

Dental

MAY 1990

Research News

Research Development Office, (902) 494-1675

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Dalhousie at the Top

The headline in the Dalhousie News on the 14th March informed us that according to the Toronto Star, Dalhousie and McGill were sited as two of the "hot five" Universities in Canada based upon Ontario student preferences. All this is on top of our own experience that Dalhousie was the top Canadian University at the recent International Association for Dental Research meeting in Cincinnati, at which we had 30% of all the Canadian papers being presented. We were well ahead of McGill and even ahead of Toronto. These facetious observations should not however, cloud the fact that presentation of our research findings at international meetings does significantly enhance the reputation and image of Dalhousie University.

A Course on Statistics for the Dental Faculty will be put on by the Research Development Office. This participation course will be limited to five or six individuals. See page 11 for the full details.

The Driving Force

"Sometimes I hear people say: If the professors didn't have to do all this research, they would be better teachers! That almost makes me lose my supposed Scandinavian reserve. I almost get irritated! Research scholarship, and artistic activity are the driving force in the intellectual activity that we call a university"

Nils Hasselmo, President
University of Minnesota.

RESEARCH NEWS ON FILE

A complete collection of all previous copies of the Dental Research News published since September 1987, is on file in the Faculty Lounge in a green file folder.

Any Research News?

If you have any research news which you would like to share with your colleagues? Please forward such items to the Research Development Office. It would help if submissions were produced on a (Macintosh) disc in Microsoft Word, or simply call 1675.

The Future of University Research

Between the 8th of May and 10th of May, 1990, the Royal Society of Canada will be holding hearings at Dalhousie University. They are conducting a survey across Canada of the needs and concerns relating to university research in Canada. An open meeting of the Research Development Committee was held on Wednesday, April 18. The purpose of the open meeting was to discuss in detail the proposed meeting between the Royal Society of Canada and faculty members of Dalhousie University. Hearings are to be held at the University dealing with research in Canada on the 9th and 10th of May. The Committee are to hold public hearings to allow university researchers to participate. Written briefs can also be submitted to the Committee at any time until the end of May. It was made clear at the Research Development Committee open meeting that it was very important for the Faculty of Dentistry to articulate clearly any strong views or recommendations which they would like the Royal Society of Canada to hear. If these views were accepted they would ultimately be made to the federal government. The document which had been prepared by the Committee of the Royal

Society of Canada was circulated to each of the departments in the Dental Faculty by the Research Development Office. It was particularly disappointing that there was such a poor response to the open meeting which was aimed to provide an opportunity for faculty input on this very important topic which will effect the way that research will be conducted in Canadian universities in the future. The document prepared by the Royal Society Committee outlined the issues which were thought to be significant to the future contribution of Canadian universities to the national research enterprise.

At the open meeting of the Research Development Committee the group discussed in some depth the various issues which have been raised within the document which had been circulated from the Royal Society of Canada. It was generally agreed that it was important to emphasize the special role of health science research in which there may not be an industrial interest or motivation for profit. It was felt perhaps important to put forward the strong view that there was a moral obligation to undertake research which would benefit the health of an aging Canadian population.
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Strong views were also expressed that there was clearly inadequate funding provided for graduate students. Not only were the individual stipends very low but there was clearly insufficient funds for sufficient graduate students to provide the training in numbers which would be necessary for Canada to hold their own competitively in the various scientific fields. A further area discussed was the severe competition that Dentistry faced from Medicine with respect to funding. It was suggested that perhaps this issue could be brought forward as a concern from our Faculty. A further major point which was discussed at considerable length concerned the question of overhead on grants. It was unanimously agreed that this was something which should, in fact, be provided since universities were struggling to cope with the totally inadequate funding with which they were provided. However, it was also equally agreed that any overhead payments should be new money in addition to the existing research funding being provided and indeed there should be an urgent request for an increase in the amount of research money which was considered to be well below that which was necessary to sustain a viable

research program across the various disciplines on our university campuses in Canada. However, it was also agreed that this may not be the best message to give to the Royal Society since they will be well aware of the financial problems, it may be better to put forward more constructive ideas for ways in which research can be improved in our universities.

