)	10.000,00
IMU (Schedule B: Scientific Activities)	18.000,00
IMU grant for ICME-7	11.000,00
interest	2.257,17
<b>total</b>	<b><u>64.006,83</u></b>
<b>Expenditure:</b>	
transfer charges (IMU)	15,37
transfers to DKR account	4.500,00
<b>balance 1992</b>	<b><u>59.491,46</u></b>
<b>total</b>	<b><u>64.006,83</u></b>

#### Danish Kroner Account:

<b>Income:</b>	
balance 1991	1.306,50
transfer from Swiss Franc Account (4.500)	19.288,20
transfer from Sterling Account (1.500)	16.375,35
private contributions to ICMI's Solidarity Fund	916,16
<b>total</b>	<b><u>37.886,21</u></b>
<b>Expenditure:</b>	
Secretary's meeting in Unesco (April)	4.731,53
typing and printing, Bulletin	4.922,50
postage Assessment Study manuscripts	740,00
EC members' participation in ICME-7, including GA and EC meetings	22.257,50
credit card charge	150,00
<b>balance 1992</b>	<b><u>5.084,68</u></b>
<b>total</b>	<b><u>37.886,21</u></b>

## **Sterling Account:**

### **Income:**

balance 1991	25,267,53
CUP royalties for studies	306,87
interest	1,930,63
total	<u>27,305,03</u>

### **Expenditure:**

accumulated previous tax due in the UK	1,891,55
transfer to DKR account	1,500,00
<b>balance 1992</b>	<b>23,913,48</b>
total	<u>27,305,03</u>

## **US\$ Account:**

### **Income:**

balance 1991	26,764,38
Unesco grant for ICME-7	2,200,00
payments	185,10
interest	270,71
private contributions to ICMI's <b>Solidarity Fund</b>	<b>20,300,00</b>
total	<u>49,720,19</u>

### **Expenditure:**

ICMI contribution to ICME-7	5,000,00
IMU contribution to ICME-7 (≈ CHF 11.000)	8,700,00
Unesco contribution to ICME-7	3,000,00
Contribution to SEACME 6	2,000,00
Tibor Nemetz fund finished	750,00
EC members' participation in ICME-7, including GA and EC meetings	628,96
transfer charges	24,48
<b>balance 1992</b>	<b>29,616,75</b>
total	<u>49,720,19</u>

## Notes:

1.

As a consequence of the ICMI General Assembly and Executive Committee meetings held in Québec, August 1992, it was decided to establish an ICMI Solidarity Fund based on private contributions. The **Solidarity Fund** is mounted to assist mathematics education and mathematics educators in less affluent countries. Its money can only be spent (by a committee chaired by Professor Jean-Pierre Kahane) to serve such purposes and is therefore **not** part of ICMI's general resources. However, the appearance of the Solidarity Fund on the ICMI accounts for 1992 is due to the wish to keep ICMI's number of bank accounts at a minimum.

2.

Unesco contributed a grant of US\$ 3.000 to support the participation in ICME-7 of delegates from developing countries. In accordance with Unesco practice the grant is paid in two parts. Only the first sum (US\$ 2.200) appears in the accounts. The second sum is yet to be paid, but ICMI has transferred US\$ 3.000 to ICME-7.

3.

In addition to the amounts displayed directly in the accounts, considerable extra sums should appear but do not and cannot. In 1992 Roskilde University (the Secretary's institution) has contributed a substantial support of ICMI's work (e.g. telephone and -fax, e-mail facilities, postage, some of the printing costs and all the distribution costs of the Bulletin, plus secretarial help of various sorts). It is estimated that the total contribution of Roskilde University is equivalent about US\$ 5.000. The ICMI Executive Committee expresses its gratitude for this generous support.

The Executive Committee's thanks also go to the institutions of its other members. These institutions, too, have given invisible support to ICMI's work in a variety of ways. For instance, in many cases these institutions have paid travel and other expenses related to participation in EC meetings and so forth.

4.

In 1993, the preparation and holding of an ICMI study conference (on *Gender and Mathematics Education*), and the preparation of one, perhaps two, other ICMI studies (on *Research in Mathematics Education* and on *Geometry*, respectively) will imply considerable costs.

5.

In appreciation of the extraordinary and most impressive work done by Professor Tibor Nemetz in ICME-6, Budapest 1988, the then ICME EC decided to establish a small fund to make it possible for Prof. Nemetz to participate in ICME-7. In 1992 the fund was used for its purpose and has hence come to an end.

**Mogens Niss**  
**12 February 1993**

# Cases of Assessment in Mathematics Education

An ICMI Study

edited by Mogens Niss, Roskilde University, Denmark

This book presents a variety of carefully selected cases describing and analyzing in depth and considerable detail assessment in mathematics education throughout in the world. The book is based on work presented at an international ICMI seminar and includes contributions from first rate scholars from Europe, North America, the Caribbean, Asia and Oceania, and the Middle East.

The cases presented range from thorough reviews of the state of assessment in mathematics education in selected countries, each possessing 'archetypical' characteristics of assessment, to innovative or experimental small or large-scale assessment initiatives. All the cases presented have been implemented in practice.

The book will be particularly stimulating reading for mathematics educators - at all levels - who are concerned with the innovation of assessment modes in mathematics education, as well as everybody working in the field of mathematics education.

