

# Support of the Mathematics Community

## Report of Task Force #6

Presented to the Canadian Mathematical Society

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## **(i) Introduction and Mandate of the Committee**

In 1997 the Canadian Mathematical Society (CMS) executive undertook a process of planning for the future of the society. The goal and statement of purpose of the society were defined, and eight Task Forces were established to investigate various activities of the society. Task Force #6: Support of the Mathematics Community was formed in the fall of 1998. Its membership consists of:

Kathryn Hare, University of Waterloo, Chair  
Doug Farenick, University of Regina  
Neal Madras, York University  
Jon Thompson, University of New Brunswick, Fredericton  
Ravi Vakil, Massachusetts Institute of Technology  
Graham Wright, CMS Executive Director, Resource person

The mandate of the committee was developed by the CMS Executive.

### **Mandate**

1. **Member Support:** Review and evaluate all CMS activities/programs that provide support to our members. Describe strategies for ensuring their success in line with CMS objectives (this may require some to be eliminated or modified and others enhanced). Are we making the most of our conferences: are we offering the right sessions at the right locations; is the session format appropriate; are plenary lectures accessible; are we using local talent optimally; are we cost effective; are we effectively promoting and marketing the meetings; is there greater opportunity for interdisciplinary activities and public activities to promote research and educational activities? Consider our award structure and whether it adequately reflects the activities and accomplishments of Canadian mathematicians. Is the CMS adequately supporting its members; from student to retiree? Are our members adequately supporting the CMS?
2. **Student Support:** Review and evaluate all CMS activities/programs that provide support to students (high school, undergraduate and graduate) and educators. Describe strategies for ensuring their success in line with CMS objectives (this may require some to be eliminated or modified and others enhanced). In doing so pay attention to promotion, marketing and overall management of the programs. Develop a process for regular review including limiting the life-time of any project, and ensuring we are always in a position to be innovative and flexible when responding to emerging needs.
3. **Representation:** Review current representation (geographical, mathematical discipline, gender, visible minority, type and size of home institution) of members and participants in all our activities and where necessary develop strategies to ensure broader representation.
4. **Institutes:** Review the present arrangements between the CMS and the Institutes with particular reference to joint activities, sharing of information and, where appropriate,

resources (not necessarily fiscal but certainly volunteer time and expertise).  
Recommend on future initiatives.

## **(ii) Process**

The Task Force consulted widely during 1998-9. We met with members of the Executive Committee on several occasions. The Task Force as a whole, or individuals on the Task Force, spoke with the chairs of the Research Committee, the Education Committee, the Math Olympiad Committee, the Women in Math Committee and the Nominating Committee. We met in St. John's with members of the Education Committee. As a committee we met with D. Dawson of the Fields Institute, and L. Vinet and J. Hurtubise from CRM. Individuals on the committee spoke with S. Halperin (then) of MITACS, A. Lawniczak and R. Corless from CAIMS, and with D. Piche (of the Board of Directors) and B. Charbonneau, who were seminal in the establishment of the new CMS Student Committee. N. Ghossoub of PImS was also given the opportunity to express his opinions.

An extensive questionnaire was sent to the directors of the last six annual meetings, with excellent feedback. A copy of the survey and summary of the responses can be found in Appendix 2.

Graduate students, both in Canada and abroad, were invited to give input through an electronic survey. Responses were received from approximately 32 and their opinions, as well as those of Piche and Charbonneau, are reflected, in part, in the section of this report on graduate student support. The survey and responses can be found in Appendix 3.

At the spring 1999 meeting in St. John's the committee led a discussion at the department chair's lunch, gave a brief report to the Board of Directors and had a detailed preliminary report and discussion at the Development Group meeting. We have encouraged the communication of opinions, and have heard from a number of people.

Following the spring meeting a survey was sent to all faculty members of Canadian mathematics departments. Approximately 60 responses were received; a copy of the survey and summary of the responses can be found in Appendix 4.

Finally, we note that extensive informal consultation has also been carried out.

The Task Force met together at the winter 1998 meeting in Kingston, over a weekend in April 1999 at the Fields Institute and on several occasions during the spring 1999 meeting in St. John's. We also communicated electronically and had two meetings in the fall of 1999 by conference call.

## 1. Promotion of Mathematics

The goal of the Canadian Mathematical Society is to promote and advance the discovery, learning and application of mathematics. There are four items which have been identified as defining the CMS and its activities. Three of these can be summarized as follows: to unify and support Canadian mathematicians, to support mathematics research, and to support mathematics education. Overlapping with all of these is the fourth item: to champion mathematics through initiatives that explain, promote and increase the general understanding of mathematics. In this era of tight government funding and an emphasis on research with immediate application, this fourth item is of utmost importance.

Mathematicians must convey the message that mathematics is both a useful and beautiful discipline, which has advanced considerably in recent years, and has found significant applications in such diverse, new areas as the financial industry, biomedicine and cryptography, to name but a few. As the power of sophisticated mathematics to solve practical problems and the increasing importance of mathematics in an information-based society become better known in government and business circles, there will be an increasing demand for more people with such training. This should enhance the opportunities for government and industrial funding of mathematical research and education. As well, it will assist in attracting many of Canada's best young minds to study mathematics, and this in turn will enhance research developments and lead to new opportunities.

The advancement of mathematics in Canada has been encouraged and facilitated by the CMS and the three research Institutes. There has been substantial national and international recognition of this advancement, including the favourable review of mathematics in Canada by the NSERC-sponsored Bourguignon panel, the elevation of Canada to the highest national category in the International Mathematical Union (IMU) and the increases in NSERC funding for the Mathematics Grant Selection Committees and for the Institutes. The NSERC Council now includes two mathematicians.

A significant factor in the recent successes of the mathematics community with NSERC, including the funding reallocation exercise, was that, in addition to the actual development of mathematics, a concerted effort was undertaken by the community to ensure that NSERC properly understood and appreciated the level of advancements in mathematics and their significance to society. The CMS was able to play a substantial role in this lobbying activity because it had its own funds and an administrative infrastructure. The CMS thus supported and participated in the work of the Liaison Committee, which included the Presidents of the CMS and Canadian and Applied Industrial Mathematics Society (CAIMS), the Chairs of the Mathematics Grant Selection Committees, a representative of the Royal Society of Canada and a representative of the Chairs of mathematics departments (who are organized through the CMS).

During this multi-year lobbying process, good working relationships were established between NSERC staff and representatives of the mathematics community. It is very important that the mathematics community maintain these contacts with NSERC and that it begin planning for the next reallocation exercise.

**Recommendation 1.1.** The President of the CMS should initiate the formation of a new Liaison Committee, which should include the Directors of the Institutes, Presidents of the CMS and CAIMS, and other representatives of the mathematics community, to maintain contacts with NSERC and organize for the next reallocation exercise.

In addition to this on-going government lobbying activity, an intensive effort must be made to promote mathematics to business, industry, educators and the general public. In particular, media contacts must continue to be developed to help communicate the message that mathematics is an important and practical discipline, which benefits society in significant ways. The recent media coverage of the Canadian International Mathematical Olympiad team is one indication that the CMS is making progress in this regard.

Given the current political climate this promotion of mathematics is vital to the health of mathematics in Canada, and must be done in a consistent, on-going and effective way. It is a difficult task as the public image of mathematics is often in stark contrast to the perspective of mathematicians.

At present, promotional activities are scattered among various committees with the executive director primarily communicating with the media. In particular, the Fund Raising committee is charged with the task of promoting the CMS and its activities. This is a specific task, with a focused goal, which is quite different from the general promotion of mathematics for the long term health of the discipline.

Because the promotion of mathematics is an important and substantial undertaking, it is our recommendation that primary responsibility be placed with one high-level group who could develop expertise and maintain continuity. Thus we recommend that a new standing committee be established which would be responsible for organizing a coherent and consistent approach, and for overseeing all outreach and promotional activities. The membership of such a committee should include the president and the executive director of the CMS as it would speak on behalf of the entire Canadian mathematics community, and would likely meet with leaders of both the public and private sectors on a frequent basis. The other members of the committee should be drawn from the Board of Directors.

The new committee would work in conjunction with the Liaison and Fund Raising committees, and would consult with, and be consulted by, many other committees of the CMS. It should act as a resource group, aiding and encouraging other committees to participate in the general promotion of mathematics. It would report to the Board of Directors on a regular basis.

The committee would maintain good relationships, and partnerships where appropriate, between the CMS and other professional organizations. It would develop and maintain

media contacts and issue press releases. Opinions on mathematical issues should be formulated by the committee and public statements be expressed on matters of mathematical relevance such as education matters (c.f. **Education issues, Recommendation 5.2**).

The CMS already has a number of outreach activities in place, such as the public talk, and the grants for public lectures and for raising awareness of mathematics. The effectiveness of these activities in achieving their goals needs to be evaluated. They should be administered by this committee.

With the newly established Endowment Funds there are excellent funding opportunities for outreach and promotional activities. This committee would put into place a coordinated effort to support, encourage, and enlist such events. They should be both proactive and reactive, taking advantage of opportunities which present themselves, and creating new opportunities.

While they would supply much-needed leadership for the championing of mathematics, the long run success of the endeavour depends on the involvement of the Canadian mathematics community. Thus a major task of the committee would be to encourage mathematicians to initiate such activities and otherwise become involved themselves.

**Recommendation 1.2.** The CMS should establish a Promotion of Mathematics Committee which would be a standing committee. The members of the committee would include the president and executive director. The mandate of the committee would be to publicly champion mathematics. Its suggested duties and responsibilities are outlined in Appendix 1.

## 2. CMS meetings

As part of their efforts to support Canadian mathematicians, the CMS holds meetings twice each year at locations which vary around the country.

The primary purpose of these semi-annual meetings is the advancement and dissemination of research. The scientific component of the meetings consists of plenary talks, special sessions in particular research areas and on educational issues, and talks by CMS award-winners. Each meeting has a talk to which the general public is invited. There are social activities, and ample time for informal communication and collaboration. The business and committee meetings of the CMS also take place at these events. Most attendees are mathematics professors and graduate students.

As the national organization of a geographically large country, with many mathematicians in isolated mathematics departments, the value of building a sense of community and maintaining good communication links cannot be underestimated. The semi-annual meetings help to do this by rotating the locations of the meetings and bringing together mathematicians from across the country on a regular basis.

Two thirds of those responding to our questionnaire had been to at least one meeting in the past two years. They indicated that special sessions in their research fields and discussions with colleagues from other institutions were the most important aspects of the conferences for them.

