



Stimulus & Challenge

The voice of Dal Dental research

Dental

OCTOBER 1993

Research News

Research Development Office, (902) 494-1675

VOLUME VII, NUMBER 10.

Special Edition - Review of Research

The Meaning of Bill 93

Several of the Readers of the Dental Research News were puzzled by the caption on page one in the September issue which made the statement that "Bill 93-Will provide strong support for research. The message was simply stating that our new Dean designate of 1993, Dr. William (Bill) MacInnis, will provide strong support and encouragement for our research efforts within the Faculty. The Dental Research News would like to congratulate Dr. MacInnis on his appointment at this crucial time in the history of our Faculty.

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A Message From the Dean Elect.

I look forward to fulfilling my role as Dean of our faculty. The future is not going to be easy, it will require a team effort. One of the important aspects of the functions of our Faculty which I am committed to strongly supporting is the development of research. We have exciting opportunities to answer the many questions facing us in the 90's. This can only be achieved by a dedicated effort to research and scholarship. Through the Dental Research Development Office we plan to increase the opportunities for participation in research by all of our Faculty members.

William MacInnis, Dean Elect.

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Further messages from the Dean will appear in future issues.

Research Review 1993

For the past four years a special edition of the Dental Research News has been devoted to a review of our ongoing faculty research based upon abstracts submitted to the IADR/AADR meetings. A review of some of the ongoing faculty research is provided on pages 2-7. This is based upon 12 abstracts which have been submitted for the IADR/CADR meeting to be held in 1994. It should be made clear that this is not by any means a complete review of all of the research being conducted in our faculty. This review does not cover the educational research which is currently being undertaken, which may be presented at the AADS meeting. The object of the review of research is to make available to our Faculty and the Dalhousie University community an indication of the type and diversity of research which is currently being undertaken. Three of the research abstracts submitted for the 1994 IADR/CADR international research meeting, if accepted will be presented by undergraduate students. The funding to support two of these students (Janice Wilson and Chris Zed) is from the Canadian Fund for Dental Education the other student (Gordon Taylor) is supported from a corporate sponsor. Congratulations to the three students who have a chance to attend this very important meeting should their abstracts receive approval from the IADR.

MRC Appoint Regional Directors.

The Medical Research Council has appointed seven regional Directors. Dr. Catherine B. Lazier of the Department of Biochemistry at Dalhousie has been appointed as the Atlantic Canada Regional Director. The initiative is being viewed as a trial experiment for the next 12-18 months. If successful it will be expanded to cover all 16 Universities in Canada which have Medical, Dental and Pharmacy programs. The idea is to promote understanding of MRC in the regions by facilitating contacts between MRC and individuals, institutions, funding agencies and organizations in the region. The aim will also be to promote public and media relations in the interests of health research. A further important function is to promote understanding of regional issues at MRC by bringing to the attention of the President and staff of MRC those issues, concerns, problems or opportunities which have been identified in the region. We congratulate Dr. Lazier on her appointment and look forward to working with her on regional issues pertinent to MRC. One of the important issues clearly is the lack of Provincial research funding in the region. This presents a distinct disadvantage to our members in competition for MRC funds with colleagues in other institutions across Canada.

Effects of low-level CO₂ Laser Radiation on Etched enamel. T.L. BORAN*, M. NICHOLS and R.M. MacDONALD (Faculty of Dentistry, Dalhousie University, Halifax, Canada).