## Contents and Contributors

Introduction; *M. Niss*. Mathematics Assessment in the Spanish Educational System; *L. Rico*. Major Issues in Assessing Mathematics Performance at 16+ Level: A Caribbean Perspective; *D.R. Broomes, J.A. Halliday*. Assessment in Mathematics Education in the Arab Countries; *M. Jurdak*. Issues in Mathematics Assessment in the United States; *J.A. Dossey, J.O. Swafford*. Assessment in the Context of Mathematics Instruction Reform: The Design of Assessment in the QUASAR Project; *E.A. Silver, S. Lane*. Assessment in Mathematics Education: Developments in Philosophy and Practice in the United Kingdom; *M. Brown*. The School Mathematics Project: Some Secondary School Assessment Initiatives in England; *C. Little*. The Teaching/Learning Process and Assessment Practice: Two Intertwined Sides of Mathematics Education; *L. Bazzini*. Types of Problems and How Students in Norway Solve Them; *G. Gjone*. Assessment of Primary and Lower Secondary Mathematics in Denmark; *H.N. Jensen*. Assessment in Upper Secondary Mathematics in Denmark; *K. Hermann, B. Hirsberg*. Assessment of Examinations in the Netherlands; *W. Kleijne, H. Schuring*. New Developments in Senior Secondary Assessment in Australia; *M. Stephens, R. Money*. Assessment in an Innovative Curriculum Project for Mathematics in Grades 7-9 in Portugal; *L. Cunha Leal, P. Abrantes*. Educational Assessment in Mathematics Teaching: Applied Research in China; *Wei Chao-Qun, Zhang Hui*. The Practice and Study of Evaluating Mathematics Teaching in China; *Cheng Zemin, Lü Shaozheng*. Assessment in Mathematics Within the International Baccalaureate; *R.K. Sweetnam*. Index.

1993, 226 pp.

Hardbound, Dfl.145.00/£58.50

ISBN 0-7923-2089-1

# Investigations into Assessment in Mathematics Education

An ICMI Study

edited by Mogens Niss, Roskilde University, Denmark

This book attempts a systematic in-depth analysis of assessment in mathematics education in most of its important aspects. It deals with assessment in mathematics education from historical, psychological, sociological, epistemological, ideological, and political perspectives. The book is based on work presented at an international ICMI seminar and includes chapters by a team of outstanding and prominent scholars in the field of mathematics education.

Continued Overleaf

Kluwer  
academic  
publishers



## **The Influence of Computers and Informatics on Mathematics and Its Teaching: A new edition.**

In 1986 the first ICMI Study, *The Influence of Computers and Informatics on Mathematics and Its Teaching*, edited by R.F. Churchhouse et al., was published by Cambridge University Press. As this book went out of print rather soon it was clear that the need for a book on this theme was not yet satiated. At the same time the rapid development in the field made it desirable not just to reprint the original version but to produce an updated version that could take new states and trends into account. Therefore ICMI in cooperation with UNESCO asked Bernard Cornu (Grenoble, France) and Anthony Ralston (Buffalo, USA) to edit a new edition of the study with the purpose of bringing it up to date with the situation in the early nineties.

We are pleased to announce that the volume has now appeared as

*The influence of computers and informatics on mathematics and its teaching*,  
edited by Bernard Cornu and Anthony Ralston,  
Science and Technology Education Document Series, No. 44, Unesco, Paris, October 1992, v+ 133.  
Available from UNESCO, free of charge, Education Sector, 7 Place de Fontenoy, F-75352 Paris 07, France.

The volume contains contributions by the following authors (in their order of appearance): H. Burkhardt and R. Fraser; R.F. Churchhouse; A. Ralston; B. Cornu; L.A. Steen; S.B. Maurer; J. Stern; K.-D. Graf, R. Fraser, L. Klingen, J. Stewart and B. Winkelmann; S.B. Seidman and M.D. Rice; B. Cornu; B.R. Hodgson and E.R. Muller; M. Mascarello and B. Winkelmann; D. Tall and B. West.

# The cooperation between ICMI and UNESCO

Edward C. Jacobsen, USA

Regular readers of the ICMI Bulletin know of the close cooperation between ICMI and UNESCO. After leaving the mathematics education post at UNESCO, Professor Bent Christiansen wrote in the March 1978 Bulletin a history of this cooperation, especially about the preparation of UNESCO's *New Trends in Mathematics Teaching*, Volumes I to IV, between 1969 and 1979. Since then, UNESCO's collaboration has continued by helping in the organization and financing of ICMEs and especially the ICMI regional groups in Latin America, Southeast Asia and Africa (IACME, SEAMS, and AMU). UNESCO is not a funding organization, especially with its reduced budget, so cooperation depends upon common purposes of ICMI and itself. These activities frequently result in documents in the Science and Technology Education Documentation Series (STEDS). The following titles are free of charge upon request from ED/ECS/SE/STE, UNESCO, place de Fontenoy, 75700 Paris, FAX 33-14065-9405:

*The Influence of Computers and Informatics on Mathematics and its Teaching (UNESCO/ICMI Study)* edited by B. Cornu and A. Ralston. STEDS 44, 1992 English only;

*Educacion Matemática en las Americas VIII*, edited by R. Scott (IACME 8 Conference, Miami 1991). STEDS 43, 1992, Spanish only;

*Educacion Matemática en las Americas VII*, edited by E. Luna and S. Gonzalez (IACME 7 Conference, Santo Domingo, Dominican Republic, 1987). STEDS 37, 1990, Spanish only;

*Mathematics, Education, and Society*, edited by C. Keitel, P. Damerow, A. Bishop and P. Gerdes (ICME 6 Fifth Day). STEDS 35, 1989, English, Spanish and Russian versions;

*Evaluation and Assessment in Mathematics Education*, edited by D. Robitaille (ICME 6 Theme Group). STEDS 32, 1989, English only;

*Innovations in Science and Mathematics Education in the Soviet Union*, STEDS 24, 1987, English only;

*Mathematics for All*, edited by P. Damerow, M.E. Dunkley, B.F. Nebres and B. Werry (ICME 5 Theme Group). STEDS 20, 1986, English and Spanish.

