CMESG GCEDM

NEWSLETTER

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**The NEWSLETTER is a publication of the
Groupe canadien d'étude en didactiques des mathématiques
Canadian Mathematics Education Study Group**

CMESG is a group of mathematicians and mathematics educators who meet annually to discuss mathematics education issues at all levels of learning. The aims of the Study Group are:

1) to study the theories and practices of the teaching of mathematics

2) to promote research in mathematics education

3) to exchange ideas and information about all aspects of mathematics education in Canada

4) to disseminate the results of its work.

GCEDM est composé de mathématiciens et de didacticiens des mathématiques qui se réunissent une fois par année pour étudier diverses questions relatives à l'enseignement des mathématiques à tous les niveaux. Les objectifs du Group d'Étude sont les suivants:

1) faire l'étude de diverses theóries et practiques de l'enseignement des mathématiques
2) promouvoir la recherche enseignement des mathématiques
3) assurer des échanges d'idées et d'information sur tous les aspects de l'enseignement des mathématiques au Canada
4) assurer la diffusion des résultats de ses travaux.

CMESG/GCDEM Reception at ICME
COME ONE--COME ALL

The GCDEM/CMESG monograph, *Current Research on the Teaching and Learning of Mathematics in Canada,* will be unveiled at the reception during the opening day of ICME.

The reception will take place during the Social Hour on August 17th, 17:00-19:00, in a room adjacent to the main reception area. Pick up a glass of spirits from the bar and then drift over to the GCDEM/CMESG reception. Members are invited, indeed encouraged, to attend this event at which our President, Tom Kieren, will make a special presentation of the monograph on behalf of the membership. Incidently, a short AGM will be held in conjunction with the reception, but it won't be so long as to interfere with the conviviality of the event!

Copies of the monograph will be available for distribution to members of GCDEM/CMESG, and for sale to other attendees at the conference.

PRESIDENT'S MESSAGE

This year, 1992, is an interesting one for CMESG/CGEDM. We are coming off a highly successful meeting in Fredericton, the proceedings of which are about ready to go to press thanks to Martyn Quigley and our Newfoundland connection. I received many favourable comments about the nature, the structure, the contents, the size and, of course, the hospitality of that meeting. The quality of the meetings and the ambiance surrounding them can be attributed to many people:

our hosts from the mathematics education community at UNB and in New Brunswick; to those who made special contributions to the programme; and to all of us who attended and hence made our own contribution to the success of the meeting. Such favourable comments suggest to me that our meetings contribute a great deal to those attending and give us, the Executive, confidence that CMESG/CGEDM meetings of this nature will typify our future as well. [You will notice elsewhere that the executive has been made aware of the development of a "math group" at CSSE and that we have decided to continue our meetings in our usual fashion.]

But, in 1992, for this year only, we are changing our normal pattern. Because of our strong commitment to the International Congress on Mathematics Education at Laval in Québec City in August, we will have a short business meeting in conjunction with that meeting. In addition, we will have a reception for the unveiling of our new Monograph on research in mathematics education in Canada at the ICME meeting and it will be part of the Canadian special display there. I hope you will be going to ICME in Québec in August. It represents a significant opportunity to interact first hand with leaders of developments in mathematics education at all levels from throughout the world. In these days when our Canadian mathematics experiences and curriculum are being challenged, it will be useful for each of us - teachers, supervisors, government specialists or university professors - to take the opportunity to inform ourselves of developments in mathematics teaching on a worldwide basis. While you are there, I hope you will join your CMESG/GCEDM colleagues at our meeting and following reception.

The monograph, *Current Research on the Teaching and Learning of Mathematics in Canada*, mentioned above is an attempt by CMESG/GCEDM to inform all members of the community of interest in mathematics education in Canada of the resources in new ideas and people available to those making decisions about mathematics curriculum and teaching in Canada. Carolyn Kieran and Sandy Dawson have done an outstanding job, with the help of many of you throughout the country, to put this excellent source of information in our hands. Look for it at ICME and in your mail afterwards! I hope it will be useful in your work and that you will want to suggest its use and value to others with whom you work.

