

# Dental Research News

Research Development Office, (902) 424-1675

## VOLUME III, NUMBER 3.

### ACFD Workshop on Research

A workshop dealing with clinical evaluation of biomaterials research will take place on the 11-12th June just prior to the ACFD meeting at the University of Western Ontario. The workshop will deal with biostatistics, epidemiology and a hands-on research project development session. The workshop facilitators will be Don Lewis, Dave Banting, Alan Domner, Doug Dederich, Denny Smith and Derek Jones. Two individuals from our faculty will be funded by ACFD to attend the workshop. Further details can be obtained from the Research Development Office.

### Hazardous Materials

New federal regulations dealing with the management of chemicals came into effect on the 30th November 1988. The University and the Faculty of Dentistry must comply by law with these regulations. This has meant a considerable amount of work for our busy Biomaterials staff. An inventory, room-by-room has had to be produced

for all chemicals and compounds; these have all to be labelled in accordance with federal (WHMIS) regulations. Gordon Hall, Technologist in charge of our Biomaterials Laboratory has attended the Department of Labour course and he will be holding an information session to instruct the various units within the Faculty of Dentistry as to what will be required. An on-line system will be put in place by the University to obtain information on chemicals. Safety data sheets will also be made available by the University. Kathy Robertson of the Biomaterials Laboratory has done a wonderful job in putting a complete inventory of our chemicals onto a Macintosh computer file. The Faculty of Dentistry must do all in its power to ensure that our students, staff, and Faculty have a safe and healthy environment in which to work.



**RESEARCH AWARD FOR  
KATHY RUSSELL**

Kathy Russell 3rd Year DDS student is the recipient of the 1989 Warner-Lambert Award for her demonstrated aptitude in research. This recommendation by the Research Development Committee will allow Kathy to attend the 25th Annual Dental Students Conference on Research. The meeting this year will be held at the School of Dentistry of the State University of New York at Buffalo, April 9th - 11th. 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

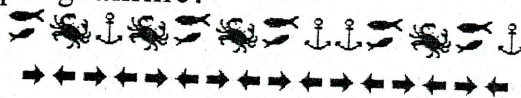
contribution to the future of dental science in Canada. Kathy's research experience at Dalhousie may pave the way for a dental science career. Kathy will be reporting to faculty and students on her experience at the conference on her return.

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**"BIOADHESIVES" RESEARCH  
GRANT FOR DALHOUSIE**

Dr. Leo Vining of the Biology Department at Dalhousie University who is one of the Principal Investigators on our Biomaterials Centres of Excellence proposal, has, together with colleague Dr. J.M.Wright and others just received a Strategic Grant from the Natural Science and Engineering Research Council to investigate marine bioadhesives. The development of bioadhesives and wound dressings is one of the key project areas in the Centres of Excellence research programme. This success coming on top of the award of our MRC Programme grant in Biomaterials has put Dalhousie on the cutting edge in a rapidly developing field. These two grants now provide an excellent base on which to build the Centres of Excellence programme.



### The Essential Balance

J.E. Hodgetts once said "If the dreaming spires are to be preserved we must find a balance between "in-depth" studies (including research) and the general liberal education which ideally gives the University its primary role as the developer of the critical intelligences required to operate an increasingly complex social apparatus and to prevent it from destroying essential human values."

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### WEIGH AND CONSIDER

"Read not to contradict and confute, nor to believe and take for granted; nor to find talk and discourse; but to weigh and consider....studies themselves do give forth directions too much at large; except they be bounded in by experience.

Francis Bacon  
of studies. The Essays.1625

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### Glass-making Rediscovered

We might ask what it is that drives a researcher. The deep interest in the subject and a strong sense of enquiry. In the case of Amin Rizkalla, who was born in Egypt, his research interest in glass synthesis and the characteristics of the atomic bonding which hold such materials together could be said to have strong linkages to the cradle of glass manufacture of

5,000 years ago in Mesopotamia and Egypt.

