Dalhousie University, Faculty of Dentistry

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The Abstract Courier

Amongst the thirty two abstracts being forwarded from Dalhousie to the IADR Central Office in Washington for review are eight special abstracts. These bear the names of students as the **potential** presenters of the research papers should they be accepted by the IADR review committee. This year we are indeed fortunate that funding has been found from four separate sources to allow a total of eight students to attend the meeting in Cincinnati. The Research Development Office are particularly grateful to the Dental Alumni Office and the Dalhousie Dental Students Society for supporting the students to attend this meeting. The the last data points have been agonized over and the statistics repeated for the third time to make sure that it really was $P<0.001$ and not $P<0.05$. The abstracts have been typed in the regulation Macintosh Courier 12 point font, and yes that is the last top copy of the official abstract form, what a miracle it just fits into the box. The package with its 32 abstracts has been taken by the Courier service to be judged and reviewed by an international panel. All we can do is wait, and wish good luck to our eight students.

EXPERIMENTS

"No field in the philosophy of science is more systematically neglected than experiment. Our grade school teachers may have told us that scientific method is experimental method, but histories of science have become histories of theory".

Ian Hacking

The Value of Scientific Conferences.

Many of our faculty members will have submitted an abstract for the the next IADR or AADS meetings to be held next March in Cincinnati. The emphasis and publicity given by the 'Dental Research News' to the IADR and AADR meetings and the presentation of abstracts by faculty members may seem to some to be rather excessive emphasis on the research value of this component of our academic activities. John Ziman has written the following comments about scientific conferences.

"It is easy to poke fun at the whole business of scientific conferences. There are obviously too many of them: the programmes are too crowded; the discussion is seldom very elevated. On the one hand they are taken too seriously, as if they were really important; on the other hand there is an element of frivolity is supposing that anything useful can be said in a ten-minute talk or learnt in a fortnight of lectures. They have become a part of the trappings of modern science - an excuse for the conspicuous travel that now replaces conspicuous expenditure as a symbol of power and success in worldly affairs"

However, the real value of the scientific conference and the justification for our emphasis on IADR, AADR and AADS conferences can be supported by the following words of John Ziman, who clearly recognizes the full value of the experience. Ziman further writes:

"Yet they (scientific conferences) serve a vital function in the transfer of knowledge, binding the international scientific community together by ties of personal friendship and mutual understanding. Not to be able to attend the international conferences in one's subject, not to be able to meet one's scientific contemporaries around the world, is to be condemned to isolation, to provincialism, and eventually to the frustration of all one's efforts to keep up with the moving frontiers of research. This is the plight of scientists in developing countries, who have so little money for travel, and who have so far to go."

"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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An OSKAR for Research

"I became interested in research not because I had to but because I wanted to answer some questions, I first undertook research seriously when I was in Graduate school. It is not easy to state my philosophy about research. In the academic world, a strong and vigorous research prevents stagnation. Research to me is almost a relaxation in which I work in a different atmosphere from clinical teaching. Yes, research can at times be a frustrating experience but nevertheless I find it to be a stimulating path into an unknown territory. I became interested in my present research endeavours due to the fact that I knew so little about the history of the Faculty of Dentistry at Dalhousie University and dentistry in Atlantic Canada. In the case of, my prosthetic research into the dimensional stability (or rather instability) of acrylic resin denture bases this was stimulated by my inability to maintain the Holy Grail of Prosthetic Dentistry, namely the bilateral balanced occlusion in complete dentures. Shall I say more?"

This according to Dr. Oskar Sykora is why he was on a flight to Dublin last June to present some of the results of his prosthetic research at the IADR meeting. Oskar's research involves a study of the posterior palatal seal for dentures as it relates to the processing techniques and the shape of the palate. Minimizing dimensional changes due to acrylic resin processing is critical to the proper functioning of complete dentures. Oskar's research has compared the dimensional accuracy along the posterior palatal border of denture bases which were processed by a newer continuous-injection technique and a standard trial-pack technique. Measurements were made after deflasking, trimming and polishing the dentures, and after immersion in water. Statistical analysis showed that denture bases processed by continuous-injection had less posterior palatal seal opening than the trial-packed group. Differences between the two techniques were greatest after immersion of the bases in water for 1 week. It was concluded from this study that the continuous-injection technique gives better posterior palatal border adaptation in comparison with the trial-pack technique, and that adaptation is also a function of palate shape. Further research has also shown that the use of a new stone substantially improved the fit of the acrylic denture bases.