Other documents are under preparation. One to appear later this year, also free of charge:

*Factors Influencing the Learning of Mathematics*, edited by A. Bishop (prepared by ICMI Study Group PME).

My principle goal at UNESCO was to facilitate the exchange of information. Since trends don't change frequently, New Trends in Mathematics Teaching was replaced in 1980 by the more frequent Studies in Mathematics Education. Eight volumes have been published, each concerned with a single topic in mathematics education. Some titles are The Goals of Teaching Mathematics; The Mathematical Education of Primary School Teachers; The Education of Secondary School Teachers of Mathematics; Geometry in Schools; The Teaching of Statistics; Out-of-School Mathematics Education; and Moving into the Twenty-First Century. These books are published in English, French and Spanish, with several volumes also published in Arabic and Chinese, and are for sale from national United Nations booksellers. I am now editing Volume 9, The Teaching of Numeracy, for publication next year.

Most of UNESCO's work is directly with the governments of its Member States, and the mathematics education programme is no exception. UNESCO's mathematics programme cooperates with other non-governmental organizations besides ICMI; the International Statistics Institute (in convening the International Conference On the Teaching of Statistics), the International Federation for Information Processing (its World Conference on Computers in Education), and the IEA (for their International Mathematics Studies).

Having reached UNESCO's retire age, I have left after 18 years in the mathematics education post. The post was subsequently abolished due to financial constraints, although the school mathematics education programme continues. Hence I have been asked to continue to work closely with UNESCO. Professor A. Marzollo in the Science Sector, who also has collaborated closely with ICMI over the years on various scientific activities, continues to be responsible for university mathematics education and mathematical research.

If you have further questions or have difficulties in securing the above documents, please feel free to write to me at my new adress:

Edward C. Jacobsen, 4900 Dake Road, Webster, WI 56893, U.S.A.,  
telephone/fax + 1-715-349-2761, e-mail (Internet): <72122.63@compuserve.com>, or  
telex 650-565-9766.



# **A Brief Report of the Work done by M. Martínez and M. de Guzmán at the Universidad Centroamericana**

**Managua, Nicaragua, January – February, 1993**

**Miguel de Guzmán, Mariano Martínez, Spain**

The following is a brief report on the visit made by Mariano Martínez and Miguel de Guzmán, of the Facultad de Matemáticas (Universidad Complutense de Madrid), in January - February 1993 to the Universidad Centroamericana in Managua, Nicaragua. The travelling expenses of Marino Martínez (1,500 US \$) were paid by the ICMI Solidarity Fund initiated at the opening of ICME 7 (Québec) in August 1992.

We started to prepare our work in Managua at the beginning of December 1992. The first contact had been made in July 1992. One of us (MG) had, during that month, been working at the Universidad Nacional de El Salvador and made a short visit to the Universidad Centroamericana in Managua (UCA). Through this visit we knew that January-March was perhaps the best period for the university professors in Central America to attend courses in order to contribute to their professional development. At this time of the year they are already at the university after the vacation period but their students are not yet in class. We ourselves could make use of the examination period at the Universidad Complutense de Madrid (no classes) in order to stay two weeks in Managua. We arrived there on January 28, started our courses on February 1 and finished them on February 12.

The Universidad Centroamericana had announced our courses, as open to all mathematics teachers of the five universities in Managua. Mariano Martínez was offering a course on the use of the history of mathematics in its teaching and Miguel de Guzmán was offering another course in two sections, the first one devoted to general ideas in mathematical education and the other section to problem solving.

About 20 teachers attended each course. Most of them were teachers of mathematics at the different universities in Managua. Also four high school teachers participated.

In Managua there are five public universities. The Universidad Nacional Autónoma de Nicaragua (UNAN) is the biggest, with about 25,000 students. The Universidad Centroamericana and the others have around 5,000 each. The students do not pay any tuition fee.

For each of the courses there was a two-hour period per day.

The interest in these activities among the teachers was very satisfactory. Many of them had never had an opportunity to take any course on the history of mathematics, nor had they ever been exposed to the possibilities that the history of mathematics offers for an effective teaching of it. On the other hand, in many cases teachers' ideas about

mathematical education are still very much influenced by the formalistic tendencies of thirty years ago. This is not only evident at the universities, but also at the initial levels of mathematical education. Children of small age are very seriously introduced to set theory and similar abstract subjects.

On our departure we left a number of useful books and recent articles on the topics related to our courses so that our "students" could continue the work they had begun during this short period.

The living conditions set up for us by the university were so pleasant that our stay were most relaxing.

\* \* \*

This first contact was also useful for our attempt to explore, together with the authorities of some of the universities in Managua, the possibilities for future work that can be more profound and stable than was possible at our first visit.

