

Natural Sciences and Engineering Research Council of Canada

NSERC *Contact*

Investing in people, discovery and innovation

A Continuing Source of Good News

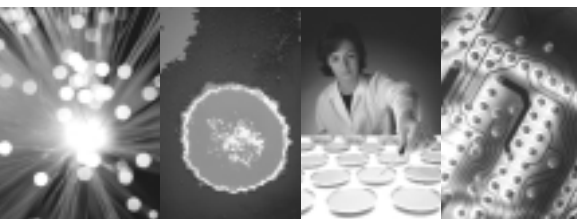
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The Government's renewed interest in research support has been attracting new researchers to faculty appointments in Canada, and that is very good news. The evidence is in NSERC's current application statistics. This development is great for Canada, but it creates a need for additional research funding through NSERC.

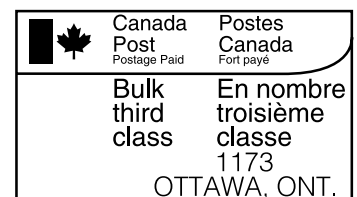
We now have the actual application statistics for this fall, so we no longer have to rely on estimates, as I have been doing in discussing this subject over the last couple of months. There are 762 first-time applicants who are new to the NSERC system. In addition, we have another 485 applicants who had been in the system before but aren't currently funded. These increases will be offset by only 269 currently funded researchers retiring. The total number of applicants will be 3,051, including 1,804 continuing in the system.

Last year we had about 600 new applicants, and the previous year about 500, and in both years the growth put a

pressure on the Grant Selection Committee budgets. The GSCs met that pressure by severely limiting the grants for continuing researchers in order to give a reasonable opportunity to new ones to get started. This year we have 762 new applicants, the budget pressure has become much greater, and dealing with it by limiting the support of excellent continuing researchers could cause serious long-term damage. Clearly, NSERC needs new funding for the new applicants this year, all the more since about 200 of them are senior people who require substantial support for the research programs they are bringing with them.

The 762 new researchers include 106 in Computer Science (compared to 25 four years ago) and 62 in communications and electromagnetic engineering. These 168 new professors are precisely in the area where increased numbers of graduates are desperately needed by the ICT sector. This is also the area where much concern has been expressed about

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Communications Division
NSERC
350 Albert Street
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K1A 1H5
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Fax: (613) 943-0742

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Editor-in-Chief
Joyce French
E-mail: joyce.french@nserc.ca

NSERC is Canada's
instrument for promoting
and supporting university
research in the natural
sciences and engineering,
other than the health
sciences.

NSERC supports both basic
university research through
research grants and project
research through partner-
ships among universities,
governments and the
private sector, as well as
the advanced training of
highly qualified people.



Continued from cover page

“brain drain.” For these two reasons, this growth in applicants must be considered a very positive development.

Another 241 of the new applicants are in the life sciences, 152 in other areas of engineering, 118 in the physical and earth sciences, 68 in mathematics and statistics, and 15 in interdisciplinary fields. Detailed application statistics show that no important area of research is being abandoned. And that, too, is very good news.

I have approached the government for urgent assistance in funding these new applicants. This source of budget pressure was foreseen in the business case that we have been making for doubling our budget in four years (see “NSERC’s Budget Prospects” on our Web site at www.nserc.ca for details), but we are taken aback by the amount of growth, and by its early appearance.

In approaching the government about the new applicants, I provided an estimate of the immediate need. I did not propose to continue the low grants given to the “news” in recent years. On the contrary, I made my estimate by assuming a success rate of 75% for the new applicants and an appropriate grant averaging \$50,000. (Recall that more than a fifth of the new applicants are senior people.) I assumed a success rate of 50% and an average grant of \$40,000 for the unfunded applicants already in the system. I am aware, of course, that these amounts are much higher than the grantees funded in some recent competitions have had to manage with, and the business case includes a significant improvement in the support of their research as well.

My estimate is that we need \$38.3 million p.a. of new money starting in April 2001 to provide reasonable research grants to the new applicants. The 269 retirees are leaving

\$6.6 million p.a. in our budget, so the net pressure on the 2001-2002 budget of NSERC from this source alone is \$31.7 million p.a.