The potential for CO₂ low-level laser energy as an enamel preventive treatment, to decrease subsurface demineralization in artificially produced carious lesions has been widely reported in the literature. This investigation examined the effect of low-level CO₂ laser radiation on acid-etched and laser etched enamel subsequent to the demineralizing process. Ten extracted third molars were painted with acid resistant varnish leaving four windows on the buccal surface measuring 1 mm in diameter. Window #1 and #2 were etched with 40% phosphoric acid for 45 seconds, 30 second wash with dH₂O. Window #2 was treated with CO₂ laser irradiation 1.5 watts at 0.15 seconds with a 1.5 mm focal spot as well. Windows #3 and #4 were etched with a CO₂ laser using 6.0 watts for 0.15 seconds, single pulse at a 1.5 mm focal spot. Window #4 as well was treated with a low level CO₂ laser as above. The teeth were immersed in the demineralizing solution (2.2 mM Ca⁺⁺ and PO₄, 50 mM acetic acid .5 p.p.m. F @ constant pH = 4.3) for 12 days. 100 μ hard tissue sections were prepared, imbibed in dH₂O and photographed under polarized light. Photo enlargements were made and the lesion areas were quantified with a planimeter, t-tests were used to compare lesion area of the etched groups versus the etched groups treated with low-level CO₂ laser irradiation. Means (mm²) and standard deviations were as follows: acid-etched (only) = .86 (.34); acid etched (laser) = .60 (.16); laser-etched (only) = .39 (.13) laser etched (laser) = .46 (.11). The acid-etched group lased with low level CO₂ radiation showed a significantly smaller zone of demineralization (p = .05). No significant difference was observed between the laser etched group and the lased etched group tested with low level CO₂. Research is ongoing to determine the appropriate parameters required for managing the reduction of demineralization and increasing consistency.

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CDA - DAT and Visual Perception Test Validity for Second Year Grades.
D.V. CHAYTOR*, H.J. MURPHY. Dalhousie University, Halifax, Nova
Scotia, Canada.

This study aimed to determine the predictive validity of the Canadian Dental Aptitude Test (DAT) (especially Carving) and two visual perception tests. METHOD: 190 Canadian, second-year students from six classes had completed the DAT, the Group Embedded Figures Test (GEFT) and the Impression Die Matching Test (IMP/DIE) prior to admission; GPA and 19 course grades served as criterion variables in regression analyses.

RESULTS: DAT Academic Average and DAT Reading were significantly correlated with grades in 13 and 15 courses respectively; Carving, with only one; and GEFT and IMP/DIE with 6 and 7 respectively. Statistically significant correlations for females outnumbered those for males by a ratio of 3:1. Regression equations with all predictors explained, at best, only 15% of a criterion's variance. Removing Carving was not detrimental, and adding either GEFT or IMP/DIE yielded slight improvements. The explained variance in women's scores reached 60% for one course. Carving scores contributed essentially nothing but the visual perception scores contributed as much as 12% for some courses.

CONCLUSION: Although statistically significant correlations were found with a number of course grades, their magnitude and the differential effects for women and men call into question the predictive validity of these measures for performance beyond the first year of the DDS program. The modest contributions of the visual perception tests and their potential diagnostic values suggest that further research is warranted. This study was partially supported by the Canadian Dental Association.

Special Symposium Sponsored by the CADR/AADR/AADS

Symposium: Restorative dentistry in the 1990's and beyond.
A.I. ISMAIL (Dal U.), K. J. ANUSAVICE (U. Florida), D. ERICSON (Lund),
O. FEJERSKOV (RDC), N. PITTS (Dundee), S. ROSENSTIEL (Ohio SU).

This joint CADR/AADR/AADS symposium will attempt to bridge the gap between researchers, educators and dental practitioners by developing scientifically based and clinically oriented guidelines (COSB) for restorative dentistry. This symposium will discuss issues such as: reasons for the variability in restorative decisions; guidelines for clinical and radiographic diagnosis of dental caries; guidelines for risk assessment in clinical practice; guidelines for restorative decision making; and an evaluation of the scientific basis for restorative management from the traditional cavity design to fissure sealants. The reviewers will rely exclusively on published scientific findings to formulate their guidelines. The Canadian Task Force for the Periodic Health Examination's rules for formulating recommendations and evaluating the literature will be followed. For each intervention or procedure (e.g. diagnosis of incipient caries; when should incipient caries be watched, sealed or restored?), the reviewers will determine the validity and reliability of diagnostic criteria and whether there is scientific evidence to support the effectiveness of current management modalities and what are the associated benefits/risks. The symposium will conclude with an open discussion period.