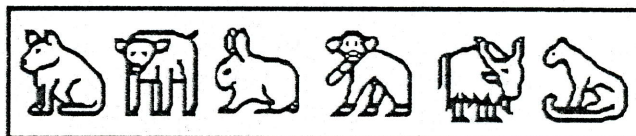
Ancient Egyptian glassmakers used three essential oxides of silicon, sodium and calcium. The ingredients would be prepared from sea sand, marine shells and seaweed ash. The first glass-making formulations of 3,700 years ago written on clay plates in cuneiform were found in the Assyrian Asurbanipals library. Chinese glasses were also made some 2,600 years ago. Our own biomaterials research programme is studying methods to synthesize glass biomaterials using modern wet-chemistry methods. We have come a long way in 5,000 years or have we?

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### The Animal Care Facilities

The Animal Care Facilities at the Tupper Building will be closed for renovations for a period of eight weeks starting on the 15th June until the end of August. Since this is often our busy time for research it is encouraging to learn that we will be able to use the animal care facilities in the life sciences building during this period. The renovations costing \$1.3 million are necessary in order to comply with the Canadian Council on Animal Care Guidelines.



### X, R and T Rating for UK Universities May Not Work

Peter Scott editor of the London Times Higher Education Supplement wrote a lead article in the January 1989 issue of University Affairs dealing with the proposed reforms of the 45 Universities which make up the British University system. Underfunding of universities is not only confined to Canada but is a world wide problem. Peter Scott, wrote that the UK "Advisory Board for the Research Councils, which advises the Secretary of State on Research policy, has suggested that all institutions should be assigned to one of three categories - R for those with a comprehensive research mission, X for those with a research capacity in some subjects only and T for those institutions that would be confined largely to teaching". Peter Scott points out that the government has shied away from this proposal fearing the political difficulties, its implementation would provoke. Mr. Kenneth Baker, Secretary of State for Education and Science informed the Vice-Chancellors (University Presidents) that he wished to see a clear distinction drawn between teaching and research funds so that the latter could be targeted more exactly rather than dispersed across a wide spectrum of weak departments.

### Technology Transfer from Researcher to User

The sixth Canadian Symposium on International Technology, entitled "Computer-Assisted learning - Theory and Reality" sponsored by the National Research Council's associate committee on instructional Technology will be held in Halifax 3-5th May 1989. Topics include artificial intelligence in education and training, innovations in courses dealing with development and technology transfer from the researcher to the user. This provides an opportunity to attend a top meeting without the need for travel funds. For further information contact L. Forget, Conference Services, National Research Council of Canada, Ottawa, Ontario, K1A 0R6.

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### Research Environment

"Technology is important if you are concerned with the quality of life of the people of your country, we must make investments attractive to companies and create a dynamic research development environment".

Fraser Mustard  
President, Canadian Institute for  
Advanced Research

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### China/MRC Agreement

Canada and China have signed an agreement to cooperate in the field of biomedical research. The agreement was signed by Dr. Pierre Bois, President of MRC and Au Zheosen, Executive Vice-Chairman of the National Natural Sciences Foundation of the People's Republic of China runs until the end of 1991, with provisions for a further three year renewal. Specifically the agreement will provide for the exchange of researchers for up to three months, with the host nation covering the living costs of visiting researchers.

### MAC-Research

How would you like to turn your Macintosh computer into a paperless 4 Channel recorder or oscillographic recorder. All this is now possible. A new 12-bit analog-to-digital converter, trigger input, plus a waveform generator for analog output through a 12 bit DAC, has been produced which can plug into the modem port of any Macintosh. The software available includes "Chart" which turns the Mac screen into a four-channel recorder and "Scope" which turns the Mac into a digital storage oscilloscope, the results can then be printed out using an image writer or laser printer. The system runs on any Mac with at lease 512K memory and two

disc drives. The manufacturer is World Precision Instruments, Inc., 375 Quinnipial Ave., New Haven, CT 06513. (203)469-8281.

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### BIOMATERIALS ?

"The best tissues we can manufacture will not take as high potentials as the natural product: that is where Nature beats us".

