

Alumni Bulletin

SCHOOL OF DENTISTRY

Fall Issue 1973



Indiana University - Purdue University at Indianapolis

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A free and non-profit bulletin issued by Indiana University School of Dentistry, Indianapolis, Indiana, for the purpose of keeping its alumni informed of the activities and progress of the School.

EDITORS' NOTE

On behalf of the Alumni Bulletin staff and the administration and faculty of the Indiana University School of Dentistry, it is a pleasure to present as the opening feature of this issue a pictorial salute to our good friend Dr. Maynard K. Hine.

Dr. Hine, who served for 23 remarkably productive years as Dean of the School of Dentistry until his appointment in 1968 as Chancellor of the Indianapolis campus, was honored last June at two dinners (one sponsored by the University at large and the other by the School of Dentistry) marking his retirement as IUPUI chancellor.

The following pages contain scenes from those events, including a page of photos showing some of Dr. Hine's long-time associates on the Dental Faculty as they hailed his many educational and professional achievements. There are also pictures of a reception and buffet supper at which Dr. Hine was host to faculty members in the beautiful Lilly House.

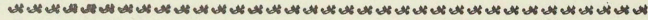
The photography is by Richard Scott, Director of Illustrations, and Dr. Jack Carr. Scotty made the page layouts.

Also in this issue, two of our authors deal with a most timely topic: the public image of dentistry and some of the things the public may not know about dentistry. You will be interested in the discussion of these issues by Dr. J. William Adams, former Chairman of the Department of Orthodontics, and Dr. Eric Bothwell, a 1973 graduate.

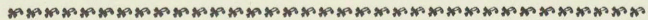
We hope you will enjoy these and other features of your Alumni Bulletin.

Ralph W. Phillips

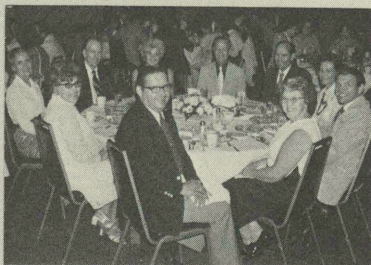
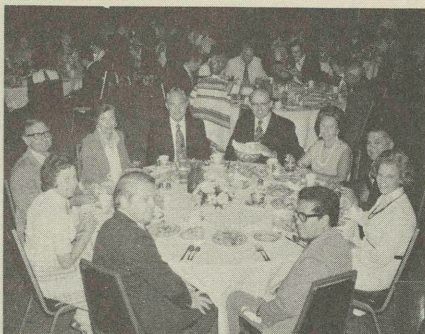
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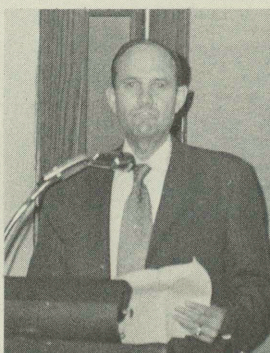
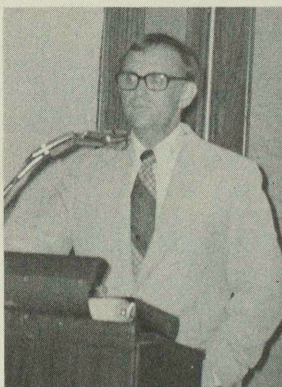
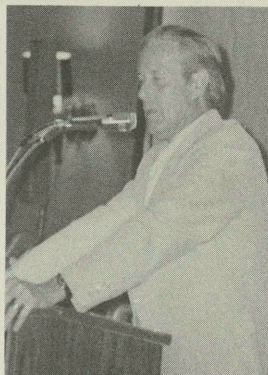
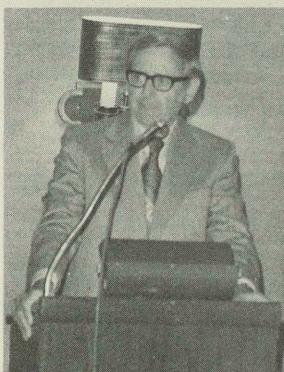
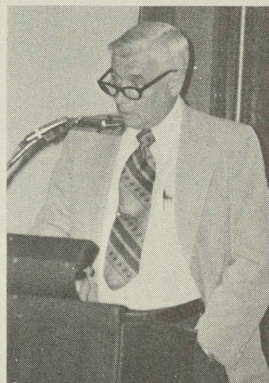
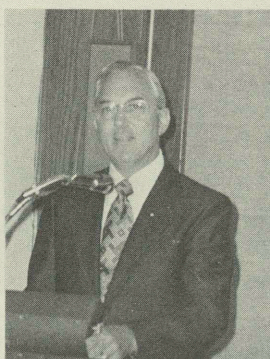


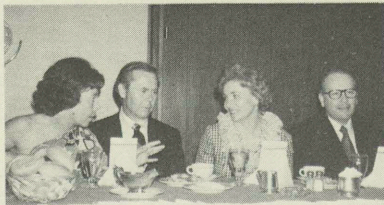
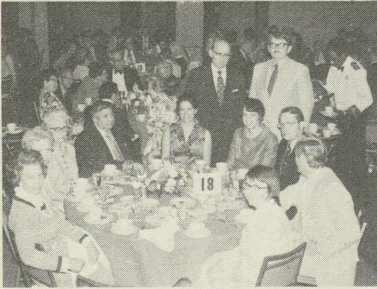
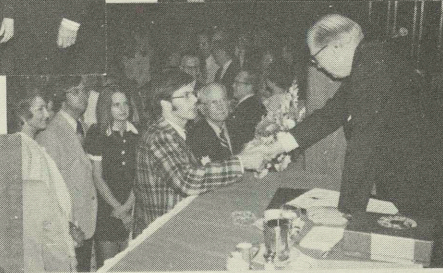
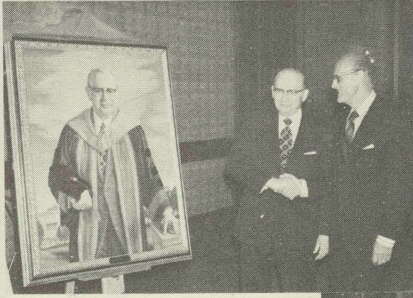
A
Tribute
to
Dr. Magnard K. Hine

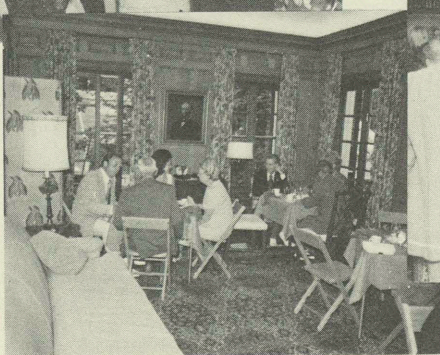
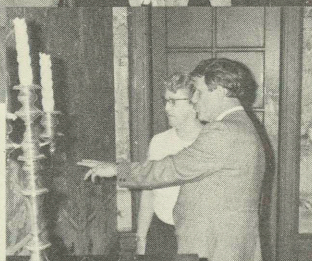
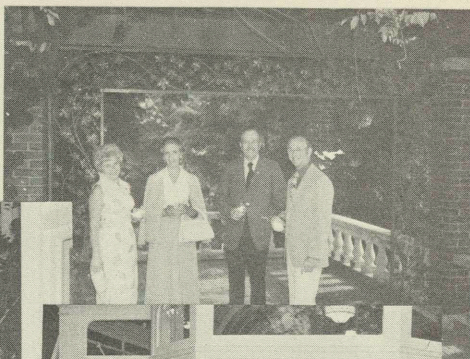
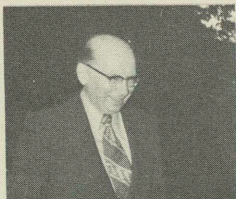


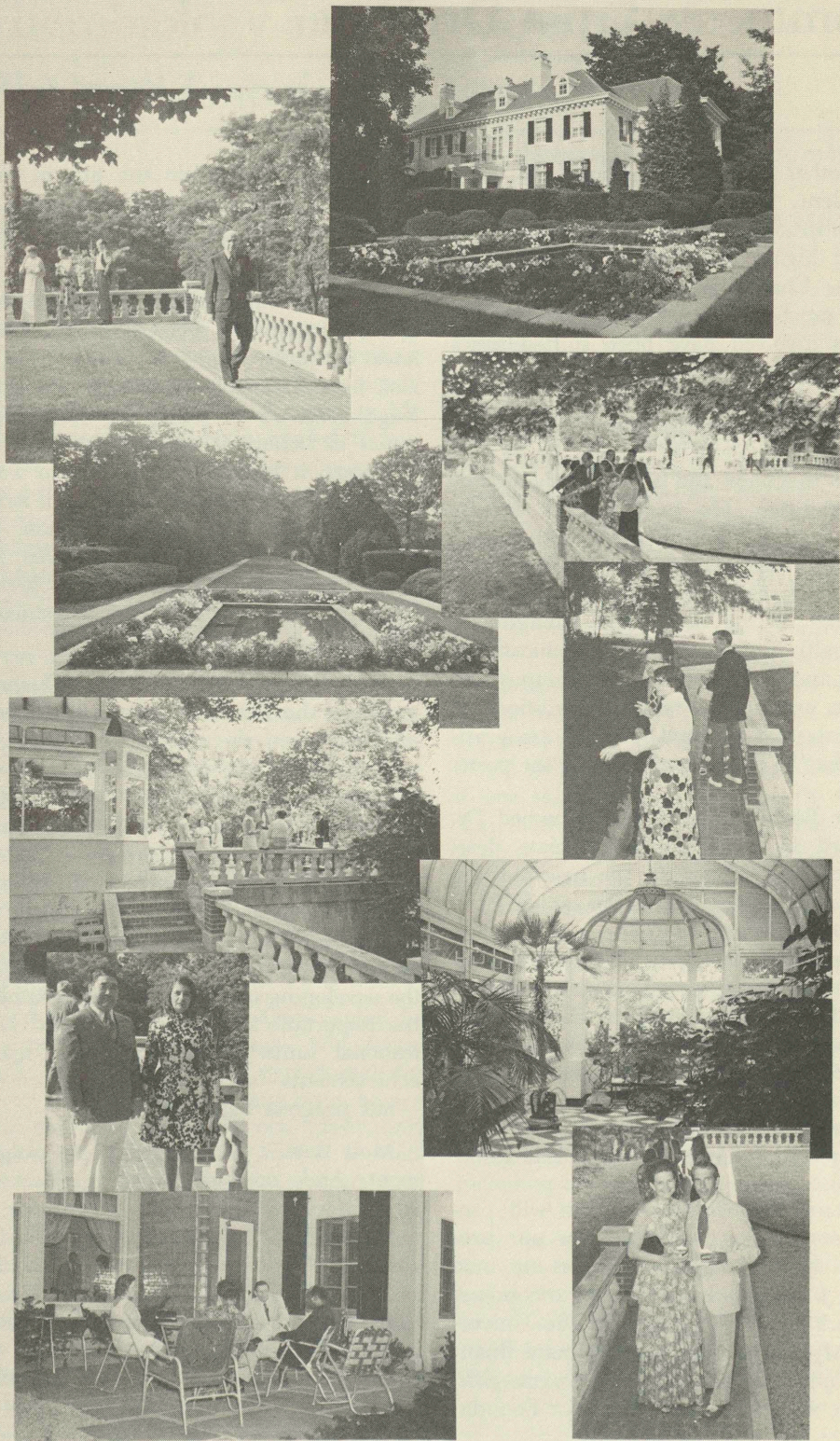












Comments From Dr. Hine

Maynard K. Hine

Another period of transition (and, I am confident, smooth transition) faces the administration of the merged system of public higher education in Indianapolis. A new Chancellor officially assumed the reins on September 1, and the various chores involved have been shifted systematically to him.

The new chief executive officer of IUPUI, Dr. Glenn W. Irwin, Jr., is well known to alumni and faculty of the School of Dentistry. He has been a faculty member at the School of Medicine since 1950 and has served as dean of the School since 1965. He has great depth of understanding of the needs and strengths of the health professions, of other educational needs and aspirations on our campus and in the community, and of conditions at the state and national levels. I am gratified that he has been chosen for the post.

The Board of Trustees also named Dr. Edward C. Moore, I.U. associate dean for academic affairs, to the new position of executive vice chancellor at IUPUI. Dr. Moore, whose discipline is philosophy, has broad experience in academic administration, having served as chancellor of the Massachusetts Board of Higher Education, and Dean of the Graduate School at the University of Massachusetts, Amherst. One of his assignments at I.U. has been to act in a liaison capacity with the State Commission for Higher Education.

I know that these two men will provide outstanding leadership for our programs in Indianapolis. As for my own plans, I am pleased to be able to continue to work for IUPUI and for the University. My role will be to coordinate financial support of the campus through gifts, grants, and bequests to the I. U. Founda-

tion. I shall also retain the title of Professor of Periodontics, and who knows, I may want to try my hand at scaling teeth again!

Although much of my experience has involved spending money, some efforts have naturally gone into obtaining it. I look forward to the stimulation and challenge involved in taking up these new duties in behalf of our institution. Over the years, it has been a pleasure to work with Chancellor Wells and with Bill Armstrong, president of the Foundation, on various projects. A significant area for attracting support has been that of dental research, so some of that experience should come in handy.

As the first Chancellor of IUPUI, moving from the Dental deanship to the post in 1969 when the merger took place, I have been fortunate in receiving support, patience, and tolerance from many quarters, I am grateful for the dedication and effort that have been demonstrated by faculty, staff, students, and alumni, including those at the School of Dentistry. Our central objective has been to develop all units of IUPUI, placing emphasis on the developing units without handicapping the important and better developed professional units. There have been many achievements—and many disappointments—but progress has been made.

Most days I have enjoyed my assignment. And, on most days, I expect to enjoy my new assignment. I continue to be enthusiastic about the potential for continuing growth and progress at the Indianapolis campus. I am glad to continue to have a role in advancing those prospects, changing hats from that of fund-user to fund-raiser. I shall continue to seek your support!

Microbiology and the Control of Plaque—Associated Diseases

Chris H. Miller, Assistant Professor of Microbiology

Since the first observation of "animalcules" by Leeuwenhoek in 1674, discoveries of the ubiquitous nature and diverse activities of microbes have continued to amaze mankind. We are frequently unaware of the presence of microorganisms, but their metabolic activities play important roles even in facets of everyday life which are only indirectly related to our health or disease states. Our septic tank systems and parts of our sewage treatment facilities function successfully because microorganisms degrade the organic waste products. Without microorganisms we would be unable to savor the delicate tastes resulting from picking and brewing processes or to enjoy the characteristic flavors imparted to various cheeses, milk, butter and cultured dairy products. If microorganisms were not present in the soil, life-giving nitrogen compounds would soon become unavailable to plants.

Although other beneficial aspects of microbial activity can be cited (e.g. production of antibiotics, vitamins, organic acids, enzymes which unclog our drains or are used to treat certain disease states), microorganisms also cause many harmful infections.

To the myriad disease states caused by microorganisms, we can now add dental caries and some forms of periodontal disease. Although it has long been known that microbes exist in the oral cavity, only within the last decade or so has a direct relationship been shown between oral microorganisms and caries and some forms of periodontal disease. These are infectious diseases. However, the basic function of a given microorganism is not to cause a disease or harmful infections, but simply to grow. The infectious disease process is a by-product of microbial growth and is influenced by environmental conditions. Interactions between host, parasite, and environment determine the initiation and extent of all infectious path-

oses, and in reference to dental caries this triad refers to the teeth, the oral microbiota, and the diet.¹

Microbiology of Plaque-Associated Diseases

The microbiological aspect of the initiation and prevention of plaque-associated disease is a difficult problem to investigate because the oral cavity itself and the various sites within the mouth (saliva, tongue, dental plaque, gingival crevice, periodontal pockets) represent extremely complex microbial ecosystems. Leeuwenhoek offered his observation of this fact long before it was generally accepted as a fact. "I have had several gentlewomen in my house, who were keen on seeing the little eels in vinegar; but some of 'em were so disgusted at the spectacle, that they vowed they'd ne'er use vinegar again. But what if one should tell such people in future that there are more animals living in the scum of the teeth in a man's mouth, than there are men in a whole kingdom?"²

In reality, there are approximately 200 billion microorganisms per gram of wet dental plaque.² This is a rather large number, for it would take a little over 634 years just to count to 200 billion at the rate of one numeral per second. Bacterial concentrations in saliva range from 43 million to 5.5 billion cells per ml. To complicate the matter, there can exist in the mouth as many as 50 different species of organisms, including bacteria, fungi, viruses and protozoa. Although most people have the same types of organisms in their mouths, the numbers (and less frequently the types) do vary among individuals, in the same individual at different times of the day, and in different sites in the mouth of the same individual.³ Many factors related to host and environment affect the nature of the oral microbiota, including an individual's natural resistance to infectious diseases, various nutritional assaults, tempera-

ture variations, local and systemic diseases and, of course, oral hygiene. Although these variations and complexities of the oral microbial flora present difficulties in conducting research in oral microbiology, many facts and concepts have been established concerning the microbiology of caries and periodontal disease.

Of prime importance for the development of dental caries, as well as periodontal inflammation, is the bacterial colonization of the oral tissues. From this accumulation of microbial debris, five results may occur: 1) there may be no interaction between the host and bacteria; 2) plaque may continue to develop; 3) caries may form; 4) calculus may form; 5) gingivitis and periodontitis may occur; or there may be any combination of the above. The consequences depend upon the host - parasite - environment interactions. Many of the oral microbiota may be involved in these processes, but such organisms as *Streptococcus mutans*, *Strep. sanguis*, *Lactobacillus*, *Actinomyces viscosus* and *A. naeslundii* have one or more properties which are at least potentially conducive to the formation of caries or periodontal disease. Examples of these properties would be the ability to produce acids from carbohydrates and the ability to form adherent deposits (plaque) on the oral tissues.

Most investigators and clinicians now accept the acid decalcification theory of caries initiation.^{4,5} Lactic acid is a primary metabolic by-product which results from carbohydrate-dependent bacterial growth, and is thought to be the main culprit in initial decalcification of enamel. The acid, and therefore bacteria, must remain in contact with the tooth surface long enough for demineralization to occur. On the smooth dental surfaces plaque provides the retention mechanism, and in the pits and fissures, gingival crevice area, or periodontal pockets, this contact is potentiated by mechanical trapping of food debris as well as plaque formation.

Plaque is not merely an accumulation of food on the tooth surface, but is a tenacious deposit composed of approximately 70% (by volume) bacteria cells. In most individuals, plaque formation is a continuous dynamic process which is interrupted

only by oral hygiene measures. In the absence of oral hygiene, there is nothing to stop the disease-producing potential of this bacterial mass. It serves as a habitat for potentially harmful microorganisms, provides for close and often continuous association of these microorganisms with the oral tissues, and is a source of harmful microbial products (e.g. acids, cytotoxic substances, histolytic enzymes). At present, the most clearly understood mechanism of plaque formation involves adherence due to the production of an extracellular polysaccharide (dextran) by organisms such as *Strep. mutans* and *Strep. sanguis*. *Streptococcus mutans* requires sucrose for dextran formation.^{6,7} This organism is capable of enzymatically converting the glucose moiety of sucrose to dextran (polyglucose), while the fructose moiety of sucrose is metabolized to mainly lactic acid and at times to small amounts of levan (polyfructose). The high molecular weight polymers of dextran cause specific aggregation of *Strep. mutans* cells, and facilitate adherence of this organism to enamel surfaces.^{8,9}

Streptococcus mutans has world-wide distribution in man, is acidogenic and causes extensive plaque formation and caries in mono-infected animals.^{6,7,10} This organism probably plays a significant role in human caries. However, human plaque contains a complex microbial flora and its matrix is only partially composed of dextran. Other caries-conducive organisms besides streptococci and other non-dextran involving mechanisms of plaque formation may also be of importance in the oral environment. For example, certain salivary glycoproteins have the capacity to cause the aggregation of oral bacteria,¹¹ and several of the oral flora form aggregates with each other when washed cells are suspended in an inorganic environment.¹² Species of *Actinomyces* may play an important role in the etiology of human periodontal disease and possibly caries. *Actinomyces viscosus* and *A. naeslundii*, which are gram-positive pleomorphic bacillus-shaped bacteria often found in human dento-gingival plaque, form plaque and induce periodontal disease and root caries when inoculated into the oral cavities of conventional

and gnotobiotic animals.¹³⁻¹⁵ *Actinomyces viscosus* produces large amounts of levan from sucrose, but dextran formation is not detected.^{16,17} On the other hand, *A. naeslundii* does not appear to produce levan or dextran from sucrose metabolism.¹⁸ *Actinomyces naeslundii* has been shown to adhere to the surface coatings of other plaque organisms,¹² and (unlike *Strep. mutans*) can form plaque in the presence of a variety of sugars as well as in the absence of sucrose.^{14,18,19} Such diversity suggests that the oral actinomycetes have the potential to form plaque under various conditions, and that plaque formation is indeed a primary pathogenic property of organisms which cause periodontal disease or dental caries.

Prevention Through Microbiological Techniques

The National Institute of Dental Research has estimated that residents of the United States spend about \$2 billion a year to repair damage resulting from dental caries, and this represents only the 40% of the population who receive dental care.²⁰ Fortunately caries and periodontal diseases are usually not life-threatening conditions, but they are among the most prevalent and annoying of infectious processes. Prevention is the logical approach to control of these plaque-associated diseases, and any potentially successful control methodology must take into account the relationships between host, parasite, and environment. This realization has resulted in three major areas of research: 1) modifying the diet; 2) protecting the teeth; 3) combating caries-conducive bacteria. Although significant progress has been made in all three areas, the present discussion will be limited to the fight against bacteria, which involves two general approaches that are not necessarily mutually exclusive. These approaches stem from the fact that there are two basic microbiological requirements for plaque formation: 1) adhesive retention; 2) growth of bacteria.

Preventing Adhesion: The high cariogenicity of *Strep. mutans* seems to relate to its ability to produce sucrose-dependent high molecular weight dextrans which in turn are responsible for the adhesive nature

of this organism. Measures which either degrade dextran or prevent its formation would appear useful in combating plaque-associated diseases. In 1968 Fitzgerald et al²¹ reported using the enzyme dextranase from the fungus *Penicillium funiculosum* to degrade artificial dextran-base plaque. Later incorporation of a fungal dextranase preparation into the diet and/or drinking water of experimental animals on a high-sucrose diet harboring *Strep. mutans* reduced both caries development and plaque formation.²² However, recent *in vitro* and clinical studies indicate that dextranase is less effective or not effective at all in preventing human plaque formation.²³⁻²⁵ This relative ineffectiveness is probably due to the fact that human plaque is much more complex than animal plaque in its microbial and chemical content.

The amount of dextran in human plaque may be very low under some conditions.²⁶ Newbrun²⁷ has also shown that the glucans (poly-glucose polymers, such as dextran) produced by several strains of caries-conducive streptococci vary in their susceptibility to dextranase attack. Dextranase (alpha-1, 6 glucan 6-glucanohydrolase) from *P. funiculosum* mainly cleaves the alpha-1, 6 glycosidic bonds in dextrans, but the high molecular weight dextrans thought to be involved in plaque formation contain varying percentages of alpha-1, 3 or alpha-1, 4 bonds at the branching points of these glucan molecules. The degree to which the dextran from a given organism or in a given type of plaque would be hydrolyzed by the fungal enzyme thus depends upon the extent of alpha-1, 6 glycosidic bonds present.

Perhaps other types of dextranase or glucanase preparations with substrate specificities different from those of *Penicillium* or *Cytophaga* will prove more useful in degrading human plaque. In 1972 Guggenheim et al²⁸ reported the purification and properties of an enzyme mutanase from *Trichoderma harzianum* (a fungus) which is capable of degrading alpha-1, 3 linked glucans (mutans). The enzyme preparation also inhibited fissure caries in rats but did not reduce smooth surface caries.²⁹

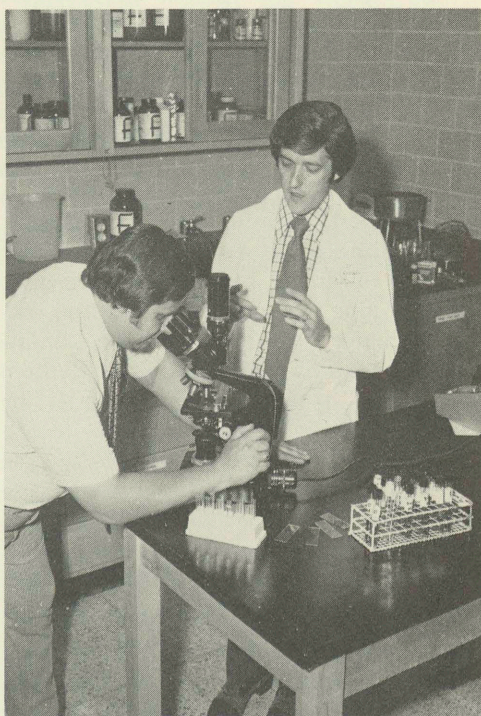
Another dextranase prepared from *Spicaria violaceae* (a fungus) has de-

graded various polysaccharides produced by oral streptococci.³⁰ When this enzyme was given in tablet form to four male subjects, less plaque was collected than from individuals who received a placebo preparation. Some caries-conducive streptococci also display dextranase or dextran-glucosidase activity, but the possible effects of these enzymes on human plaque degradation have not yet been determined.³¹⁻³³ Other enzymes, such as proteases, lipases, and glycoprotein or other carbohydrate hydrolases, might be capable of degrading components of plaque matrix,³⁴⁻³⁷ but clinical trials have not yet been reported in sufficient number.

Inhibiting Growth: Chemotherapy really began in the early 20th century when Ehrlich developed his "magic bullet" (nearsphenamine) to kill the organism which caused syphilis. Since the arrival of the antibiotic era in the 1940's, the use of chemical agents to kill microorganisms and treat infectious diseases has become one of microbiology's major contributions to the well-being of mankind. It is only natural that research on the control of the infectious diseases associated with plaque-formation would include the use of antibacterial chemicals. Control of plaque-associated diseases through the application of antibiotics is an approach which directly attacks the causative organisms, and the effectiveness of such pharmacologic measures has been proved many times in the treatment of other infectious diseases. However, any therapeutic agent has certain contraindications in itself, and use of such agents in a topically applied form in the oral cavity necessitates even further precautions to prevent the development of a hypersensitive state. As previously outlined,³⁸ the ideal anticaries agent should possess a low toxicity, an antimicrobial spectrum preferably confined to caries-conducive microorganisms, and a low potential for inducing the development of resistant microorganisms or causing hypersensitivity. It should also be poorly absorbed by the oral mucosa, should not be inactivated by salivary components, and should not be in general use for treatment of systemic diseases. Such an agent should also be stable during storage, relatively in-

expensive to prepare, and capable of being placed in a suitable vehicle. It should not cause unwanted esthetic affects such as tooth staining.

