

The NEWSLETTER is a publication of the 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.*

Ce BULLETIN est une publication du Groupe canadien d'étude en didactique des mathématiques

Le GCEDM est composé de personnes oeuvrant en mathématiques et en didactique des mathématiques et qui se réunissent une fois par année pour étudier diverses questions relatives à l'enseignement des mathématiques à tous les niveaux. Les buts du Groupe sont les suivants:

- 1) *susciter une réflexion critique sur la théorie et la pratique de l'enseignement des mathématiques*
- 2) *encourager la recherche en didactique des mathématiques*
- 3) *faciliter l'échange d'idées et d'information sur tous les aspects de l'éducation mathématique au Canada*
- 4) *faire connaître les résultats de ses travaux.*

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PRESIDENT'S MESSAGE DE LA PRÉSIDENTE

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Greetings and welcome to our first newsletter of the Year 2000 - the Year of Mathematics.

Thank you for the confidence you have shown by ratifying me as CMESG President for another term. I would like to introduce to you the other members of the executive:

Elaine Simmt (elected for a 2-year term)

Bill Higginson and David Reid (coopted for 1-year terms)

and, of course, continuing their terms: Olive Chapman and Frederic Gourdeau.

You have all received by now the conference programs for our 2000 Annual Meeting in Montreal, and the information about accommodation. The program looks very exciting. I am looking forward to attending the meeting, and hope to meet all of you there!

I would like to mention one important event which just missed the deadline of our Fall 1999 Newsletter. At the CMS Winter 99 Meeting in Montreal, our colleague and former member of the executive, Eric Muller, was awarded the 1999 Adrien Pouliot Award.

The Adrien Pouliot Award, created by the Canadian Mathematical Society, is given yearly for significant and sustained contributions to mathematics education in Canada. Here is what *CMS Notes* says about Eric in the announcement of the report:

Many members of the Canadian mathematical community are aware of Eric Muller's work to the extent that they could provide a list sufficient to justify his selection for the award. Yet they are likely to be aware of only some of things he has done to enrich the mathematics education environment in Canada and beyond. These include: development of numerous courses at Brock University, courses with a wide range of target students; creation and sustained support of Math Trails, and Math and Science Camps, and teacher workshops with regional and provincial scope; service in a variety of executive and planning roles on behalf of the Canadian Mathematics Education Study Group, of International Congresses on Mathematics Education, of the International Commission on Mathematics Instruction, of the Fields Institute, and of our own society.

But a breathless list of some of Eric Muller's service and contributions does not do justice to the personal qualities that augment the impact of his work. People who have worked with him know of his passion for teaching and learning mathematics, of his vision, coupled with the energy to make that vision real, of his wonderful blend of imagination and practical acumen, his focus on the needs of the community he serves, and of his ability to bring people together on behalf of a stronger mathematical education community. In presenting to Eric Muller the 1999 Adrien Pouliot Award, the Canadian Mathematical Society speaks on behalf of an extended community that is grateful for all he has done on our behalf.

The award was presented by Adrien Pouliot Jr (the grandson of the man after whom the prize was named), and Bernard Hodgson, the 1998 recipient of the prize.

We are all very proud of you, Eric!

(You can see the article and the picture on line, at <http://camel.math.ca/CMS/Notes/> - choose No.1 February).

Report on the Millennium Project

In the previous Newsletter, I presented to you a proposal for the CMESG Millennium Project: an invitation to all Canadians to write a short (1 - 2 pages) essay: My most memorable experience with mathematics. I asked for your comments - and for people who are interested in working on the project. I haven't received too many responses, possibly due in part to the new format of the newsletter (how many people did read about it?). However, there are a few people interested in going ahead with the project. At this point, Ed Barbeau, Rick Seaman, Doug Franks and Elaine Simmt agreed to be involved. We don't have, as yet, representatives of all provinces, which is what I was hoping for. And my own workload this semester did not allow me to be more active in organizing the project or recruiting more volunteers. However, I would like very much to pursue this idea - although the deadlines will have to be extended.