It was clear that, at the university level, the professors in more developed countries, in particular in those countries where Spanish is spoken, could contribute in a very productive way to the scientific and economic progress of Nicaragua by offering some of their time to work there for a period. In order to make this project more efficient one should try to establish some priorities and work towards fulfilling them in a coordinated way. The following project was considered realistic and very helpful for the present needs of Nicaragua in several respects.

A degree of *Master* (possibly in Operations Research or in Applied Mathematics) will be offered at the Universidad Centroamericana. It will consist in about 600 hours, distributed over 20 modules of 30 hours each. No more than two modules will be offered at the same time. (This means that the visiting professors for each of the modules will spend three weeks in Managua, teaching 2 hours per day, using a period that is convenient for the students there. January-February is a possibility, but June-July is another one).

This programme will be offered to people who have already the degree *Licenciado* (in Mathematics, Economy, Engineering, ...) and who are working either in industry or in a university (about 40 persons for each course).

The courses for this degree will be offered by competent professors from different parts of the world who can express themselves in Spanish and are willing to offer their work without any economic reward. The UCA will offer them convenient accommodation. The funding of the travel expenses has to be found somewhere else.

Amongst professors of different Spanish universities this project has found a very positive reception. We hope that the project will become a reality before long.

It is expected that such a Master's programme will soon contribute to the professional progress of the university teachers in Nicaragua and to the formation of competent

professionals for industry and business.

One might think that this type of cooperation between developed and less developed countries could perhaps serve as one model to help the less developed countries further their educational and economic progress, making, after some years, their universities sufficiently autonomous to adequately prepare the professionals the countries need and to maintain the lines of research which are most useful for them. Perhaps ICMI could serve as one of the promoters of this kind of collaboration between universities.

# **Political Dimensions of Mathematics Education: Impressions from the PDME2 Conference, April 1993**

**Stieg Mellin-Olsen, Norway**

## **Background**

The first PDME conference was held at the London University Institute of Education in 1989, as a reaction against a general tendency of excluding political issues at conferences about mathematics education.

As a result of recent legislation of the African National Congress (ANC) four participants from the Republic of South Africa (RSA) participated in PDME1. With the immense educational problems in the region of South Africa in mind, it was decided to arrange PDME2 in this region in 1993. The conference took place 2-5 April at the Alpha Training Centre, Broederstroom, RSA.

There were 120 members of the conference. Among these 90 were from RSA. The remaining members came from Brazil, Cuba, Denmark, England, Mozambique, Norway and USA.

## **Content**

As a result of this distribution of participants, the conference activities clearly were related to the present problems of mathematics education in the RSA. This was also reflected in the theme of the conference, *Curriculum Reconstruction for Society in Transition*, the political dimensions of which are evident. Issues such as access to education, methods of assessment, racist approaches to teaching and learning, women's education, the language problems in a multilingual society, were among the important themes of the conference. Many of these themes are certainly not relevant only to the RSA and its neighboring countries; during the conference it was confirmed that they are just as relevant to education in South America or in inner cities in England and USA.

In this way PDME2 in many ways became a meeting between a small group of Western educators and a large group of educationists from countries with huge numbers of illiterates and a long history of violence within and outside schools.

In her opening address to the conference, Cheryl Carolus, of the ANC Education Department, stressed the difficulties of fostering political responsibility and power after generations of oppression and political struggle. She expressed a sincere desire that the conference would take responsibility in this respect and deal with these issues.

These difficulties were made specific in many ways during the conference. The discussions about assessment serves as an example. Frequent assessment by testing, as practised in apartheid RSA, is a hindrance to versatile mathematics education. For many of the RSA participants it was hard to grasp the fact that they can now get the possibility to develop new foundations for assessment that can open for a less oppressive education.

The RSA participants belong to two groups. One is a group of teachers and of college and university lecturers. The other group comprises educationists connected with various non-governmental projects (NGPs). These two groups have a non-empty intersection. The NGPs raise an enormous problem for a post-apartheid democracy. There exist about 14 000 NGPs in the RSA, financed from abroad, operating within health care, social services and education. Although there usually are "good intentions" behind these projects, they have been established during the apartheid period, and rarely operate in relation to each other.

For a future democratic government of the RSA (or for any government in a similar situation in other countries) it will be an enormous task to reorganize such projects to serve overall political goals of the nation. Specifically, in mathematics education a variety of projects financed by churches, humanitarian organizations and multinational companies, have to be assessed and carefully transformed so that they can work according to the same set of overall educational goals.

It became clear during the conference that a national forum for mathematics education had to be organized in the RSA. In particular the reports from the Action Groups which met three times during the conference, will provide important input to such a forum. Also in this way the request from Cheryl Carolus was met by the conference.

The conference report will be available through Dr. Desi Angelis, The NECC Mathematics Commission, 20 Low Street, Observatory 7925, Cape Town, South Africa.

### **PDME3**

PDME3 will take place in Bergen, Norway, in the last week of July 1995. The advice from PDME2 to the organizing group is that the preparation should ensure that a considerable number of women, blacks, and teachers from underdeveloped countries can participate, together with white academics.

From the Norwegian delegation it was suggested that women issues and numeracy should be central themes of PDME3. The PDME3 organization committee will be in regular contact with representatives of countries involved in PDME2.