It was reported as early as 1946 that antibiotics (in this case penicillin) inhibited the formation of experimentally induced dental caries in rats.³⁹ Many later studies confirmed these results with other antibiotics and in other animal systems.⁴⁰⁻⁴¹ Studies involving humans have generally shown that a decrease in caries or plaque formation can result through the use of antibiotics which express antimicrobial activity towards gram-positive microorganisms. Children who received oral penicillin for 2 to 5 years for treatment of respiratory diseases or rheumatic fever had 54-60 percent fewer carious tooth surfaces than an untreated control group.^{42,43} While some clinical investigations have indicated little, if any, plaque reduction from the use of topical vancomycin,⁴⁴ others have shown significantly reduced plaque scores in contrast to those for untreated controls.⁴⁶⁻⁴⁹ Lobene et al⁵⁰ reported that using an erythromycin liquid



Dr. Chris H. Miller (right) discusses an observation with a graduate student.

suspension for seven days resulted in a 35% reduction in plaque development, and Stallard et al⁵¹ showed that a macrolide antibiotic (cc-10232) mouthrinse produced reductions of 11-23% in plaque, 70-91% in calculus, and 55-72% in gingivitis when compared to control subjects. Topically applied 5% Kanamycin sulfate in Orabase has improved the oral health of institutionalized patients.⁵² As reported in past reviews of this topic,^{1,38} there is still no tested antibiotic agent which is now considered appropriate for long-term use as an anticaries or plaque-inhibiting agent. However, a number of studies have been conducted on vancomycin.^{53,54} Actinobolin⁵⁵⁻⁵⁷ and a macrolide preparation⁵¹ are undergoing stringent investigation.

Antimicrobial agents other than the classical type of antibiotic may finally prove useful in inhibiting growth of microorganisms conducive to caries or plaque development. This class of agents consists of the synthetic antibacterial chemicals. Hundreds of such compounds have been studied as possible oral antibacterial agents in *in vitro* systems, animals, and man⁵⁸⁻⁶¹. The chemicals investigated have included dyes, alcohols, iodophores, quaternary ammonium compounds, amines, amidines, guanidines, alkanes, as well as certain metal ions. Some of these appear to have potential use as caries or plaque control agents in man and only a few more promising examples will be mentioned. Victamine-C is a surface active agent and demonstrates appreciable activity against various microbial species. Victamine-C, along with an additional 15 of a total of 45 chemicals tested, inhibited growth of *Strep. mutans* (Strain 6715) and *in vitro* plaque formation by this organism on teeth, wires, and glass surfaces.⁶⁰ It appeared that the phosphoramidate and the other surfactant chemicals which inhibited plaque on tooth surfaces were adhesive as well as antibacterial, and that the effectiveness depended upon a gradual release of the chemical agent from the treated teeth.

Keyes and McCabe⁶¹ have also reported that a 0.15% concentration of Vitamine-C, as well as other antibacterial agents, in-

hibited the "glycolytic activity and vitality" of *Strep. mutans* (strains SL-R) and *A. viscosus* (strain 5-5) in pre-formed *in vitro* plaque. Calculus inhibition and reduced plaque formation by topical application of the chloromethyl analogue of Victamine-C have been reported.⁶² A recent study has also demonstrated a 25.4% reduction in labio-lingual mean plaque scores in subjects using a Victamine-C mouthrinse preparation when compared to subjects given the placebo mouthrinse.⁶³

Bradosol has reduced plaque accumulation in humans⁶⁴ and inhibited *Strep. mutans* and *A. viscosus* in pre-formed *in vitro* plaque.⁶¹ Recent reports have also shown that OR-10 (0.1% hexylresorcinol plus 0.5% pyromellitic acid) and OR-11 (0.03% cetylpyridinium chloride plus 0.5% pyromellitic acid) mouthrinses reduced plaque accumulations by 42% and 45%, respectively, when compared to subjects using a placebo preparation.⁶⁵ Further confirmation that cetylpyridinium chloride alone is a recognized human antiplaque agent has been recently reported⁶⁶.

Interest has been shown over the past few years in the potential of chlorhexidine to prevent plaque formation. Much of the work dealing with this broad-spectrum antimicrobial chemical has come from Scandinavian groups headed by Dr. Harald Löe, now at the University of Michigan. Two daily mouthrinses with a 0.2% solution of chlorhexidine prevented plaque formation on all tooth surfaces except the interdental areas in lateral segments of the fourth in each of 4 test subjects, and one daily topical application of a 2.0% solution completely prevented plaque formation in each of 6 subjects.⁶⁷ Discontinuance of the chlorhexidine treatments resulted in plaque formation at normal rates. The daily chlorhexidine mouthrinses caused an 85-90% reduction in the total number of cultivable bacteria per ml of paraffin-stimulated saliva from 4 subjects throughout the 22-day experiment.⁶⁸ Although the total number of salivary bacteria was reduced, large numbers of microorganisms persisted in the saliva without coincident dental-plaque formation.

Subsequent studies suggested that the

topically applied chlorhexidine prevented bacterial colonization of the tooth surfaces,⁶⁹ and that this agent absorbed to hydroxyapatite, tooth surfaces and salivary mucins.⁷⁰⁻⁷³ The absorbed chlorhexidine is released when the environmental concentration is low, and slow release of chlorhexidine from possible reservoirs on the tooth surface or pellicle presumably could prevent bacterial colonization and subsequent development of dental plaque.

More recent clinical trials have confirmed previous observations and have demonstrated that chlorhexidine mouthwashes reduced gingival inflammation and plaque by 43% and 84% in individuals with scaled and polished teeth.⁷⁴ When calculus and rough tooth surfaces were present, the reductions were 24% and 66%, respectively. It has also been reported that three 30-second mouthrinses a day with 0.1% chlorhexidine gluconate for six days resulted in a 72.7% reduction in the mean plaque score of test subjects when compared to that of subjects receiving a placebo mouthrinse.⁷⁵

Chlorhexidine does inhibit microorganisms in pre-formed *in vitro* plaque^{61,76} and possibly exerts its antibacterial affect by causing permeability changes in the bacterial cell membrane⁷⁷ from inhibition of membrane-found ATPase.⁷⁸ The major undesirable side effects of chlorhexidine appear to be its bitter taste and discoloration of the tongue and teeth in some test subjects.^{67,79,80} There have been conflicting reports concerning the development of resistant streptococci after long-term use of chlorhexidine.^{81,82}

Besides the chemicals previously described, inorganic fluorides, amine fluorides and zinc-containing preparations apparently have direct effects upon dental plaque microorganisms.⁸³⁻⁸⁷ A discussion of the "anticaries" effects of fluoride is not intended here. However, while such effects appear to be closely related to the reaction of fluoride with the inorganic material of the tooth, a direct inhibitory-type of reaction towards plaque microorganisms or plaque adhesion may be involved in the overall mechanism of fluoride action.

Microorganisms or their activities which are conducive to the development of

plaque-associated diseases may someday be kept under control by artificially acquired active immunization. The reaction of specific antibodies to whole cells of caries-conducive organisms may inhibit their adhesive surface properties or perhaps impair their nutrient transport and inhibit acidogenesis. Although phagocytic activity in saliva is slight and the major salivary antibody (IgA) is not capable of reacting with complement (required for antibody-lysis of bacterial cells), some immunological destruction of oral bacteria may possibly occur by involvement of the minor salivary antibody IgG. Salivary complement levels are apparently quite low, but IgG is at least capable of reacting with complement effecting cell lysis. Specific antibody against the dextranucrase enzyme would theoretically prevent dextran formation and possibly retard plaque formation.

Control of infectious diseases through active immunization programs has resulted in or greatly facilitated the "conquering" of polio, diphtheria, whooping cough, smallpox, measles, and yellow fever, with the control of mumps and rubella hopefully soon to follow. However, there are several aspects of plaque-associated diseases which make it difficult to predict the effectiveness of an active immunization approach to their control. These conditions are indeed complex in etiology and unlike many infectious diseases, they apparently do not confer immunological resistance to subsequent attacks. While significant advances are being made concerning a possible immunological etiology of gingivitis and periodontitis, much information is still needed concerning the specific immune defense mechanisms in the oral cavity and the synthesis and properties of salivary IgA.

Despite the difficulty of predicting the effectiveness of a human caries vaccine, investigators are pursuing this approach with quite interesting results. Wagner in 1966 and 1967^{88,89} first reported success by immunizing gnotobiotic rats with caries-conducive *Strep. faecalis*. Caries was virtually eliminated and the animals demonstrated higher serum and saliva antibody titers against the microorganisms than the controls. Bowen in 1969⁹⁰ also reported that

vaccinating monkeys with caries-conductive streptococci reduced the incidence of caries. Three immunized monkeys developed a total of 6 cavities against 38 in three non-immunized controls. Two studies reported in 1973 have again demonstrated that immunization of specific pathogen-free rats with killed cells of *Strep. mutans* reduced the caries scores when compared to proper control animals.⁹¹⁻⁹² When such animals were immunized either locally (salivary glands) or systemically (foot pads) specific antibody was demonstrated in both saliva and serum.^{92,93} Reduced caries scores for rats immunized with the enzyme responsible for dextran synthesis (dextranase) when compared to nonimmunized controls have also been reported.^{94,95} It has also been shown that rabbit antiserum against a caries-conductive *Streptococcus* inhibited *in vitro* plaque formation by this microorganism.⁹⁶ It should be mentioned that negative results with respect to immunological protection against caries in animals have been reported.⁹⁷⁻⁹⁹

In a recent issue of Dental Student, Smith¹⁰⁰ has alluded to the possibility that he has developed a vaccine which can reduce dental decay by 80% to 90% in children. He apparently injected an antigen preparation into the oral mucous membrane and this elicited the formation of antibodies against the dextranase enzymes of oral streptococci. Since these results apparently have not been described in the scientific literature, have not been presented at any scientific meeting, and have not been detailed by Dr. Smith during a meeting with officials of the American Dental Association, the Association expressed skepticism about his claims and indicated that reports of vaccines currently being studied in animal models would not yet merit testing in human subjects.¹⁰⁰

Summary and Conclusions

Microbiological concepts and methodology are important parts of the developing armamentarium against the plaque-associated diseases. Prevention and hence control of these complex maladies will probably not be achieved by application of a single measure. A combined utili-

zation knowledge from several areas of plaque control and caries prevention research would seem appropriate. It is hoped that such an approach, possibly involving specific inhibition of caries-conductive microorganisms, protection of the teeth with an occlusal sealant and fluoride, appropriate modification of the diet and proper oral hygiene, will soon eliminate plaque-associated diseases as a major health problem.

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Dentistry's Disadvantaged Image In the Family of Professions

J. William Adams, Professor in Orthodontics

Periodically, reports appear which definitely indicate that dentistry not only lacks a superior image for the man on the street but over the years appears to be slipping in comparison with other professions and business groups. A quick judgment might conclude that such a status is solely the fault of dentistry, that the profession deserves no better rating. However, I believe that such a conclusion is unjust. It might be illuminating to mention a situation that occurred many years ago in which a chiropodist was able to correct or alleviate a foot problem that several orthopedists had tried unsuccessfully to solve. However, since the work was not accomplished in a medical institution under dramatic circumstances, and since it was done for a relatively modest fee, it never was given the recognition it may have deserved.

I contend that the image of dentistry not only needs but deserves upgrading in the public mind, and that an information campaign should be developed to attain that goal. One can easily infer that a paper of this sort is in the realm of sour grapes and that the intent is to ridicule members of other professions. This is not the motive. The author has had the opportunity to know physicians, lawyers, engineers, veterinarians, accountants, and so on, quite well, or perhaps I should say as well as one can without actually being one of them. They have confided in me that no group is free of problems. A best and a worst exist in all segments of society and the trend appears to be in the direction of making it more difficult for professional societies to police their own ranks. Over the years the conduct of professional people has tended to shift from what was once known as an adherence to ethical standards to an adherence to that which is legal as opposed to illegal. In this connection I might point out that the most ethical professional

men I know are unable to tell you what the code says—to them it has been a way of life rather than a fence behind which they have conducted their activities.

Adverse publicity is damaging to any profession and may have more impact on what we feel is the better element. Hence the indication for appropriately disseminated, high grade propaganda—truthful in content—to enhance the relationship of good dentists to the thinking public.

Dentistry as a university course is very challenging for a reason that few appreciate: namely, because in addition to absorbing facts and learning reasoning processes that are myriad in scope, difficult technical skills must be mastered in preparation for working on the hardest tissue in the body, namely tooth structure. Handling restorative materials properly calls for the discipline of the most artistic jeweler, with the skill to create the design and fabrication which can resist the terrific impact that the material encounters in usage. The bio-mechanical challenges which dentistry routinely encounters have often mystified members of the engineering fraternity who have experts in dental materials describe the procedures in their terms. This is also true regarding the problems of attaining and maintaining hermetic seals in the mouth media.

To the writer, this entire educational process seems analogous to the situation of a music major having to learn to play a musical instrument from start to concert level, along with all the history, theory, educational principles which that field presents as a challenge.

Dentistry as a course of study tends to be or actually is more expensive than other comparable professional curricula. However, in regard to expense, the greatest variation occurs at the point of getting physically set up for private practice, when an indebtedness of \$50,000 has been

known. Lack of suitable collateral invariably results in premium rates of interest.

Few lay people, and few members of other professions, are aware of the fact that the overhead of a well run dental facility averages around 50% of gross income, so that net return is relatively modest as compared to medicine, law, accounting, and so on. Traditionally, good dentists are not compensated adequately for advice and counseling, but rather have to render a material service for the patient to feel that a fee is just. This becomes increasingly significant since overhead has escalated from \$7.50 per hour to \$25.00 per hour in our generation.

A dramatic contrast is mentioned for illustrative purposes only. A patient I know of underwent a week of medical examination in a reputable hospital with 23 negative findings which cost his insurance company \$1,600.00. Yet grievance committees of dental societies are frequently faced with the matter of a dentist making a charge when "he found nothing wrong except . . ." A recent newspaper article reported, rightly or wrongly, that the legal profession had the potential of reaping 4-1/2 million dollars in fees for defending a number of drunken drivers. At about the same time another item reported that an astronomical fee had been collected for an estate settlement—perhaps a larger sum of money than a dentist would collect throughout an entire lifetime.

Non-dentists are apt to be unaware of the fact that good dentistry can be done only for a given number of hours per year without being medically inadvisable. Sit-down dentistry presents the possibility of altering these figures, but in the past 2,000 hours per year was regarded as the amount that is recommended for health reasons. Many dentists have been encouraged by their physicians to pace themselves down to 1,200 hours per year in order to enhance life expectancy. The above are the real production figures whereas hours in the office may be significantly greater. The point to stress is the fact that in those 2,000 hours per year the dentist must *collect* \$25.00 every hour

to gross \$50,000 if he is to net \$25,000 before personal taxes are paid.

Dentistry presents another unique aspect in that few dental problems are resolved satisfactorily without the services of the dentist. People can fill out their income tax forms if they choose to rather than engage an accountant. The common cold and even the flu will run their course without medical help. Many people engage attorneys to represent them for convenience reasons, or to allay fears, even though such matters will resolve satisfactorily with time.

Recent governmental reports tell dentists what they have known for decades—namely, that a tremendous amount of dental need exists in John Q. Public. However, it is pictured as an astronomical need for the purpose of increasing the number of practicing dentists and in this regard dental educators go along. But these is a fallacy here. Military dentists have taken care of hordes of people who never frequented a dentist before entering the service, and will not go to a dentist after dismissal from the service except for relief of pain. This matter of acceptance where it's free and refusal when it calls for a sacrifice has plagued dentists who are not as busy as they would care to be, and selling \$20.00 bills for \$18.50 will not solve the problems.

There is a large element of American society, or perhaps I should say human society, which has been told by dedicated men, free of charge, how to prevent dental troubles, especially in caries control or prevention of periodontal disease. Yet these people refuse to follow that advice. They will pay for a shot of penicillin if they have a cold and they will patronize a pharmacist for medical remedies, but they won't reduce cariogenic foods or keep mouths clean in spite of sound dental advice. It is highly unlikely that flooding the country with dentists will do any more than beat down fees to a point of inadequate return for a segment of society, the dental profession, whose members have never been compensated in keeping with the sacrifices they make and the responsibilities they bear.

One can go on and point out innumerable inequities in comparing dentistry to other fields, such as the enviable sources of auxiliary help in some professions, the fund-raising campaigns through popular appeal, the building of certain supporting facilities by public subscription, and the government subsidies that seem to benefit professions other than dentistry.

Practically all dentists are happy with their lot in life, especially because of the satisfaction that they get from most of their work, their relative independence, their community prestige, and their control of working hours. But like the small business man who played such an important part in the development of American life, they have had difficulty in generating and sustaining a commensurate public image.

One cannot help looking with a bit of envy at the effectiveness with which some professions have been able to muster public interest, know-how, and money to help achieve goals in their chosen fields. For example, the Public Health Department has been instrumental in passing laws which make the inoculation of pets mandatory, and as a result the veterinarians have a constant flow of work, for the public good, naturally. On the other hand, dentists almost have to beg people to let them do that which is good for them.

Society has concluded that those who cannot afford, or claim they cannot afford, legal counsel will have such counsel supplied to defend them in any litigation. Thus the taxpayer foots the bill for the indigent and it is usually the moral thing to do.

The public reaction to medical needs in a community has at times reached almost emotional proportions so that medical men can do their work with ample well-trained auxiliary help and a fair share of outright volunteers. Any situation in which a patient fails to get the finest that medicine has to offer can become "front page"; that has become a very desirable American tradition worthy of perpetuation. Good dentists would be thrilled if a comparable sequence of events were to make it possible for them to do likewise, as occasionally occurs in Oral Surgery.

Men in medicine are quick to admit that the quality and quantity of their accomplishments are facilitated by the amount and calibre of their auxiliaries. With a less efficient organization, "know-how" on the part of professional men would tend to be wasted. There is reason to believe that medicine has gained some impetus during and after the great wars when the magnitude and nature of patient care literally forced efficiency upon that profession.

Attracting the better element of candidates into programs for dental auxiliaries is linked with the matter of income from employment. Since dentists must engage such persons themselves, their salaries become a part of the general dental fee, instead of being separate, such as hospitalization charges or laboratory fees. Perhaps dentistry should have decided some time ago that the dental laboratory charge should be paid directly by the patient, just as he makes direct payment to the optician dispensing the glasses, and not as a part of the ophthalmologist's fee.

One reads or hears from time to time of lay persons posing as physicians and apparently doing a fairly satisfactory job of keeping the public happy. In one instance an impostor attained a rather impressive status on a hospital staff over a period of some 15 years before his identity was made clear. So far as is known, no such counterpart has turned up in dentistry, probably because the eradication of dental defects demands special education and skills far above and beyond the cleverness of an impostor.

Let me conclude by saying that instead of continually being envious of our fellow professions and repeatedly citing examples of same, it would be far more constructive to generate imaginative solutions and implement them to an effective degree. This can be done in the foreseeable future if the members of organized dentistry so desire. The following proposals are offered for criticism:

1. Let each member take inventory of himself and his organization with the thought of appearing more professional, or as professional as possible.

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A Message From The Past-President

*D. Robert Lindborg, Past-President
I.U. Dental Alumni Assn.*

As a member of that great group, called the I.U. School of Dentistry Alumni, it has been my privilege to enjoy many happy experiences and contacts with fellow alumni since graduation thirty years ago. Our "great" class of '43, along with "great" classes of other years, recently celebrated reunions at the annual fall conference in Bloomington . . . incidentally a fine time to renew acquaintances with classmates and friends.

The class of '43, along with graduates of several other years, were "war time" classes and so, many I.U. dental graduates of this period and later were obligated to practice their profession . . . for a few years at least . . . in the various branches of the armed forces. Comparison of reputation, skills, and quality of dentistry of I.U. dental graduates with those of other schools and areas of the country was inevitable. It has always been a great satisfaction to me, from those service years until now, to be asked where I went to school, so that I could answer loud and clear, "Indiana University."

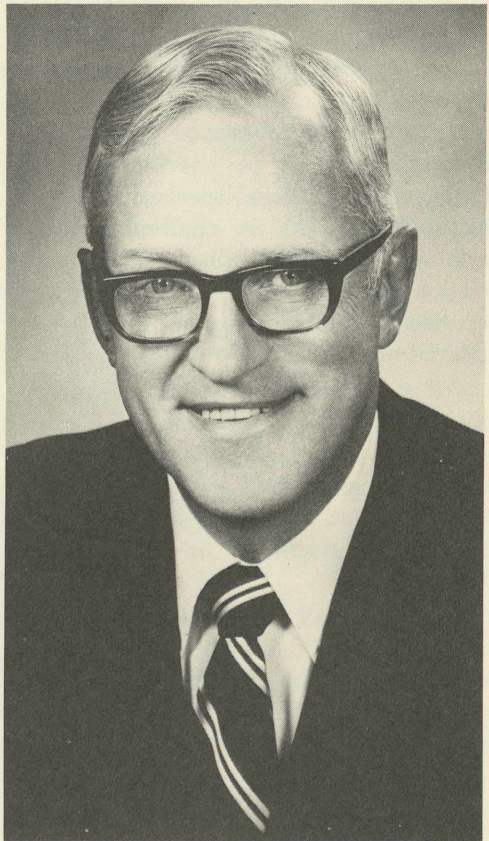
We, as graduates of I.U., value and benefit from the excellent world-wide reputation of our school and its outstanding faculty. I.U. School of Dentistry is not only maintaining its fine reputation, but continues to improve it. However, with the privilege of being able to call ourselves alumni, go inescapable individual obligations for personal professional excellence, integrity, public service and loyalty to school and profession. Improving of professional skills and methods, participation in the many opportunities for continuing education, involvement in civic service to community, support of church or synogogue and of worthy charitable organizations . . . all these, it seems to me, are attributes of a graduate for which a school might take pride.

An aspect of alumni support to I.U.S.D. which has been, happily, steadily on the increase, is its annual financial support

through Century Club and other giving. And certainly, participation in its many post-graduate courses benefits both graduate and school.

And now, shortly, if plans of faculty and administration are approved and implemented, I.U. Dental Alumni will have additional opportunity to offer assistance and support to an innovative and imaginative program developed by the curriculum committee. This new curriculum involves a basic three-year "core" discipline which prepares the student for a fourth year experience free of required courses. As I understand it, beginning with the fall semester in 1974, all courses for the fourth year will be elective. Basically the program will be divided into two

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Dr. D. R. Lindborg

Continuing Education Courses—1973-74

The theme of the continuing education program offered by Indiana University School of Dentistry for 1973-74 will be "Continuing Education for the Dental Team."

Courses will be designed to integrate new techniques and research developments with accepted dental practice in order to give the student insight and experience as he advances in his continuing education. Short intensive symposiums as well as longer more comprehensive courses are offered to permit the student to partake of them in his available time.

In general, the need for continuing education in all fields of professional life has become a recognized fact. The dental profession at large is seeking more formal and detailed instruction than is given at routine dental meetings, etc.

Indiana University School of Dentistry in cooperation with the Indiana Dental Association and the Indiana University School of Dentistry Alumni Association, plans to provide the dental team with a wide variety of programs. This will be done through use of television, movies, slides, and using local speakers and guest lecturers. A booth on continuing education will be at the Indiana Dental Association meeting in May, at which time dentists and their personnel may request desired programs for the following year.

All members of the Indiana Dental Association and/or Academy of General Dentistry will be given a 20% discount on all programs held within the state of Indiana. Due to the dollar devaluation all travel programs will be delayed temporarily.

We invite all members of the dental team to review the list of continuing education courses for 1973-74. We hope you will plan to attend many of these fine programs.

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|----------|--|
| C.E. 113 | January 11 & 12, 1974. Advanced Practical Course in Oral Implantology. Indianapolis. \$220 Dr. Leonard I. Linkow |
| C.E. 114 | January 16, 1974. A Symposium on Periodontics. Indianapolis. \$40 Niles M. Hansen & Dr. William Gillette |
| C.E. 115 | January 19, 1974. Clinical Program for Dental Laboratory Technicians. Indianapolis. \$15. Dr. Ray K. Maesaka |
| C.E. 116 | February 27, 1974. Clinical Skills for Dental Hygienists and Dental Assistants. Indianapolis. \$25 Dr. James E. Vaught & Dr. Donald R. Tharp |
| C.E. 117 | March 2, 1974. Clinical Procedures in Restorative Dentistry. Indianapolis. \$50 Dr. John H. Mosteller |
| C.E. 118 | March 6, 1974. The What, When and How of Mixed Dentition Treatment. Indianapolis. \$60 Dr. La-Forrest D. Garner |
| C.E. 119 | March 13, 1974. Acupuncture for the General Practitioner. Indianapolis. \$50 Dr. Max Sadove |
| C.E. 120 | March 20, 1974. Electro-Surgery in General Practice. Indianapolis. \$60 Dr. Joseph C. Morganelli |
| C.E. 121 | March 29-31, 1974. Relative Analgesia. Indianapolis. \$175 (dentist) \$80 (hygienist or assistant) Dr. Harry Langa |
| C.E. 122 | April 3, 1974. Amalgam Polishing & Diet Counseling for the Dental Hygienist. Indianapolis. \$25 Dr. Hala Z. Henderson & Mrs. Suzanne Boundy |
| C.E. 123 | April 3-6, 1974. The Complete Denture Service in General Practice. Indianapolis. \$150 Dr. Malcolm E. Boone |
| C.E. 124 | April 10-12, 1974. Surgical Endodontics. Indianapolis. \$250 Dr. Samuel S Patterson & Dr. Harold Gerstein |
| C.E. 125 | April 16, 1974. Four-Handed Dentistry. Indianapolis. \$80 (dentist & 1 assistant) \$20 (each additional person) Dr. F. E. McCormick |
| C.E. 126 | April 19 & 20, 1974. The Pankey-Mann-Schuyler Philosophy & Technique. Indianapolis. \$160 Ohio Occlusal Seminar |

- C.E. 127 April 24 & 25, 1974. The Design, Operation & Management of a Dental Practice. Fort Wayne. \$50 (dentist & 1 assistant) \$25 (each additional person) Dr. Arthur I. Klein
- C.E. 128 April 29-May 3, 1974. Maxillo-facial Prosthetics. Indianapolis. \$200 Dr. Varoujan A. Chalian
- C.E. 129 May 1-3, 1974. Clinical Adventures in Amalgam or Direct Gold Restorations. Indianapolis. \$125 (dentist & 1 assistant) Dr. Melvin R. Lund & Dr. Harold Schnepfer
- C.E. 130 May 14-17, 1974. Clinical Pedodontics. Indianapolis. \$150 Dr. Paul E. Starkey & Staff
- C.E. 131 May 15-17, 1974. Basic Procedures for Success in Periodontal Therapy. Indianapolis. \$200 Dr. Timothy J. O'Leary
- C.E. 132 May 18, 1974. Advanced Surveying Course for Dental Laboratory Technicians. Indianapolis. \$25 Dr.
- Donald M. Cunningham & Mr. Calvin Linton
- C.E. 133 May 28-31, 1974. Achieving Orthodontic Goals for the Cleft Palate Patient. Indianapolis. \$250 Dr. LaForrest D. Garner & Dr. Sheldon Rosenstein
- C.E. 134 May, 1974 (dates to be announced). The Diagnosis and Correction of Occlusal Problems. Indianapolis. \$100 Dr. David R. Jordan & Dr. Lloyd J. Phillips
- C.E. 135 June 5-7, 1974. Fixed & Removable Partial Prosthodontics. Indianapolis. \$150 Dr. Roland W. Dykema & Dr. Donald M. Cunningham
- C.E. 136 July 10, 1974. Oral Surgery for the General Practitioner. Indianapolis. \$60 Dr. Daniel M. Laskin
- C.E. 137 July 17-20, 1974. Dental Radiology for Dental Hygienists & Dental Assistants. Indianapolis. \$150 Dr. Myron J. Kasle, Dr. Jack D. Carr and Dr. James F. Matlock

REGISTRATION FORM

Name

Office Address

City State Zip Code

Degree in dentistry School Year

Please enroll me in Course No.
(title)

To be presented
(date(s))

at
(city) (state) (zip code)

Enclosed is my check for \$..... made payable to Indiana University School of Dentistry
Canadians please state "Payable in U.S. funds."