*G. Bernard Shaw*

(Back to Methuselah).

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### Research and Development

Canada is falling behind in R&D. Robert Ferchat, President of Northern Telecom Canada points out that Canada will spend 1.2% of the Gross National Product on research and development this year. This is down 1.69% from just five years ago. According to Robert Ferchat, Canada needs to create a culture that favours science and technology. To do this a strong partnership between business, government and the private sector should be developed.

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### VISION

"Canada's need is for people with vision, with fresh perspectives, because the future is not just a linear extension of the past."

Geraldine Kenney-Wallace  
Chairperson Science Council of  
Canada

## Inventions

Scientific and technological innovations in Canada have given birth to some major ground-breaking inventions. Reginald Fessenden in Quebec, was the real father of radio, since he made the first verbal transatlantic broadcasts in 1906 - a full five years prior to Italian inventor Guglielmo Marconi. Did you know that Wallace Turnbull of New Brunswick invented the variable-pitch propeller, which provided for safety and efficiency at all engine speeds, this paved the way for the air-transportation industry. We all know about Alexander Graham Bell with his invention in Brantford, Ontario of the telephone in 1921. Canadian historian J.J. Brown in his book "Ideas in Exile", a history of Canadian Inventions makes the point that 'Canadians have made contributions to world science and technology out of all proportion to their small number. A chemist James Guillet of Toronto was granted the millionth patent for a biodegradable plastic in 1976 by the Canadian Patent Office. Canadian inventions have ranged from methods for producing frozen food, helium, the modern zipper, the pint roller, the cobalt bomb, the snowmobile, basketball, and the nuclear reactor. A private foundation was set up in 1982

called the Ernest C. Manning Award Foundation, this has awarded \$750,000 to Canadian innovators. An annual award of \$100,000 is given out each September plus two \$25,000 Awards of Merit.

Any faculty member may contact the Technology Transfer Office (Mr. Gordon Owen) to obtain information on protection of an invention. Information on the various patent options is available to faculty members. If the idea looks worth following up it can be forwarded to a patent agent Canada Patents and Development Limited (CPDL) for preliminary review. This in most cases will not involve any expense since it is a Canadian organization. It should be pointed out that any such details should be first reviewed by the Department Chairman for comment and confirmation that exceptional University resources have not been used to develop the invention. This step will be required to ensure that the university does not have to claim ownership of the invention. A disclosure form will eventually have to be filled out which is then forwarded by Dr. R.O. Fournier, Associate Vice-President (Research) to CPDL with a request that they

(Cont. on page 7).

### Inventions (Cont)

consider the disclosure under the Agreement between Dalhousie University and CPDL. CPDL will inform Dalhousie Research Services whether or not, in their opinion, the invention can be protected by patents and can be developed, licensed and marketed. According to Dan Chase of Research Services the University then has three choices: the connection with CPDL can be discontinued, or CPDL can be requested to act under the "Agency" mode, as the patent agent on a fee-for-service or alternatively the university can request CPDL to use the "Exploitation" mode in which the rights to the invention are assigned to CPDL and they file the patent applications, returning a preset percent of the royalties to University/inventor. The Canadian Patent Office houses an immense library of scientific information in the form of patent disclosures which are available to the public, well over 1,000,000 Canadian Patents and 4,000,000 US Patents are available. A researcher/inventor can obtain access to the Patent literature through CPDL. A state-of-the-art patent search can be carried out with copies of any relevant patents of interest being provided to the faculty member. Pre-project patent searches are

in fact currently being conducted by CPDL for some of our Dental Faculty members. If you have any ideas which you feel may have potential why not discuss it initially with the Dental Research Development Office. Following this Gordon Owen of the Technology Transfer Office of Research Services will be able to explain the Dalhousie University agreement with CPDL under which they will, free of charge, evaluate the invention for possible proprietary protection and commercial potential.

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### Nobel Thoughts

"If we neglect our universities we are neglecting thought, Surely we can't allow ourselves to do that. ....Science is an almost seamless garment, and the Nobel committee has a dreadfully difficult job trying to pick the person responsible for any discovery or advancement. There has to be an element of arbitrariness in that".