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Elastic Moduli of Seven Base and Lining Cement Materials.
D. W. JONES*, A. S. RIZKALLA, E. J. SUTOW, & G. C. HALL.
(Dalhousie University, Halifax, Nova Scotia, Canada).

Objective: To compare the elastic moduli for seven commercial base and lining materials. Dynamic (sonic) moduli of elasticity (Young's shear and bulk) and Poisson's ratio ($n=3$) were obtained for a range materials. In the case of four materials evaluations were made on specimens mixed at two different P/L for either base or liner use. Specimens were aged in water at 37°C for 1 and 6 weeks prior to determining the moduli in air at room temperature. A Student-Newman-Keuls rank order test separated the Young's modulus values for the one week old lining materials into 4 groups ($p= 0.05$), the base materials at one week could be separated into 5 groups ($p = 0.05$). At 6 weeks the liners could be separated into 4 groups, while the bases at 6 weeks were all significantly different ($p = 0.05$). Values for Young's moduli of lining materials at 6 weeks varied from 7.05 ± 0.15 (Time-Line™) to 17.33 ± 0.20 GPa (Ketac Bond™). The values for Young's moduli for base materials at 6 weeks varied from 7.05 ± 0.15 (Time-Line) to 21.77 ± 0.08 GPa (Ketac Bond). A comparison of 1 week vs. 6 week moduli values for the base and lining materials indicated that four materials (Variglass™, Base-Line™, Vitrabond™ and GC Fuji™) were not significantly different at the two times of testing ($p = 0.05$). Conclusions: Significant variations were obtained for the elastic moduli for 7 commercial base and liner materials. Variations in P/L recommended by the manufacturers for base and liner use produced significant changes in the moduli for four of the materials. This research was supported by MRC (Canada) Grant UI/11519.

Utility of the Dental Aesthetic Index to assess orthodontic treatment outcomes.
W.K. LOBB *, A.I. ISMAIL, D.A. BOWSER
(Faculty of Dentistry, Dalhousie University, Halifax, Nova Scotia)

This study evaluates the utility of the Dental Aesthetic Index (DAI) in determining treatment outcomes in orthodontic patients. A total of 80 treated orthodontic cases were selected from 246 possible cases. 40 of those selected, were chosen because they were classified as failures, based upon a negative or zero DAI change between the pre-treatment and post-treatment conditions. The remaining 40 cases were chosen randomly from a stratified sample (by degrees of success) of cases which were classified as successes based upon a positive DAI change. Each of these cases had the pre-treatment and post-treatment models rated for acceptability of the appearance of the dentition. 16 raters (9 dental and 7 non-dental) independently rated the casts using an 11 point Likert scale. Every fourth case had it's pre-treatment and post-treatment casts duplicated and rated again to allow determination of intra-rater reliability. The agreement among many of the examiners in rating these casts was "fair to good". (Kappa coefficients 0.40 - 0.75) Determination of treatment outcomes by the 16 raters was idiosyncratic. The raters had good inter-rater agreement when determining success, and poor inter-rater agreement when they determined failures. The agreement between the raters and the DAI in identifying treatment failures was "poor". (Kappa coefficients < 0.40) The utilization of DAI scores offers a more conservative estimate of treatment success, and the more subtle changes following treatment that were perceived by the raters were not detected by the DAI. The results of this study indicate that the DAI in it's current form may not be a useful index to assess treatment outcomes in orthodontic patients.

The Bonding/Failure characteristics of Orthodontic Brackets Using Laser Etching. R.M. MacDONALD*, W. LOBB, T. BORAN, M. NICHOLS
(Faculty of Dentistry, Dalhousie University, Halifax, Canada).