Information concerning PDME3 may be obtained by contacting

Professor Stieg Mellin-Olsen, Institutt for Praktisk Pedagogik, University of Bergen, Øisteinsgate 1, 5007 Bergen,  
tel: +47 5544839, fax: +47 5902829, e-mail <mellin-olsen@psych.uib.no>.

## **The International Association for Statistical Education (IASE)**

The International Association for Statistical Education (IASE) is the new section of the International Statistical Institute, the international umbrella organization for statisticians. IASE will hold its first scientific meeting in Perugia, Italy, 23-24 August, 1993. During its formation IASE was directed by an interim Executive Committee, with David Vere-Jones (Wellington University, New Zealand) as President. The first regular Executive Committee will take office in Perugia and serve for the period 1993-95. The Executive Committee consists of

David S. Moore (USA), President  
Ann Hawkins (England), President-Elect  
Giuseppe Cicchitelli (Italy), Vice-President  
Annie Morin (France), Vice-President  
Brian Phillips (Australia), Vice-President  
Richard Sheaffer (USA), Vice-President.

IASE is based on individual membership. Anyone interested in statistical education is invited to join the Association. The annual dues are Swiss Francs 57 (or the equivalent in other currencies) for members in developed countries, and Swiss Francs 31 for members in developing countries. Further information can be obtained by writing to IASE, c/o International Statistical Institute, 428 Prinses Beatrixlaan, P.O. Box 950, NL-2270 Voorburg, The Netherlands.

It is a great pleasure for ICMI to welcome the IASE. ICMI looks forward to cooperating with IASE in various ways on matters of common interest.

**Mogens Niss**

## FUTURE CONFERENCES

### **BISME-3: 3rd Bratislava International Symposium on Mathematical Education, August 1993**

This conference will be held 25-27 August, 1993, at the Comenius University, Faculty of Mathematics and Physics, Bratislava, The Slovak Republic. The topic of the symposium is *Understanding*. The conference language is English.

The international programme committee is chaired by Professor Hans-Georg Steiner, Bielefeld, Germany. Invited plenary speakers include T. Cooney (USA), C. Hoyles (UK), J. Monaghan (UK), G. Schoemaker (The Netherlands), A. Sfard (Israel), H. Steinbring (Germany), and H.-G. Steiner (Germany).

For further information please contact

Ivan Trenčanský  
MFF UK, KZDM  
Mlynská dolina  
842 15 Bratislava  
The Slovak Republic

### **SEMT93: International Symposium on Elementary Math Teaching, August-September 1993**

The conference will be held 30 August-4 September, 1993, at the Charles University, Faculty of Education, Prague, The Czech Republic. The programme topics are *Curricula for primary schools and their use; Teacher training for the new ways of teaching mathematics; Psychology of mathematics education*. The conference languages are English and French.

The conference programme has been planned by an international programme committee.

For further information please write to

SEMT 93  
Katedra matematiky a didaktiky matematiky  
Pedagogická fakulta UK  
M.D. Rettigové 4  
116 39 Praha 1  
The Czech Republic  
e-mail: <novotna@csearn,bitnet> or <novotna@earn.cvut.cs>

## **Technology in Mathematics Teaching, September 1993**

This conference, Technology in Mathematics Teaching - A Bridge between Teaching and Learning, is the sixth annual international conference in the series Technology in Collegiate Mathematics. It will take place 17-20 September, 1993, at the University of Birmingham, UK.

The structure of the programme, which has been organised by an international programme committee, provides for those involved in the teaching of mathematics at every level. There will be a diversity of themes, both educational and technological, and opportunities for talks, workshops, research reports, symposia and discussion groups. Guest speakers include Andrea diSessa (California, USA), Colette Laborde (France), Philip J. Rippon (UK).

For further information please contact

Pam Bishop  
CTICMS  
Faculty of Education  
The University of Birmingham  
Edgbaston  
Birmingham B15 2TT  
UK  
tel: +44 21 414 4800  
fax: +44 21 414 4865  
e-mail: tmt93@bham.ac.uk

## **ICM 94: The International Congress of Mathematicians, August 1994**

The next International Congress of Mathematician will be held 3-11 August, 1994, in Zürich, Switzerland, under the auspices of the International Mathematical Union. The lectures will be held at the Kongresshaus of the city of Zürich and in the lecture theatres at the Federal Institute of Technology (ETH-Zürich) and at the University of Zürich.

The Swiss Mathematical Society has entrusted a committee with the organisation of the congress. The President of this committee is Henri Carnal, the Secretary is Christian Blatter. The administration of the participants (hotels, reservations etc.) has been delegated to a professional congress organiser.

The First Announcement containing further details will be available in July 1993.



For further information please write to

ICM 94  
International Congress of Mathematicians  
ETH Zentrum  
CH-8092 Zürich  
Switzerland

### **ICMI-China Regional Conference on Mathematics Education, August 1994.**

A regional conference on mathematics education will be held in Shanghai, 16-20 August 1994. The theme of conference is *Teacher Preparation in Mathematics*. More specifically, the goals of the conference are to examine current practices in teacher preparation in many countries, and to identify practices that can promote further development of mathematical instruction. Mathematics educators from outside the South-East Asian region are encouraged to participate in the conference. The official language of the conference is English.