Fees will be refunded only in exceptional cases. The sponsoring department reserves the right to cancel any course or change its location if circumstances so demand.

Send application and fee to: Dr. Robert H. Derry, Director of Continuing Education, Indiana University School of Dentistry, 1121 West Michigan Street, Indianapolis, Indiana 46202.

Dentistry: Rip-off or Bargain?

*Eric Bothwell, Dental Officer, Pine Ridge (S.D.) Indian Hospital**

If one were to question a large number of average American adults concerning dental fees, a disturbingly large number would state in all honesty that they believe dental fees are outrageous. This is unfortunate, and to a large extent it is the fault of the dentist. Too often dentists are reluctant to discuss fees with their patients, and as a result patients are often shocked at dental fees, and resentful of them.

Without explanation, patients see a dental procedure as something that took X amount of chair time and X amount of material. They have little appreciation of what a dentist is confronted with financially and, perhaps more important, they have little understanding of dentistry as a health service.

It is the purpose of this discussion to look at the factors governing dental fees and the importance of educating patients concerning these fees.

The Education of a Dentist

Let us consider first things first. How does one earn the initials D.D.S. after his name? The aspiring young man with goals set on dentistry must successfully compete with many other aspiring young men with similar goals. These fellows pore over the books and burn the midnight oil with grammar and composition, foreign languages, all the basic sciences, and come out with at least a 3 point average for three to four years of undergraduate school. They then must prove their skills, both manual and mental, on a dental aptitude examination. Finally, if they have done their homework well, and Lady Luck shines her light on them, they are accepted to dental school. In 1971, dental schools in the United States recorded 61,488 applications; only 4,745 of these (less than 8 percent) were accepted!¹

*Dr. Bothwell's article was a prize-winning entry in the 1973 Senior Essay Competition of the I.U. School of Dentistry.

Now the four years of dental education begin . . . Well, you have to live it to believe it, and you have to love it to live through it!

As freshman dental students, the first thing to learn is to accept your fate for a year, that of being "low man on the totem pole." Not only must you prove your proficiency just as medical students do, in biochemistry, physiology, microbiology, but you must become "new masters" of art and learn to sculpture teeth from blocks of plaster and wax. Many nights your wife wakes you from nightmares of a ten foot tall molar chasing you with a Buffalo knife in one cusp, and a gold foil mallet in the other!

Sophomore year finally comes, and you have high hopes of mastering the fine arts of crown and bridge overnight. But the phrase "do over" haunts your every attempt, and you have your biggest taste of gold veneered defeat yet.

As juniors and seniors, you have almost reached the plateau of being members of the health professions. You are working on live patients with mouths that do not open 180 degrees as did the technique dentiforms. Also, a human being is more than just teeth, and his emotions and general well-being are also your concern.

The final stumbling block for seniors is proving that your schooling has not been in vain, by getting past the National and State Dental Boards. Now you are a qualified dentist, ready to practice general dentistry and accept the responsibilities that go with the title "D.D.S."

Dentists must be able to diagnose and treat diseases of the oral cavity above and beyond problems associated with teeth—a fact that many patients are totally unaware of. In addition, a dentist has the legal right, shared only with physicians, to prescribe medications.

With such responsibilities, a dentist is ethically obligated to stay up-to-date on the latest improvements in dentistry. This

includes regular reading and continuing education courses. As members of the health professions, dentists must never stop learning.

Let us look back and see what you have invested in time and money (not counting blood, sweat, and tears).

The four-year average cost per dental student in 1971 was \$8,000.00.² In addition, the cost of three to four years of undergraduate training totals approximately \$4,000.00. These costs are minimal when considering the real investment of having spent the last seven to eight years in school, rather than as an earning member of the labor force.

The average income of a high school graduate in 1968 was \$8,148.00. The average income of a college graduate in that same year was \$12,938.00.³ These figures indicate that we are starting our dental practices nearly \$100,000.00 in the red.

Setting Up A Practice

As if the young graduate dentist has not already given up enough capital, he must now take the big step, or fall—as it may seem, and set up a practice.

The cost of setting up a practice varies widely according to the number of operatories, whether new or used equipment is purchased or rented, and so forth. Let us assume that the average young dentist sets up practice with one new and one used operatory, plus instruments, supplies, business equipment and furniture. The average cost of such a facility for Indiana University Dental School graduates in 1967 was \$12,480.00.⁴ This figure does not include the building or rental of the office space itself, nor the many types of insurance which must be purchased and the hiring of assistants and receptionists. Considering the initial cost of equipment plus these last expenditures, a young dentist will probably spend \$25,000.00 to \$30,000.00 setting up and maintaining his practice the first year.

Dental Costs—Yesterday and Today

When considering dental expense today, we must look to the past and con-

sider the rising cost of living. In the 1930's a full set of radiographs cost the patient \$15.00, and a prophylaxis \$5.00. Now, over forty years later, our cost of living has more than quadrupled. To keep pace, the radiographs could cost \$60.00, and a prophylaxis \$20.00. But A.D.A. statistics for 1971 show the average cost of a full set of radiographs in the United States to be \$18.00, and a prophylaxis \$11.00.

Here is a chart showing the percentage distribution of the health dollar spent on dentistry, private hospitals and health insurance from 1935 to 1970.

PERCENTAGE DISTRIBUTION
of the HEALTH DOLLAR
1935-1970⁵

	1936	1940	1950	1960	1970
Dentists	13.2	13.9	10.9	10.5	9.3
Privately controlled hospitals & sanitariums	17.7	17.5	22.5	26.6	36.3
Health Insurance	4.1	5.5	6.9	6.2	6.0

While other costs have increased markedly, the percentage of money actually spent on dentistry has decreased.

Now that we have looked over the financial aspects of the picture, let us consider what we are actually giving the patient for his money.

Services to the Patient

When a patient comes to us, we have two major obligations to him: (1) helping him to attain optimum dental health and (2) justifying the expense. We are faced with the task of educating the patient. The uneducated patient may believe that "optimum dental health" has been reached when the toothache that brought him to us has been relieved. This attitude does not take into consideration the prevention of further toothaches by caring for the rest of his mouth. Herein lies patient education. Every dentist owes it to himself, his patients, and his colleagues.

We cannot overemphasize the need for preventive dentistry through operative and maintenance care and, equally important, through plaque control. Patient

education and the justification of expense involves explaining (1) the condition to be treated, (2) the skills required to correct the condition, and (3) the benefits to the patient. For example, a post and core requires time, service and investment. The condition is that of a tooth badly broken down to the extent that normal restorative procedures will not provide sufficient retention. The skills involved include endodontic therapy requiring cleaning out, sterilizing, and filling the evacuated area. A post and core is cast and placed so that it extends down the root for support of the core which gives the tooth the necessary retention for a full cast crown. The benefits are that both tooth and money are saved. An extraction would have required a bridge replacement and would have been significantly more expensive, and inferior.

With sound patient education, most patients' appreciation of dentistry can be greatly upgraded. What value should they place on dentistry? Next to food, shelter, and clothing, health care, including dentistry, should be the most valuable commodity in their lives. Dentistry is not really a commodity per se. We know that people from all economic levels find a way to purchase material things that are not nearly as important, such as expensive cars, boats, color television, etc.

A survey of consumer expenditures for selected items in 1970 shows that our patients, or should-be patients, spend over twice as much on tobacco and four times as much on alcohol every year as they do on dental care.⁶

Is there any question of the need to emphasize the importance of dentistry to the public? The oral health of our nation depends on our ability to do this.

Dentists and physicians must learn to openly discuss money. The dentist should be willing to explain and justify a fee for the procedures he performs. The fee should be fair to both patient and dentist. The purpose of a fee is to cover (1) cost of practice, (2) principal invested in education, and (3) service provided. The profit over these costs provides a living for the dentist.

Few people consider the expense to a dentist who provides patients with optimum service. He must furnish his own operating room, X-ray equipment, laboratory, anesthesia, and dental assistants. A physician's fee is separated from the expense of laboratory work, X-rays, and other services provided through hospitals. Few dentists are providing an adequate explanation of the nature of dental fees.

Looking at the dentist in retrospect, we see a person who has competed hard to get where he is, and has spent a significant amount of time and money in the process. His responsibilities for patient health are second only to a physician's, and his expenses are higher.

With a sound preventive program, a dentist can help patients attain better dental health and save them money and discomfort in the process. When a dentist gives such service and accepts the responsibilities as a health professional, he certainly deserves a fair fee. In light of these facts, people should see that dentistry is one of the best buys in America.

REFERENCES

1. American Dental Association, *Dental Education: Annual Report 1971/72* (Chicago, Ill., 1972), p. 16.
2. *Ibid.*, p. 10
3. U.S. Bureau of the Census, *Statistical Abstract of the United States: 1972* (Washington, D.C., 1972), p. 114.
4. James L. Mullis, *Initial Cost of Equipping a Dental Office, Based on a Survey of the 1967 Graduates of Indiana University School of Dentistry* (unpublished paper), p. 3.
5. "Expenditures and Prices for Dental and Other Health Care", *Journal of the American Dental Association*, 83 (Dec., 1971), p. 1334
6. *Ibid.*, p. 1336



Dr. Lindborg and three of the new officers of the Alumni Association.

Notes from the Dean's Desk...

Ralph E. McDonald

The 1973-74 school year began in Indianapolis August 22 with a record number of students enrolled in dental programs. The first year dental class again numbered 129 students. The dental assisting class was increased to 26 students, and the dental hygiene program accepted 40 first year students. The total enrollment of 314 at regional campus programs included 30 dental assisting, 44 dental hygiene at South Bend; 30 dental assisting, 43 dental hygiene, and 25 dental laboratory technology students in the two classes at Fort Wayne; and 18 dental assisting, and 27 dental hygiene at Indiana State University at Evansville. The enrollment of 134 graduate students on a full-time and part-time basis brought the total number of enrolled in dental programs in Indiana to 922.

Rooms Identified to Recognize Achievement of Alumni and Former Faculty Members

Four seminar rooms in the new addition to the Dental School have been selected to honor alumni and faculty of Indiana University School of Dentistry who have made outstanding contributions to dental education, research, administration and public service.

Soon after the dedication of the new building in May of 1972, it was decided to invite Dr. Maynard K. Hine, Dr. Gerald B. Timmons, Dr. John E. Buhler, and Dr. Joseph L. Volker to send their certificates and plaques to the School to be permanently displayed in rooms that are used daily for seminars and conferences. All four of these distinguished scientists responded enthusiastically to the invitation.

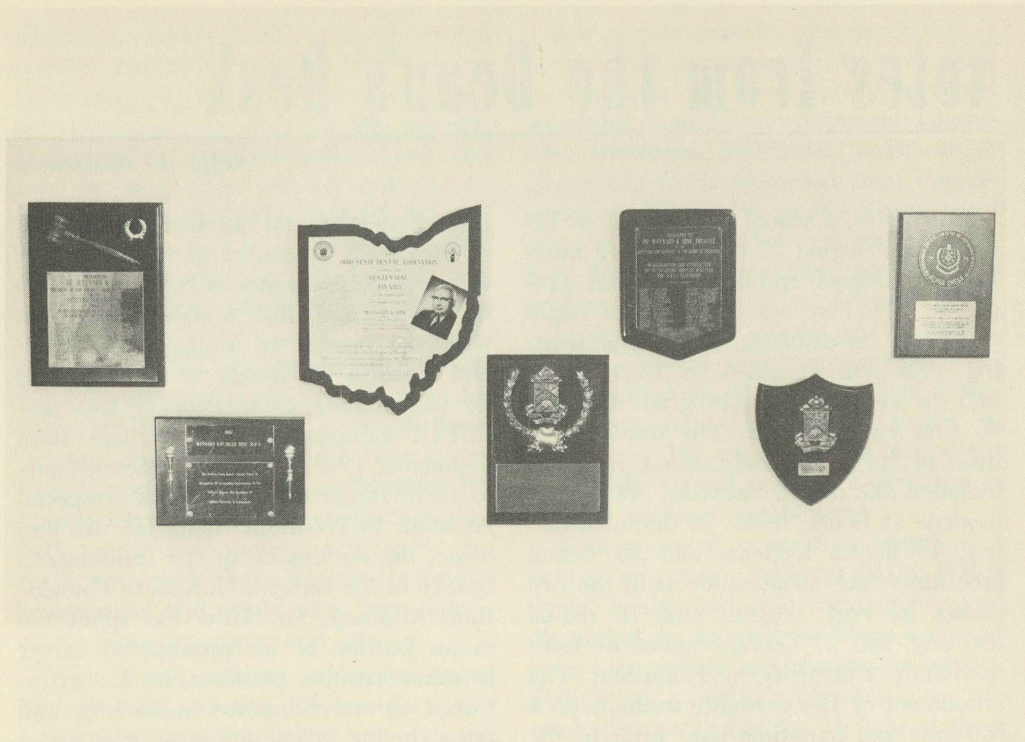
The executive conference room on the first floor was selected for housing many of the treasured professional possessions of Dr. Maynard K. Hine, who served the School for a short time as Professor of

Periodontology and as Dean from July of 1945 until November of 1968, when he was named Chancellor of Indiana University at Indianapolis. A short time later, with the merger of Indiana University and Purdue University at Indianapolis, he was named Chancellor of the new IUPUI campus, a post he held until September 1, 1973. Dr. Hine is continuing to serve Indiana University as a Special Assistant to President Ryan. He will also direct the developing of the Indianapolis branch of the Indiana University Foundation. Although Dr. Hine has spent the major portion of his professional career in administrative positions, he has maintained an active interest in teaching and research and is co-author of five books.

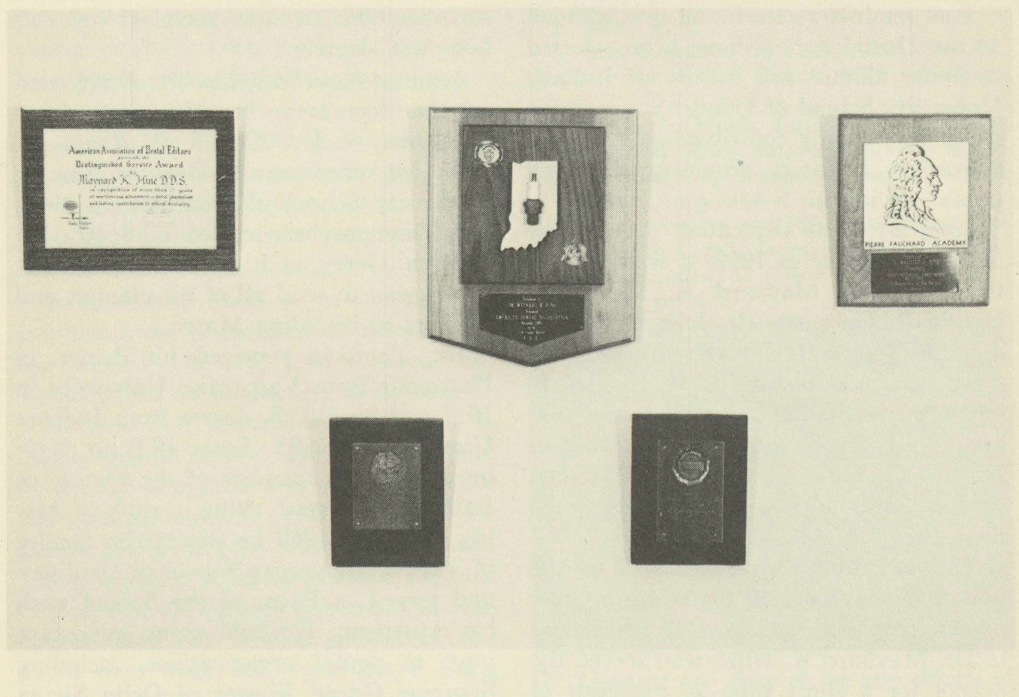
During Dr. Hine's distinguished career, he has served as President of the American Association of Dental Schools, the International Association for Dental Research, the American Academy of Periodontology, and the American Dental Association. He is the recipient of five honorary degrees.

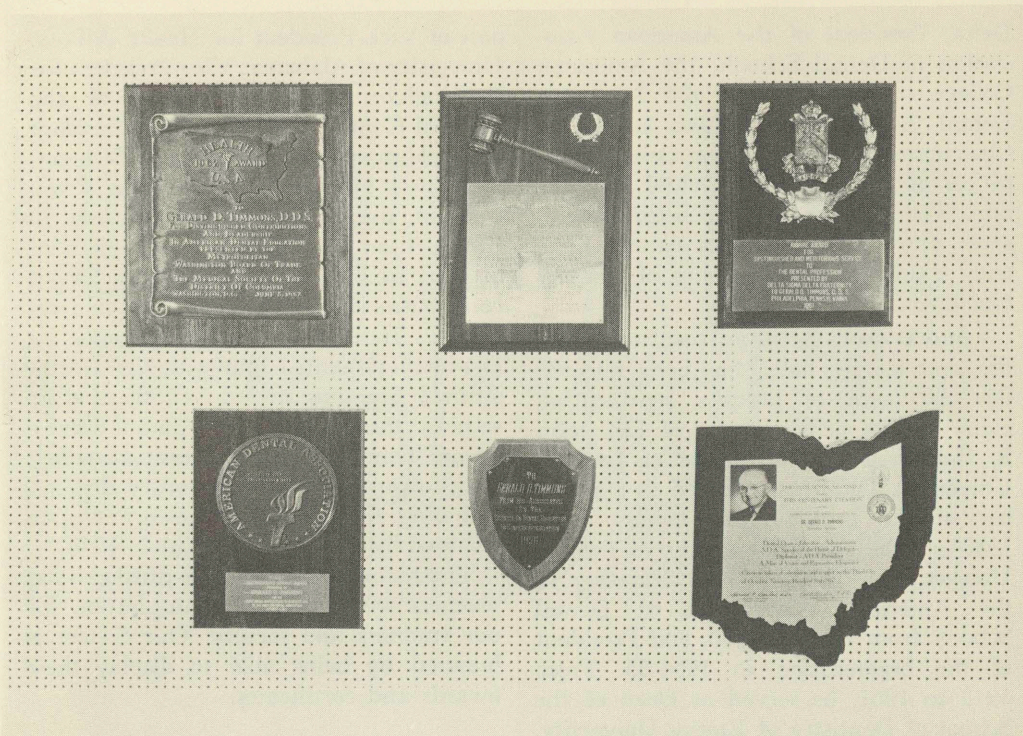
Seminar room S426 has been designated as the repository for the professional mementos of Dr. Gerald D. Timmons. Since his retirement as Dean of Temple University School of Dentistry in 1964, Dr. Timmons has resided in Scottsdale, Arizona. Gerry, as his friends know him, has chosen to send all of his plaques and trophies to his Alma Mater.

Dr. Timmons received his degree in Pharmacy from Valparaiso University in 1917 and his D.D.S. degree from Indiana University in 1925. From 1925 to 1940, he served as a member of the faculty of Indiana University, rising in rank to Acting Dean. In 1940 he joined the faculty of Temple University School of Dentistry and served as Dean of the School until his retirement. He held many important posts in dental organizations, including Supreme Grand Master of Delta Sigma

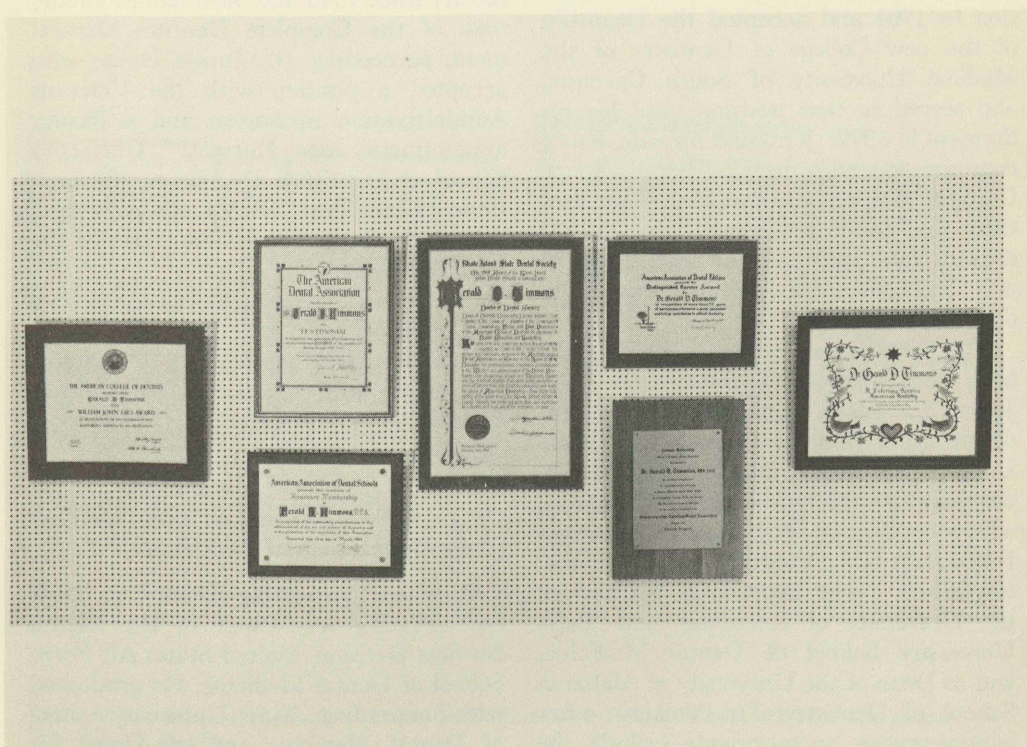


A conference room in the Dental School has been designated for display of the awards of Dr. Maynard K. Hine.





Several of the plaques included in the collection of the mementos of Dr. Gerald D. Timmons.



Delta, President of the American Association of Dental Schools, the American College of Dentists, and the American Dental Association. He also served as Chairman of the Council on Dental Education of the American Dental Association. The recipient of five honorary degrees, and many prestigious awards, he is truly a distinguished alumnus of Indiana University.

Seminar room S119, adjacent to one of the new lecture halls, has been selected for placement of plaques representing many of the achievements of Dr. John E. Buhler, a 1935 graduate of Indiana University. Dr. Buhler served as a member of the oral surgery faculty from 1936 until he joined the faculty of Temple University in 1940. He was Secretary of the American Association of Dental Schools from 1946 to 1950, and President of the organization in 1954-55. From 1948 to 1961, he served as Dean of the School of Dentistry of Emory University. Dr. Buhler left Emory to become Executive Vice-President of the Hanau Engineering Company of Buffalo.

Dr. Buhler returned to dental education in 1964 and accepted the Deanship of the new College of Dentistry of the Medical University of South Carolina, and served in that position until his retirement in 1972. John and his wife, Ruth, continue to reside in Charleston, South Carolina. They are proud of the fact that their son, John, Jr., received his D.D.S. degree from Indiana University in 1970 and has chosen a military career in dentistry.

The fourth seminar room, S118, has been designated as a room to honor Dr. Joseph L. Volker, who received his dental degree from Indiana University in 1936. Dr. Volker later earned M.S. and Ph.D. degrees from the University of Rochester, where he was the recipient of a Carnegie Fellowship. Dr. Volker has had a distinguished career as dental teacher at the University of Rochester and Tufts University School of Dental Medicine, and as Dean of the University of Alabama School of Dentistry. Dr. Volker's other administrative appointments include the

post of Vice-President for Health Affairs, University of Alabama; Vice-President for Birmingham Affairs; Director of the Medical Center; Executive Vice-President of the University of Alabama in Birmingham; and his current position as President of the University of Alabama in Birmingham. Dr. Volker has been honored by nine foreign governments for his contributions to dental education and research. Indiana University School of Dentistry presented him with the Distinguished Alumnus Award in 1966, and he received the Distinguished Alumni Service Award from Indiana University in 1967. Dr. Volker holds four honorary degrees, including the Doctor of Science Degree awarded by Indiana University in 1970.

The records of these four distinguished teachers will serve as an inspiration for our students and faculty. Our School is honored by being able to display their awards and certificates.