Previous studies have shown that bonding orthodontic brackets to laser etched enamel is comparable to bonding to acid etched enamel. The purpose of this study is to compare bond strength and bond failure characteristics of brackets bonded to enamel using laser etch vs. acid etch. Twenty recently extracted 3rd molar teeth (stored in Thymol Solution) were mounted in stone blocks using a jig. Two areas on the buccal surface of each tooth were identified for standard placement of Orthodontic brackets. Each mounted tooth was lased with the CO₂ laser (6.0 w X 0.015 sec., 1.5 mm) and each tooth was etched with 37% phosphoric acid gel for 45 sec. and the acid etched teeth were rinsed for 30 sec. and air dried. Brackets were resin bonded using a standard technique for placement. The specimens were subjected to shear force using an Instron machine (cross head speed 0.5 in./min.) and debracketing forces recorded in Newtons. Two independent trials of ten specimens were done. The mean values and S.D. were: trial one laser etched mean: 26.1130, s.d. = 11.282; acid etched mean = 88.367, s.d. = 31.881. Using a matched pairs t test, it was found that there was a significant difference ($p \leq .0001$). Trial two laser etch mean = 26.761 s.d = 11.70; acid etched mean = 160.34, s.d. = 18.177. The matched pairs t test showed a significant difference. ($p \leq .0001$) Using a Chi square test ($p = .0005$), there was a significant difference in the failure characteristics between the two methods of enamel etching. Under the condition of this study, the forces required to remove orthodontic brackets were greater with acid etching than with laser etching. The failure in all cases with laser etching was adhesive and with acid etch it was cohesive or a combination of adhesive/cohesive. Supported by C.F.A.O. (Canadian Foundation for the Advancement of Orthodontics).

A Retrospective Study of Implant Retained Overdenture Prostheses.
R.B. PRICE*, J.D. GERROW, R. BRYGIDER, D. CHAYTOR and
G. SIDHU. (Dalhousie University, Halifax, N. S., Canada).

While an implant supported fixed prosthesis has been shown to be an effective treatment option in the edentulous patient the cost of this treatment may be prohibitive. An implant retained overdenture (IRO) may offer a cost effective alternative treatment option. This retrospective study examined 24 patients treated in 5 different private practices, who had received an IRO. The mean (range) subject age was 61 years (31-81). The mean number of abutments was 2 (2-3). 20 patients had 'O' ring retention, 3 had Clip attachments, and one patient had Magnetic retention. The mean (range) time in function was: 'O' ring 82 weeks (11-181), Magnetic 262 weeks (262), Clip 59 weeks (37-70). Two of patients with 'O' ring retention had abutments fail, the only patient with Magnetic retention had abutments fail, there were no failures with the Clip retained prostheses. Very few adjustments, mean 0 adjustments (range 0-3) were required to correct problems associated with the 'O' rings. Overall patient and dentist satisfaction with the IRO was high. This study concluded that: 1. The success rate of IRO was 87.5% 2. Few post insertion adjustments were required. 3. There was high patient and dentist satisfaction with the IRO. 4. An IRO can provide an acceptable treatment option.

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Mechanical Properties of Commercial High Strength Ceramic Core
Materials. A. S. RIZKALLA* D. W. JONES, E. J. SUTOW, &
G. C. HALL. (Dalhousie University, Halifax, Nova Scotia, Canada).

Objective: To compare the modulus of rupture, elastic moduli and true hardness (H_o) values of commercial Vita In-Ceram™ core and Vita In-Ceram matrix glass with the standard conventional aluminous porcelain materials (Hi-Ceram™ and Vitadur™). Modulus of rupture of specimens (21 x 5 x 1 mm) was determined using three point bending (n=5) on a servo hydraulic Instron testing machine at a cross head speed of 0.5 mm/min. Elastic moduli (Young's shear and bulk) and Poisson's Ratio (n=5) were determined using a dynamic sonic method. True hardness (n=3) was also calculated from crack free Knoop indentation at 6 different force levels. The modulus of rupture of Vita In-Ceram core (484 ± 62.78 MPa) was significantly higher than the Vitadur (150.89 ± 19.53 MPa) and Hi-Ceram (127.96 ± 17.37 MPa) at $p < 0.05$. The Young's Modulus of Vita In-Ceram core (262.21 ± 0.93 GPa) was significantly higher than Hi-Ceram (126.37 ± 1.18 GPa), Vitadur (113.73 ± 2.13 GPa) and Vita In-Ceram matrix glass (100.65 ± 0.96 GPa) at $p < 0.05$. Poisson's ratio of Vita In-Ceram matrix glass (0.287 ± 0.001) was significantly higher than Vita In-Ceram core (0.192 ± 0.005), Vitadur (0.174 ± 0.003) and Hi-Ceram (0.171 ± 0.004) at $p < 0.05$. The true hardness (H_o) of Vita In-Ceram core (10.32 ± 0.45 GPa), Vitadur (5.17 ± 0.13 GPa) and Vita In-Ceram matrix glass (4.93 ± 0.16 GPa) were significantly different at $p < 0.05$. Conclusion: Mechanical properties of Vita In-Ceram were significantly higher than conventional aluminous core materials.