Dr John Polanyi U of T.  
Nobel laureate for chemistry

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### REALISM

"..the positive argument for realism is that it is the only philosophy that doesn't make the success of science a miracle"

*Richard Boyd.*

## SCIENTIST

The Dictionary of English Etymology (Oxford, 1966) cites Scier, scier, scient, scientman and scientiate. Had any of these terms persisted we may have had to invent science-person. All of these terms are now superseded by the term proposed by William Whewell, Master of Trinity College, Cambridge, who in 1840 wrote, "We very much need a name to describe a cultivator of science in general. I propose to call him (her) a scientist".

Most of our University faculty members are "Scientists", some are engaged in "Pure" science, but the majority are involved in applied science. The study of medicine, dentistry, biology, chemistry, physics, computing, geology, microbiology, oceanography, pathology, pharmacology, physiology, biophysics, involve the use of scientific reasoning.

Samuel Taylor Coleridge wrote in Aids to Reflection (1825), "Scientific reasoning is the faculty of concluding universal and necessary truths from particular and contingent appearances". The basic logical research methods used are the same if we are attempting to understand and interpret rock formation from a specimen in a geology research laboratory, or the formation or breakdown of

natural biological tissues, animal and human behaviour, or the observation of 'clinical' symptoms in order to determine possible cause or effect.

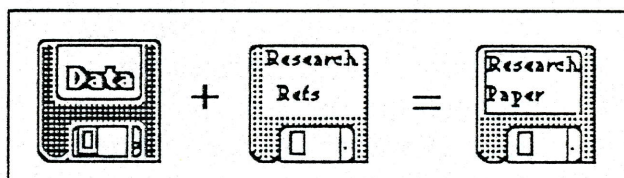
The knowledge base on which we draw on in order to teach our students has been developed over many years by careful search and research using the scientific method. For a subject to survive and advance as an applied science we have to continually question review and renew the knowledge base. William Whewell wrote in 1837, in The History of Inductive Sciences, "The advance of science consists in collecting general laws from particular facts and combining several laws into one higher generalization in which they still retain their former truth".

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## MAC-RESEARCH

The RDO now puts research references from 500 journals on the MacServe Network.



See page 9 or call the Research Development Office for further details.

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## SPACE and MATTER

"Nothing exists, but atoms and the void". *Democritus.*



## MacServe Network Now Has Research Reference Search

Following the Lunch time Research Seminar Presentation dealing with Searching the Scientific Literature on the 7th February, a reference retrieval service covering some 500 journals has been placed on the MacServe Network. The search provides the names of authors, titles of articles and author-assigned "Key-words" when included in the journal. You can design your own search strategy, to most efficiently retrieve those articles in your personal area of interest. You can choose your own subject areas, key words, journal titles, dates or authors names. Search strategies can be stored and modified when required. References that are of interest may be "marked" and then transferred to your own (disk) "Reference Manager Data Base" or if you wish printed them out. The references can also be directly pasted into your manuscript as you write up your research paper. Further information and a list of journals available on the reference retrieval service can be obtained from the Research Development Office.

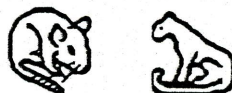


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## LOGIC

" Do not ask why the mouse runs from its enemy. Species which did not cope with their natural enemies no longer exist. That is why there are only ones who do".

*Bas van Fraassen.*



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## RESEARCH AND LEARNING

"As to the scientist being now obliged to spend ten to fifteen years before he can become adequately proficient in research, the scientist takes much longer than that, for what is research but learning- and what scientist ever feels that, being complete, his research is now at last finished."

Peter Medawar

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## A LONG STORY

"Thus did the neck of the giraffe reach out across the whole heavens and make men believe that what they saw there was a gloaming of the gods. For if this sort of selection could turn an antelope into a giraffe, it could conceivably turn a pond full of amoebas into the French Academy".

*G. Bernard Shaw.* (Preface, Back to Methuselah).