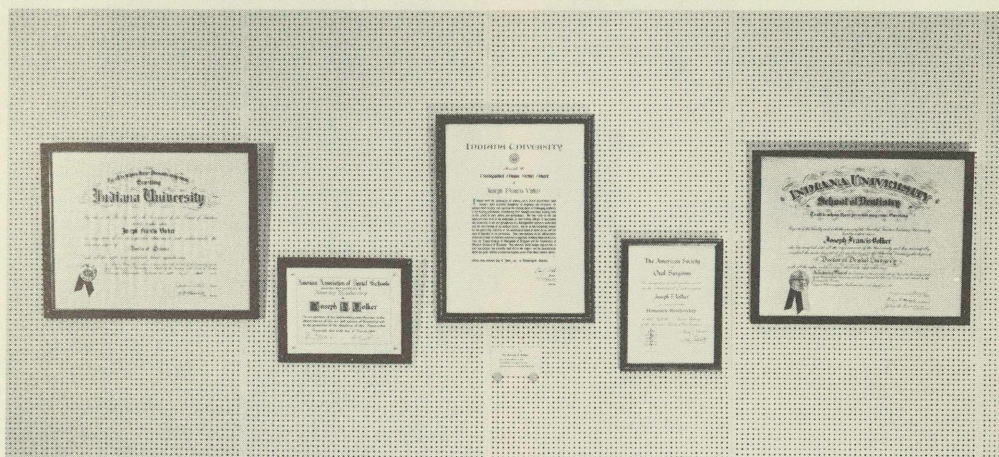
Dr. Robert H. Derry Heads the Complete Denture Department

Dr. Robert H. Derry, a member of the faculty since 1943, has been named Chairman of the Complete Denture Department, succeeding Dr. James House who accepted a position with the Veterans Administration in Boston and a faculty appointment at Harvard University School of Dentistry. Dr. Derry will continue to serve as Director of Continuing Education, a position he has held for the past five years.

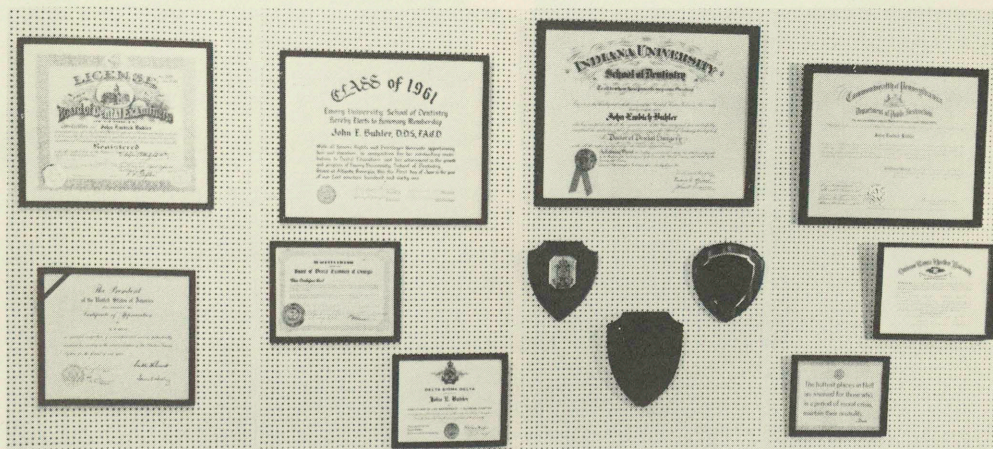
During his long tenure with the School of Dentistry, Dr. Derry has been a very popular and effective teacher. In his new position he will continue to build on an effective program developed by his predecessors.

Dr. Timothy J. O'Leary Named Chairman of the Department of Periodontics

Prior to joining the faculty in 1968, Dr. O'Leary was Chief of the Dental Services Division, United States Air Force School of Dental Medicine. He graduated with honors from Tufts University School of Dental Medicine and completed his



Dr. Joseph F. Volker sent a representation of his plaques and diplomas to be displayed in a seminar room.



One of the seminar rooms in the new addition to the Dental School displays the plaques of Dr. John E. Buhler

advanced education in periodontics at New York University. Dr. O'Leary is a member of the American Board of Periodontology and the author of many scientific articles. He currently serves as editor of the Journal of Periodontology.

Dr. Robert L. Bogan Is Named Associate Dean for Student Affairs

Dr. Robert L. Bogan has been appointed to the position of Associate Dean for Student Affairs. During the past six years, he has served as Assistant Dean and has played an important role in the administration of the program of the undergraduate students. He has also served as Chairman of Admissions and directed the activities of the office of Recorder. Dr. Bogan will continue to serve as coordinator of the graduate prosthodontics program and will participate in the teaching of prosthodontics on a part-time basis. Dr. Bogan's experience in private practice, teaching, and administration provides an excellent background for his responsibilities as Associate Dean.

Two New Assistant Deans Appointed

Dr. Ralph G. Schimmele, who previously held the appointment of Director of Dental Auxiliary Education with a joint appointment in the School of Dentistry and in the Office of Regional Campus Administration, has been named Assistant Dean by the Indiana University Board of Trustees. In his new administrative role, Dr. Schimmele will be responsible for program development at regional centers, including the planning for new dental auxiliary programs at centers where none now exist. He will also be responsible for extramural programs for undergraduate students.

The new Dental School curriculum with elective time for fourth year students will allow students to gain experience in private dental offices and in educational and clinical facilities away from the Indiana University at Indianapolis campus. Dr. Schimmele, in his new administrative role, will direct the new extramural programs developed by the

curriculum committee and approved by the faculty council. Dr. Schimmele is a 1952 graduate of Indiana University School of Dentistry.

Dr. James E. Vaught has been appointed Assistant Dean for Dental Auxiliary Education at Indiana University. Dr. Vaught is a 1961 graduate of Indiana University. He served eight years as a dental officer in the United States Navy. Prior to joining the faculty of Indiana University in 1972, he served as Director of Dental Auxiliary Education at East Tennessee State University. An executive committee, including directors and supervisors of dental auxiliary programs on regional campuses, will work with Dr. Vaught in the continued development of curriculum for dental auxiliary programs and will establish policy for this important phase in dental education in Indiana.

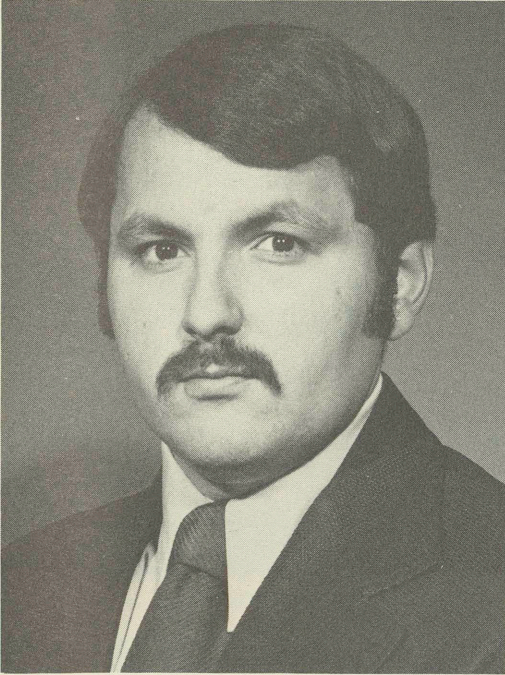
New Full-Time Dental Faculty Appointed

Dr. Ronald L. Armstrong, a 1970 graduate of the School of Dentistry has completed two years of active duty in the U. S. Army Dental Corps and has joined the faculty to assist in the teaching of oral anatomy and occlusion. A native of Fort Wayne, he attended Purdue University and Indiana University prior to entering dental school.

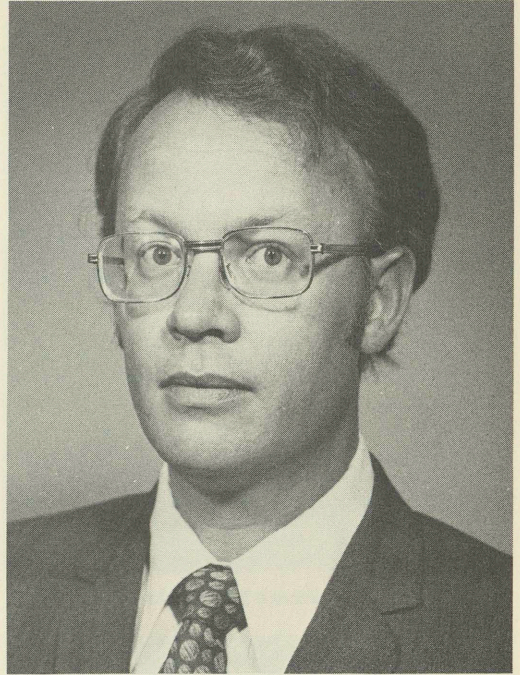
Dr. Ronald J. Billings, a native of Vincennes, Indiana and a 1969 graduate of Indiana University School of Dentistry, M.S.D. in 1973, has been appointed Assistant Professor of Preventive Dentistry. In addition to teaching preventive dentistry, Dr. Billings will participate in the research program of the Oral Health Research Institute.

Mrs. Juanita H. Chisler has served as a dental assistant in the graduate pedodontic program since 1965. Prior to her July 1 appointment as an instructor in dental auxiliary education, she served as dental assistant supervisor in graduate pedodontics. Mrs. Chisler will work with Mrs. Marjory Carr in the teaching of students in the new dental assisting program in Indianapolis. Mrs. Chisler was certified by the American Dental Assisting Association in 1969.

New Dental Faculty



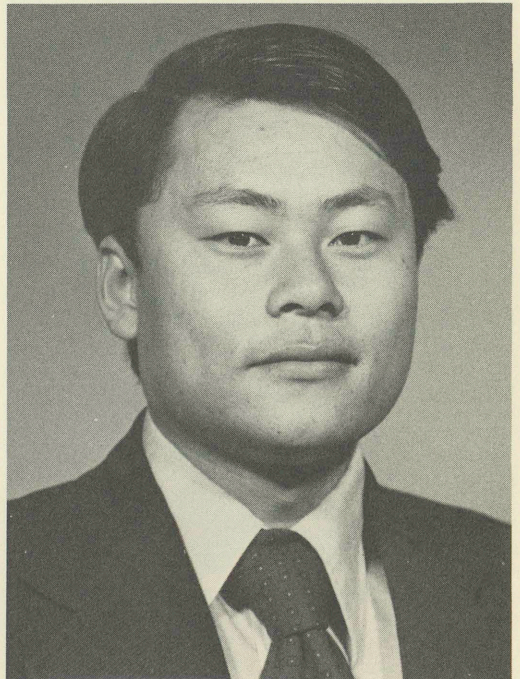
Dr. Ronald L. Armstrong



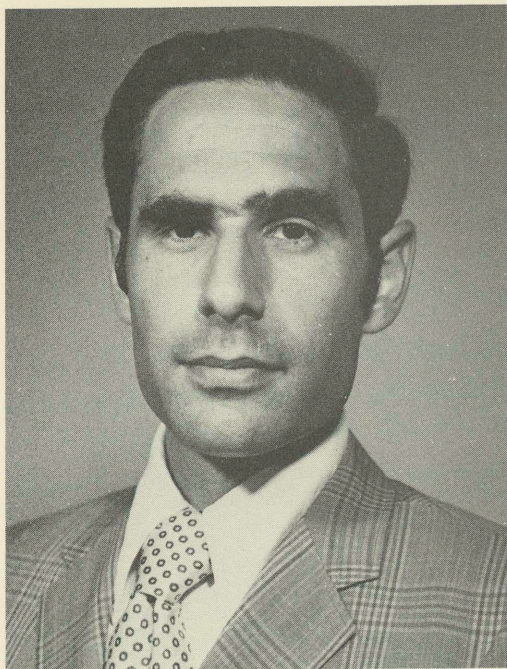
Dr. Ronald J. Billings



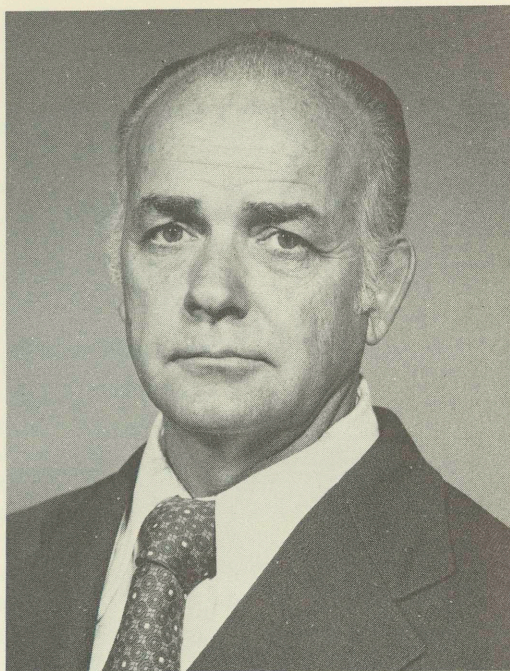
Mrs. Juanita H. Chisler



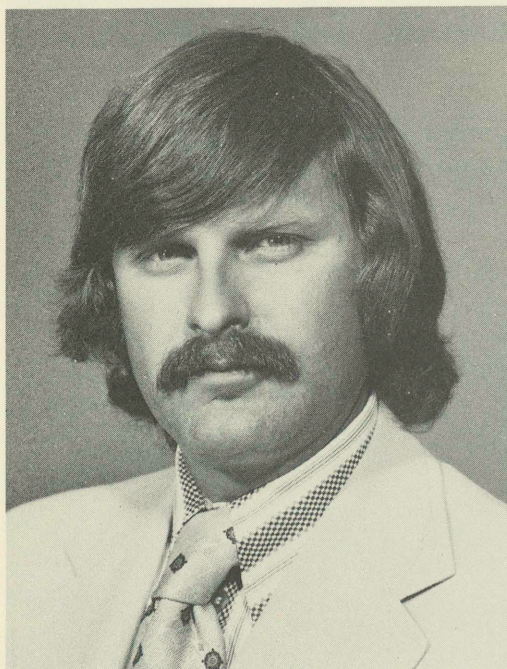
Dr. Eiji Funakoshi



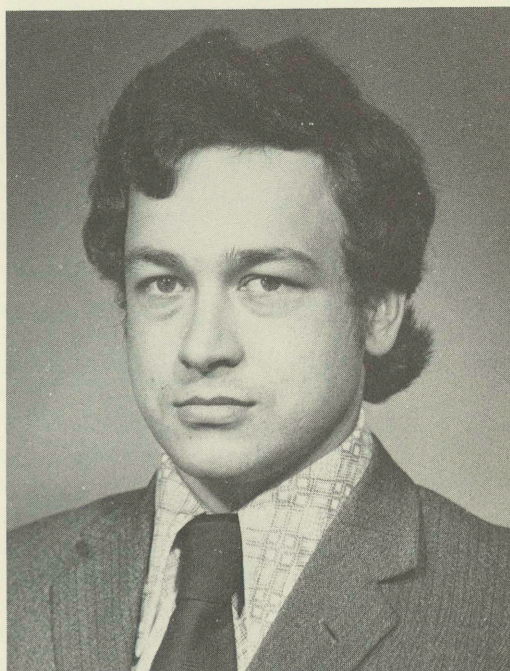
Dr. Lawrence I. Goldblatt



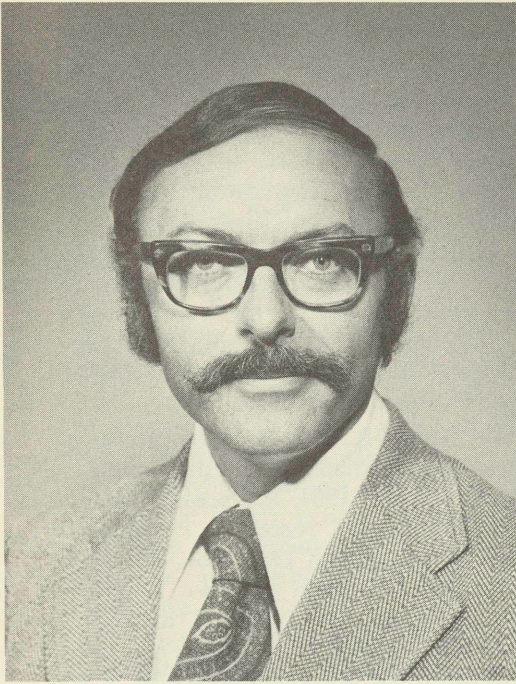
Dr. Merle G. Harris



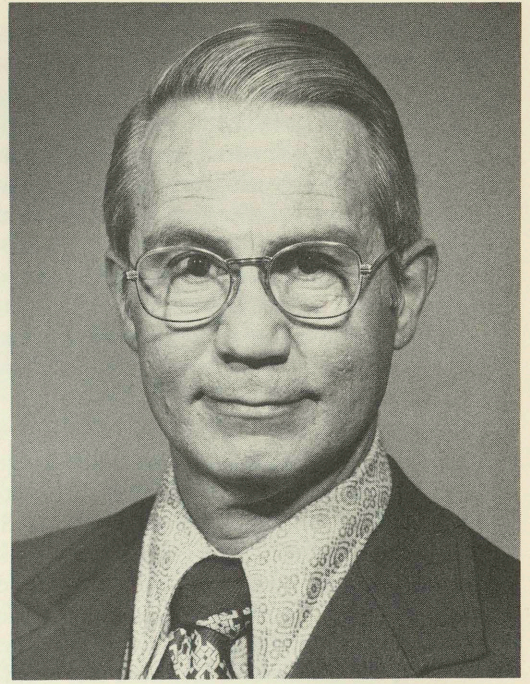
Dr. John W. Osborne



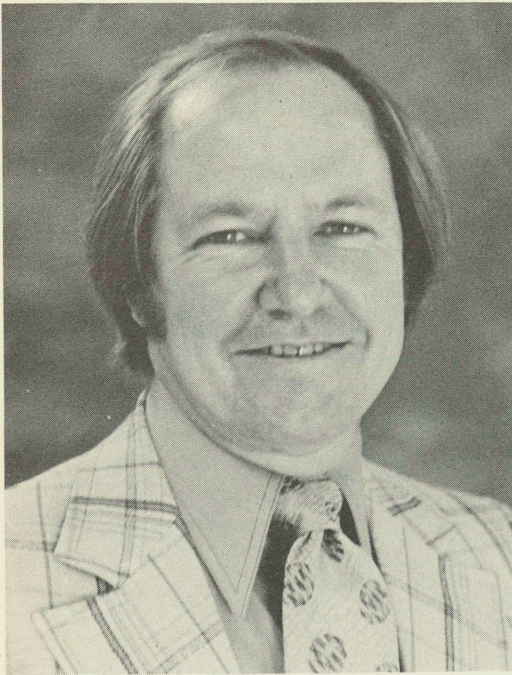
Mr. David F. Pascoe



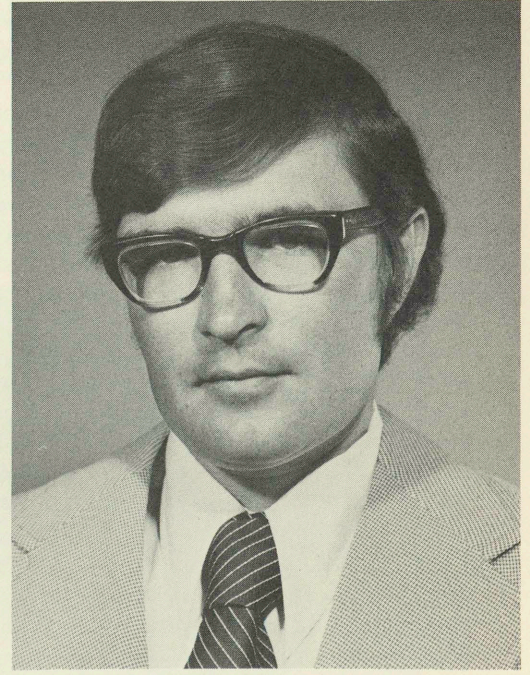
Dr. Peter R. Reibel



Dr. Robert J. Risch



Dr. George C. Smith



Dr. Kenton A. Susott

Dr. Eiji Funakoshi, a native of Fukuoka, Japan, has been appointed Assistant Professor of Periodontics. After receiving his D.D.S. degree from Kyushu Dental College, he spent two years in the graduate periodontics program at Tufts University School of Dental Medicine and later served as an instructor in the program. Dr. Funakoshi will devote full-time to teaching periodontics to dental students and will also participate in the graduate program and assist Dr. O'Leary in the department's research program.

Dr. Lawrence I. Goldblatt, a native of the District of Columbia, has joined the faculty of the Oral Pathology Department. Dr. Goldblatt received his D.D.S. degree cum laude from Georgetown University Dental School and has completed requirements for his M.S.D. degree in Oral Pathology from Indiana University. During his graduate education, Dr. Goldblatt was awarded an American Fund for Dental Education Teaching Fellowship. Dr. Goldblatt was named to Omicron Kappa Upsilon at the time he graduated from Georgetown University.

Dr. Merle G. Harris, a graduate of Emory University School of Dentistry and Loma Linda University, where he received an M.P.H. degree, has joined the faculty of the Fixed and Removable Partial Prosthodontics Department. Dr. Harris was in the general practice of dentistry in Grande Prairie, Texas and Salem, Indiana prior to entering the advanced dental education program at Loma Linda University. Dr. Harris has been given the rank of Associate Professor and will devote full time to the undergraduate clinical and laboratory program in the Crown and Bridge Department.

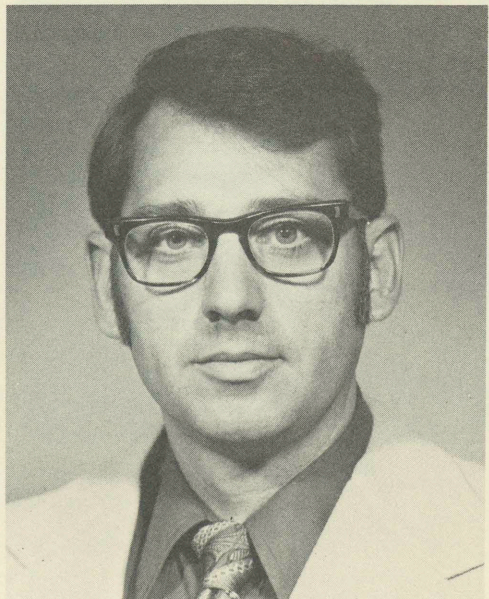
Dr. John Osborne received his D.D.S. degree from Indiana University in 1963 and the M.S.D. degree in 1968. Soon after he completed his advanced education program, he joined the Operative Dentistry Department of the State University of New York at Buffalo and played an active role in the education and research programs. Dr. Osborne returned to Indiana in April of 1973 to join the Dental Materials Department

where he will devote his major effort to clinical research.

Mr. David F. Pascoe, a native of Portsmouth, England, and a graduate of Guy's Hospital Dental School, has accepted a teaching position in the Department of Fixed and Removable Partial Prosthodontics. Mr. Pascoe, the recipient of the American Dental Society of Europe Scholarship, completed a two-year graduate education program in Crown and Bridge and also served as Graduate Assistant in the department.

Dr. Peter R. Reibel, a part-time instructor at Indiana University School of Dentistry since 1964, has accepted a full-time position as Associate Professor of Oral Anatomy and Occlusion. Following his graduation from Indiana University in 1960, Dr. Reibel served a rotating internship at Lackland Air Force Base and for three years was stationed in the United States Air Force at Ramstein, Germany. Dr. Reibel will offer the Dental Anatomy course to first year students and will coordinate the teaching of occlusion during the undergraduate program.

Dr. Robert J. Risch, a part-time instructor in Complete Denture since 1960,



Dr. Donald R. Tharp

has joined the department on a full-time basis. Dr. Risch, a 1951 graduate of the School of Dentistry, has devoted essentially full time to private practice since graduation, but in addition has served as Staff Dentist for Sunnyside Sanitarium in Indianapolis and as Staff Dentist for the Health and Hospital Corporation of Marion County. Dr. Risch is a member of Omicron Kappa Upsilon.

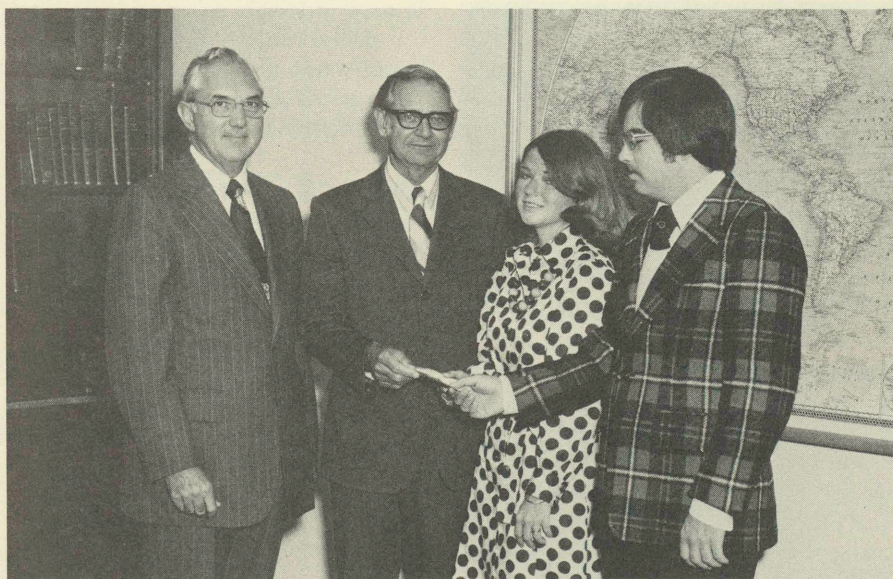
Dr. Kenton A. Susott graduated with honors from Indiana University School of Dentistry in 1971 and then entered the graduate orthodontic program. He completed his advanced education in July and accepted a full-time position in the Orthodontic Department. Dr. Susott has been given the responsibility of coordinating the undergraduate teaching of orthodontics.

Dr. Donald R. Tharp, a 1964 graduate of Indiana University School of Dentistry, practiced dentistry in Greencastle, Indiana for six years prior to joining the faculty. Earlier, Dr. Tharp served two years in the Navy Dental Corps. Dr. Tharp joined the dental auxiliary educa-

tion program as an Assistant Professor and will play a major role in the new program designed to teach expanded-duty functions to the dental auxiliary students.

Dr. G. Creston Smith has been appointed Director of Dental Auxiliary Education at Fort Wayne Campus of Indiana University.