Influence of Base/Liners on Stress Distribution for Composite Restorations. B. SMYTH*, D. W. JONES, A. S. RIZKALLA, L. RUSSELL & E. J. SUTOW. (Dalhousie University, Halifax, N. S. Canada).

Objective: To use 2 dimensional finite element analysis to compare the stress distribution for two types of composite materials when placed in a cavity in combination with 11 base/lining materials having different elastic moduli ranging from 7.35 to 21.01 GPa. Young's modulus of P-50™ was 31.34 ± 0.22 GPa and for Adaptic II™ 24.01 ± 0.11 GPa. The modulus data were determined by dynamic sonic measurements made on commercial composite and base/lining materials. The effect of the base/lining material on the maximum stress and stress distribution in the tooth was evaluated at both 1.5 and 0.5 mm thickness. Regression analysis gave a very high correlation coefficient for maximum stress and the modulus of the base/liners ($p < 0.001$). The highest modulus base/liners produced the highest stress concentration in the tooth. A 11.4% increase in maximum stress was observed for 0.5mm of the lowest modulus base/liner with P-50, compared to 0.5mm of the highest modulus base/liner. For 1.5mm thickness, the increase in max stress was 11.7%. Using Adaptic II these increases were 9.5% and 11.2%, respectively. Increasing the thickness of the base/liner (0.5 to 1.5mm) decreased maximum stress in the tooth. With P-50 and a high modulus base/liner, a 0.5mm vs. 1.5mm base/liner produced a 2.6% decrease in stress. The liner which gave the lowest stress, did not have the lowest modulus. Conclusion: 2 dimensional finite element analysis indicated that variations in the modulus of the base/liner had a greater influence than base/liner thickness on maximum stress in the tooth.

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Influence of Heat Treatment on the Mechanical Properties of Cerammable Glass Systems. D. W. JONES, A. S. RIZKALLA, G. TAYLOR*, & E. J. SUTOW. (Dalhousie University, Halifax, N. S., Canada).

Objective: To study mechanical properties of a heat treated ceramic system (Dicor™) and a series of experimental glass materials. Dynamic (sonic) moduli of elasticity (Young's shear and bulk) and Poisson's ratio ($n=3$) and indentation fracture toughness (K_{IC}) ($n=30$) were obtained for heat treated specimens. 'True hardness' values (H_0) were also calculated from crack free Knoop indentations at 6 different force levels. K_{IC} indentation tests were performed using a Vickers indenter and a load of 4.9 N. Several heat treatment schedules were investigated for Dicor heating at 700°C, 750°C and 1075°C for periods of time ranging between 10 min and 12 h. Progressive crystallization at 700°C was indicated by changes in Young's modulus. H_0 values for Dicor ranged from 4.27 GPa for 10 min at 700°C to 3.58 GPa for 4h at 1057°C. The as cast uncerammed Dicor had a H_0 value of 4.06 GPa. Significant variations ($p < 0.05$) were found for the elastic moduli values for Dicor specimens heat treated at 700°C for 0.5h compared to 5h and 10h. K_{IC} values for Dicor, 1075°C for 4h (1.33 ± 0.06 MPa $m^{1/2}$) were not significantly different from 12 h at 1075°C (1.25 ± 0.03 MPa $m^{1/2}$), but were significantly different from the as cast condition (1.07 ± 0.04 MPa $m^{1/2}$). A series of experimental cerammable glass materials gave Young's modulus values ranging from 68.52 ± 0.38 to 80.53 ± 0.52 GPa. This compared to the Dicor 12h at 1075°C, 64.69 ± 0.90 GPa. Conclusions: Ceramming Dicor at 1075°C for 4 hours produced K_{IC} values equal to 12h at 1075°C. Heating Dicor at 700°C for 5h produced a higher modulus than 12h at 1075°C.