I have asked the students I teach this semester to write about their experiences with math, and some of the responses I am getting are extremely interesting! This is an exercise which can be very rewarding.

Bienvenue à notre premier bulletin de l'an 2000, Année mondiale des mathématiques.

Je tiens tout d'abord à vous remercier de la confiance que vous m'avez témoigné en ratifiant mon élection comme présidente du GCEDM pour un deuxième mandat. Permettez-moi de vous présenter les autres membres du Comité exécutif :

- ? Elaine Simmt, élue pour deux ans
- ? Bill Higginson et David Reid, membres cooptés pour un an
- ? et, bien sûr, Olive Chapman (trésorière) et Frédéric Gourdeau qui poursuivent leurs mandats.

Vous avez tous reçu le programme et l'information pour notre rencontre annuelle 2000 à Montréal. Le programme s'annonce passionnant. J'ai hâte de participer à la rencontre et j'espère tous vous y rencontrer !

J'aimerais signaler un événement important que nous n'avons pu mentionner dans notre bulletin de l'automne. Lors de la rencontre d'hiver de la Société mathématique du Canada à Montréal, notre collègue et ancien membre de l'exécutif Eric Muller s'est mérité le prix Adrien-Pouliot 1999.

Le prix Adrien-Pouliot est décerné annuellement par la SMC afin de souligner la contribution soutenue et importante d'un individu à l'éducation mathématique au Canada. Voici ce qui est écrit à propos d'Eric dans *Les notes de la SMC*.

Nombreux sont les membres de la communauté mathématique canadienne qui connaissent le travail d'Eric Muller au point de pouvoir fournir une liste suffisamment longue pour justifier son choix comme lauréat. Mais ces personnes ne connaissent probablement qu'une partie de tout ce qu'il a fait pour l'enseignement des mathématiques au pays et à l'étranger. Il a notamment élaboré de nombreux cours à l'université Brock à l'intention d'un vaste éventail d'étudiants ; il a créé et appuyé de façon soutenue des Sentiers Mathématiques, des camps mathématiques et scientifiques, de même que des ateliers pour des enseignants à l'échelle régionale et provinciale ; il a occupé divers postes de nature administrative et organisationnelle au sein du groupe de travail sur l'éducation mathématique au Canada, de congrès internationaux sur l'éducation mathématique, d'une commission internationale sur l'enseignement des mathématiques, de l'institut Fields et de notre Société.

Mais une liste interminable, quoique partielle, des réalisations d'Eric Muller ne rendra pas pleinement hommage aux qualités personnelles qui accentuent le rayonnement de son œuvre. Ceux et celles qui ont travaillé avec lui connaissent sa passion pour l'enseignement et l'apprentissage des mathématiques, sa façon de voir les choses et l'énergie qu'il déploie à les concrétiser ; son merveilleux mélange d'imagination et de perspicacité ; son attachement à répondre aux besoins de sa communauté, et sa capacité de rassembler des gens pour créer un milieu dynamique dans le domaine de l'éducation mathématique. Au nom de la communauté mathématique élargie et en remerciement de tout ce qu'il a fait pour elle, la Société mathématique du Canada est fière de remettre le prix Adrien-Pouliot 1999 à Eric Muller.

Le prix lui a été remis par Adrien Pouliot Jr, le petit-fils d'Adrien Pouliot, et par Bernard Hodgson, récipiendaire du prix en 1998.

(Voir le site <http://camel.math.ca/CMS/Notes>, numéro de février, pour voir le texte et la photo de la remise.)