Some considerable discussion was directed to the question of elitism in research and comparisons were made between the United Kingdom in which there had been a move recently to provide additional funding for those universities which had a very strong research base. The counter argument to this was that the rich would get richer and the poor would get poorer with respect to any research activity. It was clear from the discussion that there was no simple answer to this very complex problem. It was agreed that it may be inappropriate to fund all research equally and perhaps Canada should concentrate on certain specific areas of research which are being well done.

There was one item which was discussed with some enthusiasm and that was the
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question of perhaps introducing a small grants program in which "first time" researchers would receive something like \$15,000 without too many questions being asked and without a track record being required. This funding would then allow individuals to perhaps produce results which would then enable them to demonstrate competence in research and which would allow them to be competitive in the regular grants program.

Further discussion took place relative to the differences between the NSERC and the Medical Research Council systems. It was recognized that the Medical Research Council operated programs which were more along the lines of a strategic grant rather than the system within NSERC which supported individual researchers. The question of possibly restructuring the three federal agencies was discussed and the general consensus was that it may be a useless exercise since it may just end up wasting money and taking up an awful lot of time without any major advantages being produced. It was generally felt that the present structure should be retained but perhaps modified to improve the effectiveness and efficiency. It was agreed that it would be

appropriate to try to improve the methods used to deal with evaluating those subjects which at the present moment seem to often fall between the one or two of the funding agencies. Biomaterials and Bioengineering were mentioned as areas which did have a problem in this respect.

The Chairman agreed that although the attendance had been somewhat small at this important open meeting, nevertheless the discussion and enthusiasm for the subject had more than made up for the limited attendance. He thanked those present for their participation and valued the comments that had been made and would try to make sure that these concerns and comments would be brought forward in the meeting between the Royal Society of Canada and the University Research Committee.

Those faculty members who were unable to attend the open meeting of the Research Development Committee can make any comments in writing to the research Development Office before the 5th May.

Skin Deep?

Nothing is rich but the inexhaustible wealth of nature. She shows us only surfaces, but she is a million fathoms deep.

Ralph Waldo Emerson

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**SOCIAL SCIENCES AND
HUMANITIES RESEARCH
COUNCIL**

Traditionally we have not considered applications from dentistry to the Social Sciences and Humanities Research Council, this may well be an over-site since for certain research topics it could well be most appropriate. However, we would clearly have to make sure that the applications fall outside the range of programmes which are funded by MRC or NHRDP.

Projects to be considered should clearly have a much broader impact and applicability to the general public than to the profession of dentistry.

SSHRC has made a number of changes in its Strategic Grants Program. The Council is currently supporting research in five themes:

1. Women and Work
(could be Women in dentistry?)
2. Education and Work
in a Changing Society
(Could be dental education?)
3. The Science and
Technology Policy in Canada
(Dental Science policy- MRC?)
4. Applied Ethics
(Cosmetic dentistry?)

5. Managing for Global
Competitiveness.

(This may be a very difficult area to address from the dental stand-point.)

The first two themes have been in place for a number of years and are fairly well known. The final three are either modifications of existing themes or new themes. Here is a brief description of these themes:

Science and Technology Policy
in Canada

The purpose of this theme is to encourage research aimed at improving both the process and substance of science and technology policy in Canada. Science and technology have transformed human life and society in fundamental ways over the centuries and have changed the way we understand ourselves. It is of vital importance to reflect upon, and to reach a critical understanding of, the impact of science and technology on our lives and our world. This understanding should, however, be transformed into action to ensure that science and technology are directed creatively in ways which enhance the quality of life.

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(SSHRC cont from page 5)

While research supported under this theme should be policy - relevant, this program presupposes fundamental reflection on the nature of technological society and the impact of technology. It should also help to develop a critical appreciation or understanding of science and technology culture.

Applied Ethics

The purpose of this theme is to encourage research in applied ethics, which is understood to be the systematic analysis of values and ethical criteria and their practical application to vital human decisions. This program presupposes fundamental reflection on the nature and role of ethics, and on rights and responsibilities in a democratic and pluralistic society.

Ethics is a central part of social life and a matter of significant public concern. The public's concern about ethical issues has been aroused by the appearance of new technologies, whether in dental health care, communications, industry or science, which have challenged our moral thinking and posed ethical dilemmas without precedent. The fluoride issue the use of mercury in dental fillings are clearly matters which come into this area. Many of the central issues of our times are

moral and ethical ones, as we must re-define, in our complex, technologically sophisticated, pluralistic society, the rights and responsibilities of individuals, groups, organizations and governments to each other and to their common environment.

