

**MATHEMATICS EDUCATION AND ICMI IN THE PROCEEDINGS OF THE INTERNATIONAL  
CONGRESSES OF MATHEMATICIANS**

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**Preface**

The inspiration for the subject of my contribution to celebrate Ubiratan D'Ambrosio firstly came to me when reading the article (D'Ambrosio, 2003). This was a concrete opportunity to reflect on how important the establishment of the tradition of International Congresses of Mathematicians has been not only for projecting the community of mathematicians into the modern pattern of current scientific research, but also for strengthening national mathematical communities. U. D'Ambrosio has been a chief character in the story of making mathematical research really international, as officially acknowledged in ICM-1978 held in Helsinki (*Proceedings*, Vol. 1, p. 9).

**Introduction**

The idea of organizing an international congress of mathematicians was launched in the first issue of the journal *L'Intermédiaire des Mathématiciens* (1894, Vol. 1, question 212, p. 113) directed by É. Lemoine and C. A. Laisant. Together with H. Fehr, Laisant was the founder and editor of *L'Enseignement Mathématique*, the journal that launched the project of an institution for studying at an international level the problems of mathematical instruction, see (Furinghetti, 2003). This project was warmly received by the community of mathematicians and in 1908, during the fourth ICM the International Commission on Mathematical Instruction<sup>1</sup> (ICMI) was founded, with F. Klein as first president. Circumstances and modalities of the birth of both ICM and ICMI show the link between the communities of mathematicians and mathematics educators. This link has affected the life of ICMI. Just to mention the most relevant facts, we note that:

- originally the International Congresses of Mathematicians were the privileged occasion for presenting the results of ICMI inquiries and for deciding ICMI activities
- until 2006 (ICM of Madrid) the ICMI Executive Committee has been appointed by IMU
- the 1970 IMU General Assembly decided that the Past President of ICMI, the Secretary of the IMU, and the representative of the Union in the ICSU Committee on the Teaching of Science (CTS) are members *ex officio* of the Executive Committee of ICMI.

The aim of the present paper is to offer elements that illustrate aspects of this link based on the analysis of the proceedings of the International Congresses of Mathematicians. For further aspects of the history of ICM see (Albers, Alexanderson & Reid, 1987; Barrow-Green, 1994; Lehto, 1995 and 1998). For the history of ICMI see (Bass & Hodgson, 2004; Howson, 1984; Schubring, 2003).

Since the first ICM in 1897 up to the latter in 2006, there have been 25 Congresses. The proceedings of the first 24 are already published, whereas the proceedings of ICM held in Madrid are still to appear. Reading the proceedings is an emotional experience because one feels she is making a journey through the XX century and she is living again the social history of that century, although viewed from the particular perspective of the mathematical community. In spite of the neutral spirit that the editors tried to keep in the chronicle of the events happening in the world, we grasp echoes of both these events and their consequences for the mathematical community: the tragic impact of wars, the difficult after-war period, the burden of political constraints in the life of mathematicians, the technological revolution, the changes in society.

Each editor has chosen a different way of reporting what happened in the Congresses, but the common layout of the proceedings encompasses:

- an introductory part dealing with: chronicle of preparatory meetings, opening and closing ceremonies, secretary's report, work in the sections, assembly minutes, social programs, lists of participants, donors and sponsors, exhibitions, record of Fields and Nevanlinna Prizes, other awards. Reports of the decisions taken in the IMU General Assembly held before the Congress are also reported
- invited addresses (one-hour, 45 minute, half-hour)
- works in the sections.

In this rather homogeneous pattern the main differences are:

- space dedicated to short communications, that are often reported only in separate booklets, distributed at the moment of registration
- report of the work in the sections. Sometimes the whole texts of the communications are reported, in other cases only short abstracts, or just authors' names and titles. Not all the communications delivered at IMU were reported in the proceedings. In a few cases the sections are not appearing separately with their title in the proceedings
- list of participants. In some case the author's affiliation is not recorded, thus making it difficult to identify school-teachers among participants. For this reason we miss an interesting piece of information in our study about instruction. Just to mention a datum, about 50 secondary teachers attended the Congress held in Rome.

The introductory part is sometimes detailed, in other cases very short. Often talks or messages of local or national authorities of the hosting country are reported. Two outstanding cases are President Ronald Reagan, who sent a message to ICM-1986, and President Jiang Zemin, present at the ICM-2002 in China.

Some changes in the style of the proceedings are due to the increasing number of participants. For example, in the proceedings of the first editions of ICM (up to Strasbourg) there was a short report of the discussion that followed each presentation, with the names of the intervening people. The increased number of participants made it difficult to keep this pattern. In some proceeding the names of the chairs in the sections' sessions are reported. Often booklets with abstracts of either talks or communications were made available to participants and distributed at the beginning of the Congress.

In recent editions the proceedings have been written in English. In the past, French, German, Italian and Russian have been used for both communications and introductory parts.

Except the first ICM, in all Congresses a section was devoted to mathematics teaching. Usually this was the last in the proceedings, associated or not with other disciplines

(history, philosophy, logic)<sup>ii</sup>. Often mathematics education contributions are reported with no references. In recent times, notably after the foundation of the journal *Educational Studies in Mathematics* in 1968, papers were written in a scientific-like style: we can feel that a new discipline (Mathematics education) was growing up, see (Niss, 1999). We will see in what follows that usually mathematics education was not the main theme of plenary talks. In its 100 years ICMI has gone through deaths, lethargies and resurrections. This tumultuous life is highlighted in the proceedings by the different emphasis it was given: we perceive some idyllic moments with the mathematicians' community (when ICMI meetings and information are given enough space) and moments of coldness (when ICMI and mathematics education are neglected).

Within the ocean of data and emotions that one may gather from reading the 50 volumes of the proceedings from Zurich to Beijing I have identified some basic elements that illustrate the intertwining of the lives of ICMI and IMU and the role of mathematics education in the Congresses. These elements are briefly reported in the next section. The reports published in the journal *L'Enseignement Mathématique*, official organ of ICMI, provide further and more detailed information on the subject at issue.