Tom Kieren
President
CMESG/GCEDM

A note from the Executive in the matter of CSSE

You may recently have received letters or notices from individuals or from CACS (Canadian Association for Curriculum Studies) regarding the formation of a mathematics subgroup within CSSE. Because of the importance of the CSSE and the Learneds meetings within the Canadian educational context, we recognize that some colleagues desire a forum for mathematics education within that framework. Indeed, on a number of occasions the CMESG/GCEDM Executive has been asked to explore a closer relationship with CSSE.

Our relationship to CSSE was discussed at the last Executive meeting held in Montreal in November 1991. At that meeting we considered again the pros and cons of a closer liaison. As in the past the decision of the Executive was not to look for closer ties for a number of reasons, the most prominent of which are:

1) The format of the CSSE/Learneds meeting precludes our Working Group format. This has always been considered a strong feature of the CMESG/GCEDM meeting.

2) The size of the Learneds meeting and the diversity of competing attractions is seen as detrimental to the smallness and closeknit feeling of our own meeting.

3) CMS (The Canadian Mathematics Society) is not part of the Learneds. It has always been considered a strong feature of CMESG/GCEDM that we continue to attract a significant proportion of our membership from the mathematics community. There is a sense that moving to the Learneds would endanger this membership. Furthermore, we have on a regular basis located our meeting

geographically closed to the CMS meeting in order to enable participation of both constituencies. Indeed, a few overlapping meetings with joint sessions have been held in the past.

The CMESG/GCEDM Executive is open to further discussion on this matter either by direct communication to it or in open discussion at the AGM. The Executive is elected by the membership of CMESG/GCDEM and endeavors to respond to the desires of the membership. In the meantime, we wish well to those mathematics educators who desire to organize in another forum.

Member Reports

The editors of the Newsletter solicited reports on the activities of members of GCDEM/CMESG. Two reports were submitted, one by David Robitaille of UBC, and a second by Lars Jansson of the University of Manitoba. The editors are anxious to received reports from other members. Won't you take a few moments and drop us a page or so about your research, curriculum development, or teaching activities?

The Third International Mathematics and Science Study

David Robitaille
University of British Columbia
International Coordinator for TIMSS

The headquarters of Third International Mathematics and Science Study (TIMSS) are located in the Department of Mathematics & Science Education at the University of British Columbia, under the direction of David Robitaille. TIMSS is a massive study whose goals are to investigate the teaching and learning of mathematics and science at the elementary and secondary school levels (ages 9, 13 & 17–18) around the world. International coordination of TIMSS is being funded by the B.C. Ministry of Education, the Canadian government, and the U.S. government. All participating countries are expected to contribute as well.

TIMSS will not only measure students' achievement in mathematics and science worldwide, but will also investigate differences in curriculum, instruction and student outcomes. The focus for TIMSS is to gain a better understanding of the relationships between context, curriculum (intended, implemented and attained), instructional practices and achievement. The investigation of factors that may influence achievement sets TIMSS apart from other similar studies of mathematics and science achievement.

The first aspect of the study is a thorough analysis of the curriculum in mathematics and science in the participating countries, with particular emphasis on the topics in science and mathematics offered at the populations of interest. A report on the curriculum analysis is expected to be released early in 1993. Data about the structure of the education systems, the qualification procedures for teachers, and the examination systems in each of the countries will provide a rich contextual framework for understanding the differences and similarities in science and mathematics education around the world. A series of monographs describing these systemic factors is planned for release early next year.

The design of TIMSS includes a set of investigations of the science and mathematics attainments for four different student populations of the K–12 system: 1) the level or grade which includes most nine year olds, 2) the level or grade which includes most thirteen year olds, 3) the general population of students completing the last year of secondary education, and 4) students completing secondary school with some degree of specialization in either mathematics or science. The major source of data on students' achievement in mathematics and science will be collections of multiple-choice items selected on the basis of their relationship to the international curriculum grids developed for the TIMSS study. Questionnaires designed to elicit information about students' and teachers' backgrounds will be included for descriptive comparisons and to act as controls for multivariate analyses. School and classroom variables, including school climate, opportunity to learn, and time on task, will be investigated in a

variety of relational analyses to be conducted. Piloting of instruments has begun and will continue through this spring; a full "dress rehearsal" is scheduled for May 1993 with actual testing to begin in May 1994. The first international report of results is scheduled for the end of 1995.