The conference, which is being planned by an international programme committee chaired by Professor Lee Peng Yee (Singapore), will be held under ICMI auspices and with the following sponsoring institutions: East China Normal University (Shanghai); Shanghai College of Education; Teacher Training Center for Higher Institutions under SEC; Shanghai Association for Science and Technology.

The conference programme will feature major paper presentations and will further be organised around five Working Groups (each focusing on a certain age/teaching level) and five Topic Groups as follows: The structure of educational systems and teacher preparation policies; The mathematics curriculum in teacher preparation; Professional courses for teachers in teacher preparation programmes; Practice teaching as part of teacher preparation; The role of technology in teacher preparation. So far the following main speakers have accepted to contribute: Geoffrey Howson (UK), Glenda Lappan (USA), Mogens Niss (Denmark).

The registration fee for foreign participants is US\$ 200. It covers a copy of the conference proceedings, excursion, receptions and all meals. Three-star hotel accommodation will be available for approximately US\$ 45 per night and on-campus accommodation (with air conditioning) for approximately US\$ 15 per night.

For further information about the conference please contact

Professor Zhang Dian-zhou or Professor Zhang Zhen-ya,  
Department of Mathematics,  
East China Normal University,  
Shanghai 200062  
The People's Republic of China  
Tel: +86 21 257 1095  
Fax: +86 21 257 8367

### **7th International Symposium on World Trends in Science and Technology Education, August 1994**

This symposium will be held 24-31 August 1994, at Veldhoven (Koningshof), The Netherlands, under the auspices of the International Organization for Science and Technology Education (IOSTE). The theme of the symposium is *Science and Technology Education in a Demanding Society*. The intention is to examine the current state of science and technology education, and to reflect on desirable and feasible educational innovations by exchanging and discussing ideas and practical experiences in the sub-themes *claims and strategies* and *strategies and empirical evidence*, and connected to cross-curricular themes such as science/technology related issues; further education employment; teaching methods. The conference language is English

The conference is being organised by a Dutch committee, chaired by Jacques van Trommel, Enschede, The Netherlands. The deadline for sending in abstracts of papers is 15 October 1993.

The conference fee is Dfl. 1900 (roughly equivalent to US\$ 1100). Its includes full accommodation and meals, symposium papers and proceedings, IOSTE membership fee.

For further information please contact

Jacques van Trommel  
SLO  
P.O.Box 2041  
NL-7500 CA Enschede  
The Netherlands  
Tel: +31 53 840 840 or +31 53 840 631  
Fax: +31 53 307 692  
e-mail: vantrommel@utwente.nl (bitnet)

## SHORT NEWS

### IMU Turn of the Century Committee

In order to mark the turn of the century in a manner appropriate to the standards set by David Hilbert in his 1900 address to the International Congress of Mathematicians in Paris, the Executive Committee of IMU (The International Mathematical Union) has set up a *Turn of the Century Committee*. The committee is chaired by J. Palis Jr. (Brazil). Its members are V.I. Arnold (Russia), F. Hirzebruch (Germany), L. Lóvasz (Hungary), B. Mazur (USA), S. Mizohata (Japan), G.D. Mostow (USA), W. Thurston (USA), S. Varadhan (USA). The first task of the committee will be to prepare a report for the International Congress of Mathematicians to be held in Zürich, 3-11 August 1994.

### SAMSA Who is Who

The Southern Africa Mathematical Sciences Association, SAMSA, recently published a booklet *Who is Who in Mathematics and Mathematics Education in Southern Africa*, December 1992. The booklet is edited by the Secretary of Samsa, Paulus Gerdes, and may be obtained by writing to

Professor Paulus Gerdes, Director, Mozambique's Higher Pedagogical Institute (ISP), P.O. Box 915, Maputo, Mozambique.

### Honorary award to Jeremy Kilpatrick

Jeremy Kilpatrick, one of ICMI's two Vice-Presidents, has been granted a rare honour at his university, University of Georgia, Athens, USA. Every year the Regents of the University of Georgia name one of its professors a *Regents' Professor* for outstanding scholarship. This distinguished professorship for 1993 went to Jeremy Kilpatrick. The award was presented to him on the 3rd of June. The editor of this Bulletin wishes to express his congratulations!

### The ICME-7 logo investigated

The ICME-7 logo - a spiral arising from a simple geometric arrangement that constructs the square roots of the intergers - was the subject of a presentation by Professor Philip J. Davis, Brown University, USA, at ICME-7 in Québec, August 1992. Calling this spiral for historical reasons "The spiral of Theodorus", Phil Davis showed

how it embraces mathematics from the most elementary sort to some of the deepest contemporary considerations. These matters are explained in detail a new book by Philip J. Davis entitled *Spirals from Theodorus to Chaos* and published by A.K. Peters Ltd, 289 Linden St., Wellesley, MA 01281, USA.