Post-adjustment pain experience and coping methods in orthodontic patients. W.K. LOBB, K.L. ZAKARIASEN, P.J. MCGRATH, J. WILSON * (Dalhousie University, Halifax, NS, Marquette University Milwaukee, WI;)

This study assesses the nature of pain experienced subsequent to appliance adjustment, and methods used to cope with such pain in a group of orthodontic patients. This data is abstracted from a larger study designed to evaluate three prescribed coping strategies. 65 patients (40 female 25 male), undergoing treatment with fixed edgewise appliances completed a questionnaire and recorded any pain experience on a 6 point Likert scale at regular intervals for the three days following an appliance adjustment. 53 of 65 ($78 \pm 10\%$ - 95% C.I.) reported some pain during the period of this study. 24 of 53 ($45 \pm 13\%$) reported pain levels ≥ 3 during the day of the adjustment. 16 of 53 ($30 \pm 12\%$) reported pain levels ≥ 3 during the second day following the adjustment. 8 of 53 ($15 \pm 7\%$) reported pain levels ≥ 3 during the third day following the adjustment. There was no difference in this trend when considering either the type of adjustment, or the attending orthodontist. 9 of 53 ($17 \pm 10\%$) reported a diet change, 15 of 53 ($28 \pm 12\%$) reported use of an analgesic, and 13 of 53 ($25 \pm 12\%$) used a combination of diet change and medication as coping methods. This represents a total of 37 of 53 ($70 \pm 12\%$) utilizing diet and/or analgesics as coping methods. The results from this study indicate that a high percentage of orthodontic patients experience some post-adjustment pain. Of those who experience pain, the pain can be categorized as clinically significant (≥ 3) in a high proportion, and as occurring primarily during the first two days following the adjustment. Furthermore, the trends observed appear to be independent of adjustment type or practitioner. These results also indicate a high percentage of those with post-adjustment pain utilize diet change and/or analgesic use as coping methods. Supported by C.F.D.E./Wrigley Canada Inc. and C.F.A.O

Localized Corrosion Susceptibility of Orthodontic Bracket/Archwire Combinations. E.J. SUTOW, W.K. LOBB, D.W. JONES and C.M. ZED* (Dalhousie University, Halifax, Nova Scotia, B3H 3J5, Canada).

Different alloys are used in combination as brackets and archwires to produce appliances for orthodontic tooth movement. Some alloys may cause adverse tissue reactions, due to the release of Ni. Clinically, contact between dissimilar alloys may result in galvanic and crevice corrosion. It was the objective of this study to determine the corrosion behavior of Ni containing bracket/archwire combinations that are susceptible to localized corrosion. Test combinations simulated clinical use of stainless steel brackets with stainless steel and NiTi archwires. Relative susceptibility to localized corrosion was measured using a modified version of ASTM Designation: G 61-86. Stainless steel brackets (n=5) and archwire alloys (n=5) were tested separately and in combination (n=5). Bracket/archwire combinations were compared to their respective archwires using two localized corrosion parameters: the potential at which the anodic current increases rapidly (BD), and the hysteresis loop completion potential (HL). Data were statistically analyzed using a t test. Results showed brackets had higher BDs vs. archwires ($p < 0.05$). Bracket/stainless steel archwire combinations had a lower BD ($p = 0.003$) and HL ($p = 0.016$) vs. the stainless steel archwire alone (BD, 266 ± 116 vs. 587 ± 128 mV; HL, -164 ± 42 vs. -60 ± 64 mV). Bracket/NiTi archwire combinations had a BD ($p = 0.830$) and HL ($p = 0.674$) that were not significantly different vs. the NiTi archwire alone (BD, 8 ± 41 vs. 18 ± 88 mV; HL, -136 ± 35 vs. -151 ± 69 mV). However, the NiTi vs. stainless steel archwire had a much lower BD ($p < 0.000$). It was concluded that localized corrosion susceptibility of stainless steel components should be determined in a clinically simulated combination in preference to testing individually.