This, of course, is not the only budget pressure that NSERC feels. We are being asked for the operating costs of the facilities and infrastructure funded through the Canada Foundation for Innovation (CFI) to date. These are continuing costs, that cannot be met with one-time money through CFI. We are also under pressure from industry to provide additional support for professors and students in the ICT areas (an example of this is eMPOWER Canada, a group representing segments of the high-tech industry); and we are expected to provide big grants to new holders of the Canada Research Chairs, improve the funding of our university-industry programs, etc. These budget pressures are all included in the business case for doubling the NSERC budget in four years. And we now envisage even more new applicants for research grants next year.

In his acceptance speech on election night, the Prime Minister explicitly mentioned the importance of research, development, and innovation for the future of Canada in the 21st century. NSERC is in total agreement, and the university researchers that we support are contributing a great deal to make the Prime Minister’s vision a reality. But they need sustained and internationally competitive research funding to move to the higher levels of activity, quality, and impact that we all want.

There is good news for Canada in the very large number of new applicants to NSERC. And it will become a continuing source of good news if NSERC is given the resources to fund their research adequately.

Food That's Good for What Ails You

It doesn't take a scientist to know that food keeps us alive, but scientists are only now beginning to unravel the subtleties of how some food can keep us healthy. And the results of that research are being published not just in scientific journals, but also on the labels of groceries.

In the United States, a dozen different types of foodstuffs can feature this kind of information on their packaging, including government-sanctioned claims that such products can lower a consumer's cholesterol levels, reduce the chances of developing heart disease or prevent osteoporosis. These strong assertions have established a new category of "functional" foods, which offer benefits that go well beyond simple nutrition.

"Nutrition as a discipline is used to taking a rap, where many of the food ingredients that we consume have been touted as contributing to increased disease risk," says Peter Jones, a professor with McGill University's School of Dietetics and Human Nutrition. "The appearance of functional foods means that now what you do eat may indeed be more important than what you don't eat."

He was speaking on Parliament Hill in late September, introducing the topic for an audience made up largely of Canadian MPs and other government representatives. His talk, "Functional Foods: Snake Oil ... or the Grand Elixir," marked the launch of the 2000-2001 Bacon and Eggheads breakfast speaker series, which is sponsored by the Partnership Group for Science and Engineering and NSERC.

Dr. Jones portrayed the prospects of functional foods to be highly promising, though he acknowledged that the findings of researchers can appear to be too good to be true. For example, the n-3 polyunsaturated fatty acids found in fish oils have been shown to have a positive effect on seven distinct health problems: coronary heart disease, fatty acid deficiency, autoimmune disorders such as lupus, type II diabetes, inflammatory bowel disease, rheumatoid arthritis, and three types of cancer.

"It sounds a bit like snake oil, but actually these studies have been carefully constructed and there is an increasing consensus of opinion that n-3 fats really are good for us," he says.



Rustling Up Longevity

Mary Emily Clinical Nutrition Research Unit at McGill University.

Dr. Jones noted that a product naturally containing those fats should eventually be permitted to describe their

properties on labels in the United States, where for the past decade the Food and Drug Administration has led the world with legislation to inform shoppers about functional foods in this way. Developed countries around the world have been following that lead, and since 1996 a joint committee within Health Canada has been working on standards for a similar system of adding such claims to food labels in this country.

"The regulatory framework has to both allow the opportunities for these foods to exist, while at the same time face the challenge to protect consumers against false or unsafe claims," he said, later pointing out that key distinctions had already been drawn between functional foods and the much broader field of natural health products, where health claims remain sharply confined.

Nevertheless, Dr. Jones insisted that Canadians will be formally introduced to functional foods, and that their designation on our grocery store shelves will be much more than another dietary fad.

"I believe we are in the midst of a continuing evolution where, as with many countries, here in Canada we'll soon see actual health claims present on food materials," he said. "The consumer and Canadian society stand to benefit from functional foods — to increase health and wellness, and also thereby to reduce the cost to health care."

Strategic Project Grants News

Competition results

The 2000 Strategic Project Grants competition — the first one held since the program was repositioned to support early-stage research — funded 124 proposals totalling \$15,322,974 in year one, for an overall success rate of 45.6 per cent. The average annual award was \$123,600, up from \$107,500 in 1999. The table at the bottom of the page summarizes the results by area.

ProGrid™ pilot project

NSERC is undertaking a pilot project on the use of ProGrid™ as an evaluation tool in the Strategic Project Grants program. Customized for the individual organization and program, ProGrid™ provides a framework for writing and reviewing proposals and software to help capture and display the data generated in the assessment process. Of course, ProGrid™ doesn't make funding decisions or replace the current external peer review and selection panel process.

