

Dental Research News

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RDO The Third Anniversary
On April the 1st it will be three years since the RDO was established.

On this third anniversary of the RDO we can look back with pleasure and some pride on the accomplishments in terms of scholarship during the past twelve months. This clearly shows that the third year of our "Academic Plan" has continued with an increased level of success. We have seen a repeat performance in 1990 of the record number of papers (37) being presented at the AADS and IADR meetings. This included a record number of 32 papers at an international meeting for Dalhousie Dental Faculty. This represented 30% of all the Canadian papers presented at the IADR meeting. The students staff, faculty and administration together with our Division of Instructional Resources can feel justly proud of the excellent team effort which has made the past

twelve months such a success in terms of our scholarly activities. The feed back received at the AADS and IADR meetings indicated that our research papers were of a very high standard and were well presented. The international reputation of Dalhousie in the field of dental research and scholarship now stands very high indeed. This was a fantastic third year for the RDO.

Knowledge Driven Research
The Faculty Council of the Faculty of Science at Dalhousie University recently passed the following motion. "Faculty Council acknowledges the importance of knowledge driven research and urges the university to maintain the necessary infrastructure to support this. Council also urges that the Federal Government and the granting agencies maintain the financial support to fund knowledge driven research".

Summer Projects Approved

An ad hoc Committee of the Research Development Committee has selected the following 14 research projects as being suitable for summer student research for 1990.

- 1) (a) "Anti-caries effects of pulsed and non-pulsed CO₂ laser energy".
(b) "Temperature changes associated with CO₂ and Nd-YAG dental hard tissue lasing".

Project Supervisors:

Dr's. K Zakariasen*, T Boran, & R. MacDonald.

2. "Comparison of the bond strength of composite resins to lased and acid etch enamel".

Project Supervisors:

R.M. MacDonald*,
W.A. MacInnis, T.L. Boran,
W. Lobb, and K.L. Zakariasen.

3. "In vitro studies of laser effects on dental caries using an artificial caries system".

Project Supervisors:

Dr's. T. Boran*, K. Zakariasen,
& R. M. MacDonald.

4. "The effect of silicoater treated reinforcement elements on the strength of previously repaired fractured methyl methacrylate denture base resin".

Project Supervisor

Dr. R.M. Brygider*.

5. "Patterns of Diagnosis, Treatment and Outcome of Oral Pre-cancer in the Maritimes.

Project Supervisors:

Dr's. J. Lovas* and A Ismail.

6. "Test Development: An Electrochemical Analytical Technique to Measure Porcelain Retention".

Project Supervisors:

Drs. E. J. Sutow*, D.W. Jones,
and A.S. Rizkalla.

7. "The specificity and sensitivity of visual-tactile examination for dental caries.

Project Supervisors:

Drs. A I. Ismail*,
W.A. MacInnis, R.M. MacDonald,
and D.P. Cunningham.

8. "Control of bruxism using combined biteplane and biofeedback therapy".

Project Supervisors:

Dr. H. Al-Hasson*,
Dr. A. I. Ismail.

9. i) "Dimensional Stability of Visible light cured (VLC) system compared with the injection and Trial-pack techniques for the processing of complete dentures".

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- ii) Testing of New Resin-Metal Primer for removable partial dentures.

Project Supervisors:
Dr's. O. Sykora* & E. J. Sutow.

10. "An investigation of the role of visual perceptual ability, as measured by the Group Embedded Figures Test and the Impression/Die Matching Test, in student achievement.

Project Supervisors:
Dr's. D.V. Chaytor* & H.J. Murphy

11. "Changes in aesthetic status of orthodontic patients before and after treatment: A historical cohort study.

Project Supervisors:
Dr's. W.K. Lobb* & A.I. Ismail

12. "Orthodontic Archwires: Corrosion Behaviour".

Project Supervisors:
Dr's. W. Lobb*, & E.J. Sutow.

13. "Effectiveness of Polishing Procedures on Different Metals"

Project Supervisors:
Dr's. M.G. Doyle*, E.J. Sutow, and A.S. Rizkalla

14. "A Comparison of Student Self-Assessment and Instructor Assessment of Student Management Skills"

Project Supervisor:
Dr. B Graham*

A further 3 research projects were also approved by the committee but not funded for summer students and a further five research projects were also selected for the MRC Farquharson Scholarships.

Experiment

"Experiments, the philosophers say, are of value only when they test theory. Experimental work, they imply, has no life of its own. So we lack even a terminology to describe the many varied roles of experiment. Nor has this one-sidedness done theory any good, for radically different types of theory are used to think about the same physical phenomenon".

Ian Hacking

Subterfuge and Confusion

"The field of statistics bows to no master for ability to furnish subterfuge, confusion and obscuration". R. A. Epstein.

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RESEARCH NEWS ON FILE

Did you know that 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.