A 1961 graduate of Indiana University School of Dentistry,, Dr. Smith practiced general dentistry in Anderson, Indiana for 12 years. He has been active in organized dentistry at the county, district and state levels and is a past-president of the East Central and Madison County Dental Societies. Community activities have also been an important part of Dr. Smith's life: he has served on the Executive Council of the Boy Scouts of America and the education committee of the Anderson Chamber of Commerce, and he is Deacon and Trustee of Chesterfield Christian Church. His participation in continuing education programs and his interest in working with young people will be of considerable value in Dr. Smith's challenging new career.



Dean Ralph E. McDonald and Dr. Ralph W. Phillips, Assistant Dean for Research and Chairman of the Scholarship Committee of the Indiana University School of Dentistry, accept a check from Mrs. Thomas M. Hazlett and James S. Maus to establish the \$500 James L. Maus Memorial Scholarship Award in honor of their late father. Mr. Maus was the founder and president of Maus Dental Laboratories, now the Maus-Elam Dental Laboratories. The annual scholarship will be presented to the senior dental student who has demonstrated the greatest improvement during the first three years of school.

The Oral Health Research Institute

*George K. Stookey,
Executive Secretary, Oral Health Research Institute
and Associate Professor of Preventive Dentistry*

In June, 1972, the Board of Trustees of Indiana University approved the recommendation of Chancellor Maynard K. Hine resulting in the official establishment of the Oral Health Research Institute on the IUPUI campus. With this act a reorganization which began early in 1971 was officially concluded. It resulted in the relocation of the Preventive Dentistry Research Institute under the direction of Dr. Joseph C. Muhler to the Fort Wayne Campus of Indiana University with the newly-created Oral Health Research Institute occupying the research facility formerly housing the Preventive Dentistry Research Institute and located adjacent to the School of Dentistry.

Among the several unique features of the Oral Health Research Institute is its manner of organization which is illustrated in the accompanying chart. From the diagram it may be noted that externally the Institute reports to Dr. Maynard K. Hine with regard to the various research programs and to Dean Ralph E. McDonald relative to various academic affairs. Internally, the affairs of the Institute are governed by an Executive Committee which is comprised of all full-time faculty members of the Department of Preventive Dentistry. Dr. G. K. Stookey serves as Executive Secretary of the Committee.

The various internal activities of the Institute are stratified into three major divisions, each of which has a director and a consulting committee. These three divisions are (1) Laboratory Research, with Dr. James L. McDonald as director; (2) Clinical Research, with Dr. Bradley B. Beiswanger as director; and (3) Educational Programs, with Dr. Simon Katz director. Within each of the research divisions there is a separate staff comprised of a number of both full-time and part-time technicians and assistants. Thus the current staff of the Institute consists of a total of 35 persons.

Within the academic framework of the University, the Oral Health Research Institute fulfills many roles. Building upon its strong tradition in research, the Institute maintains an active pursuit of new information in the biological sciences. In many instances, such information may then be applied toward the prevention or alleviation of specific oral health problems. With this research program, the Institute faculty are exposed to many of the latest approaches toward the prevention of oral diseases. Accordingly, they are in a unique teaching position to share their knowledge with students, both at the undergraduate and graduate level.

ORGANIZATIONAL CHART

Research Programs Academic Affairs

Dr. M. K. Hine
Executive Associate
I.U. Foundation

Mr. W. S. Armstrong
President
I.U. Foundation

Dr. R. E. McDonald
Dean
I.U. School of Dentistry

OHRI Executive Committee

Dr. G. K. Stookey, Executive Secretary
Dr. B. B. Beiswanger Dr. S. Katz
Dr. R. J. Billings Dr. J. L. McDonald
Dr. D. K. Hennon Dr. B. L. Olson

Business Manager
J. Richmond

Secretary
W. Hoffman

Director of
Laboratory Research
Dr. J. L. McDonald

Director of
Clinical Research
Dr. B. B. Beiswanger

Director of
Educational Programs
Dr. S. Katz

Clinical Research
Committee

Educational Program
Committee

Laboratory Research
Committee

Research Staff
10 full-time and
6 part-time

Clinical Staff
8 full-time and
2 part-time

7 Graduate
students

Four Are Honored At Fall Conference

The Indiana University School of Dentistry Alumni Association presented Dr. David B. McClure with its 1973 Distinguished Alumnus Award during the organization's annual banquet in Bloomington on September 14.

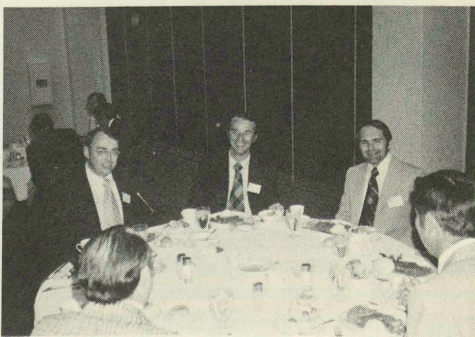
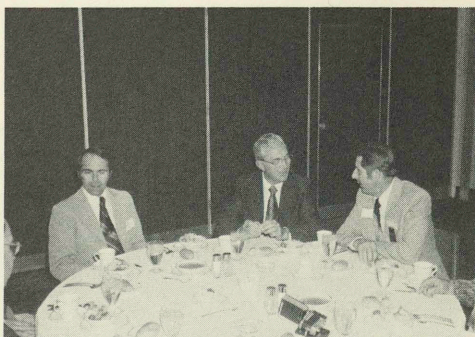
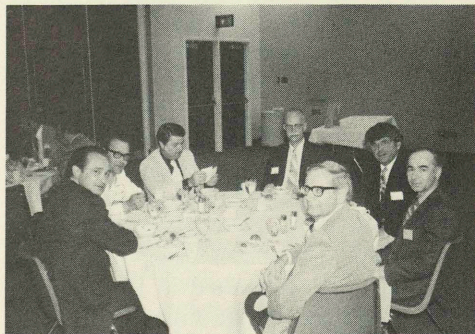
Dr. McClure, an associate professor of pedodontics, is a 1953 graduate of the dental school. He is also vice-chairman of the Madison County Board of Health.

Honorary memberships in the Alumni Association were awarded to three other members of the School of Dentistry faculty.

Mrs. Helen W. Campbell came to the dental school as a librarian in 1942. She left in 1946, but returned in 1960. Last year she was given the rank of assistant professor of dental literature and librarian.

Dr. David F. Mitchell joined the faculty 18 years ago as professor and chairman of the Department of Oral Diagnosis and Oral Medicine. He was the recipient of the annual I.U. School of Dentistry Award for Meritorious Teaching in 1959. He is editor of the Journal of Dental Research.

Dr. Henry M. Swenson was also named an honorary alumnus. A faculty member for 28 years, he is a professor of periodontics and is a national leader in his field. He is president of the American Academy of Periodontology.



Pictures taken at Board of Directors meeting in May. (Thanks to Jack Carr)

Traditional Honors Program Held

The Indiana University School of Dentistry Honors Program was conducted on May 20, 1973, with Dean Ralph E. McDonald presiding. The following awards, certificates and honors were given.

The Anatomy Award to the freshman who made an outstanding record in anatomy (\$50 and a certificate, check by OKU) was presented to Mr. David M. Miller; the Dr. Ert J. Rogers Memorial Award in Crown and Bridge was presented to Dr. Robert J. Achterberg; the John W. Geller Award in Research was presented to Dr. Wayne E. Hott; the American Association of Endodontists Award of a certificate to the senior showing interest and proficiency in the field of endodontics went to Dr. Ronald R. Fulkerson; the Indiana Society of Oral Surgeons—Glenn J. Pell Memorial Award (top 10% in oral surgery and upper 1/3 class, must have internship) was presented to Dr. Howard H. Mohler; the Great Lakes Society of Oral Surgery—award to outstanding seniors went to Dr. J. Harold Smith, II.

The American Academy of Oral Pathology Award, presented to the dental student who has shown the most interest, accomplishment, and promise in the field of oral pathology, plus a subscription to the Journal of Oral Surgery, Oral Medicine and Oral Pathology was given to Dr. Robert J. Achterberg. The C. V. Mosby Awards for scholastic excellence in: Oral Facial Genetics to Dr. Thomas J. Kiebach; Oral Health Research to Dr. Thomas J. Wickliffe; Operative Dentistry to Dr. Robert J. Achterberg; Maxillofacial Prosthetics to Dr. John S. McDonald; and Dental Hygiene to Mrs. Jacqueline R. Scofield. The Rossya Kauffman Memorial Award in Dental Hygiene for proficiency in patient education was presented to Miss Stephanie Erlichman; the A. Rebekah Fisk Award (one year membership in state and national organization) by Indiana State Dental Hygienists Association to the dental hygienist showing the greatest proficiency in clinical practice during her

senior year went to Miss Beth Ann Letterman; and an Award for proficiency in radiology from the American Academy of Dental Radiology was presented to Dr. Walter C. Brown, II. A certificate from the American Academy of Oral Medicine for Achievement, Proficiency, and Promise in the field of Oral Medicine was won by Dr. Malcolm E. Boone, II.

The "What's Your Interpretation" Contest in Radiology, sponsored by OKU was presented to (1st) Dr. Ronald R. Fulkerson, (2nd) Dr. Robert J. Achterberg and (3rd) Dr. Nolan W. Allen. The American Academy of Periodontology Award of one year's subscription to the Journal of Periodontology for proficiency in periodontology went to Dr. Paul W. Bivens; an Award for achievement in periodontics, a plaque from the Lactona Corporation plus a check for \$100, to Dr. David L. Alexander; an Award and plaque of the Indiana State Society of Pedodontics (\$50) for the senior who plans to continue in a graduate pedodontic program to Dr. Robert S. Austgen. A Certificate of Merit from the American Society of Dentistry for Children and membership in the Society for one year plus a one year subscription to the Journal of Dentistry for Children, and a cash award of \$25 from the Indiana Unit were awarded to Dr. Timothy B. Phillips.

An award of a certificate to the senior showing interest in development of the oro-facial complex was presented from the American Association of Orthodontists to Dr. Michael C. Badell.

Senior Essay Awards were as follows: First, The Block Award (\$100) to Dr. Anthony P. Urbanek, "The Elucidation and Study of Marrow Spaces Within the Human Mandible"; Second (\$50) to Dr. Thomas J. Wickliffe, "Enamel Polish and Its Effects on Bacterial Adhesion"; Third (\$25) to Dr. Steven E. Dixon, "Mechanisms of Root End Closure"; and Fourth (\$25) to Dr. Eric D. Bothwell, "Dentistry: Rip-Off or Bargain?"

Table Clinic Awards were as follows: First Place (\$50) to Dr. Robert W. Antos, "Overlay Denture-Anterior Ridge Loss"; Second Place to Dr. Bruce D. Raibley, "Incision and Drainage." The Best Dental Hygiene Table Clinic (\$50 divided equally) to: Miss Stephanie Erlichman, Miss Marsha E. Smith, Miss Nancy Ann Stutsman, and Miss Shirley J. Young, for clinic entitled: "Are Your Teeth Wear-Dated?" The Best Dental Assistant Clinic (\$50 divided equally) to Miss Debbie Tinnon, Miss Carla Smith, Miss Lana Anderson, and Miss Ruth Freije for clinic entitled, "Whose Teeth Are These?"

The School of Dentistry Alumni Association plaque (the Maynard K. Hine Award) plus membership in the Alumni Association was presented to Dr. Robert J. Achterberg; the Harriett F. Hine Award presented to a dental hygienist went to Miss Nancy Ann Stutsman; the International College of Dentists Award for outstanding achievement during his years of dental study to Dr. Larry D. Roberts; the American College of Dentists (FACD) plaque, plus \$50 cash award to the student showing the most improvement since his freshman year to Dr. Robert S. Austgen; an Award of plaque and \$40 bond by the Indiana Dental Association in recognition of services to organized dentistry through student A.D.A. to Dr. Dennis R. Bailey; a plaque from the National Chapter of Alpha Omega to the student who earned an outstanding record for four years of dental study at Indiana University School of Dentistry to Dr. Robert J. Achterberg.

Sigma Phi Alpha, Dental Hygiene Honorary Society, certificates and pins to Mrs. Marcia Louise Cady, Mrs. Jacqueline Scofield, Miss Nancy Ann Stutsman and Miss Shirley Janene Young; the Omicron Kappa Upsilon certificate to the sophomore student who made an outstanding record in the freshman year, plus a \$50 award to Mr. Stephen C. Koehler. The Omicron Kappa Upsilon certificates were presented to Dr. Robert J. Achterberg, Dr. Michael C. Badell, Dr. Richard W. Blake, Dr. Eric B. Broderick, Dr. James

Malooley, Dr. Jeanne L. McDonald, Dr. Howard H. Mohler, Dr. Jerry G. Nieten, Dr. Robert M. Page, Dr. Stephen M. Schlimmer, Dr. Patrick J. Stetzel, and Dr. Anthony P. Urbanek.

The Interfraternity Council plaque for scholarship to (1st Place), Xi Psi Phi and (2nd Place) Alpha Omega. The American Academy of Gold Foil Operators Award for Achievement to Dr. James S. Prawat.

X-L Program Certificates were presented to: Dr. Robert J. Achterberg, Dr. David L. Alexander, Dr. Nolan W. Allen, Dr. Michael C. Badell, Dr. Dennis R. Bailey, Dr. Paul W. Bivens, Dr. Richard W. Blake, Dr. Terence D. Bloss, Dr. Malcolm E. Boone, II, Dr. Eric B. Broderick, Dr. Craig D. Cooper, Dr. Michael L. Flannagan, Dr. Thomas J. Kiebach, Dr. Dale R. Krumreich, Dr. R. Stephen Lehman, Dr. Robert D. Lindsey, Dr. Jeanne L. McDonald, Dr. Howard H. Mohler, Dr. Richard D. Nickels, Dr. Timothy B. Phillips, Dr. Dale D. Pleak, Dr. Larry D. Roberts, Dr. J. Harold Smith, II, Dr. L. Stephen Ward, and Dr. Warren H. Westbrook.



Navy Lieutenant M. Thomas Barco (left), a 1969 graduate of IUSD, recently received a plaque from Capt. Victor Fairies, Commanding Officer of a Marine Corps Company at Kaneohe Bay, Hawaii, for designing and building two mobile dental units out of marine vans which had been in "mothballs" for years. The vans have wall-to-wall carpeting, acoustical tiling, air conditioning, and panelling.

Dental Auxiliary Education

James E. Vaught, Assistant Dean for Dental Auxiliary Education

Live color television instruction provides dental auxiliary education programs in Indiana with a degree of symmetry in basic dental sciences. The programs originate from the School of Dentistry at Indianapolis and are attended by dental assisting students, first year hygienists, and first year laboratory technology students throughout the state. Students at Indianapolis also receive the instruction by television.

The following basic science courses are being televised this year:

Introduction to Dentistry—

Dr. Paul Starkey

Dental Radiology—Dr. Myron Kasle

Dental Materials—Dr. R. W. Phillips

Oral Anatomy—Dr. James Vaught

This year an attempt has been made to integrate the subject matter of each of these courses into one format. Hopefully, this is a beginning in removing unnecessary overlap in material as well as assuring the inclusion of essential material. In addition to the four basic science courses, Dr. Henry Swenson is providing a television course in Periodontics for second year hygiene students at Indianapolis and throughout the state. Dr. Leonard Koerber, Director of the School of Dentistry Audiovisual Facility, and a dedicated technical staff continue to strive for the highest quality television production. This medium of instruction has done much to provide consistency in statewide dental auxiliary education.

DENTAL AUXILIARY EDUCATION INDIANA STATE UNIVERSITY- EVANSVILLE

Gordon E. Kelley, Director

The dental programs are looking forward to the beginning of classes for another year. We have two new faculty members to help us this year. We are pleased to welcome Kathy Ziegler, R.D.H., and

Nancy Heavrin, C.D.A. Kathy has been a student at I.S.U. at Terre Haute and is a graduate of the Indianapolis Dental Hygiene program. She also received her B.S. degree in Public Health Dental Hygiene in 1971, and will be our second full-time hygiene instructor. Nancy joins our program as a half-time instructor in Dental Assisting and will be giving additional insight to the dental assistants. Nancy has been working as a dental assistant in the Evansville area and is President of the local organization. Mrs. Florence McCloskey, our former instructor in dental hygiene, has moved on to Southern Illinois and we wish her much success in her new job.

Five dental assisting students presented a clinic at the state meeting in May and two other students presented papers. They were awarded trophies for the winning clinic and the winning paper among student competition. We are very proud of these girls.

The dental assisting graduates from our first two years have inaugurated a new program in which they act as big sisters to the 18 members of our new class. Because these students are on campus for only one year they do not have anyone to help them learn about the idiosyncrasies of our faculty. The girls are very enthusiastic about passing on their experience and have planned a party to begin the new year. This arrangement has worked well with the dental hygiene students.

We graduated our first dental hygiene class last May and were pleased with their Indiana State Board results. It was our first experience with both the National and State Board examinations. All of these girls are now employed and have adapted well to the dental community. The hygiene admissions committee has chosen 14 new students to begin the new year and they have already begun classes. Most of them enrolled in summer school and completed human anatomy early.

DENTAL AUXILIARY EDUCATION INDIANA UNIVERSITY— FORT WAYNE

George C. Smith, Director

Ninety-nine students compose the Fall roster, coming from as far away as Alabama, New York and California, to participate in the Dental Auxiliary Education program at the Fort Wayne campus this year.

Thirty girls were selected from 68 applicants for admission into the Dental Assisting class, almost one-third of them having had previous college background. The Dental Assisting program has been most successful in the past years. Under the guidance of Mrs. Hilda Nofzinger and Mrs. Connie Copp, all 31 graduates passed the Certification examination in May, achieving the national average. All of the girls were employed by June.

The Dental Hygiene Program has admitted 22 girls into the first year class and 21 have returned for their second year of training. Over 30 are enrolled in the pre-dental hygiene curriculum at Fort Wayne this year. Mrs. Gloria Huxoll and Mrs. Lois Skinner, Supervisors, are proud of their graduating class of 19 girls who received their Associate in Science degrees in May. Of these, eight are now employed in Fort Wayne; the others are now working in Kendallville, Syracuse, North Manchester, Bluffton, Huntington, Decatur, Columbia City, Indianapolis; St. Mary's and Lima, Ohio, and Burlington, Massachusetts. Twelve have returned to campus on a part-time basis in pursuit of their baccalaureate degrees.

Dental Hygiene student honors received included:

Proficiency Award in Radiology—

Joyce Rockwell

Sigma Phi Alpha Honor Society—

Karen Heckman, Karen Miller

A. Rebekah Fisk Award—

Ruth Kampschmidt

Isaac Knapp Dental Hygienists' Outstanding Education Award—Jan Olson

In addition, instructor Betty Jo Knafel '56 was selected by the graduating class of

Indiana University at Fort Wayne for the Outstanding Educator's Award.

The Dental Laboratory Technology program is now in its second year with many changes. The enrollment for the first year class has increased to a full capacity of 20 students. Six new part-time dental laboratory instructors have been named to work with Supervisor, Mr. John Winings. They are: John Leffingwell, Upland; John Landgrave, Gilbert Lechleitner and Chris Lepper from Fort Wayne; Thomas O'Brien, Marion; and Dr. Robert Gebfert, who graduated from the School of Dentistry in 1972, and is teaching part-time while setting up his practice locally.

We look forward to new experiences for our second year class. In the course of Applied Laboratory Experience, our students will spend eight to twelve hours each week working in local dental laboratories and office dental laboratories. Students in the Clinical Application in Prosthetics course will construct actual appliances for patients. Mr. Winings anticipates additional new experiences in the program throughout the coming year.

In October, we will be welcoming the Visiting Committee from the American Dental Association Council on Education. This will be the first accreditation visit for the new Dental Laboratory Technology program.

DENTAL AUXILIARY EDUCATION INDIANAPOLIS CAMPUS

The new year is underway in Indianapolis with increased class size both in Dental Assisting and in Dental Hygiene. Admissions Committees for both programs report having a large number of well qualified applicants. Twenty-six students were enrolled in the Assisting program, representing a 30% increase, while 40 students were enrolled in the Dental Hygiene program representing an 11% increase.

The Dental Assisting Program has now completed its first year and 19 students were graduated in May. Mrs. Marjory H. Carr, Dental Assisting Program Director, reports that 14 graduates are

employed in the Indianapolis area, with one each in Richmond, Lafayette, Rushville, Terre Haute, and Tallahassee, Florida.

The Outstanding Dental Assistant Award was received by Miss Donna Skelton. This Annual Award is given by the Indianapolis Dental Assistants' Society. The Table Clinic Award was won by Miss Deborah Tinnon, Miss Ruth Freije, Miss Lana Anderson and Miss Carla Smith.

Two students had articles published. An article by Miss Theresa Nowosielski was published in the Journal of the American Dental Assistants' Association and an article by Miss Deborah Tinnon was published by the Journal of the Indianapolis District Dental Society.

A welcome is extended to Mrs. Juanita Chisler, C.D.A., as she joins the faculty as instructor of Dental Assisting. Mrs. Chisler is well known and respected at the Dental School for her work as a dental assistant in Graduate Pedodontics.

Mrs. Suzanne S. Boundy, Dental Hygiene Program Director, reports that 36 students were graduated with the Associate Degrees in Dental Hygiene in May, and that all candidates were successful in their National and State Board Examinations. It is also of interest that all 36 graduates are now practicing in Indiana. In addition, seven candidates completed the Fourth Year Program and received the Bachelor of Science degree in Public Health Dental Hygiene. Dental Hygiene student honors received included:

Mosby Award—Jacqueline Scofield
Harriett F. Hine Award—Nancy Stutsman
Rossya Kaufman Award—Stephanie Erlichman
Sigma Phi Alpha Honor Society—Marcia Cady, Jacqueline Scofield, Nancy Stutsman, Shirley Young
A, Rebekah Fisk Award—Beth Ann Letterman
Table Clinic Award—Stephanie Erlichman, Marsha Smith, Nancy Stutsman, Shirley Young

A very special welcome is extended to Dr. Donald R. Tharp, who joins the faculty as Assistant Professor of Dental Auxiliary Education. Dr. Tharp comes to the faculty from private practice in Greencastle, Indiana. He has developed a major addition to the dental hygiene clinical practice course for second year hygienists, which includes skills in rubber dam application, study model impression and trimming technique, and the placement of restorative materials in teeth prepared by the dentist.

It is a pleasure to welcome Mrs. Deborah Brown to the faculty. Mrs. Brown was appointed as Instructor of Dental Hygiene and is now serving on a part-time capacity while remaining in a part-time practice in Brownsburg.

DENTAL AUXILIARY EDUCATION INDIANA UNIVERSITY- SOUTH BEND

Alfred Fromm, D.D.S.
Director

We are entering our fifth year of the Auxiliary Programs at South Bend with some administrative changes.

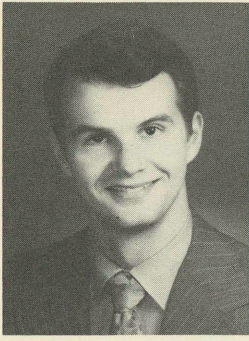
This year your correspondent has given up private practice and will be the Director of the South Bend Program on a 100% basis.

The Dental Assisting Program has selected Ms. Maureen Schneider as Supervisor. Ms. Schneider is a dental assisting educator, having received her training at the State University of New York at Buffalo.

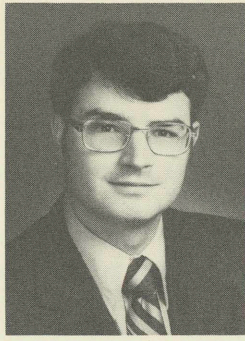
The Assistant Supervisor of Dental Assisting is Ms. Jennifer Trueblood. Many readers may know Ms. Trueblood, since she worked in Preventive Dentistry and is a graduate of the Wood School of Dental Assisting.

Both the Dental Hygiene and Dental Assisting Programs have capacity classes, and we are looking forward to a most happy and successful year.