Pharmaceutical Showcase

A total of 150 participants attended a workshop at White Point Beach Lodge on the 4th 5th and 6th October. The meeting was a restricted event by invitation only, 48 academics from Atlantic Canada were invited. Howard Dickson, who organized the event is to be congratulated for putting on a first class meeting. The object of the Showcase was to allow industry to gain a better understanding of the strengths and capacity of Atlantic Canadian Scientists to assist them in pharmaceutical R&D. The driving force to put on the meeting was the recent extension of the patent protection on pharmaceuticals that Bill's C-22 and C-91 provided. The Showcase furnished an opportunity for academics to gain a better understanding of the needs of industry and how as biomedical and clinical scientists we might interface and collaborate with the pharmaceutical industry in both basic and clinical research projects. According to Howard Dickson the Atlantic Canada Pharmaceutical Showcase was a vehicle designed to promote the scientific quality, strength and capacity of the region. Most participants at the meeting agreed that we need to better inform the industry about our research strengths. A total of 22 pharmaceutical companies were represented, in addition there were 27 key individuals from potential funding agencies both federal and provincial, including the Minister responsible for ACOA, the Premier of Nova Scotia, John Savage, the President of PMAC Judith Erola, and the Executive Director of MRC Ian Shugart. An overview was provided of the "Atlantic Canada Clinical Trials Consortium" in which our Dental Faculty are participants. The daily sessions commenced with a working breakfast with a keynote speaker. Derek Jones was invited

to participate and presented a poster dealing with some aspects of our Biomaterials Research. Significant time was scheduled to allow for industrial representatives to view the posters and for academics and representatives from industry to engage in meaningful discussions. All of the academic participants involved in the informal discussions with industrial and government officials were aiming to convince them that Atlantic Canada is a good R&D investment.

Triumvirate Process Animated by the Spirit of Research.

Twenty five years ago Anthony J. Ballard of the Class of 69 wrote an Editorial in the Dalhousie Dental Journal which has a message which is still valid to day. The editorial was as follows: "Traditionally, the professional units of universities have had a triumvirate of major responsibilities: teaching, research and service. Although Canadian dental schools discharge the teaching and service obligations very creditably, their research activities appear to be woefully inadequate." Interestingly it was in 1968 that a member of the Faculty of Dentistry at Dalhousie University presented our very first IADR abstract paper. The research environment in our Faculty was clearly very different when Anthony Ballard was writing his editorial 25 years ago.

The editorial by Ballard continued: "Dental education cannot obtain its greatest helpfulness for the individual student where the teachers lack the inspiration of the ideals of research; where the instruction fails to stimulate growth of its spirit in the students; and where the duties of practice are not shown to be obligations both of special enquiry and of direct response to the truth in the findings for each student in every

instance of treatment, prescription or advice.

The chief responsibility of a dental school is the training of relatively large numbers of general practitioners of dentistry. But it should also encourage and support research by its teachers; it should arouse and develop creative capacity and professional leadership among its students. Inspired men of unusual ability, critical judgement, and distinguished service will arise most frequently among the graduates of dental schools that are animated by the spirit of research." The inspired thoughts of Anthony J. Ballard from the class of 69, are as fresh to day as they were a quarter of a century ago. This is truly an inspiring 'ballad' from the 60's which is still in tune with the 1990's. Our new Dean of 93 can look back 26 years with some satisfaction to the time when Dalhousie presented the first Abstract from our Faculty. In 1994 he will witness the presentation of the 250th Abstract from our Faculty at the IADR.

Not Fuzzy Logic

"Computers have mastered intellectual tasks such as chess and integral calculus, but have yet to attain the skills of a lobster in dealing with the real world."

R. Searle, Sci. Am. 1990, 262, 100.



If it is true why not vote for the Lobster Party

Any More Research?