**MRC Farquharson
Scholarship Awards for
1990**

A total of four students were awarded MRC FARQUHARSON Summer Research Scholarships for 1990.

Andrew Harvy 1st year DDS, will work on projects with Dr's Price and Gerrow:-

i) "A comparison of the platability of impression materials".

ii) "A comparison of the detail reproduction of flexible die materials for indirect composite resin inlays with Type IV dental stone".

Niel Power 1st year DDS. will work on a project: "The Influence of Surface Finish on the Rate of Release of Hg from Dental Amalgam".

The project will be supervised by Drs. E.J. Sutow, W.C. Foong, A.S. Rizkalla, & D.W. Jones

Marco Chiarot 1st year DDS will work on a project dealing with the "Characterization of the new liposomal neutral red *in vitro* cytotoxicity test".

This project will be supervised by Drs. W.C. Foong and R.E. Howell.

Cathy Johnson, 3rd year DDS student, will work with Dr's Rizkalla, Jones and Sutow on the following two projects:

(i) Dynamic and Static Young's Modulus of Experimental and Commercial Resin/Glass Composite and Glass Ionomer Biomaterials

(ii) Determination of Glass Transition Temperature, Thermal Expansion and Softening Point for a Range of Methacrylate Soft Polymers.

The purpose of the MRC Farquharson Summer Undergraduate Research Scholarships is to encourage our undergraduates as future clinicians to consider careers in medical or dental research. Priority is given in selecting students with a proven academic ability as well as a perceived aptitude for research. The future applied scientists who will make up the profession of dentistry must seek out new knowledge in order to better serve mankind and contribute further to the body of our general knowledge.

"RESEARCH NEWS ITEMS"

Do you have any research news which you would like to share with your colleagues?. If so, 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.

RESEARCH AWARD FOR John Peters

John Peters 2nd Year DDS student is the recipient of the 1990 Warner-Lambert Award for his demonstrated aptitude in research. John was one of the seven undergraduate DDS students who presented a research paper at the international Dental meeting (IADR) in Cincinnati in March 1990. John has been conducting research into the effects of lasers on natural tooth with Dr's Ken Zakariasen, Tom Boran and Bob MacDonald. An *in vitro* artificial caries model has enabled the group to study the effects of lasers in the prevention of demineralization of tooth enamel.

The recommendation by the Research Development Committee will allow John to attend the 26th Annual Dental Students Conference on Research. The meeting this year will be held at the School of Dentistry of the University of California San Francisco, April 1st - 3rd. The basic objective of the conference is to expose outstanding dental students to dental educators, scientists and administrators and make them aware of the wide scope of careers available in dental research.

The Council on Dental Research of the ADA sponsors the annual orientation

programme on dental research for one dental student from each dental school in the United States, Canada and Puerto Rico. The training and recruitment of manpower is of paramount importance to the expansion and improvement of dental research. One very important source of future dental scientists is the dental student population of today. The involvement of students in our research within the faculty is one way of making a contribution to the future of dental science in Canada. John's research experience at Dalhousie may pave the way for a dental science career. John will be reporting to faculty and students on his experience at the conference on his return.



SMILE

Research Definitions

"The specimens were randomly tested" means we forgot to label the specimens.

"This is only a pilot study" means, three patients died and we scared another six away.

"We achieved a fifty percent success rate" means that the other rat died.

Text Encoding Initiative.

Digitized texts--(elect-ronic versions of works of literature and scholarship that can be searched by computer) may ultimately make scholarly research easier, however, unfortunately the digitizing process is still so new that no standards exist. Because of this problem, researchers often cannot share machine-readable texts. An interesting project "The Text Encoding Initiative", sponsored by the Association for Computers and the Humanities, the Association for Computational Linguistics, and the Association for Literary and Linguistic Computing, is being undertaken in order to devise a common text-encoding scheme that would include physical features of texts, such as character sets and page layouts, that are often critical to research scholarship. This important project has received funding from the National endowment for the Humanities, the European Economic Community, and the Andrew W. Mellon Foundation.

Knowledge

Did you know that the word science originates from the Latin scire which means to know.

Critical

"Continued employment of the scientific method encourages a critical attitude - an attitude which is mandatory for the continued growth and self-sufficiency of a profession".

L. Makrides & J. Richman

Framework of the Profession."

"Evaluation is the key to professionalization because it generates the body of knowledge that forms the base for professional techniques and it encourages a critical attitude towards the theoretical framework of the profession."

L. Makrides & J. Richman



- 5) If enough data is collected, anything may be proven by statistical methods.
- 6) You need to keep repeating the test until you get the correct answer.
- 7) Most statistical experiments (using the null hypothesis) end up proving nothing.

Science and Technology Funding Down

Although the funding for science and technology is less this year we in Nova Scotia can be comforted that since we only have a very small share of the funding our loss in dollars will be significantly less than Ontario and Quebec. Statistics Canada have said that the federal government plans to spend \$5.1 billion (3.5%) of the total federal budget on science and technology during 1989-1990.