Here's how ProGrid™ was applied to the Strategic Project Grants program. Detailed selection criteria were developed based on the program objectives. Applicants were asked to structure their proposals in sections that addressed each criterion. They were also asked to assess their own projects, by selecting the statement (from four provided) that best described the proposed project, and to justify their assessment. External reviewers and selection panels used the same criteria and statement sets to rate the application.

NSERC is undertaking a formal evaluation of the pilot project over two or three competitions before deciding whether to adopt the methodology permanently.

Valuable feedback

"Applicants, panel members and external reviewers have provided excellent feedback, and their cooperation is very much appreciated. Their input will be used to improve the application process for the next competition and will be factored into NSERC's final decision regarding this methodology," said André Isabelle, Director of the Strategic Projects and Networks Division.

Changes to the application instructions will be posted on NSERC's Web site (www.nserc.ca) and sent to Research Grants offices by January 31, 2001.

New Target Areas for the 2001 Competition

The current target areas for the Strategic Project Grants competition have been in place since 1996.

To decide what strategic areas to focus on in the future, NSERC conducted a literature study and consulted leaders in the academic, industrial and government sectors, then convened focus groups to draft descriptions of the areas. Council approved the following target areas for the next competition:

- Biosciences
- Environment and Sustainable Development
- Information and Communications Technologies
- Value-Added Products and Processes
- New Directions (introduced in 2000, this category will be retained)

Descriptions of these areas have been posted on NSERC's Web site (www.nserc.ca).

Strategic Project Grants 2000 Competition Summary

Area	Number of		Success Rate (%)	Total (\$millions)		Funding Rate (%)
	Appl.	Awards		Requested	Awarded	
Biotechnology	59	26	44.1	7.8	3.6	46.2
Energy Efficiency Tech.	21	7	33.3	2.3	0.8	34.8
Environmental Tech.	78	32	41.0	10.0	4.2	42.0
Information Tech.	39	23	60.0	5.0	2.8	56.0
Mfg. and Processing Tech.	15	9	60.0	1.6	0.8	50.0
Materials Tech.	48	24	50.0	6.1	2.7	44.3
New Directions	12	3	25.0	1.9	0.4	21.0
Total	272	124	45.6	34.7	15.3	44.1

PromoScience Program Is Off and Running

If the volume of applications is any indication, NSERC's new initiative to support the promotion of science and engineering to young people has captured the imagination of many Canadians. By its September 15 deadline, the first PromoScience competition had received more than 100 applications.

On November 2 and 3, the PromoScience selection panel met to evaluate the 114 eligible applications and make funding recommendations. Sixty-six organizations were awarded grants totalling \$3.8 million over the next three years, a success rate of 58 per cent. However, given the extremely high demand for funds — a remarkable \$17.7 million over this same three-year period — the funding rate was only 22 per cent.

PromoScience drew a diverse and creative collection of proposals from organizations across Canada, with planned activities covering everything

from dynamic tours and speakers to experiments with new media.

“Each of these applications captured an enthusiasm to bring science and engineering closer to Canadian youth,” says Panel Chair Tim Lougheed. He added that the panel was also

impressed by the sheer range of proposals, which came from newly formed regional groups as well as established national organizations.

A list of the successful applicants can be found on the PromoScience Web site at www.nserc.ca/promoscience.

A resin casting of the NSERC Herzberg Medal, created for the Council by the Royal Canadian Mint, was taken up into space by Canadian astronaut Marc Garneau on November 30, aboard the Space Shuttle Endeavour. (See page 6 for details about the first winner of the prestigious Medal.)

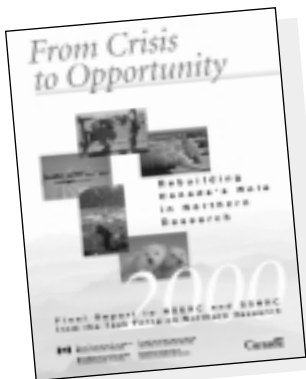


Courtesy Canadian Space Agency
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Newsbureau Busy Working for You

As always, the Newsbureau continues to alert the media about NSERC issues and NSERC-funded researchers. Here's what we've been up to since the last time we reported to you.