Zurich, Switzerland	9-11 August 1897
Paris, France	6-12 August 1900
Heidelberg, Germany	8-13 August 1904
Rome, Italy	6-11 April 1908
Cambridge, UK	22-28 August 1912
Strasbourg, France	22-30 September 1920
Toronto, Canada	11-16 August 1924
Bologna, Italia	3-10 September 1928
Zurich, Switzerland	5-12 September 1932
Oslo, Norway	13-18 July 1936
Cambridge, USA	30 August-6 September 1950
Amsterdam, Holland	2-9 September 1954
Edinburgh, UK	14-21 August 1958
Stockholm, Sweden	15-22 August 1962
Moscow, URSS	16-26 August 1966
Nice, France	1-10 September 1970
Vancouver, Canada	21-29 August 1974
Helsinki, Finland	15-23 August 1978
Warsaw, Poland	16-24 August 1983
Berkeley, USA	3-11 August 1986
Kyoto, Japan	21-29 August 1990
Zurich, Switzerland	3-11 August 1994
Berlin, Germany	18-27 August 1998
Beijing, China	20-28 August 2002
Madrid, Spain	22-30 August 2006

Table 1. List of the International Congresses of Mathematicians

### Mathematics education in the International Congresses of Mathematicians

Zurich (Switzerland), 9-11 August 1897

Rudio, F. (Ed.) (1898). *Verhandlungen des ersten Internationalen Mathematiker-Kongresses*. Leipzig: B. G. Teubner. One volume: VIII + 306 pages.

There were two plenary talks (by H. Poincaré and A. Hurwitz) and five sections. The fifth is entitled *Geschichte und Bibliographie* (History and Bibliography, pp. 274-306). Among the five contributions reported in this section a remarkable talk is that by F. Klein 'Zur Frage des höheren mathematischen Unterrichts' (On the question of advanced mathematical instruction, pp. 300-306).

In the last session (p. 59) C. A. Laisant thanks the organization on behalf of his French colleagues and reminds the audience of the role he played with É. Lemoine in establishing the International Congress of Mathematicians.

Paris (France), 6-12 August 1900

Duporcq, E. (Ed.) (1902). *Compte Rendu du deuxième Congrès International des Mathématiciens*. Gauthier-Villars: Paris. One volume: 455 pages.

Of the 19 members of the Program committee, four (H. Poincaré, E. Czuber, A. G. Greenhill, G. M. Mittag-Leffler) were also members of the editorial board of the journal *L'Enseignement Mathématique*. Other members of this editorial board, K. Stephanos and A. W. Vassilief, briefly spoke in the opening session. This session took place in the *Palais des Congrès* in the area of the *Exposition Universelle*, which was held in the same period.

There were four plenary talks; three of them (by G. Cantor, V. Volterra, G. Mittag-Leffler) are historical or have a strong historical flavor. Aspects of the talk by H. Poincaré ('Du rôle de l'intuition et de la logique en mathématiques', pp. 115-130) have already been treated in *L'Enseignement Mathématique* ('La logique et l'intuition dans la science mathématique et dans l'enseignement', 1899, Vol. 1, pp. 157-162).

Two themes appear to be a main concern of participants in the sections: the adoption of an international language and the creation of means for bibliographical information. These themes were also treated in *L'enseignement Mathématique* and we note that members of the editorial board (Z. de Galdeano, A. W. Vassilief) or important contributors to the journal (Ed. Maillet) were actively involved in the discussion at the Congress.

There were six sections. The fifth, entitled *Bibliographie et histoire* (Bibliography and history, pp. 379-403), was chaired by Prince Roland Bonaparte with secretary M. d'Ocagne, an important contributor of *L'Enseignement Mathématique*; it contains two contributions. The sixth section, entitled *Enseignement et méthodes* (Teaching and methods, pp. 405-450) was chaired by M. Cantor with secretary C. A. Laisant (both members of the editorial board of the journal *L'Enseignement Mathématique*): this is made of six contributions.

In the minutes of the sections we read that due to the absence of Bonaparte the fifth and sixth sections were put together. The minutes provide important details. The first talk of the section is the well-known 'Sur les problèmes futures des Mathématiques' (On the future problems of mathematics, pp. 58-114) by D. Hilbert; because of its great importance, it was decided to publish the full text in the plenary talks.

Heidelberg (Germany), 8-13 August 1904

Krazer, A. (Ed.) (1905). *Verhandlungen des dritten Internationalen Mathematiker-Kongresses*. Leipzig: B. G. Teubner. One volume: 756 pages with a photo of Heidelberg.

The proceedings are divided in three parts: I. The chronicle of the events, II. Plenary talks and sections, III. Exhibition of mathematics literature and models.

There were six sections. The fifth section *Geschichte der Mathematik* (History of mathematics, pp. 497-581) was chaired by M. Cantor. The sixth section *Pädagogik* (Pedagogy, pp. 582-755) was chaired by H. Schubert and J. P. Treutlein. Pedagogical issues were not confined to the pedagogical section. The first resolution of the Congress (I Resolution, pp. 51-52) advocates the introduction of exact sciences into secondary and university education. The exhibition of mathematical books and more than 300 models, equipments and tools for computing (including Leibniz machine) has a strong educational flavor.

In his talk 'Sur l'enseignement des mathématiques en Italie' (On the teaching of mathematics in Italy, pp. 594-602) G. Loria acknowledged the leading role of F. Klein and J. Perry in those years' mathematics instruction.

H. Fehr presented an investigation on mathematicians' way of working ('L'enquête de "L'Enseignement Mathématique" sur la méthode de travail des mathématiciens', pp. 603-607). In the final part Fehr stressed the need of a project concerning the relationship between psychology and mathematics education, by advocating the use of experimental psychology based on observations and experiments. His sentence "la pédagogie des mathématiques est encore presque entièrement à faire" (Pedagogy of mathematics is still almost entirely to be done, p. 607) resounds the principles underlying the creation of the affiliated *Study Group for the Psychology of Mathematics Education* during ICME in 1976.

Rome (Italy), 6-11 April 1908

Castelnuovo, G. (Ed.) (1909). *Atti del IV Congresso Internazionale dei Matematici*. Roma: Tipografia della R. Accademia dei Lincei. Vol. 1: 217 pages. Vol. 2: 319 pages. Vol. 3: 588 pages.