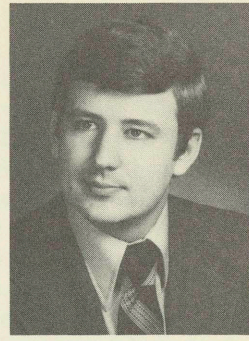
1973 GRADUATES



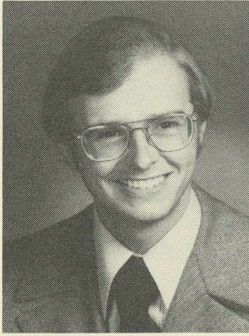
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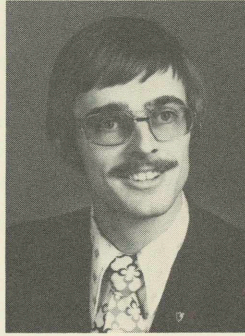
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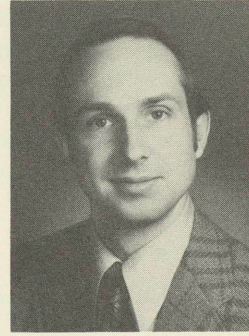
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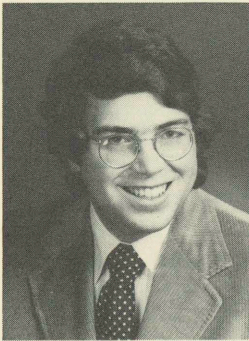
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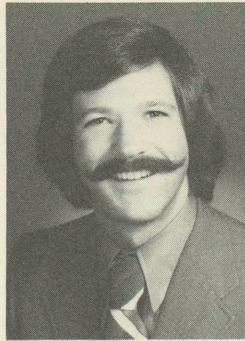
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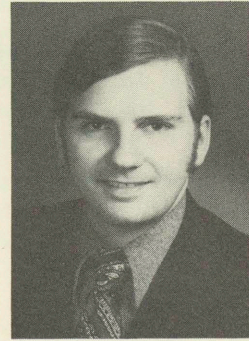
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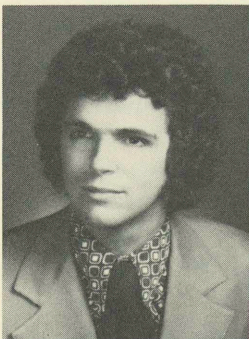
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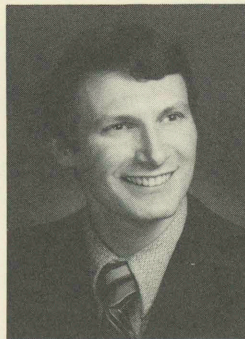
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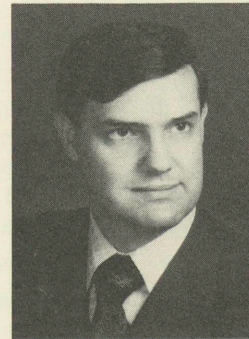
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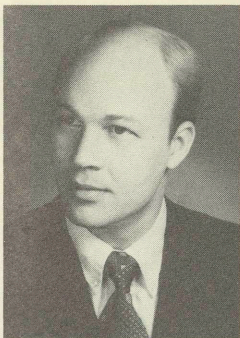
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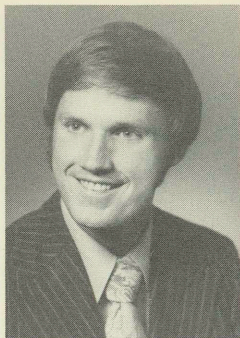
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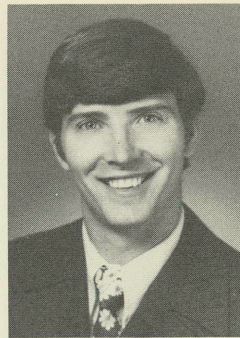
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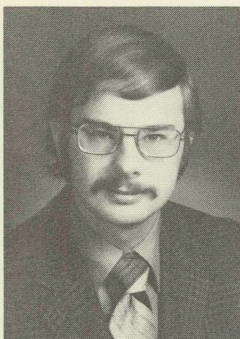
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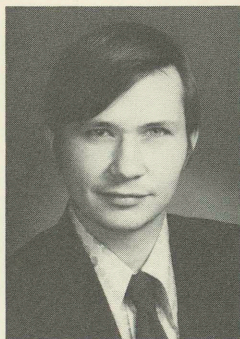
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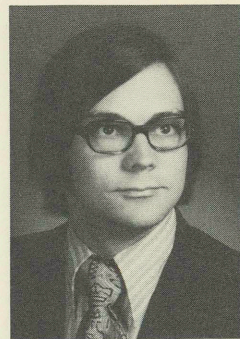
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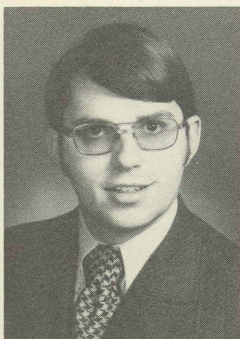
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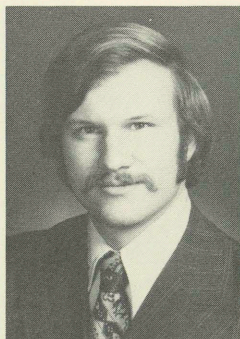
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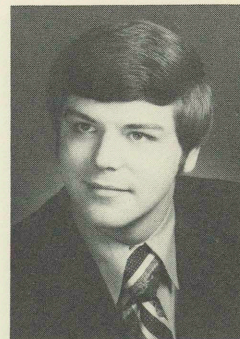
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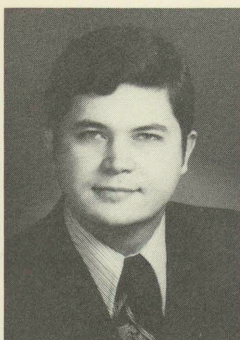
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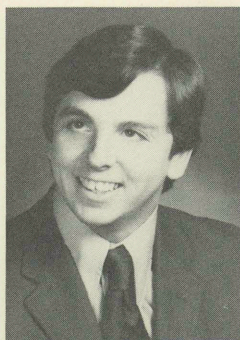
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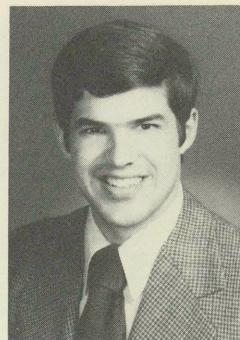
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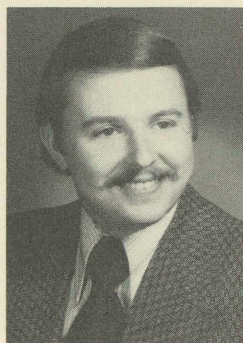
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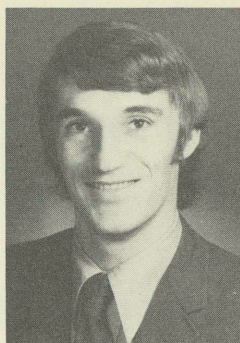
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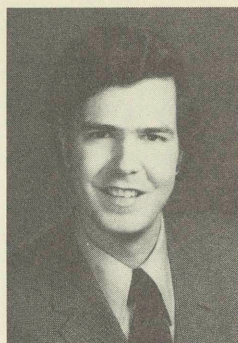
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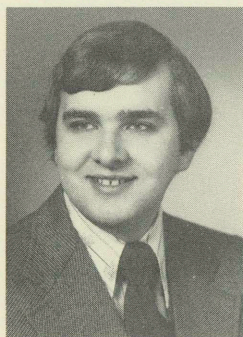
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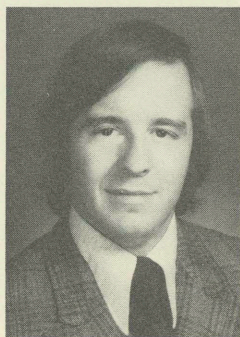
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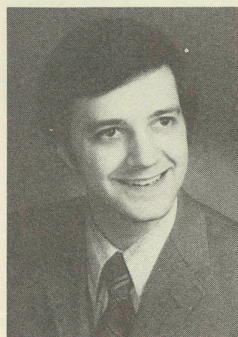
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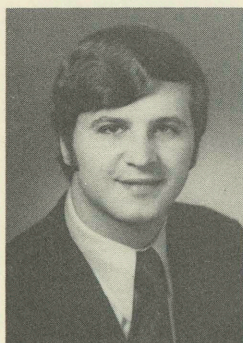
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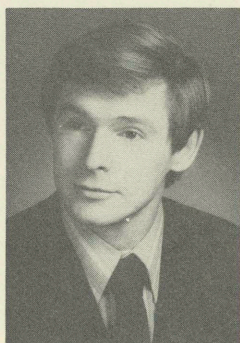
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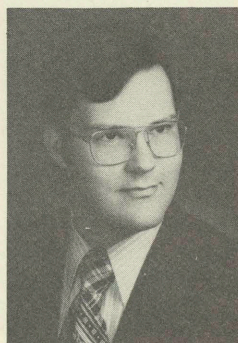
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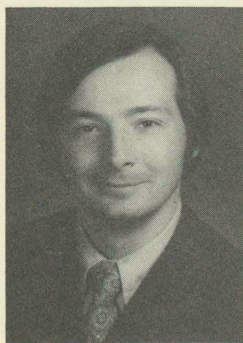
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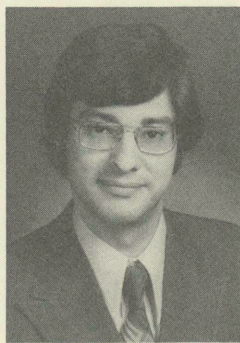
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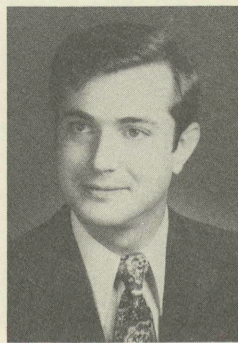
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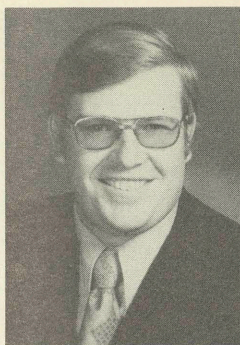
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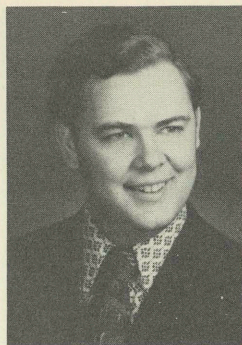
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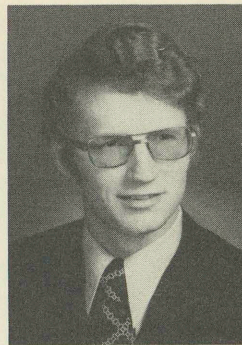
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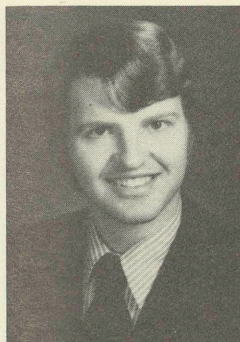
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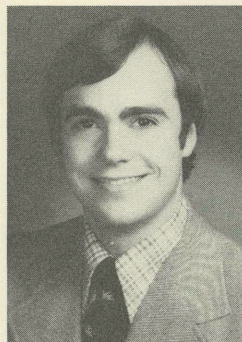
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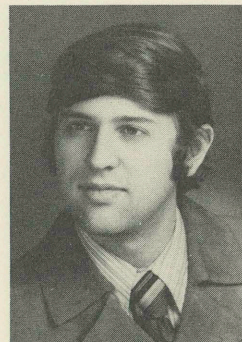
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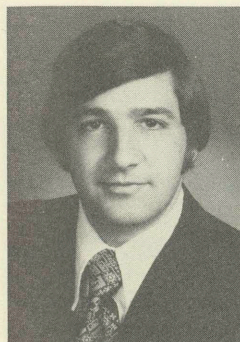
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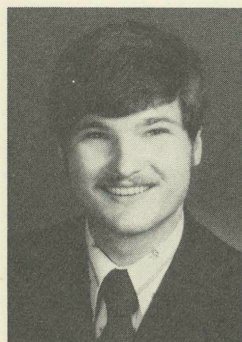
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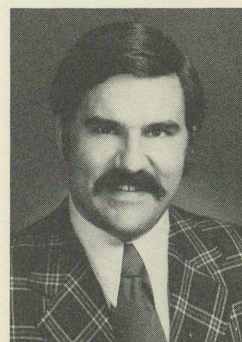
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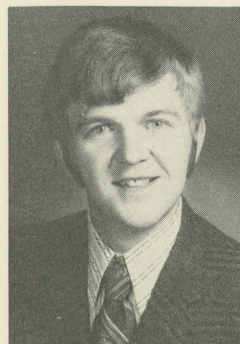
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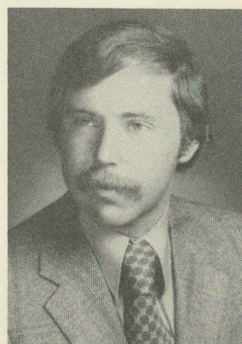
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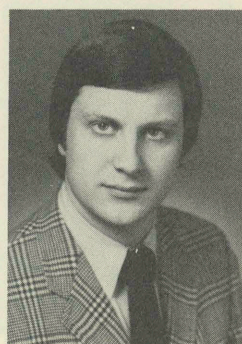
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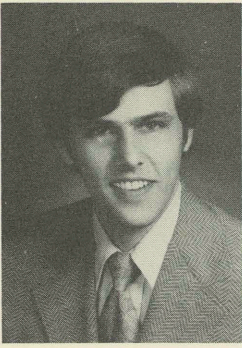
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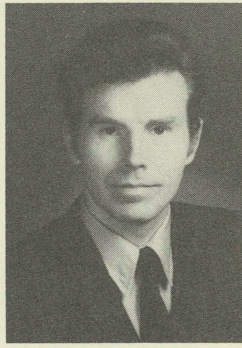
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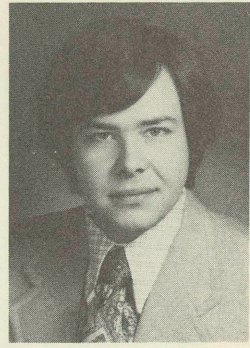
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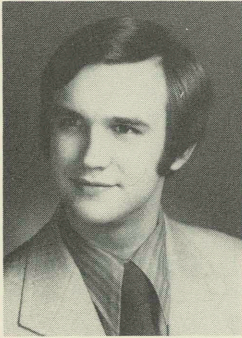
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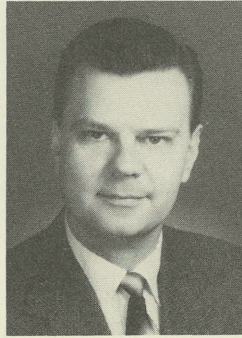
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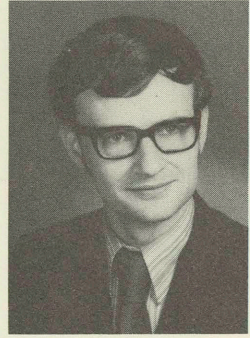
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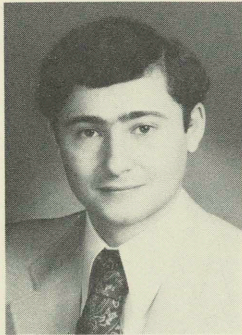
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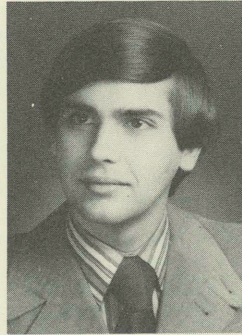
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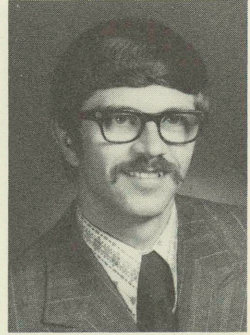
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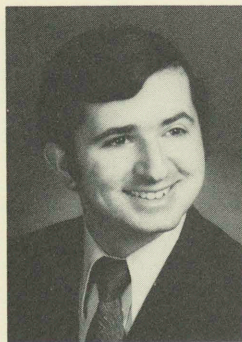
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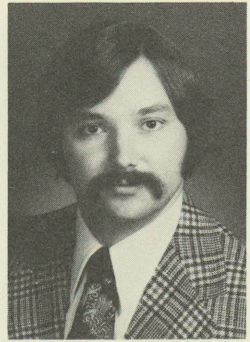
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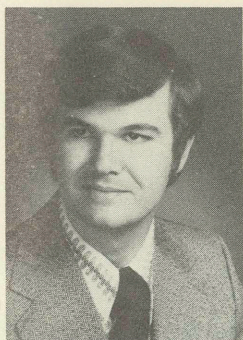
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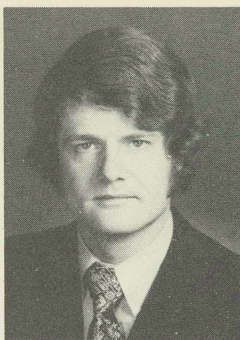
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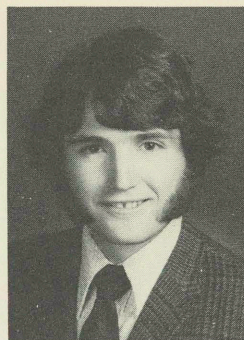
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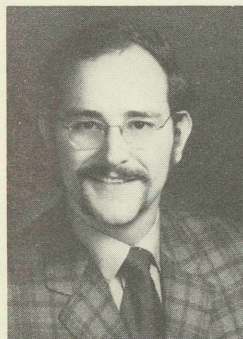
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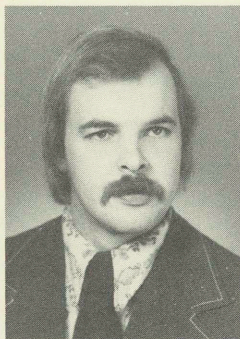
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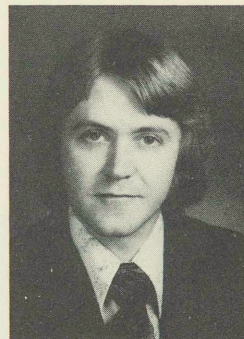
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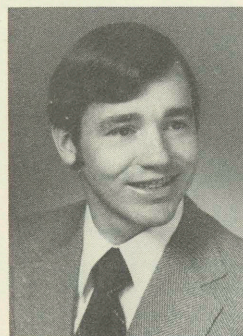
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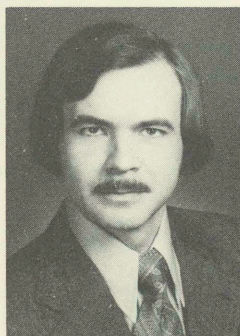
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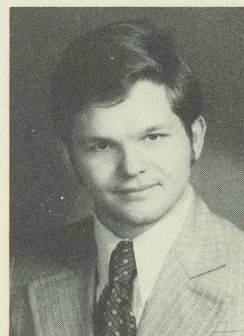
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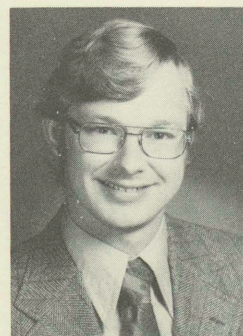
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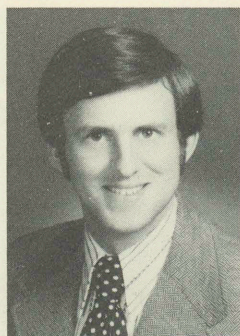
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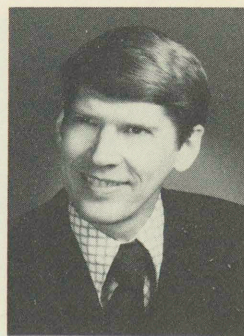
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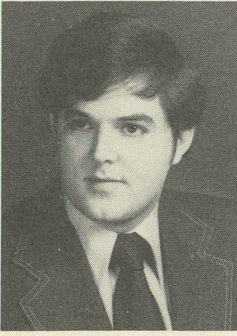
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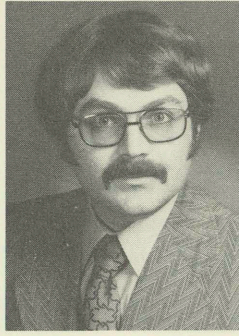
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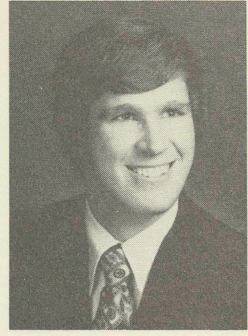
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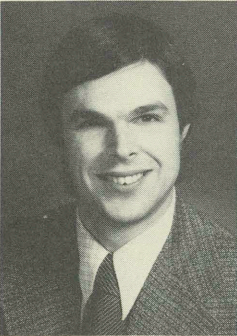
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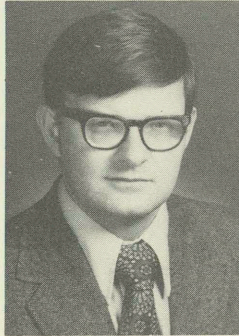
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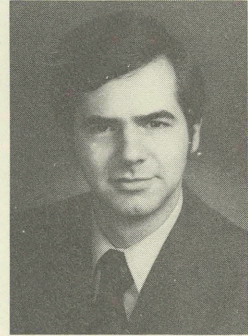
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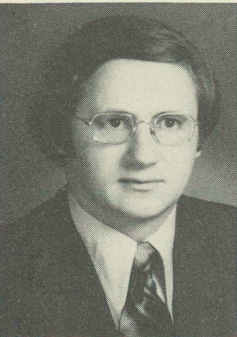
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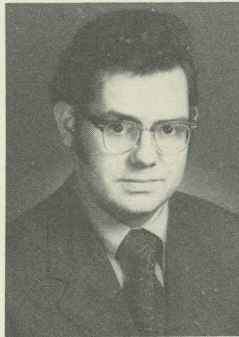
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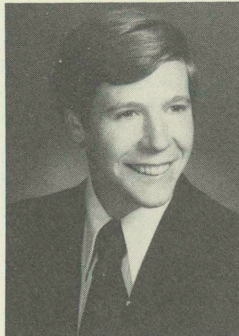
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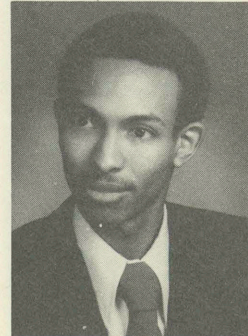
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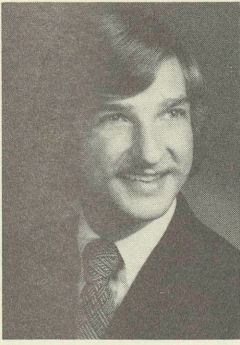
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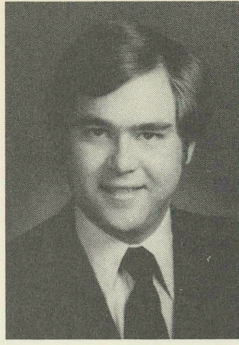
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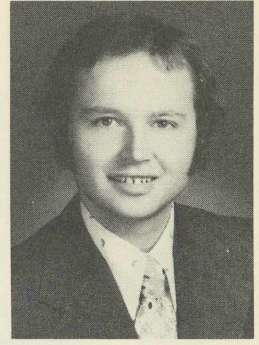
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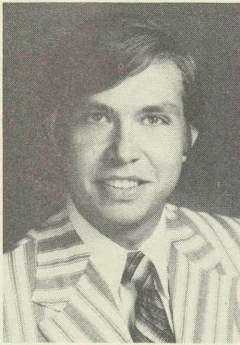
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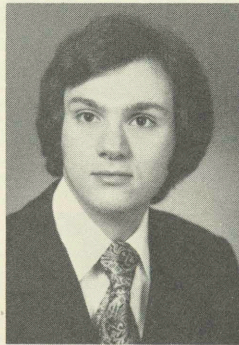
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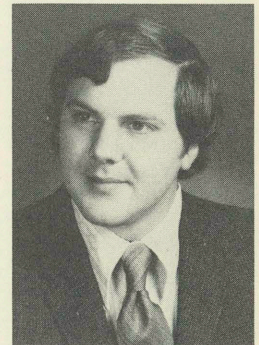
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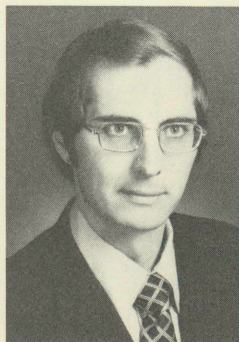
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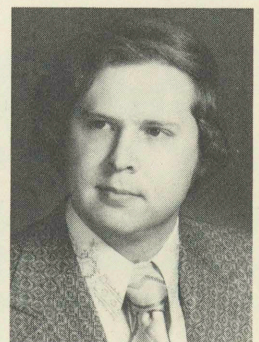
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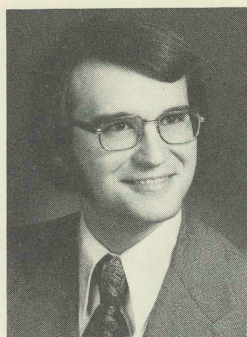
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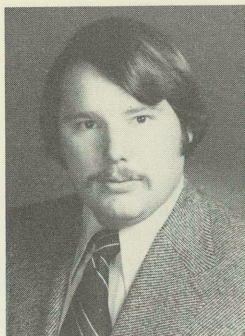
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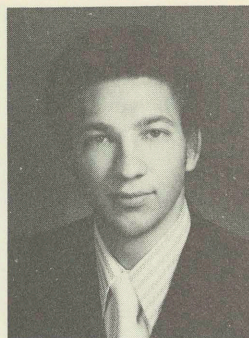
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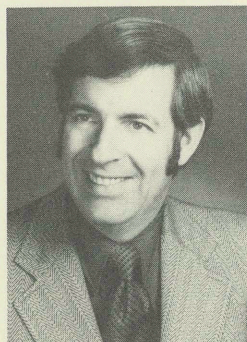
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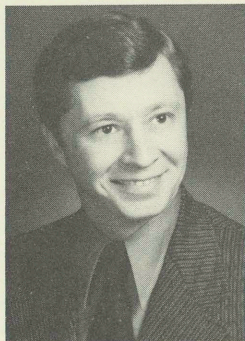
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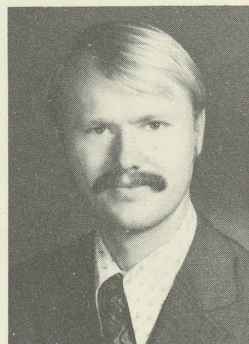
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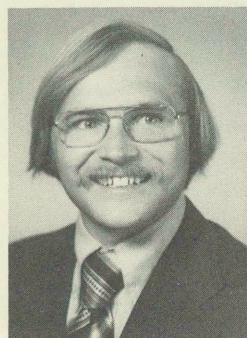
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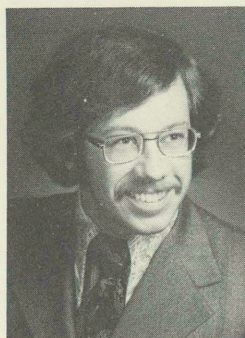
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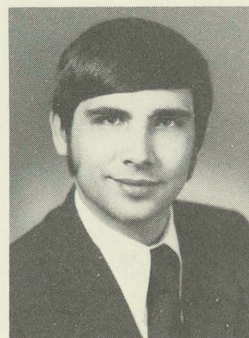
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Not Pictured—Robert Lindsey



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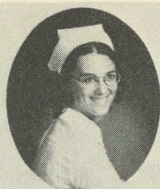
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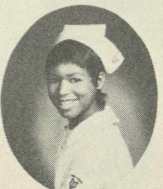
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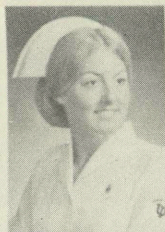


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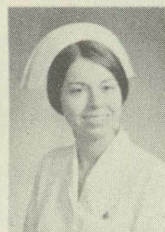
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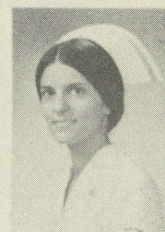
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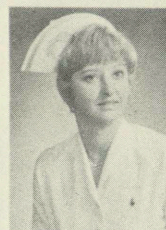


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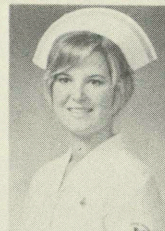
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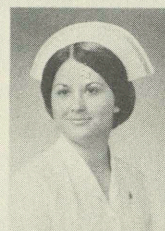
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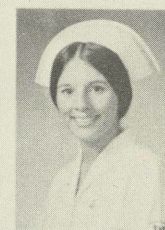
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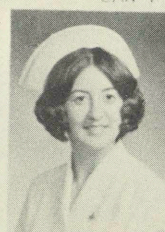
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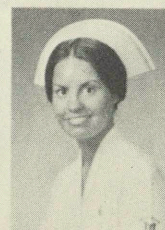
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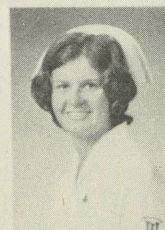
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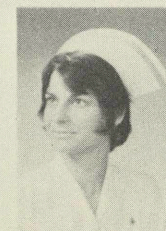
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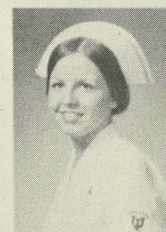
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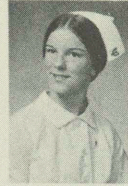
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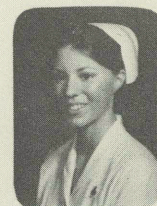


LINDA CRONK



PAMELA CRAIG

Indiana University
 Dental Hygienists
 School of 1973 Dentistry
 South Bend Campus



PAMELA STEED



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The Bookshelf

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What is the magic number? It's the telephone number for the School of Dentistry Library—(317) 264-7204—your link to 32,000 volumes of interest to the dentist.