Task Force on Northern Research



We've distributed the findings of the NSERC/SSHRC Task Force on Northern Research. The story was covered as news by CBC Radio, the *Toronto Star*, *Kitchener-Waterloo Record* and *Montreal Gazette*, as well as by *Nature*, *Research Money* and *University Affairs*. The report was also mentioned in a feature on Arctic sovereignty in the October 31 science section of *The New York Times*. Rick Boychuk, in an

editorial in the November-December issue of *Canadian Geographic Magazine*, highlighted Canada's low interest in the North, quoting Task Force chair Tom Hutchinson.

Bacon and Eggheads lecture series

The fall Bacon and Eggheads presentation on functional foods by McGill professor Dr. Peter Jones (see page 3) was covered by Press Gallery reporter James Baxter. His article appeared in the *Ottawa Citizen*, *Calgary Herald* and Victoria's *Times Colonist*.

Although there's more coming down the pipe, we're still counting on you to get in touch — and stay in touch. If you have even the faintest suspicion that your work or that of your colleagues might be of interest to either the public at large or to any sector with its own dedicated media, we'd be delighted to hear from you. Please contact us at newsbureau@nserc.ca.

And the Winners Are...

As 2000 draws to a close, it's a good time to reflect back on some of the highlights of the year, particularly the first NSERC award winners of the millennium. For more information on all the winners and the awards, visit www.nserc.ca/about/award_e.htm.

Howard Alper First Winner of NSERC Herzberg Medal

The University of Ottawa's **Howard Alper** is the first winner of the prestigious new **Gerhard Herzberg Canada Gold Medal for Science and Engineering**. (See the Spring 2001 issue of *Contact* for more details.)

In a special ceremony honouring NSERC prize winners at Rideau Hall on December 7, Her Excellency the Right Honourable Adrienne Clarkson, Governor General of Canada, presented the NSERC Herzberg Medal to Dr. Alper. The Governor General also presented NSERC's Awards of Excellence, E.W.R. Steacie Memorial Fellowships, and Doctoral Prizes.



Howard Alper

The new prize guarantees that Dr. Alper, a chemist renowned for his work in developing tools to synthesize and modify molecules, will receive a million dollars from NSERC for his research over the next five years — that means an additional \$345,000 on top of NSERC's existing investment in his research.

"Howard Alper has had a truly outstanding influence on Canadian research," said NSERC President Tom Brzustowski. "His methods are acclaimed for their simplicity and for their practical application to compounds that are of great interest to synthetic industries. Pharmaceutical companies use them in their search for new drugs to counter the serious problem of antibiotic resistance in bacteria. He has also devised new forms of synthesis that are highly 'atom efficient,' i.e., they build new molecules with little or no waste. Outside the laboratory he has turned his extraordinary energy to raising the profile of research in Canada and building bridges between the research community and government and industry."

The three finalists for the first Herzberg award were Dr. Alper, **David Regan** of York University and **David Schindler** of the University of Alberta.



David Regan

They each received the **NSERC Award of Excellence** which consists of a crystal sculpture, and Drs. Regan and Schindler also received \$50,000 each to be added to next year's research grant.

An internationally renowned psychologist, David Regan was the first to demonstrate the brain processes that underlie collision avoidance. His revolutionary findings have proven extremely important for improving safety for car drivers and pilots as well as for the design of human-machine interfaces.

David Schindler is one of the world's leading environmental scientists, acclaimed for his influence on the study of lake ecology and for convincing governments in many countries to legislate controls on acid emissions and phosphorous detergents. His lake experiments excited the world of environmental science and provided the critical understanding needed to protect freshwater ecosystems.



David Schindler

At the same event, the Governor General also presented NSERC's **E.W.R. Steacie Memorial Fellowships** to Bruce Balcom, André Charette, Wayne Grover, and Chris Le; and **Doctoral Prizes** to Ramachandra Achar, Annamalai Annamalai Jr., Mark John MacLachlan, and Carole Lyn Yauk. (See the Spring 2000 issue of *Contact* for details about the winners and their work.)