There were four sections. The fourth section's sessions *Questioni filosofiche, storiche, didattiche* (Philosophical, historical and didactical questions, Vol. 3, pp. 373-579) were chaired by F. Enriques, G. Loria, G. Vailati with the collaboration of H. Fehr; there were 32 contributions. In this section the seed sown by the journal *L'Enseignement Mathématique* was germinating. As a matter of fact, the need of interchanging views and suggestions on teaching between countries was stressed explicitly in the talk by D. E. Smith (*Proceedings*, Vol. 3, pp. 465-477), who asked the Congress to appoint international committees working on this subject. Smith listed nine points deserving particular attention by mathematics educators, thus providing a kind of manifesto for the activities of these committees. On April 9<sup>th</sup>, in the meeting of the fourth section, Archenhold (Vol. 1, p. 45) expressed his support to the project launched by Smith of creating a permanent central committee for the study of secondary level teaching issues. Two days after in the same section the following agenda by G. Castelnuovo was approved (Vol. 1, p. 51):

La Sezione IV, avendo riconosciuto l'importanza di un esame comparato dei programmi e dei metodi dell'insegnamento delle matematiche nelle Scuole secondarie delle varie nazioni,

confida ai Prof.<sup>i</sup> Klein, Greenhill e Fehr l'incarico di costituire un Comitato internazionale che studi la questione e ne riferisca al prossimo Congresso.<sup>iii</sup>

This agenda was approved during the afternoon general assembly, with “vigorous applauses” (Vol. 1, p. 32): this moment marks the birth of ICMI.

The warm acceptance by the mathematicians' community was in line with the widespread search for internationalization and communication characterizing the Congress held in Rome: a constitution for an International Association of Mathematicians was proposed; in the fourth section, eight papers dealt with the analysis of mathematical instruction in different countries. We add that mathematicians showed a widespread interest for themes linked to mathematical creativity. The plenary talk by Giuseppe Veronese on non-Archimedean geometries ('La geometria non-archimedeo', Vol. 1, pp. 197-208) concerns pure mathematics, but contains relevant remarks on teaching and learning issues. Reading the sentence (ibid., p. 208) “Il pensiero, la psiche e il senso sono così intimamente connessi fra loro, che la separazione di ciò che è speciale di ciascuno è quasi sempre un problema arduo” (Thought, psyche and sense are so intimately intertwined that extracting what is specific of each one of them is almost always a hard task), one may recognize the germ of the discussion on the intertwining of body, affect and cognition in mathematical activity carried out nowadays in mathematics education.

Cambridge (UK), 22-28 August 1912

Hobson, E. W. & Love, A. E. H. (Eds.) (1913). *Proceedings of the fifth International Congress of Mathematicians*. Cambridge: Cambridge University Press. Vol. 1: 500 pages. Vol. 2: 657 pages.

There were four sections. The fourth section (Philosophy, history, didactics, Vol. 2, pp. 447-653) contains 29 contributions split in the following subsections: *a* and *b* (*Philosophy, history, didactics*, Vol. 2, pp. 447-458), *a* (*Philosophy, history*, Vol. 2, pp. 459-541), and *b* (*Didactics*, Vol. 2, pp. 543-653).

In the joint meeting *a* and *b* there are two communications concerning teaching, both focused on logical reasoning. The section *Didactics* contains 11 contributions, including the report by Fehr on ICMI's activity and national reports on specific subjects (Vol. 2, pp. 591-653). The action of ICMI reached its apogee in Cambridge: ICMI's activity was one of the main theme discussed in the first general meeting (pp. 37-38) and in the final section of the Congress the work of the commission created in Rome was acknowledged, though it was pointed out that a lot remained to be done. About 300 articles had been sent to the central committee of ICMI from different countries (see the list of publications, Vol. 2, pp. 642-653). The central committee appointed in Rome (F. Klein, A. G. Greenhill, H. Fehr) was confirmed in charge with the addition of D. E. Smith.

Strasbourg (France), 22-30 September 1920

Villat, H. (Ed.) (1921). *Comptes Rendus du Congrès International des Mathématiciens*. Toulouse: É. Privat (Librairie de l'Université). One volume: 672 pages.

There were four sections. The fourth section, entitled *Questions philosophiques, historiques, pédagogiques* (Historical, philosophical and pedagogical questions, pp. 611-664), contains eight contributions. Although there is no reference to special sections of

ICMI, nevertheless we note one contribution on teaching in Argentina by M. Dubecq (p. 664), who did not attend the Congress, and one on mathematics teaching in Athens by P. Zervos (this and other oral communications are not printed in the proceedings). These contributions still keep the flavor of ICMI international reports. The plenary talk by V. Volterra ('Sur l'enseignement de la physique mathématique et de quelques points de l'analyse', pp. 81-97) shows the author's concern about teaching issues relating to mathematical physics and analysis. It begins with the sentence "Permettez-moi de [...] m'occuper d'une question d'enseignement" (Let me consider a teaching issue, p. 81).

This Congress marks the emerging of the mathematical community from the First World War. The context was strongly different from that of the previous Congresses. Fehr (1920a) writes that attendance at the Congress had been by personal invitation, sent only to researchers from the countries belonging to the *Entente* and from some neutral countries. In the closing section É. Picard (pp. XXXI-XXXIII) made a survey of the events after the World War and reported on the doubts of the international communities of scientists: in the meetings of Paris and London (1918) and, afterwards, in that of Brussels, an international research council was created aimed at coordinating the international unions of the different sciences, which, remained nevertheless mutually independent. These unions, and the International Mathematical Union among them, were in charge of organizing their own international congresses. In accordance with this plan the Strasbourg conference was organized. In addition to allied countries also neutral countries were invited to join scientific unions. From the report of the Congress's Secretary General (G. Koenig, pp. XXXIV-XXXIX) we know that in the preparatory meeting for Strasbourg (held on September 20<sup>th</sup> 1920) the International Mathematical Union was established and each country was encouraged to found national Unions. Fehr (1920b) writes that the activities of ICMI had not stopped during the war; nevertheless, as a consequence of the new ideology based on the restrictions on internationalism, G. Koenig stated that the dissolution of the old ICMI was inevitable. Though no initiative was taken to establish a new Commission Fehr (1920b) points out that the services of *L'Enseignement Mathématique* were available as before for supporting international cooperation.

Toronto (Canada), 11-16 August 1924

Fields, J. C. (Ed.) (1928). *Proceedings of the International Mathematical Congress*. Toronto: The University of Toronto Press. Vol. 1: 935 pages. Vol. 2: 1006 pages. At the beginning of the first volume there is a photo of the participants (about 101 per 21 centimeters), which is the first document of this type printed in ICM proceedings. There are also photos and drawings of the University hosting the Congress.

The style of the proceedings appears more similar to the one adopted in modern times. For example, while in previous proceedings questions posed to the speakers of the sections and related answers were usually reported, no more questions appear in these proceedings.