More than 50 countries from all regions of the world and at all levels of economic development have made commitments to participate in TIMSS. An additional 15–20 countries have expressed interest in becoming involved and we continue to receive inquiries from other nations. Though the TIMSS study is already underway, this overwhelming interest in the study has resulted in plans to include new partners in the study in either a modified or a more comprehensive way in a later phase of the TIMSS.

TIMSS is a complex undertaking involving large numbers of individuals, committees and organizations in several nations around the world. Educators, administrators, curriculum designers, policy makers, and governments have great expectations of the information that TIMSS will provide. TIMSS is already providing information of significant value and will continue to do so throughout the life of the project and on into the early years of the 21st century. Academics wishing to spend time working on various aspects of TIMSS should write to David Robitaille at UBC for information.

Project Prometheus

Harvey Williams, Director
Lars Jansson, Assistant Director

IBM–Canada and the University of Manitoba have joined in a 3-year cooperative project to promote mathematics and science literacy in grades K–12. The project, entitled Project Prometheus, is housed in the Faculty of Education and is aimed at exploring the application of information technology to mathematics and science education. IBM is contributing over $500 000 in computer hardware and software and the University of Manitoba an equal amount in support of project activities.

The Project publishes an occasional newsletter entitled *The Pony Express*. This name was chosen because it reminded us of the Yuppie family that moved to a hobby farm. By the time the family was unpacked, the young daughter had disappeared. After a frantic search, the father found the girl in a dilapidated, old shed on a distant corner of the property, digging through a pile of horse manure. When she saw her father, the girl cried, "Daddy, with all this horse manure, there must be a pony in here some place." Project Prometheus, like the Yuppie girl, will dig through piles of promising computer applications for computer solutions to instructional problems in science and mathematics education.

In the last ten years, schools have used computers as aids to instruction, as creative tools for learners and as management tools for teachers and administrators. While the number of teachers that feel comfortable using computers has increased, the actual proportion of teachers using computers is still relatively small. Recent research in Manitoba indicates that, even among secondary school mathematics and science teachers, computer use in the classroom is limited.

Accordingly, Project Prometheus will:

1. explore applications of information technology to promoting literacy in mathematics and science;

2. encourage use of information technology in mathematics and science instruction;

3. seek to reduce the traditional time lag between innovation and application of computers to teaching and learning in mathematics and science;

4. identify and evaluate the most promising applications of information technology to teaching and learning in science and mathematics.

Project Prometheus combines undergraduate and graduate teacher education with classroom-based research, development, and innovation in computer applications in science and mathematics education. Science and mathematics education laboratories in the Faculty of Education have been equipped with computer hardware and software and multimedia systems which connect computers with interactive videodisc players. Six computer mini-networks and five multimedia systems have been placed in

cooperating schools linking university-based research and development with day-to-day instruction in science and mathematics. Equipment placed in schools is at the sole disposal of the Project and the participating teachers. Upon completion of the project, the equipment will become the property of the participating schools.

Participating schools provide a naturalistic setting in which to test hypotheses, try out innovative applications, and originate and demonstrate their effectiveness. Other areas for research include student and teacher factors in educational computer implementation, classroom organizational structures for effective computer use and affective issues such as "math anxiety" and teacher and student attitudes toward computers.

In addition to the ongoing activities with participating schools, a summer institute for teachers is planned for 1992 and a major conference for 1993. Further information about the Project may be obtained by contacting Harvey Williams, or Lars Jansson.
Telephone: (204) 474–9086;
FAX: (204) 275–5962;
E-mail: Jansson@ccm.Umanitoba.CA.

PROFESSIONAL MEETINGS IN 1992/1993

1992

American Educational Research Association **[AERA]**, April 20-24th, San Francisco, CA.

Canadian Mathematical Society **[CMS]** / Société Mathématique du Canada., June 12-14.

Canadian Society for the Study of Education **[CSSE]**, The Learned Societies. June 5-8, Charlottetown, PEI.

Logo and Mathematics Education VI **[LME6]**, July 16-20, Vancouver, BC.

Psychology of Mathematics Education **[PME & PMENA]**, August 7 -11, Durham, NH.

International Congress of Mathematics Education **[ICME]**, August 17-23, Quebéc City, QC.

Montréal Regional Meeting of the National Council of Teachers of Mathematics **[NCTM]** , August 23-25, Montréal, QC.

