Dalhousie University, Faculty of Dentistry

Dental Research News

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Research Development Office, (902) 494-1675

Stimulus & Challenge

The voice of Dal Dental research

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Our Mandate as Academics

"I would submit that we in the schools of dentistry can put a heavier emphasis on clinically-oriented research, and should seek to develop strong university/industry linkages. We should be involved much earlier in the process of developing and evaluating new materials, devices and clinical techniques. We should see this as part of our mandate as dental academics and should consider this as an important step in ensuring that the best possible treatment modalities are available to the dental profession."

K. L. Zakariasen,
Dent. Absts. 37, (1) 48, Jan/Feb. 1992.

RDO Dental Research Development Office

Dental Research Journals

The IADR Central Office have been using desktop publishing for the past 12 months. This has resulted in a significant reduction in the cost of publishing. The IADR now publishes three journals in addition to the *Journal of Dental Research*. These are *Advances in Dental Research*, *Dental Materials Journal*, and *The Journal of Oral Implantology*. A committee under Dr. Max Listgarten is reviewing the four journals, subcommittees have been reviewing each journal in depth. Suggestions have been made by the subcommittees for more effective publication and marketing of these journals, it is expected that many of these suggestions will be implemented in the next year or two.

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IADR Strategic Plan

See page 5

Computer Graphics
The Way of The Future

The basic state-of-the-art in computer graphics is developing at an astronomical pace. Interactive computer graphics tools for cancer therapy, brain research, the design of parts for airplanes and automobiles. The medical and dental applications are numerous orthopedic and dental implants, orthodontic and maxillofacial surgery, TMJ research, as well as clinical evaluation of cavity design and restorative biomaterials. The acquisition of a computer modeling system by Jim Johnson makes available significant opportunities for applications in both dentistry and medicine. The system could be linked by modem to a CAT SCAN system and thus allow the generation of 3D images of any parts of the anatomy allowing analysis and measurements to be carried out.

The importance of computer graphics is emphasized by the five-year, $14.68 million grant to five US universities who will establish the Science and Technology Center for Computer Graphics and Scientific Visualization.

Besides the center's basic research activities, its scientists will work with U. S. companies to enhance the country's lead in commercial computer graphics. The grant will be augmented by millions of dollars from the universities and their state governments, as well as large donations of equipment from manufacturers.

Members of the center are Brown University, the California Institute of Technology, Cornell University, the University of North Carolina at Chapel Hill, and the University of Utah. Researchers at the center will seek to "rebuild the intellectual base of computer graphics, building it on science," the project leaders wrote in the proposal for the center.

Today's computers produce graphics largely through ad hoc techniques of constructing pictures, but future realistic computer images will arise from sophisticated internal models of physical reality, said the leaders. "The first generation of computer graphics emphasized drawing pictures. Tomorrow's graphics will emphasize viewing world models that obey the laws of physics," they wrote.

NSF Director Walter Massey, has said that "Visualization can bring enormous leverage to bear on scientific productivity. The potential for major breakthroughs is comparable to that of super computers."

Advanced computer graphics are expected to enhance the productivity and capabilities of a wide range of scientists, engineers and physicians.

Researchers envision a computer-graphic system that would utilize 3-D ultrasound images for diagnostic purposes.
(Cont. on Page 3)

Computer Graphics

(Cont. from Page 2)

Imagine a future obstetrics-ultrasound exam [in which] the physician flips down a gadget something like bulky sunglasses. It includes both the display and the tracking circuitry.connected by radio-frequency to a nearby base unit which would contain most of the display and tracking electronics. The physician will use the ultrasonic transducer as a 'flashlight' to illuminate the patient's internal organs.

In radiation cancer therapy, it should be possible to develop computer graphics that superimpose 3-D images of the body's anatomy, the geometry of the radiation source, and the resulting radiation dose.

Medical and dental scientists will be able to develop methods for visualizing the simultaneous movement of skin, muscle and bone.

Significant breakthroughs are expected from research involving advanced computer modeling and display techniques, 3-D user interfaces, high-speed parallel graphics computers and interactive controls for animation and simulation. The center's scientists will work toward standardized software to allow the rapid spread of advanced techniques.

Computer graphics is an amalgam of many areas of computer science. It also depends very much for success on mathematics, physics, optics, mechanics and dynamics, and perception psychology.

According to Dr. Massey, "The scope of the problems is so vast and the research requirements so large that it would be impossible for any single university to assemble the necessary critical mass of researchers to perform the appropriate investigations.