This is the first meeting in the 'New World' and it was held in the spirit of making science really international again, although an important country like Germany was still absent. Internationalization and communication of mathematics was a main concern of the Congress: the problems of notations and bibliography are mentioned in the preface. Members of big companies and researchers in sciences other than mathematics are listed as

delegates; this highlights how mathematicians involved in the Congress looked at the relationship with society. In this concern we note that the fourth section is dedicated to the various aspect of engineering and the fifth section is entitled *Statistics, Actuarial Science, Economics*.

There were six sections. The sixth section (Vol. 2, pp. 929-989) is entitled *History, philosophy, didactics*. It was chaired by F. Cajori. According to the list in Vol. 1 there were 16 communications, the texts of seven are printed in the proceedings and six are reported in the form of abstract. Some historical communications (namely those by F. Cajori and G. A. Miller) deal with aspects of interest to mathematics education. Two communications, by the Swiss L. J. Crelier (pp. 973-974) and H. Fehr (p. 987), are on pedagogy. Both these authors mention ICMI, which was not officially present at the Congress. We note that Fehr was elected vice-president of both the Congress and the Mathematical Union.

Bologna (Italy), 3-10 September 1928

(1929). *Atti del Congresso Internazionale dei Matematici*. Bologna: N. Zanichelli. Vol. 1: 338 pages. Vol. 2: 365 pages. Vol. 3: 472 pages. Vol. 4: 429 pages. Vol. 5: 494 pages. Vol. 6: 554 pages.

In this Congress Germany was re-admitted in the international community of mathematicians, though after harsh controversies (Vol. 1, pp. 5-10).

There were seven sections (some of them divided into sub-sections). The sixth section is entitled *Matematiche elementari, Questioni didattiche, Logica matematica* (Elementary mathematics, Didactical questions, Mathematical logic, Vol. 3, pp. 373-458). The seventh section is entitled *Filosofia, Storia della matematica* (Philosophy, History of mathematics, Vol. 6, pp. 391-548). For the first time the section on teaching is not the last in the proceedings. Out of the 16 communications reported in the proceedings, at least 10 have a clear pedagogical flavor (among them the first didactical contribution by a woman was published). In his communication, the Greek N. Sakellariou (Vol. 3, pp. 457-458) proposed the constitution of an international commission for the teaching of mathematics.

In the second session of the sixth section (chaired by G. Castelnuovo) H. Fehr (1929) illustrated the activities of ICMI since its foundation. This session marked the actual renewal of the activity of ICMI at international level after the meeting held in Paris in 1914.

The sixth section submitted an agenda to the Congress's approval in which IMU:

- thanks governments, institutions, and people who have supported the commission
- pays homage to deceased members
- extends the powers of the central committee and asks for the appointment of a fifth member
- asks the central committee to complete the commission so that all the countries participating in the Congress would be represented.

We remark that the general assembly of IMU had a non-official character due to the Secretary General's reservations.

Zurich (Switzerland), 5-12 September 1932

Saxer, W. (Ed.) (1932). *Verhandlungen des Internationalen Mathematiker-Kongresses Zürich 1932*. Zürich - Leipzig: Orell Füssli. Vol. 1: 335 pages. Vol. 2: XX + 367 pages.



In the final session of Monday September 12<sup>th</sup> important decisions were taken. The International Congress accepted the offer made by late professor Fields of two medals to be awarded to two mathematicians every four years by the International Congresses. The Congress invited ICMI members to continue their work, though without financial involvement by the Congress. The central committee was appointed to remain in charge until 1936; other members could be added. The central committee was allowed to appoint national sub-commissions with the task of raising money to support the expenses of the Secretariat General. The Commission was invited to produce a report on current trends in the development of mathematics teaching in the different countries. In the next Congress the national reports would be presented personally.

There were 18 sections. Section 17 is entitled *Philosophie und Geschichte* (Philosophy and history Vol. 2, pp. 333-351). Section 18, entitled *Pädagogik und Verhandlungen der Internationalen Mathematischen Unterrichtskommission* (Pedagogy and reports of the International Mathematical Commission on the Teaching of Mathematics), is divided in two subsections, *Pedagogy* (Vol. 2, pp. 353-359), and *Reports of the International Mathematical Commission on the Teaching of Mathematics* (Vol. 2, pp. 360-367). The latter section contains the abstract of four contributions by D. E. Smith on the Commission, by H. Fehr on the life of the Commission in years 1928-1932, by G. Loria on the preparation of mathematics teachers, by G. Hamel on the state-of-the-art of mathematics learning in Germany. The minutes of ICMI assembly are also reported. The theme of Loria's report had been firstly proposed in the meeting held in Paris in 1914 and re-proposed in the ICM-1928. The full text was published by *L'Enseignement Mathématique* in 1933 (with title 'La préparation théorique et pratique des professeurs de mathématiques de l'enseignement secondaire dans les divers pays. I. Rapport général', Vol. 33, pp. 5-20).

Oslo (Norway), 13-18 July 1936

(1937). *Comptes Rendus du Congrès International des Mathématiciens*. Oslo: A. W. Brøggers Boktrykkeri A/S, Vol. 1: 316 pages. Vol. 2: 289 pages.

In this Congress the reports on the two Fields medals appear in the proceedings for the first time. We note that up to this moment mathematicians have not fixed clear conditions for creating an international organization of mathematicians.

There were eight sections. The seventh section, entitled *Logique, philosophie, histoire* (Logic, philosophy, history, Vol. 2, pp. 265-279), contains 12 summaries. The eighth section, entitled *Pédagogie* (Pedagogy, pp. 281-287), contains the summaries of the contributions by R. A. Fairthorne (p. 287) and H. Przibram (pp. 283-287). The first summary deals with "cinematograph films" as a means for demonstrating the qualitative properties of differential equations.

The eighth section contains the minutes of the ICMI session held on July 15<sup>th</sup> (pp. 287-289). Being president J. Hadamard in China, the Secretary General H. Fehr chaired the section. In accordance with the suggestions of Zurich Congress the central committee had invited national delegates to present in Oslo a report on the current trends of mathematics instruction in their countries. This call for reports did not encompass a questionnaire, but it was suggested that emphasis should be on either progresses or realized reforms. The following countries presented their reports; Austria, Denmark, Germany, Great Britain,

Hungary, Japan, Norway, Poland, Rumania, Russia, Switzerland. Italy, which was under the Fascist regime, did not participate in the Congress because of the political problems related to sanctions. Other reports were presented in written form or announced as ready. It was planned to publish reports in *L'Enseignement Mathématique*.