**Mogens Niss**

## NATIONAL REPRESENTATIVES

(Readers are asked to notify the Secretary of any errors in or changes to this list)

- ARGENTINA      Professor **J. C. Dalmasso**,  
Facultad de Ciencias Exactas y Naturales  
Pabellón 2, segundo piso  
Ciudad Universitaria  
1428 Buenos Aires  
ARGENTINA
- AUSTRALIA      Dr. **M.F. Newman**,  
Department of Mathematics,  
Institute of Advanced Studies,  
Australian National University, P.O.Box 4,  
Canberra, ACT 2600,  
AUSTRALIA
- AUSTRIA          Professor **F. Schweiger**,  
Institut für Mathematik, Universität Salzburg,  
Heilbrunnerstr. 34, A-5020 Salzburg,  
AUSTRIA
- BANGLADESH      Professor **S.M. Sharfuddin**,  
58 Lake Circus, Kalabagan, Dhaka-1205,  
BANGLADESH
- BELGIUM          Professor **Gontran Eryvncq**,  
K.U.L.K, Department of Mathematics,  
Universitaire Campus, 8500 Kortrijk,  
BELGIUM
- BOTSWANA        Mr. **B.J. Radipotsane**,  
Ministry of Education,  
Private Bag 005, Gaborone,  
BOTSWANA
- BRAZIL            Professor **U. D'Ambrosio**,  
Universidade Estadual de Campinas, Caixa Postal 6063,  
131100, Campinas, S.P.,  
BRAZIL
- BULGARIA         Academician **Blagovest Sendov**,  
Bulgarian Academy of Sciences, 1,7 Noemvry, Sofia 1040,  
BULGARIA
- CAMEROUN        M. **Léon Ngouo**,  
Ministère de l'Education Nationale, Yaoundé,  
CAMEROUN

- CANADA Professor **David Wheeler**,  
206-1273 Merklin Street, White Rock, BC V4B 4B8,  
CANADA
- CHILE Professor **Rubi Rodriquez**  
Facultad de Matemáticas  
Pontificia Universidad Catolica de Chile  
Casilla 306, Correo 22  
CHILE
- CHINA Chinese Mathematical Society. Professor **Pan Chengdong**,  
Shandong University, Jinan, 250100,  
CHINA
- Mathematical Society located in Taipei, China.  
Professor **Hsi-Muh Leu**, Institute of Mathematics  
National Taiwan Normal University, Taipei,  
TAIWAN
- COSTA RICA Professor **B. Montero**,  
Asociación Matemática Costarricense,  
Escuela de Matemática, Universidad de Costa Rica,  
San José,  
COSTA RICA
- CROATIA New member of the IMU, and hence of ICMI. National Representative to be appointed
- CUBA Professor **M. Prieto**,  
Facultad de Matemática, Universidad de la Habana,  
Habana 4,  
CUBA
- CZECH REPUBLIC Professor **František Kuřina**  
Katedra matematiky  
Pedagogická fakulta  
500 00 Hradec Králové  
The CZECH REPUBLIC  
(The Czech Republic is being proposed as a new member state of IMU, and hence of ICMI, as from 1 January 1994)
- DENMARK Lektor **Bent Hirsberg**,  
Merkurvej 9, DK-7100 Vejle,  
DENMARK
- EGYPT Professor **W. Ebeid**,  
Faculty of Education, Einshams University,  
Roxy, Heliopolis, Cairo,  
EGYPT

FINLAND Professor **Tuomas Sorvali**,  
University of Joensuu, P.O.Box 111, SF-80101 Joensuu 10,  
FINLAND

FRANCE Professor **Jean-Philippe Labrousse**,  
63 Av. Cap-de-Croix, 06100, Nice,  
FRANCE

GEORGIA New member of the IMU, and hence of ICMI. National Representative to be appointed

GERMANY Professor, Dr. **H.-H. Vollrath**,  
Mathematisches Institut der Universität Würzburg  
Am Hubland  
DW-8700  
GERMANY

GHANA Professor **D.A. Akyeampong**,  
Department of Mathematics, University of Ghana,  
P.O.Box 62, Legon, Accra,  
GHANA

GREECE Not known

HUNGARY Professor, Dr. **J. Szendrei**,  
Aprilis 4, Utja 6, Szeged,  
HUNGARY

ICELAND Dr. **Kristín H. Jónsdóttir**,  
Kennaraháskóla Íslands, Stakkahlíd, IS-105 Reykjavík,  
ICELAND

INDIA Professor **J.N. Kapur**,  
Mathematical Sciences Trust Society,  
C-766, New Friends Colony, New Delhi 110065,  
INDIA

IRAN Professor **Megherdich Toomanian**,  
Department of Mathematics, Faculty of Science,  
University of Tabriz, Tabriz,  
IRAN

IRELAND Professor **D. McQuillan**,  
Royal Irish Academy, Academy House,  
19 Dawson Street, Dublin 2,  
IRELAND

ISRAEL Professor **J. Gillis**,  
Department of Mathematics,  
Weizmann Institute of Science, Rehovot 76100,  
ISRAEL

- ITALY Professor **Benedetto Scimeni**,  
Prato delle Valle 80, 35123 Padova,  
ITALY
- IVORY COAST Professor **Pierre Nezit**,  
Société Mathématique de Côte d'Ivoire (S.M.C.I.),  
08 B.P. 2030 Abidjan 08,  
IVORY COAST
- JAPAN Professor **Hiroshi Fujita**,  
Department of Mathematics, Meiji University,  
Hijashimita, Tama-ku, Kawasaki-shi, 214  
JAPAN
- KUWAIT Mr. **Mansour Hussein**,  
Mathematics Advisory, Ministry of Education, P.O.Box 7,  
Safat,  
KUWAIT
- LUXEMBOURG Professor **L. Kieffer**,  
1 rue Jean Jaurès, 1836 Luxembourg  
LUXEMBOURG
- MALAWI Inspector for Mathematics,  
c/o Secretary for Education & Culture,  
Ministry of Education & Culture,  
Private Bag 328, Capital City, Lilongwe 3,  
MALAWI
- MALAYSIA Professor **C.K. Lim**,  
Department of Mathematics, University of Malaya,  
Kuala Lumpur,  
MALAYSIA
- MEXICO Dr. **Elfriede Wenzelburger**,  
Maestria en Educación en Matemáticas,  
Oficinas Administrativas #2, Av. Universidad,  
3000-Ler.Piso,  
MEXICO, D.F.
- MOZAMBIQUE Dr. **Abdulcarimo Ismael**,  
Head of Department of Mathematics,  
Higher Pedagogical Institute (I.S.P.), C.P. 3276, Maputo,  
MOZAMBIQUE
- NETHERLANDS Professor **J.H. van Lint**,  
Rector Magnificus, Eindhoven University of Technology,  
P.O.Box 513, 5600 MB Eindhoven,  
The NETHERLANDS