Rapport sur le projet du millénaire

Dans le bulletin précédent, je vous avais présenté un projet pour le GCEDM dans le cadre de l'arrivée du troisième millénaire : une invitation à tous les canadiens d'écrire un court texte (1 à 2 pages) à propos de leur expérience la plus marquante en mathématique. Je vous avais demandé vos commentaires et je vous avais demandé de me signaler votre intérêt. J'ai eu bien peu de réponses, mais cela est peut être du en partie au nouveau format de notre bulletin : combien l'ont effectivement lu sur l'hypertoile? Il y a cependant quelques

personnes qui ont manifesté leur intérêt : Ed Barbeau, Rick Seaman, Doug Franks et Elaine Simmt ont accepté de s'y engager. Nous n'avons cependant pas de représentants de toutes les provinces, ce que j'espérais. Ma charge de travail ce semestre ne m'a pas permis de recruter d'autres personnes et d'organiser le travail. J'aimerais vraiment aller de l'avant : il faudra cependant modifier le calendrier de travail proposé initialement.

J'ai demandé à mes étudiants d'écrire un tel texte et certaines des réponses que j'ai reçues sont extrêmement intéressantes. Il s'agit là d'un exercice qui peut être très valorisant !



WHAT'S HAPPENING IN MATH EDUCATION / CE QUI SE PASSE EN DIDACTIQUE DES MATHÉMATIQUES

Reflections on the Mathematics Education into the 21st Century Project

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Pamela Hagen was one of the Canadian educators to attend the Cairo International Conference on Mathematics Education into the 21st Century last fall. She sends the following report on the 1999 conference and plans for future conferences. Pam and Medhat Rahim (medhat.rahim@lakeheadu.ca) have been appointed Canadian representatives for the ongoing projects. They would be happy to forward to you further information.

By the time that this newsletter is published the new year and new millennium will be well upon us. In November 1999 three members of CMESG attended the International Conference on Mathematics Education into the 21st Century in Cairo, Egypt. This was in fact the last international mathematics education conference of the old millennium, something of a unique distinction. Medhat Rahim (Lakehead University), Gila Hanna (OISE, University of Toronto), and Pamela Hagen (Westwood Elementary, BC) each presented a paper which addressed an issue under the theme of Societal Challenges, Issues and Approaches.

At the conference 125 math educators from many countries around the world came together to discuss and share their experiences and ideas. Canada certainly has issues and difficulties in various areas of math education, but when compared to the global perspective Canada has little about which to worry and grieve. Canadian math educators are not being told that they cannot have professional groupings such as CMESG, because of the political situation. Nor are teachers having to deal with class sizes of 60 to 70 students in schools without support of any kind, nor are educators being prohibited from giving math education to certain groups of students because of a political and racial edict. We need to ask ourselves how we as Canadian educators can continue to strengthen our international contribution to mathematics education.

The *Mathematics Education Into the 21st Century Project*, in association with the Third World Forum and the National Centre for Human Resource Development - Jordan, is in the process of organising a seminar for November 2000 to be held in Amman Jordan [See the "More Conferences" section]. The title of the seminar, "Mathematics for Living", will provide an opportunity to continue the work of the Project and examine the global issues of mathematics education. Further conferences are planned for Tropical North Queensland, Australia, August 2001, and Sicily in 2002. By taking a moment to examine the Project's web site

(<http://www.vsg.edu.au/egypt99>), or contacting one of its co-ordinators, Alan Rogerson (arogerson@vsg.edu.au), CMESG members will get an opportunity to look towards the future for math education in our world.



An Interview with a Centenarian

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Arthur and colleague Marilyn Frankenstein recently published an interview with Dirk Jan Struik, who is alive and well in Belmont Massachusetts at 105 years old! It can be found at the following reference:

Powell, Arthur B., and Frankenstein, Marilyn. (1999). In His Prime: Dirk Jan Struik Reflects on 103 Years of Mathematical and Political Activities. *Harvard Education Review*, Vol. 69, No. 4 (Winter Issue).



National Testing in Mathematics for New Teachers

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- ? In a year group of one hundred and twenty five pupils, eighty percent achieved full attendance. How many pupils were absent on at least one occasion?
- ? A teacher wants to show a twenty minute video, which must finish exactly five minutes before the end of the lesson. The lesson will end at ten minutes past eleven o'clock. At what time must the video start?
- ? A department in a school ordered a set of text books. The cost of each book was £5.95, with a special offer of one free book in every 15 ordered. How much did 70 books cost?
- ? The above charts [two pie charts] were taken from a school's report to governors.