Dental Patents

As pointed out in the August edition of the Dental research News ~~the~~ although the Canadian Patent Office has as one of its main responsibilities, to protect the inventor, it also has a much broader purpose which is to promote economic activity and technological development by making patented technical information available to the public. This includes our faculty members who may find that the Patent Office is a very useful source of research information. Faculty members need to keep abreast of technological development. As applied scientists, keeping up to date may avoid useless expenditures on a research topic which has already been undertaken. It is possible to find ready-made solutions to technical problems which may arise in our research.

The number of patents in Canada is well over a million and in the US it is well over 4 million. A visit to the Patent Office in Hull, Quebec is a very worth while experience. Copies of any patents can be obtained from Micromedia Limited (Toll free 1-800-567-1914) the cost is $4 for each Canadian Patent and $10 for each US patent, this is independent of the number of pages which they may contain. Some patents may have as many as 40 or even 90 pages. One US patent, #1.9547 taken out on the 10th June 1884 by Lucius T. Sheffield of New York dealt with a method of repairing roots of teeth using posts for reception of artificial fixed dentures having porcelain veneers on metal. In 1903, Claude Ransome Basford of California took out a US patent #80,022 on 31st March 1903 for an obturating device for dental drills. US Patent #284,261, taken out on the 18th February 1920 was for a "Gum Massaging Implement". A Canadian Patent #807,519 taken out in 1969 dealt with a "Dental Prophylactic". An interesting Canadian patent, 849,758, taken out on August 25 1970 was for a toothbrush for producing electrical potentials. George Gilmor of Santa Anna, California claimed to have invented a toothbrush having means of providing an electrical potential. It was claimed that since teeth have a small negative charge and fluoride ions are also negatively, charged and since all negative charges repel each other this presents a problem. By providing the teeth with a positive charge by means of the special toothbrush, it should be possible to cause the attraction of the fluoride ions. It is interesting to see the diverse types of patents related to dentistry which have been granted. **(Cont. on Page 4)**

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One such Canadian patent #1,170,527 in 1984 is for a method and apparatus for collecting saliva by P. Brown and J. O'Brien. A further US patent #1,180,580 taken out in 1985 deals with a method for cleaning teeth and is said to be particularly adapted for removing plaque. This was taken out by Arnold Carter. It deals with a jet system which acts against the teeth. A further US patent #1,196,219 also taken out in 1985 dealing with a surgical pack retention device. Harold Brownlee of Grimsby, Ontario took out a Canadian Patent #543,157 on July 9, 1957 for a special dental mixing slab. A US patent 91,943 taken out over 80 years ago on March 7, 1905 dealt with a method for producing porcelain inlays which had been pre-shaped then cut off from the projecting pencil shaped stick. A Canadian patent #910,859 taken out on 26th September 1972 was for a combined mixing capsule and dispenser having two compartments separated by a rupturable material.

An interesting Canadian Patent # 943323 taken out on March 12, 1974 by the National Aeronautics and Space Administration in Washington US was for a method for formation of hydroxyapatite from a nutrient gel to be deposited on to "damaged or weakened teeth" to produce formation of new tooth enamel. A US patent 1,137,339 taken out on December 14, 1982 was for a tooth pulp cavity filling material which was based upon natural collagen. A US patent #4,678,436 came out on April 29, 1985 deals with a dental cement which has a pH colour change which indicates when the material has set. A further interesting US patent 4,684,347 taken out on August 4, 1987 discusses a method for preventing the occurrence of corrosion of dental amalgam fillings. The Swedish invention claims that by incorporation of phosphate ion donators up to 0.5% phosphor per wt. of amalgam, corrosion can be significantly reduced. A US patent ,478,380 taken out by Luc P. Barrat and Rue Robert form Lyon, France was for a device for probing contours of teeth and then machining appliances to fit teeth. A US Patent 4,661,071 for a special dental furnace for vacuum sintering of powdered alloy for dental prosthetic devices was taken out on April 28, 1987. It can be seen from the above example that patents can be a valuable source of useful research information for dental subjects. It may be possible to develop a research project based upon information in a patent document.

What Use is a Baby?

Rutherford, having split the atom, went on record in the mid-thirties as seeing no way of harnessing the atom's energy for good or bad.

When the computer was invented, an expert estimate was that two or three would suffice for the needs of the United States, and one for Britain.

Alexander Fleming did not see the possibilities for the penicillin which he actually discovered. It took ten years for Howard Florey and Ernst Chain to show a way of producing penicillin which has since saved millions of lives.

Faraday could visualize no specific use for the dynamo he invented in 1931 and his much- quoted "What use is a baby?" admitted as much.