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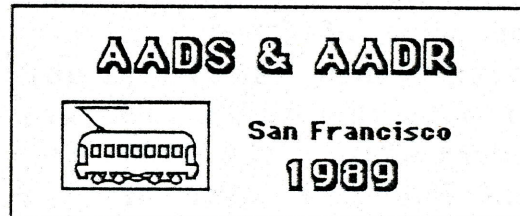
**WRIGHT TO PARTICIPATE  
IN  
ETHICS WORKSHOP**

Dr. Bruce Wright Chairman of our Faculty Human Ethics Committee ( a sub-committee of our Research Development Committee), will be our representative attending and participating in a workshop in Ottawa jointly put on by MRC and the National Council on Ethics of Research. The workshop will be attended by representatives from 16 Universities with medical , dental or pharmacy schools. Bruce Wright is a clinician with dual dental and medical qualifications as well as being a Clinical Pathologist.

**ACFD SURVEY ON RESEARCH**

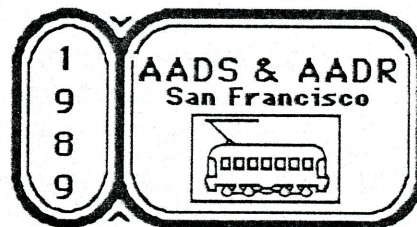
A survey from ACFD has been circulated to all full and part-time faculty relating to research. All faculty members are encouraged to complete the survey and return it to the Research Development Office by the 28th February. The mandate of the ACFD/AFDC Research Committee who have developed the survey form is to attempt to promote research activities in our Canadian Dental Faculties. A report on the survey will be made available to us at Dalhousie a few months after completion. It should be noted that identification of individuals on the survey form is intended to provide some control in

dealing with the data. However, information provided by each individual will be held in strict confidence by the ACFD research Committee.



A dry run of the 8 research papers being presented at the AADR meeting in San Francisco will be held on Wednesday the 1st March at 5:00 to 8:30 pm. (Room location to be announced). A list of the papers and presenters was published in the February edition of the Dental Research News. All Students, Staff and Faculty are welcome to attend. A light snack will be provided for those who register by calling 1675 before February 26th.

The nine papers being presented at the AADS meeting will also be presented on 1st March 1:00-2:00 pm and 3rd March 12:30 -2:00 pm. You are encouraged to attend these three sessions to ensure that you keep up to date with our educational, clinical and laboratory research which is currently being undertaken.



**FREE MEMBERSHIP OF  
IADR & AADS ?**

How would you like to have free membership of the IADR and AADS for 1990. A competition will be held with the prize of free membership subscriptions to both the AADS and the CADR/IADR for 1990. See the February issue of Dental Research News for further information.

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**"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.

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**"Avoiding Sterility"**

"The University teacher must be able, as part of his/her regular schedule, to withdraw from time to time to his/her study, or laboratory, to ponder undisturbed. When such withdrawal is clearly seen to be at the expense of taxpayers, will the taxpayer be able to rid himself of the widely held notion that the Professor has a soft life? The question is a serious one because without time to reflect in an unhurried way both teaching and research become sterile". J.A. Curry

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**SUMMER RESEARCH PROJECTS**

As in previous years a number of research positions will be available for summer students. These may involve clinical, educational or laboratory research projects. Selection of the projects will be criteria-based and will include the quality of the protocol and the potential benefits to the educational development of the selected student. Applications involving two or more faculty members are to be encouraged. Faculty members should ensure that they have adequate facilities, supplies and equipment and have determined the availability of DIR and other support requirements for their proposed project. The project applications should be received by the Research Development Office by the 24th March. These projects will be evaluated by an Ad Hoc committee of the Research Development Committee. Projects suitable for the MRC Farquharson Research Scholarships will also be selected at this time. Additional summer positions are also available for educational development projects which cannot be categorized as research projects. Project applications for these should be forwarded to Dr.B.S. Graham Associate Dean (Academic Affairs) for consideration by the Curriculum Committee.

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