University-Industry Synergy

The Synergy Awards were presented during the Innovation 2000 Conference: The Grand Challenges in Managing and



Sustaining Innovation, November 2-3, in Toronto. Sponsored for the past six years by The Conference Board of Canada and NSERC, the awards recognize the most successful university-industry collaborations — leveraging the R&D capabilities of each partner to provide economic benefits to Canadian communities and to enrich academic and research programs within Canadian universities. The winning partnerships this year are:

Small- and medium-sized companies category

- **APT Power Technologies and the University of Manitoba** for the creative approach they took in the production of leading-edge protective relays in the electrical utilities sector. Their state-of-the-art computer relay device has been successfully implemented by several utility companies across North America and continues to be the easiest and most effective tool to monitor, detect and remove problems in electrical power utility systems.
- **World Heart Corporation and the University of Ottawa Heart Institute** for their significant contributions towards the development and commercialization of artificial heart technologies, and for their dedication to bringing the HEARTSAVER VAD™ an implantable heart assist device, to market. Testing of their product to date has been very favourable, and human trials are set to begin in 2001. An effective treatment for heart disease may be just a heartbeat away.

Large companies category

- **MDS Sciex and the University of Manitoba** for their collaborative effort in the development and production of a hybrid tandem quadrupole time-of-flight mass spectrometer. This powerful new tool is used for research in proteomics, which is more specialized than research in genomics. It could well revolutionize the diagnosis and treatment of human illnesses by enabling researchers to create new drugs that are more effective and have less secondary effects.

• **L'Alliance Semex and l'Université Laval**

They have been working together for ten years now. Their successful partnership continues to keep Canada at the forefront of bovine reproduction technologies. Their research program has already provided tangible benefits to the Canadian dairy industry and is now attracting interest from researchers working on fertility treatments for humans.

Ventures involving several industry partners category

• **The Electro-Optic and Fiber-Optic Instruments Project and the University of British Columbia**

for an R&D venture involving at least two industry partners. The optical sensor technology developed by this consortium brings the benefits of fiber-optic and electro-optic instrumentation to the electric power industry. As a result of this innovative approach, optical sensors are safer and more accurate, have greater bandwidth to monitor the quality of power, and are lighter and easier to install.

• **Fold-Fault Research Project**

Researchers from the University of Calgary and Queen's University joined forces with 23 companies to form this dynamic research consortium. They have made great strides in improving the petroleum industry's ability to interpret seismic data and make informed decisions on drilling locations for oil and gas wells along folds and faults. Since the Fold-Fault Research Project began in 1995, it has more than doubled its industrial support base, has created job opportunities for graduate students inside and outside Canada, and has been recognized internationally for its research excellence in geology and geophysics.



Professor Deborah Spratt of the University of Calgary is one of three major university collaborators in the Fold-Fault Research Project.

Leo Derikx Award

• **Consortium for Software Engineering Research (CSER)**

for developing world-class software professionals and enhancing software engineering practices. Managed by the National Research Council, the organization brings together six companies, nine universities and 16 principal investigators across Canada. This team has received international recognition for their work, in large part due to their unflinching commitment and dedication.

Policy Research Awards

The Canadian Policy Research Awards Graduate Prizes were awarded in Ottawa on November 30. Twenty-two young researchers from 14 universities across Canada received the Prizes, which recognize and promote excellence in, and communication of, policy-relevant research at the graduate and post-doctoral level.

One of the winners was Eric Gordon Sanderson of McGill University, holder of an NSERC Industrial Postgraduate Scholarship, who was awarded a Prize for his research entitled "Exposure Assessment of Complex Mixtures of Pollutants in the Ambient Atmosphere."

The Prizes are jointly sponsored by the Policy Research Initiative, SSHRC, CIHR, and NSERC. The Policy Research Initiative

consists of partners in over 30 federal departments and agencies, provincial governments, numerous think tanks and many universities seeking to strengthen the policy research capacity in Canada. At the heart of the Initiative is a small group that reports to the Clerk of the Privy Council and Secretary to Cabinet.

Michael Smith Awards for Science Promotion

NSERC announced the five winners of the Michael Smith Awards in June. Since then, the awards have been presented in Edmonton, Montreal, Ottawa, and Toronto to:

- **the Edmonton Space & Science Centre**, for its success in fulfilling its mission "to inspire and motivate people to learn about and contribute to science and technology advances";
- illustrator **Jacques Goldstyn** and editor **Félix Maltais**, responsible for the highly successful **Débrouillards** concept, which promotes and popularizes science by making it fun, and has been adopted in more than 10 countries;
- **Actua**, a charitable organization that partners with government, business and education to run programs that help children discover the excitement of science and technology; and
- **Let's Talk Science**, an organization based at the University of Western Ontario in London, for its innovative science education programs.



(left to right) Félix Maltais, editor, and Jacques Goldstyn, illustrator, of *Le Club des Débrouillards*, during the ceremony in Montreal on October 19.