### Special Sessions

For each meeting the CMS Research Committee selects and funds special sessions in four core research areas. Organizers are chosen by the Research Committee for the core sessions, and these people invite speakers. In the past, the three Institutes have provided additional funding for research sessions. They have now made a commitment to fund three research sessions each year; these sessions will be chosen by their National Program Committee. To coordinate this we recommend (**see Relations with the Mathematical Institutes, Recommendation 6.1**) that the CMS approach the Institutes requesting that they include the chair of the CMS Research Committee among the members of the NPC.

As well as research sessions, each meeting includes sessions on educational issues which are organized by the Education Committee. In recent years there has also been a graduate student session. Additional sessions may be independently organized, and these might be funded through other sources, or entirely unfunded.

While location is a factor in attendance, of greater importance is the quality of the scientific program. In particular, a large number and variety of special sessions affords opportunities for diverse disciplinary groups and is key to attracting large numbers of

mathematicians. A good example of this was the CMS Winter meeting 1998 in Kingston, which had 16 special sessions and the largest attendance ever.

The success of a session depends in large part on the organizers. Sessions with hardworking, proactive organizers, who recruit excellent researchers to speak, are generally of the best quality. Funded sessions provide a vital core, ensuring minimal attendance for viability of the meeting, and around which successful unfunded sessions can be organized.

The session titled "Surveys in mathematics" at the St. John's meeting offered a variety of mini-colloquia. It was well received and of broad interest. The Research Committee should consider offering a session in a similar spirit at a future meeting.

Having workshops adjacent to the meetings, such as the Workshop on combinatorics held at Memorial University before the 1999 CMS Summer meeting, also attracts participants.

**Recommendation 2.1.** Each semi-annual meeting should include a large number of sessions from diverse areas of mathematics. In addition to the three sessions arranged each year by the Institutes, the CMS Research Committee should identify 4-6 core funded sessions and organizers, and announce a call for others. The committee should be proactive in searching for organizers for these other sessions.

Invited speakers in the special sessions should reflect the full spectrum of the mathematics culture. In particular, graduate students, postdoctoral fellows and other young faculty are important participants in the conference. For many this will be their first such event. These junior mathematicians need to participate in a meaningful way. They should not be isolated, but rather be given good opportunities to meet and present their work to the experts in their field. While recognizing that it is not always easy for session organizers to identify those who are ready to speak on their research, this should be attempted as it is of great value to the young mathematicians' research. As well, certain types of travel support are available only when there are such opportunities present.

One way to accommodate those who might not have been identified by session organizers initially, but whose work would be of interest to researchers in the area, is to have time allocated within each special session for contributed papers in that research area. The meeting director would forward abstracts for contributed papers to the appropriate session organizer, and those deemed suitable for the session by the organizer would be presented at that time. Papers which did not fit into any special session, whether contributed by faculty members or graduate students, would be presented in the general contributed papers session.

Poster sessions should also be organized, and graduate students in particular should be encouraged to participate in these.

**Recommendation 2.2.** (a) Organizers of special sessions should actively search for senior graduate students and postdoctoral fellows to invite to speak in their sessions.



(b) Each special session should include a time for contributed papers in that research area. The graduate student session should be eliminated and graduate students should instead take part in these special contributed papers sessions, when it is appropriate, and otherwise in the general contributed papers session. The call for contributed talks should make explicitly clear that graduate students talks are welcome. We recommend that this approach be tried for a two-year time period (4 semi-annual meetings) and be evaluated at the end of that time by the Research and Student Committees.

(c) In addition, a general poster session should also be held for those who prefer to present their work in this way.

One reason that special graduate student sessions were held in the past was to provide opportunities for graduate students across Canada to meet one another and discuss their distinct issues. This is important, and in the section on **Graduate student support**, *Recommendation 4.3*, we discuss more suitable ways to conduct these activities.

### **Plenary speakers and award winners**

The conference plenary speakers are arranged by the meeting director and chair of the Research Committee. Historically, the plenary speakers have been linked to the core sessions and are chosen in consultation with the session organizers. Plenary lecturers should be well-known mathematicians, working on important problems of broad and current interest. They must be good, clear expositors, who are able to explain their work to non-specialists. The current practice of linking the plenary talks to the core sessions seems to work well as it contributes to building a strong session; however those choosing the plenary speakers must always be reminded of the very important requirement to select mathematicians who can speak to a general mathematical audience. At the time of the initial invitation the plenary speaker should be told that this is the expectation.

The Research Committee can assist with this by preparing a written list of information which the organizers can pass on to the major speakers. This list should remind people that they may speak in either English or French, and emphasize the fact that their talks are intended to be expository and aimed at a general audience of mathematicians.

**Recommendation 2.3.** The Research Committee should prepare an information sheet for major speakers which indicates the nature of the talk.

One group who are often overlooked as speakers are women mathematicians. The Research Committee should ensure that there is always at least one woman organizer of a special session at each conference. The organizers themselves need to actively search for women in their field and invite them to give talks, both in the special sessions and as plenary speakers. It would be desirable to have at least one woman plenary speaker at each meeting. This should not necessitate any change in the criteria for speakers; however it may be necessary for the Research Committee to take a more active role in the selection of the plenary speakers.

**Recommendation 2.4.** The Research Committee should attempt to include at least one woman organizer and plenary speaker at each meeting.

The CMS has a set of awards which publicly recognize contributions to mathematical scholarship in the broadest sense. A call is placed in the CMS Notes for nominations. As well, the selection committees must be proactive in seeking out nominations. The awards include three prize lectureships given at the CMS annual meetings: the Coxeter-James Prize Lectureship recognizing outstanding young research mathematicians in Canada, the Jeffrey-Williams Prize Lectureship which recognizes outstanding leaders in mathematics in a Canadian context, and the Krieger-Nelson Prize Lectureship for outstanding female mathematicians. Many nominees for the Krieger-Nelson award are eligible for either the Coxeter-James Prize or the Jeffrey-Williams Prize and should be considered for such.

**Recommendation 2.5.** Nominees for the Krieger-Nelson award should automatically be considered for any other award for which they are eligible.

Selected plenary and prize winners' talks should be published as expository articles in the CMS Notes. Not all Canadian mathematicians are able to attend each meeting, and would appreciate the opportunity to learn from the major speakers. This would also provide a permanent record and interesting mathematical reading.

**Recommendation 2.6.** Selected major talks should be published in the CMS Notes throughout the year.

## **Public Talk**

One way to promote and explain mathematics to the general public is through public talks at the conferences. Unfortunately, despite the best of intentions, public talks in past meetings have often been quite unsuccessful in attracting and/or appealing to the general public. More thought needs to be given to the purpose of the public talk, the intended audience and to what makes such a talk successful. This is a task for the new Promotion Committee. American organizations such as the MAA have had better success at public talks and their example should be studied.

The speaker for the public talk should be chosen by the Promotion Committee in consultation with the chairs of the Research and Education Committees and the meeting directors. Once the speaker has been chosen, then the targeted audience should be informed through appropriate advertising venues. A suitable location should be found with the assistance of the local organizers. The Promotion Committee may wish to build a list of people known to be good public speakers.

If public lectures are to attract the general public then they should normally be given in French when the conference is held in Quebec. The CMS should also consider having the transparencies translated into French when the meeting is held in other parts of the country which have a significant French-speaking population.

**Recommendation 2.7.** The Promotion Committee, in consultation with the chairs of the Research and Education Committees and the meeting directors, should select the public speaker and location of the public talk. The talk should be well advertised to the intended audience. The public talk should normally be given in French when the meeting is in Quebec.

## **Education Sessions**

Educational issues, regarding the teaching of mathematics at all levels, are relevant and of interest to many Canadian mathematicians. In addition to university teaching issues, mathematicians are involved in enrichment activities, teacher training and curriculum development. The sessions organized by the Education Committee should reflect this full range of activities.

Education sessions often are of broad interest and attract a large audience. To enhance these sessions we recommend that their budget be modestly increased (see **Education issues, Recommendation 5.5**). There should normally be a plenary speaker on education issues whose talk does not conflict with any other speaker.

Some education sessions are designed to attract non-university mathematics teachers. It is important to choose a time for these sessions which suits the schedules of the intended audience. The organizing committee for such sessions may want to include a local person whose primary role would be to actively seek participation from local teachers. They may want to consider a one-day fee for the teachers organization they are seeking to attract.

**Recommendation 2.8.** Each annual meeting should continue to include at least one education session and one plenary speaker on education issues.

### 3. Francophone Mathematicians

The Canadian Mathematical Society is a national, bilingual organization, with Francophone mathematicians an integral part. Unfortunately, many Francophone mathematicians do not seem to consider this to be the case. This is a difficult situation to address and the recommendations which follow are initial steps to undertake. More thought needs to be given by the CMS executive to this matter.

The official languages of all CMS meetings are both French and English, and organizers should be reminded that talks are welcome in either language. This fact should be communicated to the invited speakers in both the research and education sessions, and announced in the call for contributed papers.

Major speakers should be encouraged to speak in either official language and may wish to have their transparencies translated so that participants more comfortable with the other language could follow. If enough time is allowed, the CMS may be able to arrange this by means of volunteer, bilingual mathematicians who work in the same research area as the speaker.

The Research Committee may also want to consider encouraging at least one major talk to be given in French at each meeting. At a minimum, the public talk should be given in French when the meeting is held in Quebec, as we have already recommended (*Recommendation 2.7*).

In addition, the CMS should arrange for the professional translation of all titles and abstracts of talks so that these can be published in both languages.

**Recommendation 3.1.** All speakers should be reminded that talks are welcome in both English and French. Titles and abstracts should be published in both official languages. The CMS should facilitate the translation of the major speakers' transparencies.

Similarly, articles in the CMS publications, including the Mathematical Bulletin and Journal of Mathematics, are welcome in either official language. To affirm our bilingual nature, we recommend that abstracts of all research papers in the CMS publications be published in both official languages. This is already being done by many European journals.

**Recommendation 3.2.** The Canadian Mathematical Bulletin and Canadian Journal of Mathematics should arrange to publish the abstracts of all research papers in both English and French.

Many Francophone mathematicians are active in the GSMQ, Groupe des chercheurs en sciences mathématiques. To emphasize our unity as Canadian mathematicians, the CMS executive should foster links with the GSMQ. One way to begin may be to send an official

delegate to the GSMQ conferences. Other venues for cooperation may be found in conjunction with the CRM, Centre de Recherches Mathématiques.