Do you keep putting off writing that letter to ask for information on "the hemophiliac patient in the dental office" or "the management of the handicapped child?"

Did you know that we will prepare a bibliography and send you copies of pertinent articles that may appear in journals to which you do not have access?

Have you wondered whether there is a later edition of one of the reference texts on the book shelves in your private office?

Did a teen-age patient ask you for career guidance—what aptitudes are necessary to become a dentist, what schools provide dental education, when dental admissions tests are given and where?

Unless you live in Indianapolis, has it occurred to you that you could call this Library? Please don't misunderstand and assume that we are lacking sufficient duties to keep us busy. We see the faculty and students every day, but we reach the alumni only twice a year through this column with our message that this Library is not only a collection of books of which we have custody. It is an instrument of service for continuing education and individual research, as well as professional development.

Not all of our books are devoted to "clinical dentistry," either. If you edit your district dental journal, you may be interested in *HANDBOOK FOR DENTAL EDITORS AND AUTHORS* edited by Barton and others or Meyer's *PRECISION JOURNALISM*, both 1973 publications. The Women's Auxiliary to the Metropolitan Denver Dental Society has published *THE GOODY BOOK*, "a collection of creative food ideas which are nutritious and compatible with good dental health." Other subject areas for which we

have purchased one or two basic texts are "the metric system" and "acupuncture."

Management may be an area in which you feel impelled to do some reading. If so, you might be interested in Eilers and Jones' *THE ATTITUDES AND ANTICIPATED BEHAVIOR OF DENTISTS UNDER VARIOUS REIMBURSEMENT ARRANGEMENTS* or the book by Kahn and Cannell entitled *THE DYNAMICS OF INTERVIEWING*. Bauby's *OK LET'S TALK ABOUT IT; DYNAMICS OF DIALOGUE* gives case studies in communication in personnel management. In the popular vein, we have copies of McGuire's *TOOTH TRIP*, McKeown's *EVERYBODY'S TOOTH BOOK, AN ILLUSTRATED GUIDE TO THE CARE AND FEEDING OF YOUR TEETH* and Zebooker's *YOUR TEETH, YOUR DENTIST AND YOUR HEALTH, AN ILLUSTRATED DENTAL HANDBOOK FOR THE PARENT AND PATIENT*.

Except for volumes placed on "Reserve" for class use, all our books are available for lending to Alumni and we hope you will use our "magic number."

Continuing our established policy, we are printing the abstract from each of the following theses which were written within the past year at the Indiana University School of Dentistry.

STRUCTURAL BEHAVIOR OF THE MAXILLA UNDER LATERAL LOAD APPLICATION

Gordon R. Arbuckle

This study was initiated to obtain quantitative information on the tendency of the maxilla to resist separation when subjected to lateral loads. It was hoped that a structural center of resistance for the maxilla could be determined. Strain gauges were placed in dry skulls and lateral loads were applied in five different anterior-posterior positions.

The results show a highly significant position by gauge interaction ($F = 3.467$, $P < .005$). A

loading position at approximately the mesial of the first molar elicited the least variable (or most uniform readings), thereby indicating the approximate center of resistance of the maxilla to force application in the plane considered.

A LABORATORY COMPARISON ON THE ADHESION OF UNFILLED AND COMPOSITE RESINS TO ACID ETCHED ENAMEL

Robert W. Aubuchon

The purpose of this laboratory study was to determine if the bond strengths of composite resins and unfilled resins was affected similarly when applied to enamel surfaces which had been previously etched with 50 per cent phosphoric acid. The test specimens were subjected to 24 hours, 30 days, and 6 months storage in water and then subjected to temperature stress cycling and intermittent tensile stress cycling. A tensile test was used to measure the bond strengths of the composite resins (Adaptic and HL-72) and the unfilled resin (Sevriton).

The following results were obtained: (1) Pretreating the enamel surface with 50 per cent phosphoric acid for 60 seconds significantly increased the bond strength of composite resins; (2) when placed on acid etched enamel, there was no significant difference in initial bond strengths obtained for the Adaptic and unfilled Sevriton resins; (3) with prolonged water storage, the Adaptic composite resins developed significant loss of bond strength when compared to the unfilled Sevriton resins and the composite HL-72 resins; (4) when Adaptic resins and the HL-72 resin specimens were compared, there was no significant difference in initial bond strengths but the HL-72 specimens were less affected by storage time.

On the basis of these results, it was concluded that acid etching enhances the marginal seal of both composite and unfilled resins. Both composite and unfilled resins experienced increased marginal leakage when the acid etch preparations were thermal cycled, but there were no observable differences in the marginal seal of unfilled resins and composite resins when placed in acid etched restorations.

THE CLINICAL BEHAVIOR OF THE AMALGAM RESTORATION AS RELATED TO CERTAIN MECHANICAL PROPERTIES

Paul P. Binon

Three alloys of widely varying creep values were tested for static creep, ADA flow, hardness, compressive, tensile and slow compressive strength. These same alloys were compared in vivo in Class II restorations in human posterior teeth. Nine months after insertion, 160

restorations were evaluated and 31.8 per cent showed evidence of marginal fracture. A highly significant difference in marginal breakdown and crevice incidence was present among the three alloys. The incidence of marginal fracture in the high creep alloy was 6.6 times greater than that observed in the low creep alloy. The mechanical property of static creep shows definite correlation with the in vivo performance of each alloy tested. No conclusive relationship is apparent from the other mechanical tests with in vivo performance.

The static creep test should be considered as a useful screening test that may help in predicting the clinical performance of amalgam alloys. Creep may be one of the prime factors responsible for in vivo marginal breakdown or is directly indicative of some other property or group of properties which are the prime mechanisms responsible for marginal failure.

AN EVALUATION OF THE OSTEOGENIC POTENTIAL OF A POROUS, SINGLE-PHASE, TRICALCIUM PHOSPHATE CERAMIC

Pierre Duquette

This was an investigation of the biocompatibility, osteogenic potential and degradation of a porous, single-phase, tricalcium phosphate ceramic which was implanted subdermally in rats, and in bone wounds in monkeys.

Thirty-three young adult, albino rats received subdermal implants of the ceramic and two control materials, Ivalon surgical sponge and calcium hydroxide. A Procion red vital dye was given periodically. The tissue reactions around the implants were studied microscopically after intervals ranging from two to 128 days. The ceramic was shown to be almost non-irritating. Degradation of the material was minimal and osteogenic potential was non-existent during the stated intervals.

Three monkeys received in each tibia two intra-bony implants of the ceramic, and one control wound, which was allowed to heal spontaneously for periods ranging from one week to three months. A Procion red vital dye was injected intraperitoneally into each animal. Pre-operative and post-operative radiographs were taken. The specimens were studied microscopically as follows: unstained, decalcified and ground sections were observed with the fluorescent microscope, and other decalcified sections were stained with H and E.

Optimal healing of the control bone wounds occurred. By virtue of its physical presence, the ceramic seemed to interfere with the restoration of the continuity of the bones in the later intervals. The ceramic appeared to act as a scaffold for bone ingrowth and may be useful to fill large bony defects when the establishment and organization of a normal blood clot cannot be expected.

PLASTIC DEFORMATION OF THE AMALGAM RESTORATION AS RELATED TO CAVITY DESIGN AND ALLOY SYSTEM

Joao Galan, Jr.

The role of the retentive form of the cavity in plastic deformation of the M-O-D amalgam restorations was investigated. Chromium-cobalt teeth with 4 cavity preparations, identical except for variations in retentive form, were restored with amalgam. Both the marginal ridge and isthmus were subjected to cycling stress of 11,935 psi over a period of 21 hours (7,560 cycles) at 37° C water environment. Deformation of the restorations in the proximal direction was determined by the change in distance between landmarks placed on the occlusal surface prior to testing. Tests were conducted 3 hours and 7 days after insertion of the restorations. Micro-cut alloy and Dispersalloy were used in the first part of this study. Spheraloy, Aristaloy and Aristaloy plus copper amalgam were employed in the second part. The results of the tests conducted 3 hours after placement of the restorations showed that only Dispersalloy restorations withstood the stress cycling for the entire 21 hour test. Restorations of all other alloys fractured within a relatively short period. No statistically significant difference ($p > .05$) was found between cavity designs. A significant difference ($p < .01$) between alloys studied was found. Dispersalloy had the lowest plastic deformation and Micro-cut alloy, the highest. The addition of copper amalgam into Aristaloy improved that alloy regarding the plastic deformation susceptibility.

A TELEVISION RADIOGRAPHIC EVALUATION OF PERIAPICAL OSSEOUS RADIOLUCENCIES

Myron J. Kasle

Periapical lesions were experimentally produced in 45 teeth of seven beagle dogs. These lesions were produced utilizing both septic and aseptic techniques. Preoperative and postoperative serial radiographs were produced using a specially designed animal head serial X-ray device, at 30, 60, and 90 day periods. Four anatomic study areas, which consisted of the cervical, interradiolar, proximal root and periapical areas of each tooth, were evaluated by viewbox observation of radiographs, by subtraction radiographic imagery, and by histologic examination. Correlations were made with viewbox observations, findings obtained with the subtracted image and histologic sections. The results of these evaluations indicate that the subtracted image effectively improved the viewbox radiographic diagnostic interpretation as follows:

1. Diagnostic evidence of periapical pathology could be identified in the subtracted image

- 7 and 42 days before this same evidence was noted on the viewbox radiograph.
2. The periodontal membrane space was more pronounced.
3. The lamina dura was more definite.
4. Cancellous bone trabeculae and medullary spaces were markedly enhanced.
5. Free gingival epithelium was slightly more visible.
6. The lesions were markedly enhanced and there were definite outlines of the limits of the lesions.

A COMPARISON OF READING AND ANNEALING PROCEDURES IN THERMOLUMINESCENT DOSIMETRY

Michael K. OCarroll

As a result of inconsistency in thermoluminescent dosimetry readings when the manufacturer's recommended procedure was followed, the author elected to compare a modified procedure with that of the manufacturer. Measurements were made of the exposures received by certain sites within a tissue equivalent phantom using lithium fluoride dosimeters and utilizing the two reading and annealing procedures.

The results showed that for all dosimeters and sites the modified procedure used in this study was superior to that of the manufacturer.

IN VITRO PLAQUE FORMATION BY MIXED CULTURES OF NON-PLAQUE FORMERS

John C. Parsons

This *in vitro* study investigated the possibility that microorganisms, not forming plaque in pure culture, might interact to form plaque in mixed cultures. Twenty-two organisms isolated from the plaque of periodontal pockets were assessed for their ability to aggregate on nichrome steel wires transferred daily in Jordan's medium plus 2% sucrose for 10 days. Eight organisms not forming plaque in pure culture were arranged into combinations with each other and with 7 previously tested non-plaque formers, including *Streptococcus salivarius* and *Candida albicans*. Plaque which formed in mixed culture was photographed and ultrasonically dispersed. The suspensions were analyzed for the predominant organism (viable-colony-forming-units; CFU), acetate buffer extractable carbohydrates, and dry weight of insoluble material.

Scanty amounts of plaque formed in several of the large mixed cultures. Large amounts formed in 7 paired mixed cultures, each of other organisms making up these combinations other organisms making up these combinations were 4 Gram-positive cocci, 2 Gram-positive rods, and *Candida albicans*. Dry weights of insoluble materials ranged from 3.9 to 7.6 mg

for 3 of the combinations. Extractable carbohydrates ranged from 381 to 815 ug. At least one-half of all carbohydrates extracted appeared to be levans. The results suggest that many types of bacteria may be involved in plaque formation in a mixed flora.

A METHOD FOR EXAMINING THE VARIANCE BETWEEN ARTICULATORS

B. Larry Pedlar

Controversy has existed concerning the usefulness and accuracy of simulated mandibular movement produced by various types of articulators programmed by their respective techniques.

The purpose of this study was to develop a method whereby the order of the variation between articulators programmed from the same patient could be examined.

The Whip-Mix, T.M.J., and Stuart articulators were set from three subjects. A scribing apparatus designed to record the movement of a point through space was placed in the first molar region. For each subject one set of dental casts containing this apparatus was mounted within and transferred between each articulator to record lateral border movements. Each articulator's border movement was traced on a single recording plate for the horizontal, sagittal, and frontal planes and the procedure was repeated three times.

The results would indicate that the simulated mandibular movements produced by the articulators varied to a measurable degree. The possible reasons for the differences are discussed and, although no definite conclusions could be drawn, the variations would seem to be of some clinical significance.

A CEPHALOMETRIC EVALUATION OF THE INTEGUMENTAL PROFILE OF FRENCH-CANADIAN CHILDREN

Claude H. Remise

This study was undertaken in order to obtain standards on the soft tissue facial contour in a French-Canadian sample based on analysis of lateral head-plates. Twenty boys and twenty girls were studied longitudinally from 6 to 9 years of age and the same was applied to twenty children of each sex followed from 10 to 13 years of age. No attention was paid to the occlusion and the cases were chosen on the sole basis of acceptable facial profile. The results are analysed and further investigations to be done are described.

THE RELATIVE STRENGTH OF HIGH AND LOW FUSING SOLDERS

Bruce Edward Squire

Unexplained failure of high fusing solder joints still occasionally occurs. This study was

carried out to determine the relative tensile strength of high and low fusing solder joints. A test specimen of standardized diameter (0.118 inch) was used. The effect of flux was tested with both high and low fusing solders. In addition, the effects of excessive and prolonged heating, and of heat treatment were tested using high fusing solders.

Results indicate that low fusing solders are weaker than high fusing, but are more reliable. However, one low fusing solder and its corresponding alloy proved to be as strong as the high fusing solder joints. It was also found that one high fusing alloy and solder was considerably more reliable than the other. The use of flux is essential with low fusing solders, and produces significantly more reliable results with high fusing solders. Prolonged heating and heat treatment of high fusing joints had little effect, but overheating these joints was markedly detrimental to strength. In this regard the type of soldering flame used is important.

Strength of the solder joints was seen to be related to the presence of oxidation within the joint, to the grain size of the solder, and to a much smaller extent to porosity within the joint.

IN VITRO EXTRACELLULAR POLYSACCHARIDE PRODUCTION BY ACTINOMYCES NAESLUNDII

John S. Stone

Actinomyces naeslundii has been shown capable of forming plaque and producing periodontal disease under a variety of conditions. Extracellular polysaccharides have been shown to be of great importance in the formation and retention of bacterial plaque. This study was designed to investigate the *in vitro* polysaccharide production by *A. naeslundii*.

Actinomyces naeslundii was cultured in an unsupplemented, 2% sucrose-supplemented, and 2% glucose-supplemented proteose dialysate medium for 96 hours. The presence of high molecular weight polysaccharides was determined by passing equal volumes of the cell-free culture fluids through Sephadex G-25. Uninoculated media were used as controls. The high molecular weight fractions were measured for total carbohydrate and total fructose by the phenol-sulfuric acid and resorcinol-thiourea methods, respectively.

Actinomyces naeslundii grown in an unenriched and a 2% glucose enriched proteose dialysate medium produced no polysaccharides. When cultured in the sucrose-supplemented medium it produced a maximum of only 80 micrograms of extracellular polysaccharide per ml of growth medium. This material was not levan. *In vitro* production of extracellular polysaccharide by *A. naeslundii* as the primary mode of plaque formation is doubtful.

(Continued on page 82)

Alumni Notes

Cleona Harvey

Greetings:

On this beautiful October day in Indiana I am in Room 300C of the Union Building on the Bloomington Campus to counsel pre dental students concerning courses they should take to make it easier for them to get in dental school and to stay in if they get in! Since I'm living in Bloomington at 335 S. College Avenue (47401), it is really a pleasure to visit the Campus once a week and the students do seem to appreciate it. If you know of any young man or woman who is thinking of dentistry as a career and is attending I.U., I do wish you would ask them to come and see me. The Campus paper carries the announcement of the time and place I am available for conferences.

This has been a busy year. My brother's will is still in probate court so the burden of caring for the property he left is still on us. I wonder if it will ever get over but I've learned to go ahead and get the faucets fixed, the locks repaired and the hundred and one other things that can happen to houses and apartments. I no longer believe "you can't teach an old dog new tricks" as I certainly am a living example of the fact that it isn't true! But it is interesting. We have most of our rentals filled with students and that I like. Students have been so much a part of my life for so many years that renting to them comes quite naturally. In addition to dental counseling I have been doing a little counseling for Campus House, a non-denominational Christian group of college boys and girls. There is no end of things one can do if time and energy permit.

Evelyn has not been well all winter and is just recovering from a bout with bronchitis. She is in bed most of the time but is improving slowly and we hope she will soon be able to be up and around. So we just live one day at a time. In the prayer Christ taught his disciples he said, "Give us this day our *daily* bread" and I try to remember that and not fret about

the future. Somehow all those things on my list will get done.

My brother had a beautiful lawn here at the apartment and we dared to spade up a place big enough for six or eight tomato plants and we have had our own tomatoes galore. One of the pre dental students I have known for several years rents one of the apartments here, and it was his idea but Evelyn was all for it and they sure took pride in their "garden."

I mustn't forget to tell you that Evelyn and I attended both banquets honoring Dr. Hine who retired as Chancellor July 1. We went to Indianapolis and stayed at the Hilton as we didn't feel like driving back and forth. At the banquet held by the dental people, Dr. Ralph Phillips, who was emceeding the program, said that Mrs. Harvey and Evelyn had been in Indianapolis all week helping Dr. Hine celebrate so he guessed the bars were closed in Bloomington! You can imagine how much they all enjoyed that—oh, well—I'm glad they did even if our faces did get a little red! It was worth it getting to see so many people with whom I had worked in the "jolly dental school."

Enough about us and on with news of the graduates beginning with the Class of

1908

Deceased: Dr. Orla E. Biery—Frankfort, Indiana—no date

1914

Deceased: Dr. Howard C. Dressel, Minneapolis, Minnesota—no date

1918

Deceased: Dr. Samuel P. Richards, Chicago, Illinois, 4-12-73

1919

Deceased: Dr. John P. Jones, Indianapolis, Indiana, 7-20-72

Deceased: Dr. Frank R. Peters, Fort Wayne, Indiana, 1-1-73

1921

Deceased: Dr. Forest F. Sheller, Venice, Fla., 11-13-72

1922

Deceased: Dr. Ray G. Howard, New Castle, Ind., 5-9-73

Deceased: Dr. Fred B. Smith, Indianapolis, Indiana—no date

1923

Dr. Starkey received a letter from Dr. Theodore E. Lilly in April and sent a copy to me for the Bulletin. As you all may know by now, Dr. Lilly was honored at the Fall Meeting of the School of Dentistry Alumni Association Meeting. *"Dear Paul: Was glad to receive your good letter about OKU. I hope that you have had a satisfactory year as president. I feel that no one could deserve membership more than you. The Treasurer sent a request for the payment of dues, but he didn't say how much, and I have forgotten."*

"I hope things have been going well for you; personally, family, school, professionally, and in all the many facets of your life. Give our love to Arlene."

"Have you known of Hobe Ingle's passing November 17, 1972? I wrote Lant Clark a note right away and asked him to get word to Indianapolis classmates and the college. I haven't seen a notice in the Alumni Bulletin. Would you please contact the Registrar and ask her to get the word to the right people? His friends here miss Hobe very much; as you know he was a great person. Hobe took me to the I. D. C. Meeting many years, because they had two cars. I hope that Betty and I can come over this year—it will be my 50th. Will the out-of-town people register at a different hotel this year, since the convention center will be in use? Let me know about the hotel."

"I got up to about 33% last summer after a series of heart episodes the preceding fall. Then in September of 1972 I had a bad one. Betty's heronic first-aid kept me alive an hour until the ambulance got me to the hospital in Hanover, N.H. They started me on the way, including a

heart pacer. I came home October 24 by air ambulance. I've gotten along real well, although I have little strength and stamina. I can walk about a square. I've been to church four times, to friends' homes for dinner and a not too long evening, went to the All Day Meeting luncheon. It was delightful to be with dental friends again. Betty is being wonderful!!! We're thankful for each day. I spend practically all of my time upstairs. I think of you often." What a nice letter, and how nice it was to see Dr. Lilly receive the honor bestowed upon him by the I.U.S.D. Alumni Association. Dr. Lilly, we all wish you and your 'Betty' many quiet years together. I hope you don't mind us sharing your letter with all your classmates and we do appreciate Dr. Starkey's thoughtfulness in all of this. Oh, yes, I forgot to give you Dr. Lilly's address. It is 429 W. Hillcrest Ave., Dayton, Ohio 45406.

1926

A memorandum from Pensacola Junior College informed us that the wife of Dr. Lloyd F. Abel (Capt. USN, Ret.) died July 3, 1973. Dr. and Mrs. Abel resided for 15 years in Shelbyville, Indiana where he practiced dentistry before entering the Naval Service in 1942. Dr. Abel served twenty-five years in the Navy before retiring in Pensacola, Florida. Since his retirement, he has been a member of the faculty of Pensacola Junior College and is the Head of the Department of Dental Health. Dr. Abel, please accept our sympathy and best wishes. We would appreciate a note from you concerning your work in a junior college. I am sure it must seem quite different from the Service.

1927

Dr. Mark H. Rice has retired and his new address is: 1000 Tarpon Center Dr., PH 3 Harbour House, Venice, Florida 33595. Thank you, Dr. Rice, for we do appreciate getting changes of address, as we want you to get the Alumni Bulletin and any other mail which might go out to alums. Next time do tell us more about your activities.

1929

Deceased: Dr. Thomas S. Thomas, Lafayette, Indiana. 5-21-73

1931

Dr. Marvin Cochrane, 310 N. 40th Ave., Yakima, Washington 98902 never forgets us. He wrote, "*Dear Mrs. Harvey: I was sorry to read of your most difficult experience last fall! Certainly wish you more luck this year. Betty and I have been on several trips into Oregon and Washington beauty spots with a travel club we belong to. We leave September 6 for an overnight trip over the new northern road thru the Cascades opened last Sept. It must be a beautiful trip. Hope you are well again. No news from the Class of '31.*" You were right, Dr. Cochrane, yours is the only news we received from the Class of '31 but yours counts and it does sound as if you are having a good time with all those lovely trips. I am so glad to report that so far this year things have been better for me!

1933

Deceased: Dr. Roscoe R. Smith, Bloomington, Indiana. 9-12-73

1936

Deceased: Elmer Bosselmann, Fort Wayne, Indiana. 12-21-72

1937

Deceased: Dr. Oscar E. Bodenberg, Indianapolis, Indiana. No date

1940

Deceased: Dr. Reginald E. Stookey, Fort Wayne, Indiana. 2-22-73

1946

Mrs. M. Tilson Amos, wife of Dr. M. T. Amos, 309 S. Main, Knox, Indiana, 46534 wrote us such an interesting letter: "*Everett intends to write a note of his own; but I just had to tell you how delighted we were to read your notes on our dog's soccer adventures. Just got around to it yesterday. I'm sure you know how the*

mail, etc., falls on you as you open the front door after having been away. Our secretary is wonderful; but there are some things we have to do for ourselves.

"*You gave us nice coverage.*" Then she said some very nice things about me and I am too modest to copy that part, but thank you Mrs. Amos. I always liked you, too!

To continue her letter, "*We love Guadalajara and are now furnishing our apartment simply but comfortably. It is nice to go back to.*

"*Someday I will surely find a publisher. I am trying for a British or Canadian market. Soccer is still very strange in U.S. for children's reading, apparently.*

"*Last August you may have seen the full page of pictures of Fanny which Lloyd Walton took for the Indianapolis Star and this winter in Guadalajara the editor 'interviewed' her for the Mexico City News (Vistas Sunday editorial). I did see it and was pleased that I had written about Fanny first!*

"*We think of you often and Amos misses seeing you when he comes back. Maybe he will tell you about being published in 'Who's Who in the Midwest' this year and was naturally proud. Also he was included in 'Indiana Lives' a few years ago.*"

Again I must say how nice it is that our dentists marry such talented women and those talented women sometimes write me and I like that a lot! Thank you, Mrs. Amos, and tell your husband I miss seeing him, too. and maybe someday I will get to Guadalajara. I hope so.

1952

The School of Dentistry Newsletter which is sent only to the employees has such an interesting account of something which happened to Dr. Ralph Schimmele on a trip to Flagstaff, Arizona. I think you will enjoy reading about it.

"*For the previous six months we had been assisting Dr. James N. McClure, an I.U.S.D. alumnus, in the development of a dental auxiliary facility at Northern Arizona University, Flagstaff, Arizona, in the capacity of Consultant to the President of the University.*

"As with all developmental projects, the moment of truth finally arrived when business managers, architects, and university and dental program administrators had to meet this past February to approve plans, budget, and time schedule. My presence for this meeting was requested.

"The trip to Phoenix was uneventful. Just prior to late afternoon touchdown at Sky Harbor, the flight director informed the passengers that the temperature was 76 degrees with rain. The short trip from Phoenix to Flagstaff seemed to be of little or no consequence when those 140 miles were compared to the 1600 just traversed in three hours and 30 minutes.

"The commuter flight from Phoenix to Flagstaff was delayed, delayed again, and finally cancelled because of bad weather at Flagstaff. I was told that I would be placed on a bus and that I was to take my attache case to the taxi stand, present "this" ticket, and be delivered to the bus station. I picked up my case, asked for my bag, and prepared to move out. There was no bag. Frantic checking on the part of the baggage claims personnel produced nothing. I was assured that the bag would show up at any moment and surely by the following day. Needless to say, my entire wardrobe plus toilet articles, shaving equipment, etc., was in the bag. My attache case had only floor plans, equipment lists, etc. It was raining harder. The bus departed on time.