Indicate which of the following statements are true for pupils leaving Year 13 in 1998.

- Over 55% of pupils went into higher education.
- More than 1 in 13 took a gap year.
- Less than 1/4 went into employment.

By how many percentage points had the proportion of pupils entering higher education increased between 1998 and 1999? Give your answer to the nearest whole number.

I have recently returned from England, where I found many of the same educational issues and concerns that surround us in Canada, but the questions at the beginning of this article represent one major difference.

On June 1, 2000, all student teachers in England and Wales (about 25 000 of them) will take a Pass/Fail test to assess their performance in numeracy, no matter what subject or age level they are preparing to teach. This is the first subject area to be tested by the national Teacher Training Agency (TTA), to be followed by tests in literacy and in information and communications technology next year. If students fail the numeracy test, they will be

allowed a second chance to rewrite it in July. A second failure allows them to start their induction year, but they must pass the test before they can complete their induction, and qualify fully as teachers. From May 1 2001, students may take the tests in any of the three subjects at any time during their program. They will have to pass tests in the three skills areas of numeracy, literacy and ICT before they can be awarded Qualified Teacher Status and begin their induction. They will be allowed five attempts to pass the numeracy test.

The test includes questions in mental arithmetic delivered via audiotape, where calculators are not allowed, and a paper and pencil section where calculators may be used. The whole test will take 45 minutes. Multi-step mental calculations will involve such topics as: time; money; proportions, fractions and/or decimals; percentages; measurements; conversions (e.g. from one currency to another, from fractions to decimals or percentages), and combinations of the four operations. The written part covers two major aspects of numeracy:

1. Interpreting and using statistical information, such as: identifying trends; making comparisons to draw conclusions; and interpreting information.
2. Using and applying general arithmetic, with content similar to the mental arithmetic section. The information for this section may be drawn from graphs (e.g. box and whisker, scatter graphs, cumulative frequency graphs, line graphs), charts (e.g. bar charts, pie charts) and tables (e.g. representing pupil numbers, test results, half day absences, reading ages). Most questions will be set in a context that teachers would be expected to meet in their work. Some examples of such contexts are given as: finance, national test data, absences, school trips, or timetabling.

The tests were proposed by the government to raise standards "to ensure that everyone qualifying to teach has a good grounding in the use of numeracy in the wider context of their professional role as a teacher," and "to ensure that all new teachers start their careers having mastered the knowledge and skills they need to meet the challenges of working in the schools of the 21st century." The initiative has been supported by school administrators, and criticized by the largest teacher union, which expressed concern that teachers of the arts do not need the skills that are being tested, and may be prevented from qualifying.

Students are being helped to prepare for the test in several ways. The TTA website (whose address is given below) contains sample questions, students may attend classes in the schools of education on a voluntary basis, and commercial materials containing background materials and sample questions are available. This does not seem to be reducing the stress level of some of the students I saw.

It is not fair to criticize the legislation of another country, especially after a brief visit, and before the tests have even been administered for the first time, but some questions linger.

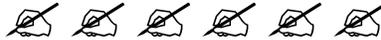
What message is being sent by the questions asked on the test? I have heard Doug Clarke say; "We show what we value by what we evaluate." Would experienced mathematics educators be comfortable with the content included in (and implicitly valued by) the content of these sample tests for neophyte teachers? Are the examples of mathematical activity in the tests likely to trickle down into the classrooms as exemplars of important mathematical content? In fact, ARE these topics the ones that should be included in school curriculum? Do they respond to the question: "What is of most worth?"