The Amendments to the Canadian Patent Act

The main benefits of the proposed amendments to the Patent Act are to harmonize Canada's patent practices with those of most industrialized countries, to speed the transfer of technological information, to provide an administrative procedure for the reexa-mination of issued patents, and to simplify patenting procedures both for the applicant and for the Patent Office. The proposed amen-dments to the Patent Act involves ratification of the Patent Cooperation Treaty The Patent Cooperation Treaty (PCT) is a mecha-nism by which a patent application can be made simultaneously in more than one country through filing at the Patent Office of a member country. Canada signed the treaty in 1970 but has not yet ratified it. Ratification of the PCT would standardize Canadian patent practices with those of our principal trading partners. It will facilitate access by Canadian applicants to foreign patents. The treaty standardizes minimum disclosure requirements and formalities prior to examination of applications. It will make it easier for Canadians to acquire foreign patents through standar-dized filing and searching of prior art.

The present Canadian system publishes or makes available to the public the contents of a patent only after it is granted. it usually takes three years between filing and granting of a patent. Early publication of the patent will permit the public and in particular small and medium-sized businesses to have access to new technology at a much earlier date.

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First to File

Canada Patent Act now uses the **first to invent** system, which has proved costly and cumbersome because the Patent Office must deter-mine which invention was first. This has led to much costly litigation. Under the **first to file** system, when two or more applications for the same invention are pending at the same time, the patent is granted to the first applicant who files the patent application rather than to the applicant who invented it first. The under-lying fundamental require-ment for an invention to be patentable is its "novelty". Canada is a **"relative novelty"** country, where an invention can be described in a printed publication for up to two years prior to the filing of a patent, without its "novelty" being affected. Most other countries are **"absolute novelty"** countries, where an invention cannot be patented if it is known before filing; some of these countries also provide for certain exceptions known as **"grace periods"**. Changes to the Patent Act will bring in **absolute novelty** provisions with a **grace period** of one year rather than the present two years.

Under the present Act in Canada, all applications are automatically examined. Under a deferred examination system, an application for a patent will only be examined upon submission of an examination request. This request must be made within a prescribed time, accompanied by an examination request fee. Failure to submit the request will result in the abandonment of the application. The advantages are two-fold: firstly, the examiner can focus his attention on more important applications and will be relieved of examining applications which would normally be abandoned after the prescribed time periods. Secondly, the applicant will be dealing with a more efficient system and will also be given an additional period of time to study the market and perfect the invention.

The term of protection afforded to Canadian patents will be changed from the current 17 years from the date that the patent is granted to the international norm of 20 years from the date of filing. Essentially this change reflects the three years it normally takes for a patent to be

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granted and in practice will provide the same period of patent protection.

Renewal Fees

Renewal fees on patents will be paid periodically. Their main advantage is that they remove inactive patents from the Patent Office files, thus enabling industry to use the technology contained in these patents at an earlier date. This "user-pay" system would ensure that patents which are more commercially viable bear a greater proportion of the costs than those which are abandoned. The present structure allows lower fees for small businesses; similar provisions would be applied to renewal fees. Canada is one of the last industrialized countries to implement renewal fees.

One of the primary purposes of a patent system is to encourage the widespread dissemination of technological information. To do so, the private sector must be able to obtain information concerning certain aspects of the commercial exploitation of patents. Recording of licences therefore aids in accelerating the use of technological information.

Re-Examination

Under the present system a patent can be declared invalid only by the courts. The introduction of an administrative procedure for the re-examination of a patent will allow for a prompt and low-cost reconsideration of the validity of a patent on the basis of previously unconsidered prior-art documents. The re-examination, which will be conducted by a Board appointed by the Commissioner of Patents, can be initiated by the patentee or a third party at any time during the term of a patent.

Discovery.

"Histories of science put the spotlight on discovery. Everyone knows by what accident Fleming discovered penicillin, but only specialists can tell us much about how that discovery was subsequently put to the test. Everyone knows of Kekule's dream of the benzene ring, but only chemists can tell us why the structure of that molecule was problematic, and how and when it was finally decided that the problem had been solved".

Pat Langley et al.

Research

"Progress as we know it in the modern world would be impossible without research."

Tyrus Hillway

Lunch Time Research Seminar Series for 1989/90

The new series of lunch time seminars will commence on Wednesday the 4th of October 1989. This year the seminars will be held in room 5236 between 1:0 pm and 2:0 pm. The plan is to hold the seminars on the first Wednesday of the month. Faculty Staff and Students are welcome to attend.