**Recommendation 3.3.** The CMS executive should develop a good relationship with the GSMQ and work cooperatively in areas of common interest.

## 4. Graduate Student Support

In a sense, graduate students are apprenticing mathematicians. The CMS can play an important role in the development of their mathematical careers. In order to do this it is essential that the CMS be readily able to communicate with them.

The newly created Student Committee of the CMS will assist significantly with this, as it provides a structured format for student concerns to be heard and initiatives carried out. The CMS office should provide the Student Committee with any news or information of interest to students, including the data from the annual survey.

Communication with graduate students could be done electronically if a database was available. To facilitate this we recommend that all graduate students be given complimentary memberships in the CMS. This would replace the current practice of offering departments a number of complimentary memberships and would enable the CMS to establish a listing of all graduate students. Email could then be used to send news such as the availability of travel support to conference, direct students to websites for job information, establish discussion groups, etc. Email could also be used to announce the publication of the CMS Notes on-line.

**Recommendation 4.1.** All graduate students at Canadian universities and Canadian graduate students abroad, should be given a yearly complimentary membership in the CMS, upon the nomination of their department chair. They would not receive a hard copy of the CMS Notes, but would have access to the on-line publication. They should receive an initial welcome package, and a database and email directory should be established.

Many resources are available for graduate students on CAMEL. The CMS should have a visible student web page, maintained by the Student Committee, that collects links to these and other resources, such as job information in and out of Canada, special opportunities for graduates and undergraduates, information about graduate schools etc.

**Recommendation 4.2.** The CMS Student Committee should maintain a central student web site on CAMEL.

Like other mathematicians, the primary reason graduate students attend conferences is to participate in research activities. Whenever possible, they should take part in the special sessions appropriate to their work (see *Recommendation 2.2*).

Many students will be attending their first mathematics conference. Participating in the research sessions will provide them with opportunities to meet fellow researchers in their own area. The CMS can help them to meet other students by holding a graduate student social activity and/or discussion forum at each meeting. The students could also be publicly welcomed at general social events.

**Recommendation 4.3.** A social event for graduate students should be held early in each meeting. All those who are attending their first CMS conference should be introduced and welcomed at the delegates' lunch.

The cost of attending CMS conferences should be kept low for students. The CMS should continue with its policy of a low student rate and not distinguish between early and late registration for students as students often receive a late invitation to speak. The local organizers and Student Committee should work together to identify inexpensive accommodation at each location. This could include dormitory accommodation, campgrounds and local graduate students hosting others.

Graduate students need to be made aware that they can apply for funding from the Institutes to help with their travel costs.

**Recommendation 4.4.** Costs should be kept low for student attendees at the CMS conferences. The CMS Research and Student Committees should inform students of opportunities for financial assistance towards their travel costs.

Finding mathematical employment is a matter of great importance for students nearing the completion of their degrees, and one with which the CMS can be of assistance. We need to communicate the message that opportunities for employment of mathematics graduates in both industry and academia are improving. Indeed, as the usefulness of mathematics in solving practical problems becomes better known there will be an increasing demand for graduates with mathematics skills.

Students are usually well advised on academic careers, but less so on industrial or business careers. As is discussed in more detail in the section on Relations with the Mathematical Institutes, the CMS should cooperate with the Institutes and the Networks of Centres of Excellence (NCE's), who have formed business and industrial connections, to help students become aware of, prepare themselves for, and find non-academic employment. One example of this cooperation is the first mathematics job fair to be held at the Winter 1999 meeting, for which assistance has come from CRM and NCM2, Network for Computing and Mathematical Modelling. We recommend that such job fairs be held regularly.

**Recommendation 4.5.** Job fairs should be held annually at the winter CMS meetings. The CMS should work with the Institutes and NCE's to assist students in finding employment in business, industry and government.

## 5. Education Issues

In comparison with the American mathematics community, the goals of the Canadian Mathematical Society are a combination of those of the American Mathematics Society (AMS) and the Mathematical Association of America (MAA). There are several CMS committees which are active in educational affairs, including the Education Committee and the Mathematics Olympiad Committee (which is to be renamed the CMS Mathematical Competitions Committee).

The Education Committee is charged with overseeing the activities of the Society in the field of education. Its duties include identifying concerns relating to the teaching of mathematics at all levels, acting as a liaison between the Society and governments on all matters affecting mathematics education in Canada, and promoting good relationships between the Society and teachers.

At present the Education Committee is also responsible for the two subcommittees which administer the grants for public lectures or the grants for raising public awareness of mathematics. Under *Recommendation 1.2* this responsibility would be delegated to the new Promotion Committee.

It is our recommendation that the Competitions Committee should be responsible for all matters having to do with competitions, including administering the grants for provincial competitions, currently the responsibility of the Education Committee. In exchange, we recommend that the Education Committee be responsible for mathematical enrichment activities which are non-competition oriented, including math camps. Mathematics camps are usually run locally, but would benefit from the support of the CMS. Through the Education Committee, the CMS should encourage members of the mathematics community to undertake such projects, and to provide information and resources. Wide participation across Canada needs to be promoted.

The Education Committee should look for ways to cooperate with the Institutes on educational enrichment activities such as the camps, and may find the Institutes a source of funds (see **Relations with Mathematical Institutes**, *Recommendation 6.2*).

**Recommendation 5.1.** At an appropriate time, the responsibilities for the Education and Competitions Committees should be reorganized, giving the Competitions Committee responsibility for all matters to do with competitions, including provincial competition grants, and the Education Committee responsibility for other enrichment programs. The grants for public lectures and grants for public awareness for mathematics should be administered by the Promotion Committee.

We hope that the removal of these administrative tasks will give the Education Committee more time to focus on the very important educational issues which have arisen in recent years, particularly at the elementary and high school levels. These are matters of great

concern to university mathematicians as the pre-university teaching of mathematics strongly influences university education. At present, the CMS has no unified voice with which to address these matters as we have not formulated a collective statement. This is a clear political responsibility of the CMS, and necessary if we are to have input into the state of mathematics education in Canadian schools today.

Drafting such a policy should be a priority for the Education Committee so that the opinions of university mathematicians can be clearly heard. The MAA has produced a number of studies and reports in response to changes in teacher education and curriculum. For example, the Leitzel report, "A call for change: Recommendations for the mathematical preparation of teachers of mathematics", describes in general terms what a mathematics teacher should have been exposed to in their university training. We recommend that the committee begin by reviewing the MAA statements on minimal requirements for mathematics teaching, and revising it, as appropriate, for the Canadian situation.

**Recommendation 5.2.** The CMS Education Committee should draft a statement on the minimal requirements for the teaching of mathematics at the pre-university level.

There are many curriculum and teacher training activities taking place across the country, such as the Fields Institute producing the Ontario high school mathematics curriculum. As a national body, the CMS is well-placed to act as a national coordinator of such activities. The Education Committee should identify key personnel involved in these activities within government, teacher organizations and universities, and support their initiatives. They should also continue to foster good relationships between education policy makers, teachers and university mathematicians. This is necessary if we are to be effective in obtaining changes. The CMS needs to be viewed as a supportive organization for teachers. Such things as an informative web site, supplying speakers for teachers conferences and hosting workshops or discussion forums for teachers are all helpful.

**Recommendation 5.3.** The Education Committee should identify the people and organizations involved in curriculum development and teacher-training activities, and seek ways to support their initiatives. They should foster good relationships with government education policy makers and teacher organizations.

At present there is great interest in career issues. It would be very beneficial for the CMS to produce a brochure on careers in mathematics, similar to the American brochure, but designed for Canadians. Apparently, this has been in process for several years. It needs to be quickly completed, but in a professional way, and be made readily available. Such a brochure would be well received by governments and teachers, and would help in building good relationships. It would also assist in the promotion of mathematics and so should be a joint effort of the Education and Promotion Committees.

**Recommendation 5.4.** A career brochure should be produced by the Education and Promotion Committees.



The Education Committee is also responsible for organizing an education session at the semi-annual meetings. As all university mathematicians are teachers, these are of broad interest and have often attracted large audiences. We have already recommended that there be at least one education session at each meeting and a plenary talk be given on an educational topic (*Recommendation 2.8*).

With a modest increase in the budget the committee would be able to accomplish more, possibly bringing in additional speakers, or more non-university attendees, such as teachers, math consultants and government decision-makers. This too would help to foster good relationships, as well as providing opportunities to express our opinions and work together for change. The Fields Institute and PImS both have an educational component to their mandate and may be willing to augment the education session budget. If not, the CMS should find additional money. This budget should be in addition to the cost of a plenary speaker on education issues.

**Recommendation 5.5.** The education session budget at each semi-annual meeting should be increased by \$1000.

## 6. Relations with the Mathematical Institutes

Important to the advancement of mathematics in Canada has been the development of the three research Institutes, CRM, Fields Institute and PImS (Pacific Institute of Mathematics), with their intensive annual programs and outreach activities, and the establishment of the NCE's; NCM2 and MITACS (Mathematics of Information Technology and Complex Systems) which have both industrial and NSERC funding.

These developments have been synergistic with activities of the CMS in several respects. For example, leading members of the CMS have been leading figures in research programs of the Institutes. The lobbying efforts of the mathematical community, through the Liaison group and otherwise, which culminated in success with NSERC increasing the funds available for research in pure and applied mathematics through the Grant Selection committees and the Institutes, were cooperative ventures involving the CMS and representatives of other groups in the mathematical community. In fact, the successes of the Institutes received particular mention in the NSERC-sponsored Bourguignon report.

The Liaison group's work in the reallocation exercise was discussed in detail in the section on the Promotion of mathematics where it was recommended that the mathematics community maintain the contacts it has established with NSERC and that the CMS begin planning for the next reallocation exercise by initiating the formation of a new Liaison Committee, which should include the Directors of the Institutes (**Promotion of mathematics, Recommendation 1.1**).

The CMS has a long-standing, broadly based, national presence. Through its meetings and journals, it provides some of the main vehicles for development and communication of research. It has relationships with federal and provincial government agencies, with the private sector and with other national societies and with the IMU. Its semi-annual meetings afford opportunities for diverse disciplinary groups and the meetings have recently been growing in number and range of research sessions, and in registration.