NEW ZEALAND Ms. **Megan Clark**,  
Institute of Statistics and Operations Research  
Victoria University of Wellington,  
P.O.Box 600, Wellington,  
NEW ZEALAND

NIGERIA Dr. **Sam O. Ale**,  
Abubakar Tafawa Balewa College,  
School of Science and Science Education,  
Ahmadu Ballo University, Bauchi Campus, Bauchi,  
NIGERIA

NORWAY **Hans-Fredrik Aas**,  
Department of Mathematics, University of Bergen,  
N-5000 Bergen,  
NORWAY

PAKISTAN Not known

PHILIPPINES Professor **B.F. Nebres S.J.**,  
Ateneo de Manila University, P.O.Box 154, Manila,  
The PHILIPPINES

POLAND Professor **Z. Semadeni**,  
Institute of Mathematics, Polish Academy of Sciences,  
ul. Sniadeckich 8, Warszawa 1,  
POLAND

PORTUGAL Professor **M.R.F. Moreira**,  
Department of Mathematics, University of Porto,  
4000 Porto,  
PORTUGAL

ROMANIA Not known

RUSSIA Professor **A.S. Miscenco**,  
Faculty of Mathematics, Moscow State University,  
117324 Moscow,  
RUSSIA

SENEGAL Professor **S. Niang**,  
Faculté des Sciences, Université de Dakar, Dakar,  
SENEGAL

SINGAPORE Dr. **Cheng Kai Nah**,  
Department of Mathematics,  
National University of Singapore,  
10 Kent Ridge Crescent, Singapore 0511,  
SINGAPORE

SLOVAK REPUBLIC	Dr. <b>Vladimír Burjan</b> Institute for Educational Research (VUP) Kutlíkova 17 852 55 Bratislava The SLOVAK REPUBLIC (The Slovak Republic is being proposed as a new member state of IMU, and hence of ICMI, as from 1 January 1994)
SLOVENIA	New member of the IMU, and hence of ICMI. National Representa- tive to be appointed
SOUTH AFRICA	Professor <b>J.H. Webb</b> , Department of Mathematics, University of Cape Town, Rondebosch 7700, SOUTH AFRICA
SOUTH KOREA	Professor <b>Han Shick Park</b> , Faculty of Mathematics, Korea National University of Education, Chongwon-kun, Chungbuk, 320-23, SOUTH KOREA
SPAIN	Professor <b>Claudi Alsina</b> , Department of Mathematics & Statistics, ETSAB, Universitat Politècnica de Catalunya, Diagonal 649, Barcelona 08028, SPAIN
SWAZILAND	Mr. <b>E.D. Bicknell</b> , William Pitcher College, P.O.Box 1473, Manzini, SWAZILAND
SWEDEN	Professor <b>Göran Wanby</b> , Department of Mathematics, University of Lund, Box 118, S-221 00 Lund, SWEDEN
SWITZERLAND	Professor <b>Urs Kirchgraber</b> , Mathematik ETH-Zentrum, CH-8092 Zurich, SWITZERLAND
TUNISIA	Dr. <b>S. Aidi</b> , 18 rue des Suffètes, Salamambo, TUNISIA
UNITED KINGDOM	Professor <b>Margaret Brown</b> Centre for Educational Studies University of London Waterloo Road, London SE1 8TX ENGLAND

USA                    **Dr. Stephen Willoughby,**  
Department of Mathematics, University of Arizona,  
Tucson, AZ 86721,  
USA

YUGOSLAVIA        **Dr. Milica Ilić Dajvoć,**  
(ex)                    Gospodar Jevremova 45, 11000 Beograd,  
SERBIA

ZAMBIA              **Dr. S.M. Bayat,**  
Secretary, Mathematical Association of Zambia,  
P.O.Box RW 204, Ridgeway, Lusaka,  
ZAMBIA

## Table of Contents

Executive Committee	1
ICMI Activities in 1992	3
ICMI Accounts 1992	5
ICMI Study on Assessment	8
Computers and Informatics: new edition	10
The cooperation between ICMI and UNESCO (E. Jacobsen)	11
Report by M. Martínez and M. de Guzmán	13
Impressions from PDME2 (S. Mellin-Olsen)	16
The International Association for Statistical Education	18
Future Conferences	19
Short News	23
National Representatives	25
Table of Contents	32







**ICMI SECRETARY:**

Mogens Niss  
IMFUFA, Roskilde University  
P.O. Box 260, DK-4000 Roskilde  
DENMARK