The Partnership Dimension

The Council encourages the establishment of partnerships among academic researchers, and public and private sector organizations to enhance the usefulness and relevance to society of thematic research. Under this initiative, research teams establish formal links with a body or bodies in the public or private sector for the purpose of jointly conducting scholarly research projects or activities of mutual interest and benefit. The non-academic partners must make a commitment to provide support in cash or in kind for the research activity, and should actively participate in all phases of the project. Private sector funding can include university endowment sources.

Strategic Research Grants

Priority will be given to multi-disciplinary research projects. While group applications are encouraged, applications from
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individuals which promise to contribute in a significant manner to the development of research in a given theme will be considered.

Strategic Research Networks

The purpose of this program is to bring together and sustain multi-disciplinary networks of researchers engaged in collaborative research activities. A network should involve at least five researchers in three institutions which are not formally affiliated. Non-university based researchers and practitioners may be included in a network, but it is expected that they will cover their own costs of participation. The network should focus on a specific problem or set of problems, and approach them from the perspective of different disciplines with the aim of reaching an interdisciplinary synthesis and more comprehensive understanding of these problems. Funds can be used for travel, workshops, and communication and dissemination activities.

Strategic Research Workshops

The Council will support research workshops that can provide a forum for the dissemination of research results, the examination of specific research topics, the

delineation of research questions and needs, or the elaboration of methodologies.

Strategic Partnership Development Grants

Partnership development grants allow groups of researchers to seek out and formalize links with potential partners. These grants will permit the researchers to arrange meetings with potential partners and to defray costs of initial collaborative activities. The Council hopes that these grants will lead to the formulation of mature proposals with a partnership dimension.

Deadlines

Normally the deadline for the Strategic Grants Program is once a year on April 1. This year, because the information has only just been made available, the deadline for "Strategic Theme" Applications only has been moved to April 17. This is too late for this year however, there will be another competition with a deadline of October 15, 1990, and thereafter the competition deadline will move to October 15 of each year with a notification date in April.

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"To be a scientist is to do research." John Ziman

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Joint Initiatives Program

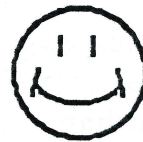
Through its programme of joint initiatives, the Council enters into agreements with public and private sector organizations for the joint funding of research programs and activities of mutual interest. These agreements will lead to thematic programs in specific areas.

The Joint Initiatives program is intended to: encourage multi-sectoral consultation and promote the development of global and multi-disciplinary approaches to the study of contemporary issues. In addition to promote consultation on the definition of needs within a sector and the implementation of the most appropriate mechanisms to meet these needs. A further aim is to encourage communication between researchers and users of research; to ensure rapid and effective dissemination of new knowledge to users. An additional aim is to help integrate strategic research results with policy making and socioeconomic development.

By involving outside partners in the funding of strategic initiatives, the Council wishes to sensitize the public and private sectors to the essential contribution of the humanities and social sciences

to major problems facing society. It is also a means of diversifying funding sources for human sciences research in Canada.

Discussions are under-way with a variety of potential partners, and the council will issue separate programme announcements as agreements are finalized. Information on joint initiatives will be provided as it becomes available from SSHRC. If you are in any doubt as to which federal research agency you should apply to for a particular subject or topic please call the RDO for advice.



SMILE

Research Definitions

"It has long been known..."
means:-

I didn't look up the
original reference.

"A definite trend is evident..."
means:-

These data are practically
meaningless.

"Of great theoretical and
practical importance..." means:-

This was an unsuccessful
experiment, but I still
hope to get it published.

Is Technology transfer Taking Place?

Technology transfer, the passing of university-based research to industrial innovation, has to start at some place. Industry, government and university leaders all keep hammering on that point. But where should it start? On the 22nd of March a Conference on Biotechnology was held in the Faculty of Dentistry by The Canadian Patent Office. The conference dealt with how to make use of patent and how to protect inventions. The session was very informative, clearly outlining the methods available in order to gain information on patents and on patenting.

Patenting is only one aspect however, the need to transfer the technology is perhaps an even more difficult problem.