The Institutes have developed major new sources of federal and provincial funding and have succeeded in building links with several mathematical sciences societies, as well as with business and industry. Their main programs are concentrated on major annual themes. But they also run programs on diverse topics, such as Fields' seminar on financial mathematics, PImS' industrial mathematics workshops and CRM's programs with engineering and other groups.

Thus the CMS and the Institutes play roles which are similar in general terms, but complementary in details. There has been ongoing cooperation and mutual support between the society and the Institutes. For example, the Institutes have been funding research sessions at CMS meetings and have recently agreed to fund three sessions each year. The Institutes have also provided funding for workshops for graduate students and faculty organized by the Atlantic Association for Research in Mathematical Sciences and

held in conjunction with CMS meetings. The CMS, as the national society, is collaborating with the Institutes in the organization of a joint Canada-China research conference in August 1999.

**Recommendation 6.1.** Cooperation between the CMS and the Institutes should continue and be expanded. In particular, the CMS could assist in advertising the opportunities to organize or participate in Institute theme programs and other programs, through Camel and the Notes, and through distributing material at its meetings. Regarding other programs, in 1999 the three Institutes have formed a joint committee, the National Program Committee (NPC) to fund activities in the mathematical sciences, including activities not related to their annual themes. As a specific vehicle for cooperation, the CMS should approach the Institutes with the request that they include the Chair of its Research Committee among the members of the NPC.

The Institutes each receive provincial operating grants, in addition to NSERC funds. Fields and PImS are expected by their supporting provinces to engage in educational activities, in addition to their primary research activities. CRM, while not funded by Quebec for educational purposes, also has an interest in these matters. The CMS has had a long-standing involvement with educational issues, particularly in competitions and other enrichment programs. There has been cooperation in this area also. For instance in 1998 and 1999, PImS and Fields, respectively, supported the CMS training camps for the IMO teams. A new possibility for cooperation could arise from a request to Fields from the Ontario Ministry of Education for projects that could help attract students to become mathematics teachers.

**Recommendation 6.2.** The CMS should seek to expand cooperation with the Institutes in educational and enrichment activities. An example might be Institute support for the regional mathematics camps organized by CMS or for education sessions at the CMS meetings.

The Institutes have succeeded in breaking new ground by successfully organizing and obtaining NSERC and industrial support for two new NCEs. First, NCM2, a Montreal-based consortium involving mathematical science researchers in universities and staff of private and public sector corporations, working in risk management, information processing and mathematical modelling, was organized by CRM. Then MITACS, a larger, Canada-wide consortium working in biomedical, financial, information technology, resource management and manufacturing areas was organized by the three Institutes as a joint venture. These developments are likely to have a substantial impact on the mathematical sciences in the coming years, in addition to their immediate impact, and will create many new employment opportunities for persons highly trained in the mathematical sciences.

Here again, the Institutes and the CMS are finding opportunities to cooperate. The first mathematical Job Fair in Canada is being organized for the 1999 CMS winter meetings hosted by l'Universite de Montreal, with the assistance of CRM, including funding support from NCM2. Also, as part of its mandate the tri-Institute Program Committee will provide

funding support, on a competitive basis, for graduate students to attend scientific meetings of the CMS.

The Job Fair could become a feature of each semi-annual CMS meeting (see **Graduate student support**, *Recommendation 4.5*). The Institutes could, in addition to providing funds for graduate students to attend meetings, and workshops related to their theme programs held in conjunction with CMS meetings, consider assisting CMS in funding summer schools for graduate students. The CMS could take an active role through, for instance, its Student Committee, in promoting opportunities to participate in Institute and NCE programs, as well as in advising students on emerging careers in applications of mathematics in industry and government.

**Recommendation 6.3.** The CMS should continue to expand cooperation with the Institutes and the two mathematical NCEs in the area of graduate student training and program enrichment, and to facilitate the development of suitable employment opportunities for persons with doctoral or postdoctoral training in mathematics.

It is useful for the CMS, in fundraising and educational activities, to be able to refer to support from the Institutes. It could also be useful to the Institutes to refer to CMS support for various activities of theirs. This could be 'in kind' through administrative infrastructure, or political as in their ventures with Institutes abroad, or it could be financial. Even very modest financial support, such as to enable a Canadian graduate student or a professor from a developing country to participate in an Institute program, could be symbolically important. The new CMS Endowment Grants Program should be a useful means to achieve this. Another way that the CMS can support the Institutes is by helping the Institutes communicate with mathematicians across Canada.

**Recommendation 6.4.** The CMS should further explore with the Institutes various ways in which it and they could be, and be seen to be, mutually supportive.

Both the CMS and the Institutes are involved in successful publishing ventures. From discussions between Task Force members and Institute directors, there seems little prospect for mergers. However, there is interest in possible sharing of electronic production personnel and facilities.

**Recommendation 6.5.** The CMS should explore with each of the Institute directors whether there may be opportunities for cooperation in electronic production of books and other publications. In particular, if the CMS Tex office can absorb more capacity, then this might be mutually beneficial.

It is important for the future development of both the CMS and the Institutes that young faculty members in Canadian universities receive as much encouragement and assistance as possible in developing their research. This is also important to university departments. One possible venue for this would be cooperation on ventures such as summer schools or short courses that would be more widely accessible than a specialized conference.

**Recommendation 6.6.** The CMS should explore with the Institutes ways to encourage and assist young faculty.

The CMS has a Committee for Women in Mathematics that works on issues of special relevance to female mathematicians. The CMS and the Institutes have both expressed the importance of attracting women into mathematics, as well as retaining them. Events like the recent conference at Waterloo on women in the mathematical sciences seem like one good vehicle, and the Women in Mathematics Committee of the CMS should work with the Institutes to ensure that this becomes a regularly held event. Other societies (in Canada as well as US) have had similar such events. For example there is a Caucus of Women in Statistics that sponsors workshops, as well as sessions and social events, at larger conferences. Such efforts should be aimed at students and postdocs as well as faculty.

Similar comments should apply to mathematicians from visible minorities, aboriginal peoples and persons with disabilities, with the difference that their situation in terms of support groups is even more poorly developed.

**Recommendation 6.7.** The CMS should explore with the Institutes ways to encourage and assist mathematicians who are female, visible minorities, aboriginal peoples and/or persons with disabilities.

There have been apprehensions that the Institutes will principally benefit mathematicians in the three metropolitan centres. The Institutes are, however, mandated by NSERC to involve mathematicians in other regions, including regions in their home provinces, as well as the prairie and Atlantic provinces. The CMS is a national organization, and therefore has an obvious interest in helping the Institutes fulfill this part of their mandate. Conversely, the Institutes should be able to use the CMS' existing national infrastructure to develop and promote activities with mathematicians in all parts of Canada. In particular, the CRM and CMS may find ways to work together to support Francophone mathematicians.

**Recommendation 6.8.** The CMS should work with the Institutes to ensure that mathematicians in all regions derive benefits from the activities of the Institutes.

## 7. Relations with CAIMS

Another professional organization which represents some of Canada's mathematicians is CAIMS, the Canadian Applied and Industrial Mathematics Society.

The inherent unity of theoretical and applied mathematics is not always properly appreciated; the Institutes and their NCEs provide demonstrations of this unity. Included among annual theme programs of the Institutes to date are topology, applied probability, combinatorics, mathematical physics, operator theory, statistics and computability, all of which figure in the industrial projects of MITACS and NCM2.

CMS and CAIMS would both benefit by working together to bring a unified presentation of mathematics to the government, the private sector and the general public. This was illustrated in the lobbying efforts of the Liaison group which included representatives of both groups. We have already recommended that this group be reestablished and that president of CAIMS be invited to participate (*Recommendation 1.1*).

Another way to work together is to cooperate with respect to the timing and location of annual meetings. The summer 2000 CMS meeting is being held jointly with CAIMS and this could be done again on an occasional basis. Other years it may be possible to hold the summer meetings at about the same time and in the same geographical area. At each winter meeting of the CMS the Research Committee could ask CAIMS to organize one of the special sessions. The CMS should offer to organize a session at each CAIMS meeting.

CAIMS could also be invited to participate in the job fairs which would be held at CMS meetings.

**Recommendation 7.1.** The CMS should cooperate with CAIMS on the timing and location of the summer meetings. For each winter meeting of the CMS the Research Committee should ask CAIMS to arrange at least one of the special sessions. The CMS should offer to organize a special session at each CAIMS meeting. CAIMS should be invited to participate in job fairs.

Communication between the two societies is important if we are to work together. A good way to inform each other's members of activities and interests is to submit regular articles to the newsletters of the respective societies. A website link could also be put into place.

There may be further avenues for cooperation through the Institutes and NCE's.

**Recommendation 7.2.** The CMS should consider ways in which the Institutes, NCM2 and MITACS can serve as vehicles for increasing cooperation with CAIMS and other societies.

## 8. CMS Notes

The CMS Notes are an important means of communication. They convey information and help to build a sense of community, especially for those in isolated settings who find travel to the meetings difficult because of cost or distance. We have heard a strong desire from the membership to enhance the Notes. Suggested additions included survey articles, book reviews, the text of talks of plenary speakers (*Recommendation 2.6*), profiles of Canadian mathematicians, and more news on outreach activities, Institute events (*Recommendation 6.1*) and interesting features of departments. It may be helpful to increase the number of regular contributors and to solicit more articles.

**Recommendation 8.1.** The CMS Notes should be enhanced.

## 9. CMS Annual Survey

The CMS undertakes a survey of mathematics departments each year. The information from this survey may be of interest to those lobbying for mathematics, whether it be internal to universities or with the government. We need to consider if the right questions are being asked and if the answers fairly reflect the full scope of departmental activities. It may also be helpful to keep track of alumni. As the survey is potentially quite useful to department chairs we recommend that a subcommittee formed from members of the CMS Chairs and Promotion Committees examine the survey and determine if it should be modified.

**Recommendation 9.1.** A subcommittee of the Chairs and Promotion Committees should examine the survey for its suitability.

## 10. Summary of Recommendations

### Promotion of Mathematics

Recommendation 1.1. The President of the CMS should initiate the formation of a new Liaison Committee, which should include the Directors of the Institutes, Presidents of the CMS and CAIMS, and other representatives of the mathematics community, to maintain contacts with NSERC and organize for the next reallocation exercise.

Recommendation 1.2. The CMS should establish a Promotion of Mathematics Committee which would be a standing committee. The members of the committee would include the president and executive director. The mandate of the committee would be to publicly champion mathematics. Its suggested duties and responsibilities are outlined in Appendix 1.