The members of the commission asked the Congress to allow them to carry on with their activity. It was up to the Central Committee to decide on what study should be carried out. In the administrative session, discussion on this point was opened up, in view of a presentation at the next Congress. As we know, World War II stopped all international activities.

The Commission decided to give the title of "Honorary members of the Commission" for their service to the following professors: "Beke (Budapest), Bioche (Paris), Castelnuovo (Rome), Dickstein (Warsaw), Enriques (Rome), Faïd [read: Farid] Boulad Bey (Cairo), Loria (Genoa), Petrovitch (Beograd), Wirtinger (Vienna)" (Vol. 2, p. 289).

Cambridge (USA), 30 August-6 September 1950

Graves, L. M., Smith, P. A., Hille, E. & Zariski, O. (Eds.) (1952). *Proceedings of the International Congress of Mathematicians*. Providence RI: American Mathematical Society. Vol. 1: 769 pages. Vol. 2: 461 pages.

With this Congress the international activities restarted after the outbreak of World War II. In the opening address (Vol. 1, pp. 124-125) the chairman O. Veblen pointed out the progresses carried out by the United States' mathematical community since the international congress held in Chicago in 1893. He also noticed that the Congress was held "in the shadow of another crisis, perhaps even more menacing than that of 1940" (Vol. 1, p. 124). He referred to the fact that the iron curtain was affecting international relationships between mathematicians and had prevented some researchers from attending the Congress in Cambridge.

The contributions consisted of 10-minute papers and stated addresses invited by the Organizing Committee (four conferences printed in Vol. 2). The chairman of each section for contributed papers was given the privilege of inviting no more than three persons to deliver half-hour addresses in his section. In the social program (Vol. 1, pp. 139-140) we find, listed among concerts and conference dinners, the mention of the lecture on computing machines given by Howard Aiken, designer of the Harvard Computing Machine. Computers are timidly appearing in the mathematical world.

There were seven sections. The sixth section was entitled *Logic and philosophy*. The seventh section was entitled *History and education* (chair C. V. Newsom, honorary chair H. W. Turnbull). In this last section 15 contributed papers were presented; their abstracts are published in the proceedings, split in a first part labeled "History" (Vol. 1, pp. 737-751, four abstracts) and in a second part labeled "Education" (Vol. 1, pp. 752-760, 11 abstracts). The full text of G. Polya's invited address is published ('On plausible reasoning', Vol. 1, pp. 739-747). In the abstract of W. Betz's talk ("Mathematics for the million, or for the few", Vol. 1, p. 752) it is asked to the Congress and to the proposed International Mathematical Union to resume the work begun in 1908 by D. E. Smith. This is the only moment in which we find a mention to ICMI (quoted as "International Commission on the Teaching of Mathematics") in these proceedings.

Amsterdam (Holland), 2-9 September 1954

Gerretsen, J. C. H. & de Groot, J. (Eds.) (1957). *Proceedings of the International Congress of Mathematicians*. Groningen: E. P. Noordhoff N. V.; Amsterdam: North-Holland. Vol. 1: 582 pages. Vol. 2: 440 pages. Vol. 3: 560 pages.

Volumes 2 and 3 of the proceedings were printed before the Congress. Volume 2 contains the abstracts of those communications in the sections which reached the Editorial Committee in time. Volume 3 contains all half-hour lectures given on invitation of the program Committee and the lecture invited by the International Committee (*sic* in the book) on Mathematical Instruction. Moreover there are the lectures given in the two of the three symposia held during the Congress (invited by the Symposium Committee) and in the joint sessions of these Symposia with the Congress (invited by the Congress Committee). Volume 1 was printed after the Congress; it contains organizational items, reports of events and exhibitions, scientific programs, the one-hour lectures (except those delivered in the Symposia). Moreover it contains those abstracts of short lectures which could not be printed before the Congress in Volume 2.

This Congress is a milestone in the history of ICMI: a new life of ICMI was beginning. World was changing and mathematics with it: J. A. Schouten in his presidential address drew the attention to “a fact which was perhaps not so clear four years ago, but which is absolutely clear now: *the place of mathematics in the world has changed entirely after the second war*” (Vol. 1, p. 143). In another passage of this address Schouten links the old inquiry of *L'Enseignement Mathématique* on the way of working of mathematicians with “our modern computing machines” (Vol. 1, p. 145). From Cambridge Congress of 1950 onwards we perceive the presence of information technology in the background of ICM.

As reported in *L'Enseignement Mathématique* ('Commission Internationale de l'Enseignement Mathématique', 1951-1954, Vol. 40, pp. 72-93) in the first General Assembly held in Rome (9 March 1952) the International Mathematics Union had reconstituted the International Mathematical Instruction Commission (IMIC). This new Commission (indicated in the proceedings in slightly different ways) was very active at the Congress of Amsterdam. A session was dedicated to its inquiry on “Mathematical instruction for students between 16 and 21 years of age”; another session was dedicated to the inquiry of the Commission “The part of mathematics and the mathematician in contemporary life”. In the seventh Section (*Philosophy, history and education*) 36 short lectures were presented (19 reported in Vol. 1, pp. 541-558; 17 in Vol. 2, pp. 411-428); almost all refer to various aspects of mathematics education. In the title of the short lecture delivered by L. N. H. Bunt (from the Institute of Education of Utrecht) there is the new expression “didactical research”. The three half-hour lectures of the seventh section (Vol. 3, pp. 295-324) concern education. The first, authored by C. T. Daltry (Vol. 3, pp. 297-304), discusses the validity of gestalt methods in teaching. This article sounds modern in its attempt of intertwining affective and cognitive factors. The contribution by G. Kurepa, delivered on invitation of IMIC, is entitled '*International Inquiry of the International Mathematical Instruction Commission (IMIC) on The role of mathematics and mathematician at present time*' (Vol. 3, pp. 305-317). The inquiry, firstly launched in the meeting held in Geneva (1952) and afterwards in Paris (1953), marked the actual rebirth of

ICMI. The subject of the inquiry highlights mathematicians' concern about changes in society and the different role mathematics plays in relation with the new achievements of science and technology. Six national subcommittees of IMIC (Austria, France, Germany, Italy, Netherlands, USA) took active part in the Inquiry. Some national representatives presented the report to the Congress. In the third contribution 'School mathematics for universities and for life' (pp. 318-324) K. Piene goes back to F. Klein's times, when university professors appeared more concerned with the preparation of secondary teachers. He outlines what mathematics should be taught in school and takes into account new emerging topics in mathematics.