The four major corporate sponsors are Digital Equipment Corporation, Hewlett-Packard, IBM, and Silicon Graphics. The team of investigators comprises Donald Greenberg, the Center Director from Cornell University, Richard Riesenfeld, Co-Director, University of Utah, Alan Barr, California Institute of Technology, Henry Fuchs, University of North Carolina at Chapel Hill, and Andries Van Dam, Brown University.

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Acquiring Knowledge

"the tiny, initial clue which, by allowing us to imagine what we do not know, stimulates a desire for knowledge." Proust

Short—Circuit

"We shall not cease from exploration/And the end of our exploring/ Will be to arrive where we started/And know the place for the first time.

T. S. Eliot

Trivia Question

Which was the first section of the IADR to be established outside of the United States?

See answer on page 5

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IADR

As reported in the June issue of the 'Dental Research News' the IADR Glasgow meeting sets an all time record for registration fees of $195. One consolation is that the membership fee for the 1993 meeting to be held in Chicago is likely to be lower than Glasgow. On the other hand the fee for non-members which was $325 for the Glasgow meeting is likely to increase to $350 for the Chicago meeting. Please note membership application forms are available from the Research Development Office. Membership in the IADR has increased from 9,107 in October 1990, to 9,328 in October 1991, while AADR membership is stable at 4,982. Meeting attendance has risen steadily over recent years culminating in the largest IADR meeting in Acapulco where 4,764 attended the meeting and 2,694 papers were presented. These figures suggest that the IADR is alive and flourishing.

It should also be noted that a proposal is now being considered which will require non-members to have the signature of a member on the abstract form which they submit to the IADR/AADR meetings. A proposal is also in place to try to improve the quality of abstracts by the introduction of changes in the review process.

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NSERC

Important Notice for Grant Competitions.

The NSERC 'Operating Grants Program' has a new name. It is now called 'Research Grants Program.' Advanced material is now required to be forwarded to NSERC for all NSERC grant applications. Potential Applicants should note that in 1993-94 you will have to complete form 180 (notification of Intent to Apply for a Research Grant). The deadline for this form 180 to reach NSERC is 15th August 1992. This is intended to allow NSERC to select referees and to allow referees to reply to the request for review. The advanced notice is also intended to allow time for the assignment of grants to the appropriate committees.

Further information can be obtained from the dental Research Development Office.

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Future IADR/AADR Meeting Sites

1993 March 10-14 IADR/AADR - Chicago Hyatt Regency

1994 March 9-13 IADR/AADR Washington State Convention Center, Seattle

1995 March 8-12 AADR San Antonio Convention Center, Texas

1995 June 28-July 1 IADR Westin Stamford Hotel, Singapore

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Strategic Plan

IADR president Robert Genco has initiated the development of a strategic plan. The first step in developing the strategic plan will be information gathering. The officers and staff are proposing several methods of obtaining information including questionnaires, interviews, and discussions with representatives of each Division, including the Presidents, as well as representatives of the Groups, including their Chairs. Information will be gathered with respect to the following:

(1) objectives of the Association;
(2) structure of the Association;
(3) finances;
(4) meetings;
(5) publications;
(6) communications and publication relations;
(7) membership services;
(8) and research promotion.

The planning likely to take approximately 18 to 20 months to complete. The final strategic plan will likely project activities for 3 years and will be updated yearly thereafter. The plan will be based primarily upon membership needs identified during the information gathering phase. These needs and initiatives will then be prioritized with broad consultation with members. Members of the CADR should make their views known to President Derek Jones who will be pleased to have input for the proposals to be developed by Canadian dental researchers.

Understanding Nature

"In fact we have to give up taking things for granted, even the apparently simple things. We have to learn to understand nature and not merely to observe it and endure what it imposes on us. Stupidity, from being an amiable individual defect, has become a social vice."

J. D. Bernal, New Scientist,
5th January 1967.

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Answer to Trivia Question

The Canadian, Toronto section of the IADR was established in 1921- this was the 4th section of the IADR to be established and the first section to be organized beyond the United States borders.

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Thought for the Month
Keep Striving

"No one is born a winner. Winners are people who choose to keep striving until they reach their goal. It would be a mistake to let ourselves get discouraged when first efforts do not work out. We may have to reassess our goals to make sure they are realistic, re-evaluate our capabilities and commit ourselves to change where necessary. Then we can give it yet another try. Adversity is valued because it has been earned."

Claude Taylor, President Air Canada.

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