### CMS Meetings

Recommendation 2.1. Each semi-annual meeting should include a large number of sessions from diverse areas of mathematics. In addition to the three sessions arranged each year by the Institutes, the CMS Research Committee should identify 4-6 core funded sessions and organizers, and announce a call for others. The committee should be proactive in searching for organizers for these other sessions.

Recommendation 2.2. (a) Organizers of special sessions should actively search for senior graduate students and postdoctoral fellows to invite to speak in their sessions.  
(b) Each special session should include a time for contributed papers in that research area. The graduate student session should be eliminated and graduate students should instead take part in these special contributed papers sessions, when it is appropriate, and otherwise in the general contributed papers session. The call for contributed talks should make explicitly clear that graduate students talks are welcome. We recommend that this approach be tried for a two-year time period (4 semi-annual meetings) and be evaluated at the end of that time by the Research and Student Committees.  
(c) In addition, a general poster session should also be held for those who prefer to present their work in this way.

Recommendation 2.3. The Research Committee should prepare an information sheet for major speakers which indicates the nature of the talk.

Recommendation 2.4. The Research Committee should attempt to include at least one woman organizer and plenary speaker at each meeting.

Recommendation 2.5. Nominees for the Krieger-Nelson award should automatically be considered for any other award for which they are eligible.



Recommendation 2.6. Selected major talks should be published in the CMS Notes throughout the year.

Recommendation 2.7. The Promotion Committee, in consultation with the chairs of the Research and Education Committees and the meeting directors, should select the public speaker and location of the public talk. The talk should be well advertised to the intended audience. The public talk should normally be given in French when the meeting is in Quebec.

Recommendation 2.8. Each annual meeting should continue to include at least one education session and one plenary speaker on education issues.

### **Francophone Mathematicians**

Recommendation 3.1. All speakers should be reminded that talks are welcome in both English and French. Titles and abstracts should be published in both official languages. The CMS should facilitate the translation of the major speakers' transparencies.

Recommendation 3.2. The Canadian Mathematical Bulletin and Canadian Journal of Mathematics should arrange to publish the abstracts of all research papers in both English and French.

Recommendation 3.3. The CMS executive should develop a good relationship with the GSMQ and work cooperatively in areas of common interest.

### **Graduate Student Support**

Recommendation 4.1. All graduate students at Canadian universities and Canadian graduate students abroad, should be given a yearly complimentary membership in the CMS, upon the nomination of their department chair. They would not receive a hard copy of the CMS Notes, but would have access to the on-line publication. They should receive an initial welcome package, and a database and email directory should be established.

Recommendation 4.2. The CMS Student Committee should maintain a central student web site on CAMEL.

Recommendation 4.3. A social event for graduate students should be held early in each meeting. All those who are attending their first CMS conference should be introduced and welcomed at the delegates' lunch.

Recommendation 4.4. Costs should be kept low for student attendees at the CMS conferences. The CMS Research and Student Committees should inform students of opportunities for financial assistance towards their travel costs.

Recommendation 4.5. Job fairs should be held annually at the winter CMS meetings. The CMS should work with the Institutes and NCE's to assist students in finding employment in business, industry and government.

### **Education Issues**

Recommendation 5.1. At an appropriate time, the responsibilities for the Education and Competitions Committees should be reorganized, giving the Competitions Committee responsibility for all matters to do with competitions, including provincial competition grants, and the Education Committee responsibility for other enrichment programs. The grants for public lectures and grants for public awareness for mathematics should be administered by the Promotion Committee.

Recommendation 5.2. The CMS Education Committee should draft a statement on the minimal requirements for the teaching of mathematics at the pre-university level.

Recommendation 5.3. The Education Committee should identify the people and organizations involved in curriculum development and teacher-training activities, and seek ways to support their initiatives. They should foster good relationships with government education policy makers and teacher organizations.

Recommendation 5.4. A career brochure should be produced by the Education and Promotion Committees.

Recommendation 5.5. The education session budget at each semi-annual meeting should be increased by \$1000.

### **Relations with the Mathematical Institutes**

Recommendation 6.1. Cooperation between the CMS and the Institutes should continue and be expanded. In particular, the CMS could assist in advertising the opportunities to organize or participate in Institute theme programs and other programs, through Camel and the Notes, and through distributing material at its meetings. Regarding other programs, in 1999 the three Institutes have formed a joint committee, the National Program Committee (NPC) to fund activities in the mathematical sciences, including activities not related to their annual themes. As a specific vehicle for cooperation, the CMS should approach the Institutes with the request that they include the Chair of its Research Committee among the members of the NPC.

Recommendation 6.2. The CMS should seek to expand cooperation with the Institutes in educational and enrichment activities. An example might be Institute support for the regional mathematics camps organized by CMS or for education sessions at the CMS meetings.

Recommendation 6.3. The CMS should continue to expand cooperation with the Institutes and the two mathematical NCEs in the area of graduate student training and program

enrichment, and to facilitate the development of suitable employment opportunities for persons with doctoral or postdoctoral training in mathematics.

Recommendation 6.4. The CMS should further explore with the Institutes various ways in which it and they could be, and be seen to be, mutually supportive.

Recommendation 6.5. The CMS should explore with each of the Institute directors whether there may be opportunities for cooperation in electronic production of books and other publications. In particular, if the CMS Tex office can absorb more capacity, then this might be mutually beneficial.

Recommendation 6.6. The CMS should explore with the Institutes ways to encourage and assist young faculty.

Recommendation 6.7. The CMS should explore with the Institutes ways to encourage and assist mathematicians who are female, visible minorities, aboriginal peoples and/or persons with disabilities.

Recommendation 6.8. The CMS should work with the Institutes to ensure that mathematicians in all regions derive benefits from the activities of the Institutes.

### **Relations with CAIMS**

Recommendation 7.1. The CMS should cooperate with CAIMS on the timing and location of the summer meetings. For each winter meeting of the CMS the Research Committee should ask CAIMS to arrange at least one of the special sessions. The CMS should offer to organize a special session at each CAIMS meeting. CAIMS should be invited to participate in job fairs.

Recommendation 7.2. The CMS should consider ways in which the Institutes, NCM2 and MITACS can serve as vehicles for increasing cooperation with CAIMS and other societies.

### **CMS Notes**

Recommendation 8.1. The CMS Notes should be enhanced.

### **CMS Annual Survey**

Recommendation 9.1. A subcommittee of the Chairs and Promotion Committees should examine the survey for its suitability.

## **Appendices**

### **1. Promotion of Mathematics Committee**

#### **Standing Committee**

Membership - President of the CMS  
Executive director  
2 members of the Board of Directors  
1 other member

#### **Terms of Reference**

To publicly champion mathematics.

#### **Duties and Responsibilities**

1. To develop and maintain media contacts, issue press releases or otherwise inform the media of newsworthy mathematical activities. To express opinions on mathematical issues, on behalf of the CMS.
2. To work with the Liaison group, and Education, Fund Raising and other Committees when appropriate, to promote the importance of mathematics to government, business and industry. To establish and maintain good relationships with other professional societies and teacher organizations.
3. To arrange the public talks at the meetings of the CMS, including working with the local committee to advertise the event.
4. To administer the grants for Public Lectures and for Raising Public Awareness of Mathematics.
5. To support, encourage and enlist public outreach activities which explain, promote and increase the general understanding of mathematics in schools and/or in the community at large, and to encourage the membership of the CMS to initiate or become involved in such activities.
6. To report to the Board on the promotional activities undertaken.

## 2. Questionnaire for directors of recent annual meetings

### Questionnaire for recent directors of annual CMS Meetings.

#### Instructions

You can reply by mail (an addressed return envelope is enclosed)  
or by e-mail or fax to either:

K. Hare, Dept. of Pure Mathematics, University of Waterloo  
fax: 519 725-0160 tel: 519 888-4567 ext 6633  
e-mail: [kehare@math.uwaterloo.ca](mailto:kehare@math.uwaterloo.ca)

or D. Farenick, Dept. of Mathematics, University of Regina  
fax: 306 585-4020 tel: 306 585-4425  
e-mail: [farenick@math.uregina.ca](mailto:farenick@math.uregina.ca)

**Please respond by February 19, 1999.**

#### Questionnaire

1. a. How many sessions were held and of these how many were self supported?
- b. What features, in your opinion, make for a successful or an unsuccessful session?
- c. At your meeting, did you feel that certain sessions were more successful than others? If so, why?
- d. To your knowledge, to what extent did graduate and/or undergraduate students participate in special sessions or in the overall meeting?
2. a. In your view, what makes the major CMS lectures (such as the plenary lectures, the Coxeter-James or Jeffrey-Williams lecture, the Nelson-Krieger lecture, and the public lecture) successful?
- b. Did many non-conference participants attend the public talk? What venues of advertising were used?

- c. Did you feel that at your meeting the other major lectures were successful? If not, then are you able to identify problems or suggest remedies?
3. a. Can you identify tasks or procedures that the local organizing committees failed to do adequately?
    - b. What suggestions might you have for the CMS that would enable local organizing committees to do their work more easily, effectively, and so forth?
  4. a. Please comment on the financial aspect of your CMS meeting. For example, was the funding adequate?
    - b. Please comment on the current registration fee structure. (e.g. are the fees too high? About right? Too low?)
    - c. Do you feel that lower registration fees for teachers, students, retirees, and unemployed are warranted? Should they be lower?
  5. a. Can you identify or suggest activities that the CMS should or should not be doing at annual meetings that would enhance the value of the meetings for each of the following groups of people:
    - (i) academics engaged in teaching and/or research;
    - (ii) graduate students;
    - (iii) undergraduate students;
    - (iv) nonacademic professionals (e.g. teachers, engineers, scientists).
    - b. Do you feel that it is important that CMS meetings address the needs of all four groups listed above? If possible, list in order of highest to lowest priority those groups above that CMS meetings should aim to serve and indicate how important it is that CMS meetings serve these groups.
  6. The cultural life, the attractiveness of the natural environs, and the costs of travel and accommodation do vary from city to city. While recognizing the importance of holding annual CMS meetings in all parts of the country, were there particular features of your city that you believed to be useful in drawing participants? On the flip side, does your city have disadvantages that may have discouraged people from attending?
  7. To conclude, what specific aspects of your CMS meeting did you consider successful or unsuccessful? What, if anything, could you suggest that might have made your meeting, or will make future CMS meetings, more successful?

8. Do you have any further comments?

Below is a synopsis of the main points made by past directors and program chairs of CMS meetings in response to the questionnaire.