At the University of Western Ontario's Centre for Cognitive Science, a show-and-tell featuring seminars and demonstrations on the Centre's work in human and machine vision was held. The director of the centre Zenon Pylyshyn, a professor in the Psychology Department said that they had done very little before to publicize what they were doing to the people who might actually be able to use it.

The event was sponsored by the Ontario government's Information Technology Research Centre (ITRC), a network

of university research centres - primarily the University of Toronto and the University of Waterloo. ITRC also has involvement and sponsorship from several high-tech companies including IBM Canada Inc., Digital Equipment of Canada Inc. and Apple Canada Inc.

The various industrial participants did not get crisp, business-like presentations showing exactly how research could be applied in the market place today. What they got was research in the raw, delivered for the most part in academic jargon.

The talks included a short overview of the basic strategies the Centre uses in studying human vision systems and applying that knowledge to machine vision. Followed by other presentations by specialists on a number of specialized topics. It is important that the participants from industry understand both the importance of the fundamental research, but at the same time also understand the needs of industry.

According to Pylyshyn these individuals ("industry receptors.") are essential in order for technology transfer to work. This may not be as important in the US, where many large corporations maintain research centres.

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According to Pylyshyn industry in Canada will have to develop industrial receptors. But in the meantime, technology transfer must move ahead. Pylyshyn praises recent government initiatives.

In addition to ITRC, UWO is also involved with three of the other Centres of Excellence the Ontario government established in 1987. Now the federal government is launching several networks of Centres of Excellence, including the Institute for Robotics and Intelligent Systems, with which the Centre for Cognitive Science will be affiliated.

This is a very important development and a very novel, creative approach to technology transfer, Nova Scotia needs to follow this lead.

It is important to recognize that applications of leading edge research probably won't emerge overnight. However, there are potential applications within our dental research for Technology transfer to take place. Dalhousie's Technology Transfer Office is there to help make this happen.

Busy Time

At the IADR meeting in Cincinnati Derek Jones was installed as the President of the Dental Materials Group of the

International Association for Dental Research, and as the Vice President of the Canadian Association for Dental Research (CADR). Derek Jones also participated as a member of the site visit team to review the \$43 million, OCMR Ontario Centre for Materials Research programme in March. Derek Jones has recently been recommended for appointed by the Federal Government to a new National Advisory Panel on Advanced Materials.



- 8) When the equipment breaks down it must be time to get the data ready for the meeting.
 - 9) Only when you find the result you expected and hoped for do you realize that you are looking at the wrong data.
 - 10) When you project your first slide at the meeting you realize that the data is all wrong.
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Statistics Course for Dental Faculty

The Research Development Office will be sponsoring a course on statistics for members of the Faculty of Dentistry.

Statistics and probability provide the tools to study chance and variability, and hence establish the means of inference which allow us to generalize, with known probabilities of error, from the particular to the general. A researcher requires a knowledge of statistics as much as he or she requires knowledge of the empirical methods of his/her area of study. Without such knowledge our findings are limited to the particular cases at hand, for we are without the means of reliable inference. Hence statistics are a necessary tool for researchers.

Proposed Course: The course will run for an academic term, two hours per week. With a maximum enrollment of five faculty members. The course could be scheduled in the late afternoon (4:00-6:00 or 5:00-7:00 pm). Alternatively, two one-hour sessions in the early morning (8:00-9:00 am) might be preferable. The course would comprise a systematic development of the basic ideas of descriptive and inferential statistics. Simple computing

software would be utilized. It would be a formal course in as much as it would require participants to attend regularly, to submit assignments and to be evaluated on their understanding and application of the concepts. The purpose of the course is not a training in the mechanical aspects of statistical calculation, but an introduction to the concepts and applications of statistical methods. An understanding of such concepts and methods, however, requires a certain proficiency with numbers and simple calculations, in order that concepts may become clear.

Applications are invited from interested faculty members. The final selection of the five individuals who will participate in the course will be made on the basis of aptitude, research experience and need. Applications should be made in writing to Derek Jones Research Development Office as soon as possible.

The Instructor for the course will be M. Kavanagh, with assistance from A.I. Ismail.

"Languages are true analytical methods" - Lavoisier

"The art of reasoning is nothing more than a language well arranged"- Lavoisier