(left to right) Dr. Tom Brzustowski, President of NSERC, and Actua's Jennifer Flanagan, Jason Côté, and Elza Seregelyi, in Ottawa on November 21.

In January, the Discovery Channel's **Jay Ingram**, will receive his award in Toronto. His ability to make science and technology understandable and intriguing has affected literally millions of viewers.

Named after Canadian Nobel Laureate Michael Smith, the award honours individuals and groups who make an outstanding contribution to the promotion of science in Canada through activities encouraging popular interest or developing science abilities. The awards are the result of a national competition and are the first to be awarded since NSERC assumed responsibility for the awards from Industry Canada late last year.

Wanted: Your Suggestions for Interdisciplinary Research

Editor's note: The main objective of NSERC's Reallocations Exercise, which takes place every four years, is to redistribute up to 10% of the Research Grants budget according to the changing needs and priorities of the Canadian science and engineering research community. See www.nserc.ca/programs/real2000-e.htm for complete information on the current and previous exercises.

Many new and emerging areas of science and engineering occur at the boundaries between disciplines, and move ahead rapidly when people with very different backgrounds bring their expertise to bear on them. Hoping to facilitate such research, NSERC's Reallocations Exercise is now accepting proposals developed jointly by two or more Steering Committees, in addition to submissions that are discipline-based. (Twenty community-based Steering Committees were established last summer to develop submissions on behalf of each discipline supported by NSERC.)

Because there were few interdisciplinary proposals in the last exercise, the previous Reallocations Committee urged NSERC

to stimulate such proposals this time around. Council formed an Advisory Group on Interdisciplinary Research (AGIR) to provide advice and make recommendations on how NSERC can better encourage and support interdisciplinary research.

To help Steering Committees identify and develop opportunities for joint, interdisciplinary proposals, AGIR is encouraging researchers to submit ideas, which NSERC will send to Steering Committees for consideration and follow-up.

In mid-March 2001, NSERC will post a summary of the incoming ideas on its Reallocations Web site (see address above). After that, the research community will have another opportunity to build upon these ideas or submit additional ones.

Send your ideas to reallocations@nserc.ca today!

Researcher Refunds PDF Support

NSERC's Committee on Professional and Scientific Integrity has resolved a case of misuse of funds involving a former postdoctoral fellow (PDF) who knowingly violated NSERC's eligibility rules by working almost full-time while conducting his postdoctoral research.

At the time, PDF recipients could only work up to a maximum of 300 hours/year outside of their research activities. (This has since been increased to 450 hours/year.) Had the researcher complied with disclosure requirements clearly set out in the PDF application guidelines, NSERC would have recognized that the researcher was ineligible, and would not have granted the award.

Following its investigation, the Committee recommended that the researcher return the full amount of funding (\$58,000) to NSERC. The researcher has done so, and NSERC has imposed no further administrative sanctions.

Note: In accordance with the federal Privacy Act, NSERC does not disclose the identity of an individual subjected to sanctions. As a public service to the scientific community, the Council reports on serious cases of misconduct and on the sanctions resulting from investigations by the NSERC Committee on Professional and Scientific Integrity.

Harmonization Project Strikes Opening Chord

University researchers and administrators will be pleased to hear that Phase I of the Harmonization Project is almost complete.

As many of you know, the project was started two years ago by the three federal granting agencies — CIHR (the Canadian Institutes of Health Research, formerly the Medical Research Council), SSHRC (the Social Sciences and Humanities Research Council) and NSERC. This was in response to a request by the research community.

The objective is to harmonize and simplify the policies and regulations governing the use of funds awarded by the three agencies. Phase I dealt with the rules on eligible expenses, and Phase II (targeted for completion in November 2001) will cover administrative policies such as transfers and terminations.

A great deal of work went into harmonizing the guidelines, which had to respect the cultural differences of the three communities. The agencies wish to thank those of you who attended the harmonization meetings and provided feedback. Your participation was instrumental to the project's success.

The result of these efforts is *Eligibility of Expenses*. It will be posted on our Web site, and copies will be sent to Research Grants Officers and Business Officers, early in the new year. We're confident that you'll find it an excellent working tool.

Once you've had a chance to review the document, please direct any questions or comments to staff at NSERC and SSHRC by e-mail at casdfin@nserc.ca or casdfin@sshrc.ca and to staff at CIHR at nmanseau@cihr.ca.