The annual meetings of the Canadian Mathematical Society are primarily for the advancement and dissemination of research in mathematics. As such, the focus of the meetings should be on research and advanced training. While the CMS meetings are designed to serve the interests of academics, there is general agreement that it is important to continue to find better ways of having graduate students and teachers participate. There appears to be very limited support for broadening the scope of the meetings in order to attract undergraduates, non-academics, or other professionals/scientists.

The past meeting directors believe that the success of a meeting depends very much on the success of the individual sessions. They would like to see each meeting have a large number of high quality sessions, with many lectures in each session. The meeting directors observe that the merits of a session depend more on the quality and number of the participants, and the proactive nature of the organizer, than on the level of financial support the sessions receive. In addition to CMS supported sessions, it has become an increasingly common practice for sessions to be locally supported, supported by one of the major Institutes, or to be completely unsupported.

The plenary and prize lectures are significant conference events. The plenary lecturers should be well known mathematicians who are good, clear expositors working on important problems of current interest. The public lecture is at times less successful in meeting its aims of "reaching out to the public" and more attention should be given in the selection of appropriate speakers.

The annual meetings usually have a session devoted to education. Under normal circumstances, there are few incentives for teachers in the host city to attend these sessions. There appears to be agreement among most meeting directors for a lower one day conference fee for teachers so as to encourage teacher participation. If an education session organizer is serious about getting teachers to attend, then it may be useful to hold an evening meeting of the session and to schedule talks that address the interests of teachers.

All meeting directors recognise the need for graduate students to attend CMS annual meetings, but there is not a consensus on how graduate students can best participate. Many prefer the contributed talks and graduate paper sessions, however there has been question as to how effective these sessions really are (they tend to suffer from small audiences, for one thing). Some directors indicate that

students ought to participate in special sessions in their fields of expertise, though the extent that they do so will depend on the organizers willingness to solicit and include graduate student papers. Factors that might lead to greater graduate student participation are partial travel/accomodation support from the CMS and some sort of academic job fair.

The current fee structure is deemed to be fine; the meeting directors believe that it is important to keep the fees for graduate students as low as possible.

The past meeting directors admit that the choice of location for a CMS meeting impacts on the number of total participants. Most advantageous is a city with an attractive cultural life, that is particularly scenic, or that is in some way novel. Cities that are difficult or expensive to get to, or that do not enjoy a high reputation, will likely attract fewer participants; perhaps it is with such venues that the quality of the scientific program will be of even greater relevance. The opinion was not voiced that the CMS ought to alter its habit of holding its annual meetings at various cities throughout the country.

Several meeting directors state that better use of the CMS website can be made for its conferences. Included here is online registration, up to date titles, abstracts, and schedules, and so forth.

In conclusion, our reading of the survey indicates that on the whole, the past meeting directors believe that the CMS annual meetings are already successful, and that future meetings should strive to offer a strong scientific program with several special sessions.



### 3. Graduate student survey

The following survey was made available in both english and french as a web form (at <http://cms.math.ca/CMS/survey.html> and [sondage.html](http://cms.math.ca/CMS/sondage.html)). Graduate students at Canadian schools were made aware of it via an e-mail to their departments, and roughly twenty or thirty Canadian graduate students studying outside Canada were also informed by e-mail.

#### CMS Graduate Student Questionnaire

##### 0. General information

Name:  
Undergraduate institution:  
Graduate institution(s):  
Field of study (if chosen):  
Advisor (if chosen):  
Years of graduate study:  
Sex (optional)  
Email address:

##### 1. Membership

Have you heard of the CMS?  
Are you a member of the CMS?  
What do you think the CMS does?

Did you know that CMS Memberships for students are at cost (currently \$25 per year)?

Many institutions that are members (most Canadian schools) have a certain number of free memberships for students.

##### 2. Information

What information do you think undergraduates and/or graduate students should have access to, that the CMS could provide, either on a web page or in some other way? Job announcements? (They are currently available at [web link]. Any suggested changes?). Information on opportunities for undergraduates outside Canada that students might not otherwise hear about (e.g. "research experiences for undergraduates" in the US, Budapest semesters in mathematics in Hungary,

Part III at Cambridge)? Information on fellowships? Access to a list of Canadian graduate students willing to offer opinions on their graduate school (to help senior undergraduates make decisions)? Any other suggestions?

Once some of these suggestions are implemented, what would you think of being on a CMS database of graduate students? There would be five or six e-mails sent out per year, informing you of new resources on Camel, and upcoming conferences, etc.

### 3. Conferences

Have you heard of CMS conferences?

Have you been to one?

Would the following increase the likelihood of your attendance (if travel weren't exorbitant, e.g. it was near your institution or your home, or subsidized)? (Of course, fees for students are low, currently 25\$.)

There was a special session in your research area.

You were asked to give a talk in a special session in your research area.

There was a mini-course for graduate students in your field of research. (This could be

separate from the usual CMS conferences, and might be at one of the 3 research Institutes.)

There was an introductory mini-course in some other field that interested you.

You wanted practice talking about your work in front of an audience.

You were on the job market.

There was a job fair.

You were on the job market, and there was structured time for department chairs to meet

potential applicants.

There was a special event (e.g. a pizza party) for graduate students to meet.

There were teaching-related events (workshops, lectures, etc.).

Travel wasn't exorbitantly expensive.

If you've been to a graduate student session, what did you think? Was it worthwhile, even with participants from different fields?

What would make a conference worthwhile for you? If you've been to a conference, what made it worthwhile for you?

### 4. The Canadian Undergraduate Math Conference

Have you heard of it?

Did you go?

If yes:

How was the timing?

What did you think? Was it worthwhile and fun?

What can be added (or eliminated) to make it better? (Are undergraduate research talks good or bad? Would you like an introductory minicourse to some fun topic?

Information on graduate schools and employment options?)

## 5. Other ideas

Do you have any other ideas of what the CMS could do to make students' lives better?

### **Summary of survey results**

There were 32 responses, from a good mix of undergraduate and graduate institutions, and fields of math (although low response from francophones). Another 15 students and recent alumni answered an earlier informal e-mail questionnaire.

It was unclear to almost all survey respondents what the CMS did, although almost half named conferences, and about a third were aware of some publications. There was very strong support for the suggestions mentioned on the surveys (from the earlier informal questionnaire):

- job announcements (academic and otherwise)
- information on opportunities for undergraduates outside Canada that students might not otherwise hear about (e.g. "research experiences for undergraduates" in the U.S., Budapest semesters in mathematics in Hungary, Part III at Cambridge); more than a few felt that Americans were far more aware of opportunities than Canadians, and were at an advantage as a result
- information on fellowships
- access to a list of Canadian graduate students willing to offer opinions on their graduate schools

There was overwhelming support for an e-mail list/database (25 wanted to be on it, and about 15-20 were extremely enthusiastic about it). The Task Force has kept the e-mail addresses of those interested, and will pass them on to the Student Committee. Several remarked that the messages should be short, and no more than 5-6 per year.

## ***Conferences***

Those who had attended one tended to feel quite positive about them. Of the various bells and whistles that would attract them, teaching and a "special event" were lowest on the list by far. However, although many said a special grad student social event might not greatly affect their decision to come to a conference in the first place, quite a few thought it would be a very good idea.

The reasons graduate students come to the conference were: to see (and hopefully meet) the top people in their field in Canada and around the world; to see talks in and near their field; and possibly to give a talk themselves. They tended to mention "meeting other graduate students" less, but it was clearly a priority in their responses.

Graduate student workshops were quite popular. Respondents were displeased by "respect" issues. A couple mentioned that in a recent conference, the graduate student session was at the very end after most people had left.

Most hadn't heard of the Canadian Undergraduate Math Conference (CUMC), but quite a few respondents did their undergraduate degrees outside of Canada, and many others would have graduated just when the CUMC had started. Nonetheless, clearly advertising is an issue. Those few who attended were very positive about it, including the idea of undergraduate research talks.

## 4. Faculty member survey

What follows is a compilation of the questions and responses to the Task Force #6 Questionnaire.

1. (a) Are you a member of the CMS ? About 2/3 of respondents indicated Y, while 1/3 said N.

(b) If not, why not?

- No. It costs money.
- Membership is too expensive and can not be charged to my NSERC grant. I can also use my professional expenses allowance but the CMS is not on my priorities list.
- In my opinion, CMS caters almost exclusively to pure math and pays very little attention to applied math
- I belong to 4 other societies already and the cost is too much.
- I am a PhD student and was not offered a free membership (as I was for AMS and MAA). If there had been CMS activities in my area of specialization (Ergodic Theory) I would have joined long ago.
- I am a Statistician
- Depuis la creation de la Societe Statistique du Canada, la SMC est devenue completement sans pertinence (irrelevant) pour les statisticiens.

(c) What does the CMS need to do for you to become or stay a member?

- Well, one thing it definitely has to do is remove the password restrictions on the use of the CAMEL facilities. I do not remember my password, so I cannot use all the facilities and I know I am paying a lot of my dues to support it, so I am less than enthusiastic about remaining a member.
- Pay much more attention to applied math
- Keep serving as a unifying force in mathematics in the country.
- An invitation to join, spelling out the benefits.
- Focussed sessions of the type that have drawn me to MAA meetings, as well a programs for undergraduates (who I mentor) would encourage me to come and bring students.
- Find a way to charge lower dues.
- Foster a sense of community among Canadian mathematicians. For that the CMS Notes need to become a lot more attractive, ie, they must go far beyond a mere data collection on events etc. The Notes of the AMS, German Math Soc. and perhaps others are interesting as they portrait a lively picture of the community, through interesting articles and reports.
- I consider my duty to support the CMS!
- Provide more support in research, collaboration, exchange and become more open organization. Research, Collaboration and Exchange: identify the areas

of interest and promote these areas by organizing conferences, workshops and meetings.

- Identify the connections with the industry and initiate collaboration etc.

Promote mathematical sciences outside mathematics.

- Show that it is effective when dealing with govt., industries and the public.

For a very long time we have been content to do math and ignore the rest; while other sciences managed to convince the society that they are worthy of support. things have changed in the last three years, but our long period of neglect of selling to the society the importance of math in so many areas of science, technology and finance has now made it that much more difficult to be taken seriously.

- It merely has to continue on its present course.

- merge with SSC

- I am satisfied with the services and also with Camel. By and large I feel the Society is doing an excellent job.