1993

71st National Council of Teachers of Mathematics **[NCTM]**, Research Pre-Session, March 28-29th, Seattle, WA.

American Educational Research Association **[AERA]**, April 12-16th, Atlanta, GA.

GCEDM/CMESG Annual Meeting, May 27-31st, (Dates tentative, location TBA)

Psychology of Mathematics Education **[PME]**, August 8 -12, Japan.

North American Group of Psychology of Mathematics Education **[PMENA]**, October, Santa Barbara, CA (date and location tentative).

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This edition of the Newsletter was edited by Sandy Dawson and Rina Zazkis of Simon Fraser University. Please submit contributions to/Veuillez envoyer vos contributions à:

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1991 - 1993

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RENEWAL TIME FOR

membership in

CMESG/GCDEM

It is time once again for colleagues to renew their membership in GCDEM/CMESG. The attached sheets provide information regarding how to renew your membership.

Please do not wait to complete the membership form, and mail it to Lars Jansson at the University of Manitoba.

Renewal of your membership will entitle you to a copy of the monograph which can be picked up at ICME 7 in Québec City in August.

Your Executive will be meeting in September at Tom Kieren's retreat in the Rockie Mountains of Alberta. The Executive is anxious to hear your views on matters relating to the Group and would welcome your input.

Please contact Tom, or any other member of the Executive, by email, snail mail, or heaven forbide in this electronic age, talk to them face-to-face at ICME in Québec City in August.

HOPE TO SEE YOU AT ICME IN AUGUST

Newsletter Insert

CALLING ALL MATHEMATICS EDUCATORS

CMESG membership for the 1992-93 year is now due! As you probably know, there will be no regular annual meeting this year because of ICME-7 in Quebec. We will hold the constitutionally required business meeting in Quebec at the time of ICME and just prior to a social ceremony unveiling the CMESG Research Monograph prepared for the occasion. This monograph, prepared by Carolyn Kieran and Sandy Dawson and entitled *Current Research on the Teaching and Learning of Mathematics in Canada*, will be made available to all paid up members as part of their membership and in lieu of the usual Proceedings. If you are attending ICME, you will be able to pick up your copy at the CMESG desk at the Canadian Presentation. For those members not in attendance, the Monograph will be mailed in the fall.

A membership form is enclosed with this Newsletter and we hope that you will return it promptly. Because there is no annual meeting this year in June, we are particularly dependent upon the prompt return of membership forms and fees. Any questions on this matter may be directed to the Secretary-Treasurer:

Lars C. Jansson
FAX: 204-275-5962 or Email: JANSSON@CCM.UMANITOBA.CA

RAPPEL A TOUS LES PROFESSEURS DE MATHÉMATIQUES

Les cotisations annuelles pour 1992-93 sont maintenant dues. Comme vous le savez probablement, il n'y aura pas de rencontre annuelle du groupe cette année en raison du congrés ICME-7 qui se tiendra à Québec. Nous aurons cependant une réunion d'affaires de notre association pour satisfaire aux exigences de la constitution du GCEDM/CMESG. Cette réunion se tiendra durant le congrés (ICME-7), juste avant une rencontre sociale, lors de laquelle sera présentée la monographie du GCEDM/CMESG sur l'état actuel de la recherche sur l'enseignement et l'apprentissage des mathématiques au Canada. Cette monographie, préparée pour l'occasion par Carolyn Kieran et Sandy Dawson; intitulée *Les recherches en cours sur l'apprentissage et l'enseignement des mathématiques au Canada*, sera remise à tous les membres qui auront acquité leur cotisation pour 1992-93 à la place du compte rendu de la rencontre annuelle. Si vous pensez assister au congrés ICME-7, vous pourrez récupèrer votre copie de la monographie à la table du GCEDM/CMESG, au kiosque de la présentation canadienne. Ceux qui n'assisteront au congrés ICME-7, recevront leur copie par courrier cet autômne.

Vous trouverez dans le présent bulletin un formulaire d'adhésion que nous vous demandons de retourner le plus tôt possible. Faute de rencontre annuelle en juin, nous sommes particulièrement dépendants de votre fidélité à renvoyer les formulaires d'adhésion ainsi que les frais d'adhésion. Pour toute question concernant se sujet veuillez contacter le Secrétaire- Trésorier:

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