Faculty members who would like to provide a report on their own specific area of research not covered in this edition of the Dental Research News which has reviewed our research for 1993, are encouraged to forward this information on a disk to the Dental Research Development Office.

Research in 1993

The 12 abstracts submitted to the IADR/CADR meeting are itemized on pages 2 to 7. These research studies carry the names of 14 Faculty members as well as 6 students and staff. Truly an impressive effort by our Faculty of Dentistry. The topics clearly indicate the broad base of our research which has developed rapidly over recent years. The 12 abstracts which have been submitted to the IADR international dental meeting next March are sequenced in alphabetical order based on the name of the presenter. These abstracts have been reproduced in full so that our faculty colleagues and other members of the Dalhousie community, can see for themselves the wide range of subject matter which our research programmes cover, as well as the high quality of the of the science involved. If all 12 abstracts are accepted we shall have had a total of 253 abstract papers presented at the IADR/AADR meetings in the past 26 years. Our 250th paper will be presented by one of our Faculty or Students at the meeting in 1994. What is amazing is that out of the 253 abstracts presented during the past 26 years a total of 192 (76%) have been presented during the past seven years.

The 12 research abstracts cover a very wide range of topics. One paper deals with laser radiation of dental enamel as a means of improving preventive dental treatments by decreasing demineralization. A further study has evaluated the treatment outcomes and degree of success obtained for orthodontic patients. This study has concluded that the "Dental Aesthetic Index" used in determination of treatment outcomes may not provide a useful assessment. A further abstract reports on a study of corrosion of orthodontic alloys which have the capability of releasing nickel ions.

An additional project deals with a comparison of the bonding of orthodontic brackets using acid etching or laser etching in order to provide mechanical locking for resin cement. It was found that the conventional method of acid etching produced the strongest bond. However, as indicated in the study mentioned above, laser etching may in fact confer the benefit of increased resistance to demineralization.

An educational research project addresses the validity of the Canadian Dental Aptitude Test as a valid predictor of performance in the dental undergraduate program.

An important abstract submitted deals with the special symposium sponsored by the Canadian Association for Dental Research. This symposium is being coordinated by Dr. Amid Ismail who will Chair the various sessions of the symposium next March. The topic for the symposium is a very timely one and will address the vital and important areas of restorative dental procedures. This will be achieved by dealing with the research issues and data available. This important symposium should also be able to highlight and emphasize areas for future research.

Evaluations of the fundamental properties of elastic modulus for base and lining materials is addressed in two abstracts. One deals with the evaluation and comparison of a range of commercial materials. The other abstract reports on a finite element analysis study of the effect of elastic modulus of base and lining materials upon the stress distribution when used in combination with two types of composite systems.

A retrospective study of the success rate for implant retained overdentures has been reported. An implant retained overdenture compared to a fixed bridge may

offer a cost effective treatment option for some cases. A further clinical study has assessed the nature of pain experienced by a group of orthodontic patients following treatment.

Two abstracts deal with studies involving ceramic materials. One addresses the mechanical properties of the new high strength ceramic materials. The other abstract reports on studies involving commercial and experimental glass-ceramic systems.

AHPRC Establish Advisory Committee

The Atlantic Health Promotion Research Centre (AHPRC) recently established a Research Advisory Committee. This committee advises on the relevance and merit of research proposals submitted to the AHPRC, and assists researchers with the development of their research methodologies. Congratulations are due to Amid Ismail, Department of Pediatric and Community Dentistry, for being selected as a committee member. Amid brings extensive and varied research skills to this position and he will certainly be an asset to the committee and to the AHPRC. Additional committee members include: Susan Kirkland and Elizabeth Townsend both of Dalhousie University, Harry Bawden IWK Children's Hospital, Angela Gillis St. FX and Gillian Leigh of the Cape Breton Regional Hospital.

Reality

"The real world is complex and stratified so that one is always discovering more complex layers of reality to explain other levels." P. T. Manicas & P. F. Secord, Amer. Psych. 38: 399-413, 1983