- I'm satisfied with the services of the CMS

- I have to say that, other than Crux, there is not much in the CMS for me.

Every year when I send in my dues, I promise myself that it will be the last time ...

- The society is moving in the right direction, so just continue addressing the concerns of people who use mathematics. In fact, a couple years ago I was considering dropping my membership since the CMS had always been irrelevant, but just at that time the CMS changed direction. Keep up the good work!

- The CMS is the national organization for mathematicians and that in itself is a reason to join.

- Keep being proactive, moving forward, increasing voice as spokesperson for math in Canada, making math accessible to a broader audience (eg recent publicity on IMO was excellent)

- Stay active in the kinds of programs it has been involved with for some time, on research and educational levels. Keep looking for new opportunities to expand. Camel, fundraising activities, special projects like year 2000, involvement with MITACS and the Institutes etc.

(d) The new reciprocity agreement with the AMS allows CMS members to hold AMS memberships at half the cost. If you are not a member now, will this reciprocity agreement make you consider a CMS membership in the future?

\_\_\_\_\_(Y/N)

Only one person who is not a member said he would become one because of the reciprocity agreement. Most CMS members are happy about it.

2. The CMS is involved in a number of activities. Are you aware that the CMS:

- (a) publishes research journals (Canadian Journal of Mathematics, Canadian Mathematical Bulletin)? \_\_\_\_ (Y/N) -- 0% responded NO
- (b) publishes a mathematics journal for a readership of students and teachers (CRUX with MAYHEM)? \_\_\_\_ (Y/N) -- 13% responded NO
- (c) offers awards to recognize outstanding research publications, doctoral dissertations, contributions to education, service contributions to the mathematics community, and student mathematics projects in the Canada Wide Science Fair? \_\_\_\_ (Y/N) -- 9% responded NO
- (d) lobbies NSERC for better funding? \_\_\_\_ (Y/N) -- 9% responded NO
- (e) maintains Camel (www.camel.math.ca), the country's electronic mathematics network?  
\_\_\_\_ (Y/N) -- 9% responded NO
- (f) supports public lectures in mathematics across the country? \_\_\_\_ (Y/N) -- 25% responded NO  
-- of those who said NO, several doubted that the CMS does indeed support public lectures across Canada
- (g) supports Canadian and International Mathematical Olympiad activities and, with external partners, math camps across the country? \_\_\_\_ (Y/N) -- 5% responded NO
- (h) supports and sponsors the Canadian Undergraduate Mathematics Group/Conference?  
\_\_\_\_ (Y/N) -- 25% responded NO -- a number of respondents were unaware of this conference

3.(a) Is there anything that you believe that the Canadian Mathematical Society should be doing but is not at present, or vice versa?

- More coordination with the three math Institutes. More outreach to high school math teachers and students, and not just the best students.
- The CMS should be more involved in offering short courses, teacher upgrading, general mathematical interest publications, supporting projects in teaching innovation and the like.
- It is moving in the right directions in my opinion: Promoting mathematics and its applications to the public and business communities.
- Perhaps more liaison work to make the mathematical community aware of contemporary needs by business, government and other sciences, and reciprocally to educate those sectors about successful collaborations with mathematicians.
- I believe our support for research is adequate and appropriate. I think we can do more for mathematics education in Canada.
- More public awareness

- newspaper articles, math in the mall type activities, definitely deeper links with provincial Departments of education.
- NSERC site visits are a useful way of maintaining links between the grant committees and departments. CMS site visits to departments might get involvement from a wider group than the small collection of meeting-goers. For example, if a department is hosting a CMS meeting, then the CMS visits that city in advance to scout out hotels, etc. for the meeting. If the site visit were organized to be at the time of a department meeting, with the CMS meeting as an agenda item, and if CMS representatives attended the meeting, one might generate more of a feeling among department members that it was "their" meeting (and "their" society).
- In recent years the AMS has revamped its services for those in the job market, by doing such things as improving the way that the Employment Register works, by maintaining a list of job vacancies on the AMS website, etc. And also by conducting its annual survey and publishing the results thereof. Rhetorical question: where does the CMS stand in comparison?
- Although I am in favour of the educational activities of the society, I think we have to realize, in distinction to some of the policies that have been Instituted in the past couple years, that the only consistent support for the CMS comes from the research community and concentrate on activities in support of research.
- Should try to recruit more members from Faculties of Education.

(b) Is there something that the CMS could do to increase its importance to individual members?

- Continue to expand and grow our activities.
- Establish more of a presence at the department level.
- Anything else that could be done to assist new and recent graduates who are just starting their academic careers would certainly be of benefit.
- Support for issues of increased workload among post-secondary teachers and what strategies are to support students and avoid burning out faculty. Support strategies for preparing junior colleagues in their teacher development. [I.e. spread the word to departments and graduate programs that this is a central issue.]
- Special campaign to promote mathematical sciences outside academic community.
- Fight for more grants to enable senior graduates and new Ph.D to get together for summer research Institutes or equivalent, so they get opportunity to know each other and also carry out joint research.
- Take a greater interest in helping young mathematicians establish their careers, namely - job fair at CMS meeting
- Need to get more people involved. The nominating committee has been working hard to include new voices and that must continue. I think inviting someone to participate in a particular activity that they can help form is the best way to get commitment to the organization.



(c) How could the CMS be more important to mathematics research?

- Perhaps it could assess the process that is used by NSERC to make decisions concerning the award of Research Grants. Obviously there are complaints concerning individual cases that could not be dealt with. But is there general satisfaction with the process used? Are there principles which are or are not involved that should or should not be involved?
- I think many would like to see the CMS obtain external funding for Research Conferences. I used to think this wasn't realistic but I am now no longer sure. I would like to see more profiles of research in the media. We have the media access now. Perhaps we should try and get Spark funding from NSERC - I wonder if they fund an organization rather than just a University? Spark funds journalism students to write about Science - Regina is one of the Spark locations.
- Continue to support high quality scientific meetings, seek ways to improve the position of Mathematics at NSERC, seek ways to bring the usefulness and importance of our discipline to the public and politicians at large. Never neglect to defend pure research while doing this!
- Publish a wider range of journals. Eg, adopt some of the electronic journals started up over the last few years, that are now looking for a stable home.
- Some strategies for responding to the world of 'matching grants', coop and industrial liaisons, etc. Strategies for developing interdisciplinary research teams.
- Emphasize quality, avoid an "old boys (and girls)" system. Be aware that there are huge new areas of mathematics which are underrepresented in our departments and membership.
- Get funding for workshops, conferences and summer research Institutes. The way we are going, the three Institutes (Fields, CRM and PIMS) have taken over what was once the function of CMS. With them getting more funding and CMS getting none, CMS has become less important and not worth the membership for many.
- It should be putting out more mathematics research journals.
- One thing the CMS could do is to recognize that in these days of absurdly priced commercial journals, we should be thinking of increasing our publication activities. One relatively simple thing, which I have been advocating for a number of years, would be to combine the Journal and Bulletin and publish 12 times a year, thus giving a modest increase in page count from  $1152 + 512$  to 2304.

(d) How could the CMS be more important to mathematics education?

- Send clear message to school kids that without good grades in appropriate math courses in high schools, many doors to high paying university degrees will be closed to them.
- Play a direct role in the educational content in schools, and reverse the trend towards equating mathematics with the knowledge of punching the right sequence of keys on a calculator!
- Helping to develop online software for communicating mathematics. It should be possible for students to use such software without much training (for

communication of symbolic material.)

- The education/research Institutes which vanished in the 60's (I guess) should be revisited. We have mainly lost those links. Where they still exist, e.g. at Waterloo, the benefits are clear. It is crucial for our community to wrest back more input, even control, of the public school agenda.
- Build more significant links with the provincial high school math associations.
- Co-ordinate with math departments to provide math prizes at all regional science fairs in Canada.
- Address issues of the recruitment and preparation of future mathematics teachers AND the preparation of elementary teachers who will be teaching mathematics (among other things).
- Right now there is an enormous hole here. I think that some of the Education sessions need to be far more prominent at our annual meetings. Having a top quality research lecture at the same time is not a good way to get people to attend an education session. We desperately need an NSERC type of funding for distance and computer-based learning. We are falling way behind in these areas.
- Find a way to include mathematicians from colleges as a start. Continue and enhance activities at provincial math teacher conferences.
- Veiller a ce que les gouvernements provinciaux cessent de diminuer le nombre d'heures reservees aux sciences mathematiques dans les ecoles publiques.
- Personally, I think it is important to provide resources and opportunities for teachers. What you have at UofR is great (Math Central). I'd like to see similar resources across the country.
- Also, I think we should stop looking to help others and spend some time helping ourselves. I'm sorry to be politically incorrect, but there are lots of bad teachers in University too. We never even seem to acknowledge that, or do anything about it. Perhaps the role of the CMS is to try to establish some guidelines for the advancement (and learning) of teaching mathematics, and then make these available to institutions to implement or ignore, as they see fit.
- Should get more involved in discussion of curriculum development and evaluation of mathematics learning and teaching.

4. The Canadian Mathematical Society organizes two national conferences each year.

(a) In the last two-year period, how many CMS meetings have you attended?

- (b) 4 meetings (12\%)
- 3 meetings (8\%)
- 2 meetings (16\%)
- 1 meeting (30\%)
- 0 meetings (34\%)

(c) Of the following activities, indicate those that are to you important (I), somewhat important (S), not important (N)

special sessions in your field	I=81.4%	S=1=4%	N=4.6%
large number of special sessions	I=25%	S=38.6%	N=36.4%
contributed papers session	I=30.2%	S=23.3%	N=46.5%
special session in education	I=37.2%	S=41.8%	N=21%
discussions with colleagues from other institutions	I=73.3%	S=24.5%	N=2.2%
plenary lectures	I=50%	S=38.1%	N=11.9%
the characteristics of the host city	I=17.8%	S=46.7%	N=35.5%

(d) Should CMS conferences continue to offer a Public Lecture? Why or why not?