How would an ordinance of this sort affect what we do in Canada? In Britain, some student teachers enter their training from school, but most already have a degree, and follow a postgraduate program. The unions claim that they have already proved their ability in mathematics before they enter university. In Quebec, the baccalaureate in education is the only route to teacher certification, and the great majority of students entering the B Ed

(Elementary) program are graduates of CEGEP programs in the humanities. Many of them dropped mathematics as soon as they were allowed to. Could they pass these tests? And is this the mathematics we want them to value as they begin their careers as elementary school teachers?

Finally, how do we ensure that our education graduates, especially those preparing to teach in elementary schools, have adequate knowledge of mathematics, let alone a positive disposition to teach mathematics? Will compulsory national tests improve this disposition?

(More information and sample tests appear on the TTA website at <http://www.teach-tta.gov.uk/skillstests/numeracy/questions/index.htm>, which is also the source of quotations in this article.)



Changing The Culture 2000 - Visualizing Mathematics

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The 3rd Annual Changing the Culture Conference, organized and sponsored by the Pacific Institute for the Mathematical Sciences, was held Friday, April 28th, 2000 at SFU, Harbour Centre Campus.

Close to one hundred people attended the conference, which was designed to bring together mathematicians, mathematics educators, students, and school teachers from all levels to work together towards narrowing the gap between mathematicians and teachers of mathematics, and between those who do and enjoy mathematics and those who don't.

The conference program included two plenary talks. In the morning, Walter Whiteley, Mathematics Department, York University, gave a talk "Visual Work and the Mathematics Classroom". In the afternoon, one of the world's best known geometers, H.S.M. Coxeter, shared his memories of his friendship with M.C. Escher and discussed mathematical concepts involved in examples of his work.

Conference participants had also an opportunity to attend two out of a choice of four different workshops on teaching geometry, and a panel discussion: Role of visualization in teaching mathematics. Five panelists: Peter Borwein, Mathematics and Statistics, SFU; Sue Habberger, mathematics teacher at Centennial Secondary in Coquitlam, B.C.; Nancy Heckman, Statistics, UBC; Susan Oesterle, mathematics instructor at Douglas College in New Westminister, B.C.; and Walter Whiteley discussed the ways they attempt to have students visualize the concepts they are trying to teach.



UPCOMING PROFESSIONAL MEETINGS

SCÉE. Du 24 au 27 mai, Université d'Alberta / **CSSE**.
May 24-27, University of Alberta
SMC. Du 10 au 13 juin, Université McMaster / **CMS**. June 10-13, McMaster University.
NCTM Canadian Regional Conference. July 19-22, Halifax.
PME-24. July 23-27. Hiroshima, Japan
[<http://www.ipc.hiroshima-u.ac.jp/~pme24>]

ICME-9. July 31 - August 6. Tokyo/Makuhari, Japan
<http://www.ma.kagu.sut.ac.jp/~icme9/index.html>
39th Northwest Fall Conference: Math for the Millennium.
October 19-21, Victoria, BC. [<http://www.numath2000.com>]
November 18-23, Aurman, Jordan
[<http://dipmat.math.unipa.it/~grim/Convegna.html>]
Mathematics Education into the 21st Century Project.
"Mathematics for Living".



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As Newsletter editor, I would like to thank Executive member Frédéric Gourdeau for his major contribution as translator, reviewer, and editor of all French language text. - Doug Franks



Newsletter Editor / Editeur du Bulletin

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L'EXÉCUTIF DU GCEDM CMESG EXECUTIVE 1999-2000

The members of the executive extend an invitation to you to contact us about any item of interest. If you have something you want to suggest, if you have a concern you wish to raise, if you want more information, etc., please let one of us know. In order to be of service to the membership, we need to be aware of what your interests are.

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Les membres du Comité exécutif vous invitent à leur faire part de votre point de vue concernant n'importe quel aspect de la vie du GCEDM. Que ce soit pour transmettre suggestions ou commentaires, ou encore pour être mieux informé, n'hésitez pas à entrer en contact avec l'un d'entre nous. En nous faisant connaître vos intérêts, vous nous aidez à mieux vous servir.

Mary Crowley, Vice-President

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