There were demonstration of some electronic devices and exhibitions of mathematical books, of graphical works by M. C. Escher, of Gaussian table-cloths. In connection with ICMI lectures in the seventh Section, under the auspices of ICMI, "an interesting exhibition of didactical and pedagogical works in the field of mathematics was held" (Vol. 1, p. 158). A. Cardot from Paris had organized it with the collaboration of E. W. Beth, president of the Netherlands sub-committee of the ICMI. The exhibition was opened by the President of ICMI A. Châtelet.

In the closing speech J. A. Schouten thanked the organizations that supported the congress, among them "the C.I.E.M., I.C.M.I., or I.M.U.K" (p. 156). We note that the ephemeral acronym IMIC was already disappearing and ICMI was appearing 'officially' as a acronym of the Commission in addition to the old acronyms in French and German languages.

Edinburgh (UK), 14-21 August 1958

Todd, J. A. (Ed.) (1960). *Proceedings of the International Congress of Mathematicians*. Cambridge: Cambridge University Press. One volume: 573 pages.

The proceedings contain the secretary report, reports of the opening and closing ceremonies, the text of one-hour and half-hour addresses, titles and authors of short communications. There were exhibitions of mathematical books, mathematical typography arranged by the Monotype Corporation. An exhibition of school text-books arranged by the International Commission on Mathematical Instruction was shown during the Congress.

New trends were emerging: we find references to the science of computing and technology in various contributions, the title of a short communication in the educational section is 'Teaching mathematics on television' (by C. B. Allendoerfer). In his presidential address (pp. XLIX-LIII) W. D. Hodge repeatedly expressed his worry about the excess of specialization of certain mathematical research. Young researchers are explicitly mentioned as a primary target of the Congress. The spirit of the following excerpt (p. LII) is still valuable:

It is part of our duty to see that our pupils who go on the walks of life outside the academic field understand that mathematics is an integral part of world culture; not only a pillar of the technological civilization of today, but an essential item in the intellectual equipment of the good citizen. To achieve this state, it is first necessary that the training we give our young men and women should be aimed at developing this understanding of principles and encouraging their interest, instead of crushing it beneath a mass of technicalities; and secondly, that we should be prepared to take the trouble to give accounts of our work to the mathematically educated layman.

From the table of contents we know that there were eight sections (some split in two parts); the addresses are printed in sequence without distinguishing the sections. In the eighth section (*History and education*) there are two half-hour addresses: one is on history, the other, by G. Kurepa, is on education ('Some principles of mathematical education', pp. 567-572); there were 25 short communications, most of them concerning education. In the eighth section a number of special sessions were arranged by the International Commission on Mathematical Instruction. These were devoted to reports and discussions on three prepared topics, namely (p. XLV):

- (i) Mathematical instruction up to the age of fifteen years [reported by H. F. Fehr]
- (ii) The scientific bases of mathematics in secondary education [reported by H. Behnke]
- (iii) Comparative study of methods of initiation into geometry [reported by H. Freudenthal].

Stockholm (Sweden), 15-22 August 1962

Stenström, V. (Ed.) (1963). *Proceedings of the International Congress of Mathematicians*. Djursholm, Sweden: Institut Mittag-Leffler. One volume: 595 pages.

The volume includes only the official record of the Congress and the text of invited talks. Authors and titles of short communications (10-minute) are listed; abstracts of short communication were published in a booklet issued to members during the Congress. We perceive a strong interest for applied mathematics and the increasing weight of computers. In the Congress presentation it is observed that the different streams of research make it impossible to reach a synthesis.

There were eight sections; the eighth, entitled *Education*, contains titles and authors' names for 20 short communications (p. XXXIII); there were not invited talks. No section was dedicated to history. At p. XXXVI of the proceedings we read that:

Within section 8 there were also three special meetings organized by the International Commission on Mathematical Instruction with reports followed by discussion on the following topics:

1. Which subjects in modern mathematics and which applications of modern mathematics can find a place in programs of secondary school instruction? (Reported by J. G. Kemeny)
2. Connections between arithmetic and algebra in the mathematical instruction of children up to the age of 15. (Reported by S. Straszewicz)
3. Education of the teachers for the various levels of mathematical instruction. (Reported by K. Piene).

Some exhibitions were arranged: an exhibition of books organized by international publishers, a special exhibition on school textbooks organized by the International Commission on Mathematical Instruction, and an exhibition "dealing with computers and other technical equipment" (p. XXXVII) arranged by the International Business Machines Svenska AB, the Facit Electronics AB and the Telefon AB L. M. Ericsson.

Moscow (URSS), 16-26 August 1966

Petrovsky, I. G. (Ed.) (1968). *Proceedings of the International Congress of Mathematicians*. Moscow: Printing House "MIR". One volume: 727 pages.

Many texts, including the Congress presentation in the introduction, are written in Russian, which was admitted as one of the official languages since 1958, together with English and

French. The proceedings contain the texts of one-hour reports (pp. 33-248), half-hour reports (pp. 249-680), reports received after January 1, 1967 (pp. 681-722). Half-hour reports are divided in sections. Section 15 (*History and pedagogical questions*, pp. 664-680) contains one historical contribution. In the volume of abstracts (796 pages) the 15 sections are numbered separately; section 15 (28 pages) contains 73 abstracts.

Nice (France), 1-10 September 1970

Berger, M., Dieudonné J., Leray, J., Lions, J. L., Malliavin, P. & Serre, J. P. (Eds.) (1971). *Actes du Congrès International des Mathématiciens*. Paris: Gauthier-Villars. Vol. 1: XXXIII + 532 pages. Vol. 2: 959 pages. Vol. 3: 371 pages.

In the general assembly of IMU held in Menton (France) just before ICM, president H. Cartan mentioned the special and very important role of ICMI among the commissions of IMU and acknowledged the work of its chairman H. Freundenthal in the period 1967-1970. No mention was made to the remarkable initiative of the first ICME held in 1969.