- Yes, since a public lecture increases awareness of mathematics in the general public.
- Oui. Il faut essayer de promouvoir les maths dans la communauté. Cependant, les conférences publiques DOIVENT à tout prix être accessibles à des non-initiés des maths.
- Yes. This should be part of our outreach to the public. We should ensure that these are superb events and get lots of press coverage.
- The most recent one, by Ed Barbeau, was a wonderful talk. The previous one, by Bill Lawvere (who is the world leader in my field) was a disaster. But I think, all in all, that it is a good idea, but handle with care. I also enjoyed Hy Bass' lecture.
- Yes. While these have not been uniformly successful, to put it mildly, I think the experiment is vital. We need to have sophisticated public speakers who can communicate the excitement and wonder of our discipline to a cynical and jaded audience. Never give up the good fight.
- Only if the public really starts coming.
- Oui, il est important que le public sache que nous existons et le public qui s'intéresse aux mathématiques a besoin de cette nourriture intellectuelle.
- Who attends? If it is only to the converted, forget it.
- Yes - but it is incredibly difficult to do well. For example, the lecture by Coxeter was interesting for historical reasons, but not effective as a public lecture.
- I do not believe there has been consistent participation from the public. It is better to put the talk in a public avenue already existing at the institution. I would like to see more talks for local students on accessible and exciting math (even the conference attendees would like this - talks at a "lower" level always attract many people - we all like to relax and enjoy a talk). Why not a session on math for general enjoyment - a bad title but perhaps you know what I am trying to say.
- No. Offer public lectures at other appropriate times.
- Yes. We should try to reach out to other groups who have some interest in Mathematics (Students, Teachers, Scientists, Engineers etc). Strengthening links with such groups is surely in the best interests of the mathematical community.

I doubt if it is possible to find many speakers who could attract an audience from the "general public".

- Yes!!! For PR purposes if nothing more. The MAA/AMS are very successful at bringing in school kids, teachers and other groups to experience the atmosphere at a math conference. This wouldn't happen without public lectures and other fun events.

- Have you ever attended an OAME conference? Great atmosphere usually. It would be interesting to consider a joint conference with Math educators.

- Yes, as long as it really attracts a lay audience.

- I don't know what the objective is. If it is essentially for mathematicians - a way to recognize and honour the speakers - it depends on the cost. I think Canada and the CMS should accord appropriate recognition to its best mathematicians, but I'm not sure this is the best way to do it. If a public lecture were to be an instrument to reach out to other sectors or the public at large to promote mathematics and to make "outsiders" aware of what mathematics can do, I think it would be worthwhile. In that case, however, it would have to be appropriately publicized and the speaker would probably have a different profile than in the past.

- Yes, if only to try to shake the perception that Math is boring, intelligible only to a few, and punishment for the masses. Only by continuing to reach out (at the right level) can we help (a few) people understand the relevance and importance of mathematics in everyday life, and the beauty of the things that may not presently have applications.

- They are an excellent idea. I wish there was better participation by the "public" however.

- I am not sure about this initiative because I have seen mostly the attending mathematicians at the one I attended rather than the general public. Maybe it should be put on only when there is clearly a topic which would be of public interest in the city where the talk is taking place, eg if the local teachers wanted it or others in the community.

- Yes. Why Not? Mathematics needs all the public exposure it can get.

Can you think of ways in which the Public Lecture could be improved?

- More advance media announcements

- Que les conferenciers sont capables de parler a une auditoire de non-mathes!

- Need an excellent speaker; not too technical lecture; not too long a talk; reception afterwards.

- Develop a list of speakers, have people in the audience whose job it is to evaluate the talk and the speaker. These people need not be mathematicians. Hire a speech writer? Are these are commercials for math? Should we treat them as such?

- The speaker is by far the main issue; mathematical content is less important than intellectual pizzaz. The talk has to be honestly public, or else this is a waste of time.
- Spend more \$\$\$ advertising it. Posters, bigger newspaper ads, etc. Get a sponsor to pay for and arrange the advertising through their own publicity department.
- The public lecture should explain to a general audience what is the influence of mathematics in their daily life, in the economic life of the country,
- Make it controversial or political, rather than a lecture on more math.
- Well, are they taped and then made available on Public TV?
- A talk which includes some hand-on activity which people can take away; and a web-site for follow up and other links.
- A top notch speaker is required even if it costs big money. Invite specific appropriate groups (kids, teachers, professional groups, etc) to attend the lecture. Ideally should be free but for a good speaker you could charge money.
- Focus on a particular group (high school students, government administrators, school teachers, or whatever)
- Just be careful who is invited. I would go for people like Knuth and Hofstadter, who are used to public lecturing.
- Speakers should keep in mind what the intended audience is.
- Try to avoid scheduling on Friday or Saturday evening.

(d) If your first language is English, then what is the likelihood that you would attend a lecture on a topic of interest to you if the lecture were presented in French?

- unlikely (48.9%)
- possibly (11.1%)
- very likely (40%)

(e) If your first language is French, then

(i) how important to you is it that at least some of the lectures be presented in French?

- Important (1 respondent)
- Somewhat important (5 respondents)
- Not important (1 respondent)

(ii) what is the likelihood that you would present a lecture in French?

- Unlikely (2 respondents)
- Possibly (4 respondents)
- Very likely (1 respondent)

(f) How important is it that the CMS conferences address the needs of the following groups? (mark I, S, or N)

graduate students	I=77.8%	S=20%	N=2.2%
undergraduate students	I=18.2%	S=47.7%	N=34.1%
nonacademic professionals	I=27.3%	S=45.4%	N=27.3%

(g) In the space below, please feel free to make any general comments that you may have about the annual CMS conferences.

- They are an important part of mathematical life in Canada, and they have been very useful. They help provide a sense of community and vital links to others in a very large country. This isn't to say there is no room for improvement. Indeed, I think the constant attention they receive is a measure of their importance to the community.
- Question (f) runs into the problem of the chicken and the egg. Undergrads and teachers don't know about the CMS, so have no reason to commit their time to going to a CMS meeting - until the CMS builds up some credibility with them, they have no reason to believe that investing their time this way will be worthwhile. Perhaps a way to get those people out in the first place is to invite some other group that does have this credibility to organize a session. Eg, if you want to bring in teachers, then hold a session on high school math education, and get the high school association (eg, OAME in Ontario) to organize it.
- How strong is the participation of Quebecois mathematicians? When Quebec separates, this question (e)-(i) will no longer matter.
- Provide comfortable places where delegates can just sit around. If you pay foreigners to come speak, then treat Canadians the same way or else don't pay foreigners either.
- Drop the women in math committee. It's merely fishing for something to do. (Of course this will meet with opposition.)
- Only a special session related to my interests, or proximity, is likely to attract me right now. Perhaps, for the summer meeting, there should be some consideration of the mini-course / preconference course of the types developed by the MAA.
- Running a special session for graduate students at CMS meetings is completely useless, as their fields of interests are unrelated. Attendance at these sessions seems to be minimal, no surprise! Grad students need to be integrated into their research field.
- Cut back to one good conference a year.
- CMS conferences should focus on the topics of interests of its members. With respect to other groups, like teachers, engineers, professionals, and undergraduate students, special activities should be organized. It is a bad idea

to intimidate them or alienate them by letting them to listen to "incomprehensible" presentations of little interest to them.

- Personal Opinion: I attend the CMS conference (1) if there is a meeting that I want to attend that is held during the conference, (2) If there is special sessions in the area of my interest, (3) if I need to get away from the routine chores at home and wish to meet mathematical friends. The duration of the conferences is too short for any meaningful joint research. This is specially true of the winter meetings.

- Something needs to be done to upgrade the contributed papers sessions. As things stand at present, these sessions often seem to be at the bottom of the list when it comes to assigning lecture times. Partly as a result of this, the number of lectures of this type is usually quite small. Yet very many people have interesting things to say, about their fields, that can be presented in a way that is of fairly general interest.

- I have always wanted to attend but I find it difficult to justify the expense when there are so few activities relevant to my mathematics research and teaching.

- How about a real-time demonstration of the utility of Mathematics for solving a real-world problem that has wide applicability (e.g. some strategy relating to investment, commuting, household supply, weather,)

- I am not active in the CMS because of having to be active in statistical societies. However, I retain membership for the sake of supporting mathematical research and education, and to keep to some extent informed about these and related issues.

- I think reducing the frequency to once per year is a good idea though.

- I want say that I will not attend a CMS conference until the practice of charging higher fees to NSERC grant holders is discontinued. I tend to forget about this issue come renewal time, which is a good thing because, if I remembered, I would not renew.

- Une reunion par annee suffit.

- They are very professional and this does us great credit - especially when dignitaries are invited to participate. I think this adds a lot of value to our reputation (you might think the math alone should do it but it won't). Conferences have broadened and I am extremely pleased about that. Have opportunities to welcome new people to the meeting and find ways to ensure they meet people. The conference is lonely when you don't know anyone.

- Je trouve qu'une reunion par an est suffisante, etant donne le grand nombre de rencontres mathematiques. Le debat a deja ete ouvert a la societe: il y a deux reunions par an parce que les comites ont besoin de se rencontrer deux fois par an, pas pour des raisons scientifiques.

- The quality of the plenary lectures is important to those for whom there is not a special session.

- I am always very pleased when I see a good number of papers presented in French. I like the bi-lingual nature of Canadian Societies.

- It would be helpful to try to combine, on some occasions, our conference with the Canadian Mathematics Education Study Group and/or the Canadian Society for History and Philosophy of Science. For example: joint meetings, contiguous scheduling at same.nearby locations.

Below are two letters that we received in response to the questionnaire.

1. I received your survey about the CMS. I am aware of the activities of the CMS and I favour them. I am not a member, and find it difficult to join, because a few years ago the CMS executive voted to suppress a letter I submitted to the CMS Notes. At the time Swaminathan was the editor.

My letter was personal, not official, and criticised the Nserc. Needless to say it was polite and carefully written.

The conclusion which I drew from the experience was that the interests of Institute managers and large grant holders were the only real concern of the CMS- that mine did not matter.

So I do not join. I have modified my will and removed the Society from it as well. I do not feel very happy about this situation- it leaves me somewhat isolated- but that is the answer to your survey

2. I have received your questionnaire and find that my experiences don't quite fit the questions asked. So I'll just give you a few comments on what I think are some relevant points. I am within 5 years or so of retirement and, having been a member of the CMS for over 30 years, I am well aware of all the services provided and I intend to continue my membership no matter what the society does or doesn't do. I don't attend semi-annual meetings because I prefer to use my limited research funds to present papers at specialist conferences in my area. However I think those meetings are one of the strengths of the CMS for younger members and one of the big attractions to membership. (including the reduced fees for members). I think the Task Forces that Kathy Heinrich set up are excellent and should help set the directions for the future. I say this in particular as current chair of the Finance Committee, which has given me an overview of the Society that I didn't have before.