NIDR Grants Awards and Contracts 1988

Rank	Institution	Number
1	North Carolina	48
2	Buffalo N.Y.	37
3	Michigan	36
4}	Seattle Wash.	32
4}	B'ham Alabama	32
6	Connecticut	30
7	Minnesota	26
8	Pennsylvania	25
9}	Forsyth Dental Cent.	24
9}	San Francisco	24
11	Gainesville Florida	23
12	San Antonio	21
13	Harvard	20
14	Ohio	19
15}	Boston	17
15}	Indiana	17
17	Rochester	15
18}	Virginia	13
18}	UCLA	13
18}	Agusta Georgia	13

Record Total of Three Biomaterials Science Graduate Students

Randall Miller has enroled at TUNS to take an MSc specialising in Biomaterials Randall obtained his BSc at Dalhousie in Physics and has been working throughout the summer in the Biomaterials laboratory. Randall's research topic will involve a study of the physical and mechanical properties of ceramic biomaterials. Randall brings the total of our graduate students studying Biomaterials to three. Kimberly Gates is in her second year of her MSc in Biomaterials which is being conducted in collaboration with the Collage of Pharmacy. Jim Johnson is now in his final year of his PhD in Biomaterials/Engineering through TUNS. Kimberly is studying drug release from biomaterials and Jim is studying the mechanical properties of bone cement and stress distribution on the total hip joint prostheses.

Uncertain

"Some scientists answer the questions about certainty simply and devastatingly. They deny that there is anything certain about knowledge."

L.W. Friedrich

Cutback for Books

According to a study by publishers the budgets of Britain's University librarys fell by a third during the period 1979 to 1987. The overall spending on books for each student declined an average 31%, and as much as 50% at some institutions.

Patent Literature Stolen

In June 1989 thieves stole 200 reels of patent microfilm valued at $150,000 (US) from 12 University research libraries in 10 states. The librarian all participate in the US Department of Commerce's Patent Depositing system, which aims to makes patent information available to researchers.

The New and Old

A new "Journal of Aging and Health may be of interest to our dental faculty members. This journal is edited by Kyriakos S. Markides, of the University of Texas Medical Branch. The new journal provides an interdisciplinary forum for research and scholarly exchange in the field of gerontological health, with an emphasis on social and behavioural factors related to health and aging.

Research Funds Approved

The US government has approved a budget of $7,678,625,000 for the NIH for 1990. This is $149,228,000 more than the Bush Administration had requested. The US House Appropriations Committee has also approved a further $3.6 Billion for University related research.

"Tree-mendous" Invention

Newspapers are important to the dissemination of scientific information to the general public, and have played a significant role historically in the development of science and technology. However, did you know that Charles Fenerty a native of Sackville, Halifax County was the inventor of newsprint in 1844. Charles Fenerty was the first person on the western side of the Atlantic and perhaps the first in the world to discover that paper could be made from ground sprucewood pulp. This discovery made possible the foundation of the paper making industry. Up to that time the paper was made from rag or linen or, in some cases raw flax.

Mysticism

"There is a school of thought which likes to vent its disdain for all it considers inferior knowledge upon that much-abused and misunderstood work, mysticism."

L.W. Friedrich

Authorware Professional

Using an Apple Macintosh you can now immediately improve course material and make learning dynamic. The software is said to provide a quantum leap forward - melding together the science of instruction with the art of teaching. This could be ideal for some educational research projects.

Physiology Research? Mac Mouse May come to the Rescue

Ever since William Harvey published his treatise On the Movement of the Heart and Blood in Animals in 1628, thus inaugurating the modern era of experimental physiology, experiments on laboratory animals have been the basis of most advances in medical knowledge. Today millions of rats and mice and smaller numbers of rabbits, dogs, cats and other animals are sacrificed every year in the U.S. for basic studies in biology; for the development of vaccines, new surgical procedures and drug therapies; for nutritional studies; for testing potential carcinogens and for establishing the efficacy and safety of new pharmaceutical agents. All such activities are now threatened by a growing new movement to sharply restrict or even to prohibit the use of animals in research. Organizations opposed to animal experimentation are currently proliferating. Legislation limiting the availability of animals for research in the US has been passed in many states and localities. Bills some investigators think would inhibit research are pending in Congress. Fringe groups in the animal-protection movement have broken into laboratories to "liberate" animals that were the subjects of research, in one instance dogs carrying experimental heart pacemakers and in another instance rats serving in a study of Alzheimer's disease.

New Mac Software

New software for the Macintosh is now available for **"Human Physiology data simulation"**. The Simulated data follow human physiological relationships in 25 systems. This software system may be of value for some research projects as well as for teaching ($59.95 US) from Oakleaf Systems P.O. Box 472 Decorah, Iowa 52101 (319) 382-4320. Data management system "McMax" for the Mac is a relational data-base system ($295 less academic discount) Nantucket Corp, 12555 West Jefferson Boud, L A. 90060 (213) 390-7923.