There were six sections. Volume 3 contains the contributions presented in the section F *Histoire et enseignement* (History and teaching, pp. 331-367). This section is split in F1 *Histoire des mathématiques* (History of mathematics, one contribution, pp. 333-334) and F2 *Enseignement des mathématiques* (Mathematics teaching, four contributions, pp. 335-367). There is reference to ICMI in the talk of Z. Krygowska ('Problèmes de la formation moderne des professeurs de mathématiques', Vol. 3, pp. 347-351). She mentions the following recommendation to ICMI contained in the resolutions of the first ICME of 1969 (quoted as *Premier Congrès de l'Enseignement Mathématique*) held in Lyon: "(2) as regards the form of the next Congress, to pay more attention to pre-school education, elementary education, mathematical education for the whole of the young people, and adult education." The consideration of all school levels marks a new trend of ICMI policy with respect to the past, when focus was mainly on secondary/tertiary education. Krygowska remarkably stresses the importance of the presence of chairs in mathematics education. The contribution by H. B. Griffith ('Mathematical insight and mathematical curricula', Vol. 3, pp. 335-345) is a good mirror of the situation of mathematics education at that time. It touches the theme of modern mathematics, the influence of Bourbaki, and of mathematics projects such as Nuffield project. The references contain papers published in the just founded journal *Educational Studies in Mathematics*. Krygowska's and Griffith's contributions validate, in a different manner, the existence of a new discipline. As Griffith (p. 345) put it, "I hope to have indicated something of the problems involved in the design of modern curricula, using the principles of the emergent activity "Mathematical education"." Other two papers about teaching issues are also remarkable: 'On teaching application of mathematics' by H. O. Pollak (pp. 353-357) and 'Quelques aspects de l'enseignement des mathématiques en U.R.S.S.' by S. L. Sobolev (pp. 359-367).

Vancouver (Canada), 21-29 August 1974

The Publications Committee composed by Daigneault, A., Gratzner, G. A., Heilbronn, H. A., James, R. D. (chairman, "editor" in the counter-cover), Luft, E. & Moser, W. O. J. (Eds.) 1975. *Proceedings of the International Congress of Mathematicians*. Canadian

Mathematical Congress. Vol. 1: LV + 552 pages, with photos. Vol. 2: VIII + 600 (pp. 587-600 short communications).

In the talk delivered in the opening ceremonies H. M. Coxeter (Vol. 1, pp. XV-XVII) stressed the change of the role of mathematics, no more “art for art’s sake” (p. XVI). The crisis of vocations in mathematics is also mentioned. In the introductory part there is no mention of ICMI.

There are 20 sections; the twentieth is entitled *History and education* (Vol. 2, pp. 547-586). It contains three historical contributions by B. V. Gnedenko (pp. 549-560), T. Hawkins (pp. 561-570), C. Truesdell (pp. 577-586), and one contribution on education by G. Matthews (pp. 571-576).

Helsinki (Finland), 15-23 August 1978

Lehto, O. (Ed.) (1980). *Proceedings of the International Congress of Mathematicians*. Helsinki: Academia Scientiarum Fennica. Vol. 1: 506 pages. Vol. 2: 516 pages.

A volume containing abstracts of about 500 10-minute communications and of the 40 works presented in poster sessions was distributed to members at registration in Helsinki. In this Congress there were participants from a higher number of countries than ever before (Vol. 1, p. 9), due also to the creation of the African Mathematical Union and the personal efforts made by U. D’Ambrosio in Latin America. In the closing ceremonies’ chapter we read that some countries worked against internationalization by not allowing their mathematicians to attend the Congress. It was regretted that China was not member of the Union.

In the introductory chapter we read “Unofficial mathematical activities also included a three-day symposium organized by the International Commission on Mathematical Instruction” (p. 7, Vol. 1). ICMI is also mentioned in the chapter “Closing ceremonies” (Vol. 1, p. 13), by stressing the fact that it has “a history antedating that of our [of mathematicians] Union. Under the able guidance of its chairman, Professor Iyanaga, and its secretary, Professor Kawada, it has continued and expanded its valuable role. Its activities [...] are too varied to be described here: it is sufficient to remind you of the successful conference at Karlsruhe [he refers to the third ICME] two years ago”.

There were 19 sections. Section 19 (Vol. 2, pp. 1005-1020) is entitled *History and education*. It contains two papers, one (mainly historical) written in Russian, the other (by T. Banchoff, pp. 1005-1013) about computer-based animation.

Warsaw (Poland), 16-24 August 1983

Ciesielski, Z. & Olech, C. (Eds.) (1984). *Proceedings of the International Congress of Mathematicians*. Warszawa: PWN - Polish Scientific Publishers; Amsterdam – New York - Oxford: North Holland. Vol. 1: LXII + 848 pages, with photos. Vol. 2: X + 882 pages.

The Nevanlinna Prize was awarded for the first time. In the first volume ICMI is mentioned (p. XIII, Vol. 1): “A Symposium of the International Commission on Mathematical Instruction was held in four afternoons, accompanied by a seminar of the International Group on the Relation between History and Pedagogy of Mathematics affiliated to ICMI”.

There were 19 sections. Volume 2 contains the three contributions of Section 19 (*History and education*): by H. Freudenthal (“The implicit philosophy of mathematics history and

education', pp. 1695-1709), A. V. Pogorelov (pp. 1711-1716), J. B. Serrin, (pp. 1717-1728).

Berkeley (USA), 3-11 August 1986

Gleason, A. M. (Ed.) (1987). *Proceedings of the International Congress of Mathematicians*. Washington DC: MAA. Vol. 1: CII + 870 +2A pages, with photos. Vol. 2: III + 838 pages.

There were 19 sections. In one of the talks of the opening ceremonies, R. Johnson, science advisor to the president, mentioned the crisis of vocation in science and mathematics. Half of the Soviet speakers did not attend. The ICSU article on nondiscrimination is mentioned. The general assembly meeting in Oakland before the Congress had accepted Ivory Coast and People's Republic of China as new members, thus reaching the total number of 53 members. The two commissions of IMU (ICMI and CDE, Commission on Development and Exchange) are mentioned.

There were 20 sections. Section 18 is entitled *History of mathematics*. In Section 19 (*Teaching of mathematics*) there were 29 short communications, whose titles and authors are listed at pages LXXV-LXXVI of Vol. 1. In the proceedings the invited addresses are printed in sequence without indicating the separation between sections. In Vol. 2 the three invited addresses at the section meetings on teaching mathematics are reported: J. V. Grabiner ('The centrality of mathematics in the history of Western thought', pp. 1668-1681), J. P. Kahane ('Enseignement mathématique, ordinateurs et calculettes', pp. 1682-1696), Z. Semadeni ('Verbal problems in arithmetic teaching', pp. 1697-1706).

In 1983 ICMI had decided to carry out a study on the influence of computers in mathematics and its teaching. The meeting was held in Strasbourg in 1984. Kahane's contribution reports on this study and records the new initiative of ICMI studies that would have turned out to be very important in the next years. In note 1 the author reminds the readers what ICMI is and how it is organized.