Thus the government is spending a smaller percentage of its budget on science and technology than at the beginning of the 1980's. In 1980-81, science spending was slightly less than \$3 billion, or about 3.9 per cent of the total.

The funding for the 1989-90 year, which ends March 31, rose four per cent over the \$4.9 billion level of last year, less than the inflation rate of about five per cent.

These figures raise some concern about Ottawa's commitment to promoting a science and technology driven advanced economy.

Canada should place great importance on scientific development and technologies since that is where our future will lie.

The planned federal spending for this fiscal year includes \$2.95 billion for research and development and \$2.1 billion for related activities such as data collection, feasibility studies, museum services or demonstration projects.

The figures show that Ontario is to get the lion's share of total funding with 53.1 per cent. Quebec is the second-biggest recipient with 19.7 per cent, and British Columbia comes third with 7.6 per cent. Thus over 80% of this spending will go to just three provinces. How can the 'have-not' provinces like Nova Scotia compete with this.?

Some 58 per cent of the federal spending on science is to be spent by the federal government, while 17 per cent will go to industry, 5 per cent to foreign recipients, and about 16 per cent to universities.

Of the amount channeled to industry and the universities, Ontario and Quebec will receive over 70%.

Faculty Member in Demand
At the request of the prosthodontic section of the American Association for Dental Research, the Federation of Prosthodontics has appointed Dr. Jack Gerrow chairman of the FPO Committee on Education and Research, as liaison to the AADR prosthodontic section.

**The Life and Times of
Brian**

"The starting line for me is the technological dimension," said Brian Mulroney who had seized upon research and development as a winning economic theme back in 1983.

"Either we go into the game and become important players in this major league or we become a nation that will, during its entire lifetime, play in the Junior B circuit. To play with the majors, we must make a firm commitment to double the public and private funds allocated to research and development before 1985. Research and development, and the resulting innovations, are the life-blood of a successful economy and country."

Mulroney bristled with anger, at the Liberal government's lack of commitment to research excellence. Brian complained bitterly at the idea of a single firm like IBM, supporting a

larger research budget than Canada as a whole.

Six years into the administration of Prime Minister Brian Mulroney, however, the subject of getting Canada on the Research and Development A-team is as far away as ever.

The Statistics Canada report on page 7 released in January of this year indicates, that the federal government's science and technology budget has not moved significantly during the Conservatives' years in power. In fact, as a percentage of total federal spending, it is down from the so called bad old days.

What is disappointing from a Maritime perspective is where the half-hearted investment is going. Fifty-three per cent of the total ends up in Ontario, another 20 per cent in Quebec, and 7.6 per cent in B.C. That leaves thin pickings for the rest of the Junior Bs who aspire to a place in a modern, dynamic economy.

"All causes are lost causes; otherwise they would be effects". Cummings.

Progress

"One of the most surprising things about technological progress is the degree to which we have become accustomed to it" G. F. Duffin 3M Research Ltd

Logging on to the Computer
John Napier, Baron of Merchiston, Protestant polemicist and inventor of martial devices including burning mirrors, artillery and an armored, weapon carrying chariot, devoted much of his leisure to easing "the difficulty and prolixity of calculation". In 1614 Napier published the invention for which he is best remembered a table of logarithms, for aid in trigonometric calculations. Then in 1617, the year of his death, he described what would turn out to be an ancestor of the modern computer: a machine intended to ease the labour "of those who prefer to work with the natural numbers as they stand." The machine is the Rabdologia, a set of rods inscribed with numbers, for aid in performing multiplications. These rods are remembered today as "Napier's bones." (The better ones were in fact actually made out of bone.) The Rabdologia eventually give rise to a remarkable sequence of calculating machines extending through the 17th century which were eventually to lead to the modern computer. This sequence of events is traced by M.R. Williams of the University of Calgary, who writes in Annals of the History of Computing. Williams himself has enlarged the history of the sequence by finding a manuscript which

described in great detail a 17th century calculating machine whose design was thought to have been lost.

Who Nose

Did you know that the nasal cavity is a highly sophisticated research instrument, with a detection threshold (by smell) for 3-isobutyl-2-methoxypyrazine of the order of 1 part in 1012 in water. Did you know that the average threshold sensitivity of the tongue to taste varies widely due to different taste sensations as follows:

Salt (sodium chloride) 0.25%;
Sour (HCL) 0.007%;
Bitter (quinine) 0.00005%;
Sweet (sucrose) 0.5%.



SMILE

Research Definitions

"This is a basic scientific study" means, I don't really know what I am doing.

"It was assumed that the data conformed to a normal distribution" means, I didn't know what statistical test to apply.

"The statement that X was an independent variable" means, that we couldn't control the damn thing.