Kyoto (Japan), 21-29 August 1990

Satake, I. (Ed.) (1991). *Proceedings of the International Congress of Mathematicians*. Tokyo - Berlin - Heidelberg - etc.: The Mathematical society of Japan, Springer-Verlag. Vol. 1: LXXXVII + 768 pages, with photos. Vol. 2: XIII + 916 pages.

This was the first Congress held outside Europe and North America. We note in the introductory part describing the history of the Congress that speakers were selected according to politically correct criteria, taking into account the presence of women and small countries' representatives.

It is reported that, at the end of the Congress, the General Assembly appointed the ICMI and CDE commissions. The ICME congress to be held in Quebec was announced.

There were 18 sections. Section 18 (Vol. 2, *History, teaching and the nature of mathematics*, pp. 1639-1681) contains four contributions: two about history, one about the nature of mathematics, and one about education (H. Murakami, pp. 1673-1681). Summaries of the 22 short communications in this section and of the two short communications in the post deadline section were printed in the *Abstracts*, issued to members during the Congress.



Zurich (Switzerland), 3-11 August 1994

Chatterji, S.D. (Ed.) (1995). *Proceedings of the International Congress of Mathematicians*. Basel - Boston - Berlin: Springer Verlag. Vol. 1: LXXI + 717 pages, with photos. Vol. 2: XIII + 887 pages.

There were plenary one-hour addresses, and invited addresses (45-minute) presented at the Section Meetings 1-19. In addition, there were five lectures organized by ICMI and five lectures organized by ICHM which were scheduled along with the section lectures. The texts of these lectures and of the abstracts of short communications were printed in two volumes given to participants at the time of their registration at the Congress. At p. XXXII of Volume I the names of the ICMI executive committee are listed.

Section 19 is entitled *History of mathematics* (Vol. 2, pp. 1568-1603). Section 18 (*Teaching and popularization of mathematics*, Vol. 2, pp. 1546-1567) contains the invited lectures by D. Hughes-Hallett (pp. 1546-1550), J. Schneider (pp. 1551-1558), J. Stillwell (pp. 1559-1567). We note the expression “popularization of mathematics” that shows the mathematical community’s concern for the perception of mathematics in society.

Berlin (Germany), 18-27 August 1998

Fischer, G. & Rehmann, U. (Eds.) (1998). *Proceedings of the International Congress of Mathematicians. Documenta Mathematica, Journal der Deutschen Mathematiker-Vereinigung*, Extra volume ICMI 1998. Vol. 1: 662 pages, with photos. Vol. 2: 881 pages. Vol. 3: 825 pages.

For the first time the proceedings of an ICM have been produced completely electronically, without any commercial assistance; contributions have been sent electronically by the authors. There were plenary lectures, 45-minute lectures at the section meetings, short communications. At p. 55 the names of ICMI officers are listed. Volumes containing abstracts of short communications and poster sessions were given at the moment of registration. The concern to reach out the non-mathematical public during the Congress is showed by the fact that in Urania, an institution with a long tradition in the popularization of science, there were exhibitions and various activities for a non-specialized audience and for high-school students.

There were 18 sections. Section 19 was entitled *History of mathematics* (Vol. 3, pp. 789-822). Section 18 (*Teaching and the popularization of mathematics*, (Vol. 3) contains contributions by G. E. Andrew (pp. 719-721), M. Artigue (pp. 723-733), M. G. Bartolini Bussi (pp. 735-746), M. De Guzmán, B. R. Hodgson, A. Robert and V. Villani (pp. 747-762, panel), D. J. Lewis (pp. 763-766), M. Niss (pp. 767-776), D. A. Smith (pp. 777-787).

Beijing (China), 20-28 August 2002

Li, T. (Ed.) (2002). *Proceedings of the International Congress of Mathematicians*. Beijing: Higher Education Press. Vol. 1: IX + 657 pages, with photos. Vol. 2: IV + 823 pages. Vol. 3: IV + 960 pages.

For the first time a woman, R. Piene from Norway, and a Chinese, Zhiming Ma, were elected members of the executive committee of IMU. Resolution seven concerns security measures and moreover stresses both freedom and independence of science. Volume 1 lists

the names of the executive committee of ICMI (pp. 30-31) elected at the 14<sup>th</sup> general assembly of IMU, which took place in Shanghai before ICM.

There were 19 sections. Section 18 (*Mathematics education and popularization of mathematics*, Vol. 3, pp. 873-920) contains the reports of one panel (D. Loewenberg Ball, C. Hoyles, H. N. Jahnke & N. Movshovitz-Hadar, pp. 907-920) and three talks (J. L. Dorier, pp. 875-884; V. L. Hansen, pp. 885-895; S. Xiao, pp. 897-906). Section 19 is entitled *History of mathematics* (Vol. 3, pp. 921-958). In Volume 1, among the 45-minute talks, we find the invited panel on 'International comparisons in mathematics education: an overview' (G. Kaiser, F. K. S. Leung, T. Romberg & I. Yaschenko, pp. 631-646).

Madrid (Spain), 22-30 August 2006

The Proceedings of this Congress are expected to be published in three volumes (Editors: Sanz-Solé, M., Soria, J., Varona, J. L. & Verdera, J.).

There were 20 sections. Section 20 was entitled *History of mathematics*. Section 19, entitled *Mathematics education and popularization of mathematics* included three panels and two papers.

In 2006 M. Artigue has been elected president of ICMI. She is the second non-mathematician president after D. E. Smith. Artigue is also the first woman president. In the future the executive committee will no more be appointed by IMU. Is ICMI ready for new challenges?

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<sup>i</sup> In this paper the acronym ICMI (International Commission on Mathematical Instruction) is adopted, but at the beginning the most used acronyms were CIEM (Commission Internationale de l'Enseignement Mathématique) or IMUK (Internationale Mathematische Unterrichtskommission). ICMI was named differently over the years, due also to the slightly different meanings of the words education, teaching, learning, instruction, pedagogy, didactic in the four official languages of ICMI (English, French, German, Italian). In this paper I mainly use the expression "mathematics education", but, referring to the past, teaching or instruction or pedagogy would be more appropriate words.

<sup>ii</sup> In this paper there will be short information on sections concerning history, whose evolution parallels pedagogical sections.

<sup>iii</sup> Section IV, having acknowledged the importance of a compared examination of the various Nations' programs and methods of mathematics teaching in Secondary schools, gives to professors Klein, Greenhill and Fehr the task of constituting an international Committee which investigates on this matter and reports to the next Congress. (In this paper the translations are by the author).

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