"It had been many years since I last rode a bus. In fact the year was 1946 and the occasion was being mustered out of the military after serving three years plus as a G.I. in the "Big War." The changes that have occurred in this mode of transportation were dramatic to me. Some of these were the presence of an ever-attentive stewardess, a kitchenette with ever-available cold juices or hot coffee, and last but surely not least, toilet facilities. As the bus proceeded down the avenue the stewardess introduced herself and the driver via the intercom and then told us when we were expected to arrive at Flagstaff and when dinner would be served. Soon the lights of Phoenix were behind us. The motor of the bus seemed to be laboring on occasion, and the rain continued. Dinner was

served, pillows were distributed, and the excitement of the day caught up with me. I dozed.

"As I continued to nap, lulled somewhat by the joggling of the bus, I was dimly aware from time to time that the rain had turned to snow. The snow became increasingly evident in the glare of the headlights, and the bus seemed to be experiencing more difficulty as the mountainous inclines became steeper. The divided interstate was now a two-lane road that snaked through passes and clung to canyon walls. Five and one-half hours after leaving Phoenix, we arrived at the Flagstaff bus depot. It continued to snow.

The first glimpse of Flagstaff, Arizona, the following morning was a sight to remember. Fluffy white snow everywhere and an accumulation of two feet on the ground. The grandeur of the landscape was marred only by the realization that I was without razor and change of clothing. A call to Phoenix offered no solution; apparently the bag was lost but the baggage claims clerk stressed the fact that I need not worry, the bag would show up within three weeks. A trip to a local men's wear store was the next step.

The following three days were spent in meetings relating to the new dental auxiliary facility, and it was again time to return to Indiana. The automobile ride from Flagstaff to Phoenix was a beautiful trip; it was especially interesting to watch the scenery change from huge snow-laden Ponderosa pine in the mountains to parched desert in less than fifty miles. My attache case was checked at the airport and our last working session included a luncheon at Sky Harbor.

"The return flight departed one hour late, which necessitated a rapid transfer from one terminal to another at Chicago, but connections were made, and I arrived on time at Fort Wayne only to discover, after waiting at the baggage claim area, that my attache case was lost. I had now been completely wiped out. I had left Fort Wayne with a suitcase and attache case. I had purchased clothing to replace that which was lost, and at that moment had nothing.

"Needless to say, I complained, only to

be told that such a happening is extremely rare and occurs in less than 2% of all air travel and baggage transfers. The clerk's explanation did not help me one bit. I did not want to be a member of such a select group—I asked only that my clothes and papers be returned and in terms I am certain were understandable to him.

"Two days later, my attache case was returned and after a total of ten days, my two-suiter came back. No explanations—just a knock on the front door of my home one evening at 11:30, and there it was. If only the suitcase could talk. I would like to hear its story."

Isn't that wonderful? I thought you would all enjoy hearing of a dilemma that has probably been a familiar one to many of you. Dr. Schimmele, I hope you don't mind that I am letting your classmates and others hear about what happened to you on what was to be an uneventful journey.

1959

It was a red-letter day when I received the following letter from Dr. James Beck, Jr., Associate Professor and Director, Oral Radiology Program, University of Minnesota, School of Dentistry, Minneapolis, Minnesota, 55455:

"How very often I have thought of you during these five years we have been in Minnesota. And each time I receive the School of Dentistry Alumni Bulletin, I look first to your Alumni Notes. And each time I do this, I vow that I simply must write to you. But you have not known of these vows, based on the purest of good intentions, for I have never gotten around to writing you. (I wonder how many other potential letters to you have been similarly paralyzed in the limbo of procrastinated good intentions?) However, each time I think of you and speak of you, it is with praise to the Lord for the expression of His love through that part of His creation known as Mrs. Harvey. (By the way, please do continue including notes about yourself and Evelyn in the Alumni Notes. What better way of answering the letters and cards sent and intended to be sent to you over the months by your dental fans.)

"The 1973-74 school year will be my

sixth year on the faculty of the University of Minnesota School of Dentistry. I am Associate Professor and Director of the Oral Radiology Program that I have developed. I am calling the program the Uminschodent Oral Radiology Program, after the Uminschodent Skull Holder, which I designed and had made for the preclinical phases of the program. The Uminschodent Oral Radiology Program for dental students now consists of four "lecture" courses totalling 50 classroom hours, an extensive preclinical and clinical program and two seminars. The dental hygiene and dental assisting oral radiology programs for the past three years have consisted of two "lecture" courses totalling 30 classroom hours, the same preclinical program as for dental students, and a clinical program. The freshman dental classes for the past three years have had 130 students, the dental hygiene classes 60, and the dental assisting classes some 40 students. The freshman class of '73 has 145, the dental hygiene 100, and the dental assisting only 31.

"Dr. Ramesh K. Kuba has been with me as faculty member number two in oral radiology for three years now. He joined me in August 1970 after he had spent two years in charge of the dental radiology program at the University of Montreal School of Dentistry following his experiences as graduate student and faculty member for four years at Indiana.

"The opportunities and the challenge of the opportunities at Minnesota have been tremendous and tremendously rewarding. And when I consider the past path of my life in dentistry, I marvel at the way and praise the Lord for those who were so significant in the unfolding drama that finds me where I am today:

"Dr. John F. Johnston, who, during my freshman year of dentistry in Bloomington and upon hearing that I was interested in finding a dental school related job in Indianapolis after the move there for the remaining three years of the dental school program, told me that Dr. William G. Shafer was looking for an "animal man" and that I should contact him.

"Dr. William G. Shafer, for whom I worked as "animal man," then as junior

researcher, then as graduate student; whose high standards of teaching and research have been a great inspiration to me and whose encouragement led me to enter the Edward H. Patton competition of the I.A.D.R. in Detroit in 1958—a most formidable experience for such a novice as I, and made even more significant by my winning first place in the competition—and to continue my dental education as a graduate student in his oral pathology graduate program.

"Then, most significantly, Dr. Maynard K. Hine, whom I respect and admire so greatly, who was responsible for my entering the field of dental radiology and the year of graduate work at the University of Rochester School of Medicine and Dentistry in Rochester, N.Y.

"And so the years have flown by, and our James the Third, born at the Bloomington Hospital on November 1, 1955, the night before the mid-semester examination in dental anatomy, is a high school senior this year. By the way, Dr. William G. Brown, also of the Class of '59 and who practices in Kokomo, Indiana, waited with me for the announcement of the birth of child number three as we continued our studying for the mid-semester examination in the crowded waiting room of the hospital. Dr. Brown was known by our children as Uncle Bill; we did much studying together during the first two years of dental school.

"Our Denise and Marilyn are both married. Marilyn was married on Christmas Day 1971, following graduation from high school that same year. Denise was married in May 1972 after one year at Baylor University. Denise's husband is a Minnesota farm boy, a graduate of the University of Minnesota, and currently a new USAF jet pilot. They are stationed at Shaw AFB, Sumter, S.C. They are buying Keith's grandparent's farm near Stillwater, Minn. Marilyn's husband is a Canadian airplane mechanic. He is from, and they are now living in, Moosonee, Ontario, Canada. And the Canadian component of our family was blessed with a lovely little girl on May 10, 1973.

"So Margaret and I are grandparents! And Margaret's current plans revolve around going back to college for a bach-

elor's degree, probably in English. She plans to make the transition from part-time to full-time university student during the coming school year. She got her PHT by helping to put me through dental school; it is now my turn to get the PWT.

"In closing for this time, I want to add my "Amen" to your comment in the Spring 1973 issue of the Alumni Bulletin that indeed "it is a wonderful world."

Dr. Beck, thank you for writing me and telling me all the interesting news of you and your family. I never gave up hope that someday you would write. I can never forget how you were instrumental in my having the opportunity to study the Bible with a group of the dental boys and also at one time some of the medical boys. Those days were some of the most inspiring I ever had and when I hear from someone that was in those classes it really raises my spirits. Thank you so much for writing and please don't wait so long as you and your family have always been special with me.

1962

Deceased: Dr. James A. Bromm, Indianapolis, Indiana. 5-30-73

1963

Dr. Charles R. Hayes, 3032 East Tenth Street, Indianapolis, Indiana 46201, wrote: "Just got my Spring of '73 Alumni Bulletin and noted that our Class of '63 response was as usual slim. I thought I would drop a line to let you know another member of the Class of '63 is still alive and kicking. My wife, Sheila and I have 3 boys, 6, 3, and 1. I am in general practice on the East side of Indianapolis. Our class just had our 10-year reunion and everybody seemed to be very contented. It was very, very nice to see you, Mrs. Harvey, and Dr. Hine after the 10 year lapse."

Since Dr. Hayes mentioned the Reunion of his Class I think you will be interested in hearing a bit more about it. At their banquet held on May 23, with Dr. Reuben White as Master of Ceremonies, they honored Chancellor Maynard K. Hine, Dr. Paul Starkey and me. They gave each of us a plaque and said some very complimentary things about all of us.

Dr. Hine was still Dean when they graduated, so they honored him as Dean and Chancellor. Dr. Hine responded with his usual *savoir faire* and ended his remarks by saying it was a pleasure to be honored along with Dr. Starkey and 'Dean' Harvey and assured the group he knew they called me that but that he tried to help me all he could! This brought down the house and they gave him a standing ovation.

Dr. Starkey was their choice in 1963 as the 'professor of the year' and they wanted him to know they hadn't forgotten him and still felt their choice was a good one.

I was Administrative Assistant to the Dean and Recorder for the School at the time they graduated and I thoroughly enjoyed seeing those fine "boys" again and meeting their lovely wives. To be honored by them was really very gratifying and I assure you it did wonders for my ego and I shall always have a special place in my memories for the Class of 1963 and the plaque they gave me. It seems to me that the 1963 Class enjoyed the May Meeting but somehow found time to spread sunshine too. It was so thoughtful of them that I just had to tell you all about it. And again, to the Class of 1963, my heartfelt thanks.

1964

Dr. Ronald M. Patterson announces the removal of his office to 7780 North Michigan Road, Indianapolis, Indiana 46268. Thank you Dr. Patterson, for remembering us when you sent out those announcements. We do like to keep our files up to date.

1966

Dr. William H. Bond of 16 Hancock Street, Lexington, Mass., 02173 has some nice words for us. In his letter of July 1, 1973 he said: "*I always enjoy the Alumni Notes you publish even though I don't know most of the people. Next semester (July 1st) I will start a two-year Prosthodontics residency at Harvard University. Thank you again for publishing Alumni Notes. It makes us seem like a closer group.*"

Dr. Bond, it sounds as if you are certainly interested in keeping up with dentistry

and that is so good. I rather think you will enjoy "hitting the books" again. I hope so.

Dr. R. R. Waldon, 4045 Wadsworth Blvd., Wheat Ridge, Colorado 80033, wrote me such an inspiring letter that I just sat and cried after reading it. Those of you who know me know that I believe that God is real and only because of His love for me was I permitted to spend all those wonderful days, months, and years working with students, faculty and the many people who became a part of my life in Indianapolis. So it is only natural when someone writes me of their experience in finding the Truth and the joy that accompany such treasure that I want to shout it to the whole world.

Dr. Waldon, you know how happy your letter made me, and I hope that those who read find joy in the fact that not only have you found the Lord but you are not ashamed to tell others about it. May God bless you in your witnessing for Him. Please write again. P.S. Thank you for the picture of you, your wife and your three children (one boy and two girls). Your faces reflect the happiness you are enjoying.

Dr. Luis Sanchez, who received the M.S.D. Degree in Operative in 1968, wrote to inform us of his present address: Department of General Dentistry, University—McCook Hospital, 2 Holcomb Street, Hartford, Conn. 06112. Thank you, Dr. Sanchez, for this brief note. Do find time some day to write us about your activities.

1969

The Chapel Hill Newspaper of Chapel Hill, North Carolina, has a most interesting article concerning Dr. Roy V. Green and it reads as follows: "*A young dentist practicing in St. Croix, Virgin Islands, is the winner of the first Morehead Fellowship in Dentistry at the University here. Roy Vincent Green, 30, who specializes in pedodontics—the treatment of children—earned his B.A. and D.D.S. degrees at Indiana University, where he won several awards, including the Student Leadership Award in 1969. At UNC he will do post-doctoral studies in pedodontics.*"

"The Morehead dental fellowship is valued at \$5,000, plus tuition and fees, to

cover expenses during two years of study here. According to Mebane Pritchett, executive director of the Morehead Foundation, the fellowship was established to contribute to the excellence of the University's School of Dentistry by attracting to its graduate programs students of superior character and academic achievement who show unusual promises of distinction in their chosen field of specialization.

"Green was selected by a special committee of faculty members from the UNC School of Dentistry and North Carolina dentists. Dr. James M. Bawden, dean of the School, headed the committee. Members were Dr. Gerald Cathey and Dr. F. Webb McCracken of the Dentistry School, Dr. William Davis of Chapel Hill, Dr. Jacob Freedland of Charlotte and Dr. James Harrell of Elkin, past president of the UNC Dental Foundation and president-elect of the N. C. Dental Society.

"The Foundation also awards fellowships in the University's Law, Medical Graduate and Business Administration (graduate) Schools.

This clipping was sent to Dr. Paul Starkey by Dr. Green and Dr. Starkey sent it with Dr. Green's letter to me and I am so grateful. Dr. Green writes: "Dear Doctor Starkey: If you have talked with Dr. Oldenburg recently then you already know that he was instrumental in selecting me as the first Morehead scholar in the graduate school of dentistry.

"I want to thank you again for your fine recommendation as I feel that it was primarily on this that he based his decision in the selection committee when they made their choice in this very important fellowship.

"I am really looking forward to limiting my practice to children and returning to school next Fall. The prospects for the sale of my practice have been fantastic. I am sure I will miss private practice, but if I go on teaching at the University of North Carolina their intramural program seems most rewarding.

"Many thanks again for your inspiration and advice and the fine recommendation you have given to me. I look forward to meeting you at professional meetings this next year."

Congratulations, Dr. Green. I am sure all who know you feel that you are capable of doing all the things this new honor will require of you. We wish you the best and ask that you write us a letter sometime about how things were at St. Croix! and how they are at Chapel Hill.

1970

Dr. Gary G. Hickman, 162 North Avenue, Battle Creek, Michigan 49017 wrote me in May of 1973. "Since I read your article in the fall issue of the Alumni Bulletin asking for more letters from Indiana graduates, I've been procrastinating writing to you, so here it is.

"First of all, I want to wish you the best in your new environment at Bloomington, and I know that by now you are well adjusted and enjoying the many patterns of a new way of life.

"My wife, Jeanne, and I have been in Battle Creek, Michigan since graduation from dental school in 1970. You're right!—that's where Kellogg's breakfast cereal is made and everyone asks me that. I took over another dentist's practice—he left to go back to University of Michigan Dental School and teach—and I have been busy since the start. I like it like that—just can't sit still.

"We have a new son, Ryan, who is 7 months old, and quite a little boy. We really enjoy him.

"We participate in the outdoor activities that Michigan offers. We snow ski in the winter, and camp and fish in the summer. We've even taken two trips to Colorado and Utah on combination skiing-dental convention trips, and plan to make this an annual event.

"I did some dentistry on a couple of animals with the aid of a local veterinarian who is a good friend of mine—he gave the anesthetic. They did a real nice job writing it up in the local paper, and taking pictures, so I'm sending you a copy. The same article was picked up by A.P., and circulated to several towns here in the state, so I got some free publicity. In closing, we enjoy your letters concerning our many friends, so keep up the good work."

The article is so interesting I think our readers will enjoy it. It is a quote from

the Enquirer and News, Battle Creek, Michigan, Sunday, September 24, 1972, and is titled "Happiness is a good Bite"

"Vyeksha, the Siamese cat, and The Baroness, a Brittany spaniel have one thing in common. Both have a gold-crowned tooth that has restored their bite and enables them to eat normally—thanks to root canal dental surgery usually reserved for people.

"It's a costly and lengthy procedure, so the two pets are lucky their humans are in the dental business and good friends. Vyeksha rules the domain of Dr. and Mrs. Gary Hickman of 117 S. Mooreland Drive. The Baroness belongs to Allen Steeves of 73 Champion St., who has a dental laboratory in the same building where dentist Hickman's office is located.

"It all started with the Baroness, a normally bouncy and friendly dog who loves nothing better than to go hunting with the two men. But at the season's start last year, she obviously was ill. For several days the usually ravenous dog refused to eat a bite.

"She was literally starving to death, Steeves recalls, before they found she had a chipped cuspid that was starting to abscess. Normally the procedure in such a case is to pull the tooth, Hickman explained, but they wanted to avoid that if possible. Dogs and cats are meat eaters, he said, and need their long canines to function.

After weighing the pros and cons, the men decided to try to save the tooth by root canal surgery. This involves removing the damaged nerve and the area affected, medicating and sterilizing the tooth-interior, then rebuilding and topping it off with a gold cap.

"Both men had heard of root canal work being done on large zoo animals but never on one as small as The Baroness. But they decided it could be done. Hickman, who before studying dentistry had received a master's degree in physiology and had a course in animal surgery, would do the canine dental work. Steeves would make the crown. The Baroness recouped beautifully from her several-hour operation.

"Then Vyeksha had a tooth chipped when hit by a car. It too abscessed, but

they tried draining it several times before resorting to surgery.

"A veterinarian advised against removing the tooth. In addition to creating an eating problem and leaving him defenseless, removal would create another problem. The tooth, X-rays showed, was curved into the maxillary sinus. Surgery would doom him to a life time of sinus sneezes and sniffles. Again the men decided to try the root-canal surgery even though the cat was so much smaller than the dog. But when the cat didn't come out from under the anesthetic for two days, 'I was frantic,' Mrs. Hickman recalls. 'Vyeksha is like a baby, docile, loving and spoiled rotten.' Vyeksha did come out of it, lively and as much of a lap-jumper as ever. He keeps a tip of that one gold fang showing, as if proud of his unusual tooth.

Since then, the Battle Creek men have read several accounts of similar root canal surgery on home pets and have even heard of one California dentist who has given up his human patients to work only with animals, 'But I wouldn't do it again,' Hickman declared emphatically, as if to forestall the idea that he has any such plans."

How I wish you all could see the pictures. Both the little animals display their gold crown with such pride. Dr. Hickman, I venture to say you have had many requests to perform similar operations! Thanks again for a good story and best wishes for happy skiing this winter.

A letter from Dr. Roland M. Yaros says, "Please send the Alumni Bulletin to my new home address: 12278 E. Louisiana Drive, Aurora, Colorado 80012.

"A lot has happened to us since we left Indianapolis. Our first year out of school was spent at Travis AFB, San Francisco doing an Air Force Internship. We were then assigned to Lowry AFB, Denver for a two-year stay. Both Chris and I hated to leave the Air Force, especially since they paid for a 4-week vacation in Japan and the birth of our new son, Craig.

"But, we made up our minds that we should try private practice so here we are. My office is in suburban Denver at: Buchtree Center Suite 201, 1930 S. Havana Street, Denver, Colorado 80232. We have had the office open about two months now, and things have gone much better than our

expectations, so I think we're here to stay. The skiing is out of this world, too!

"We will look forward to continued news of the other alumni."

Thank you, Dr. Yaros, for your good letter, and it is nice to know that you are happy in what you are doing. I think Denver is becoming very popular with dentists because they all seem to like to ski. Today is Homecoming Day at I.U. and right now the I.U. football team is battling it out with the team from Ohio State. The World Series is scheduled to go on the air in about an hour and here I sit pounding the typewriter hoping to get this in to Dr. Phillips by Monday. Of course this is Saturday—it is October 20—a beautiful autumn day—just perfect for football! So while we Hoosiers don't have much skiing we sure do go in for football, basketball and baseball. How I hope Indiana wins today but no one seems too hopeful! Late flash! We lost! But those who saw it said it was a good game.

1971

I don't often hear from our lady dentists so it was a pleasure to get the following letter: *"I graduated from I.U. Dental School in 1971. My classmates will know me as Marilyn Greene. However, I have assumed my maiden name, Cosby, for my professional usage."*

"I am now a Pedodontist, having completed my pedodontic training at Ohio State University and Columbus Children's Hospital in June 1973."

"I am now living in Baltimore where my husband is interning at The Johns Hopkins Hospital. We are expecting our first child in January '74; therefore, I am practicing only part time in a Baltimore City Health Clinic."

"We are planning to return to Indianapolis in another year and a half. Please note the change of name and address for your records." Dr. Cosby gives her address as 550 N. Broadway, No. 808, Baltimore, Md. 21205.

Thank you, Dr. Cosby, for writing us the good news about yourself and family. I often think about the women who graduated in the 27½ years that I was associated with the dental school in Indianapo-

lis and only wish more of them would let us know where they are and what they are doing. Maybe your letter will be an incentive to them. I hope so. We shall expect another letter after January '74 telling us if it is a boy or a girl or maybe one of each! Best wishes always.

Dr. Charles (Chuck) E. English, 40 Pleasant St., Marblehead, Mass., 01945 sent us a brief memo: *"June 25, 1973—out of Army—will have one-half time practice in Marblehead, Mass., and teach one-half time at Tufts University in the Restorative Dentistry Department."* Dr. English, while that was "short and sweet" we are so grateful you took time to keep in touch. I have a feeling you are going to be quite busy with that schedule but if you can, please write us again and tell us how it all works out.

So happy to receive an interesting letter from Dr. Virgil Ullom and his wife Lea from P.O. Box 90-B, Port-au-Prince, Haiti, West Indies. Those of you who know Virgil and Lea knew they were returning to Haiti to continue their calling to minister to the people of Haiti, first with the love of God and then dentistry by Virgil and nursing by Lea. They had to learn French, the dental clinic had to be built, and it seems there were many obstacles to be overcome before they were doing what they had prepared themselves to do, but the clinic is finished and the pictures indicated they have quite a clinic. Just a few days ago I received the letter which they send out to those who have a special interest in their work and I think you will be interested in what Virgil has to say about what he is doing: *"Greetings from the Pearl of the Caribbean! It is a joy to announce the opening of the Bethesda Dental Clinic! Here in these pictures you will see a little of the clinic's operation. There are nine rooms covering a total of 1300 square feet. This includes the reception area, records, dark room, laboratory, office, and four treatment rooms (one for the hygienist, one for oral surgery, and two for fillings). A few unfinished details remain, as there are in most new buildings, but even so we were able to see 172 patients during the month of June, 411 in July and 490 in August."*

"Before coming to the dental clinic the patients attend a chapel service geared to meet their spiritual needs. They then enter the reception room where we begin our preventive dentistry program. Each individual is instructed how to brush his teeth and he is encouraged to regularly care for teeth so that extractions will not be necessary.

"Usually the Haitian people think the dentist is a person who only pulls your teeth when they become too painful to endure. Seldom do they think in terms of preserving their teeth by proper care. It is often only with lengthy explanations and much persuasion that some are convinced that teeth can be filled and with proper care can endure a lifetime.

"I wish this letter to be a 'special thanks' to you for all you did to make this clinic possible. I will not list the names of those who have helped in so many ways but to me it is a very special list. There are those who gave encouragement many months ago by their advice and suggestions. Others helped to collect supplies for the construction and equipping of the clinic. Others helped to crate and ship these items to Haiti. There are those who came great distances and worked long, hard hours to construct the clinic. Also, there are those who prayed and gave financially to make this outreach possible. Men for Missions and The Christian Dental Society were especially instrumental in making this clinic a reality, and I wish to express to them our appreciation.

"Also it is with real heartfelt gratitude that we acknowledge the many funds which were given in the memory of Leon and Lorna Steel. This memorial makes the clinic even more special to us. Their memory emphasizes the shortness of life and the contentment that can only be found by serving Him."

Then Lea added a little note to me and I am going to share it with you: "It's because of God's working through people like you that all this is made possible. Thanks so very much for all you've done and are doing! We are thrilled for all the Lord is permitting us to be involved in here. The dental clinic is going well and Virgil has a very busy time trying to keep

up with his crowded appointments plus all the 'extras'. How have you been feeling? Did you have a good summer? We are all fine. The children are enjoying school here on the Compound with about 20 other missionary kids. Wish you could come visit us and see the work here."

Dear Virgil and Lea—your letters are always so interesting and informative. You have waited so long for the clinic to get going and it certainly sounds as if "God's in His Heaven, all's right with the world". At least in certain parts of the world—to-day is October 21—and yesterday our President fired Archibald Cox, then Elliott Richardson resigned, and the President fired William D. Ruckelshaus! We are certainly making history and it will be interesting to live long enough to see how the historians handle this period in our time. As you all may have guessed, this column is written at different sittings! Today is the last day of the World Series and Evelyn is going to get up and watch it even if it means another day in bed! If she doesn't get well pretty soon we will invest in a portable T.V. for her bedroom.

1973

We have learned that Dr. Robert J. Achterberg's new address is 5200 Belgreen Street, No. 401, Suitland, Maryland 20023. Best wishes, Dr. Achterberg, and we would love to hear from you.

Dr. Dennis Bailey of 3732 Lake Bend Dr., Dayton, Ohio 45404 wrote Dr. Bogan a letter and Dr. Bogan very kindly sent it to me so I could send you all some news of one of our recent graduates: "Dear Dr. Bogan: Please excuse the informality of this letter but I wanted to drop you a line and enclose the pamphlets describing courses offered here at the hospital where I am interning. If anyone at the school would be interested in any of these courses you can write to the address on the application."

"The program here is developing into quite an experience. I am quite busy and am learning new things all the time. Being here really strengthens my feelings about the value of a postgraduate internship. There are four of us here and we spend time rotating through Internal

Medicine, Surgery, Anesthesiology and the outpatient dental clinics, as well as being on call. I would recommend this program very highly to any of this year's seniors.

"I hope these courses prove helpful to some of the people at Indiana. Please give my regards to Dr. McDonald and to everyone at the school."

I am sure you all are beginning to realize that I have to depend on many different grapevines for material for this column and I am grateful to all you dear people who remember to send me letters to include in Alumni Notes. We have 3 or 4 notes from 1973 graduates and that is something.

A recent clipping given to me by one of the boys I counsel on the Bloomington Campus informs us that Dr. James T. Cirgin announced the opening of his office for the practice of General Dentistry at 51 N. Main St., Spencer, Ind. The article also said that he is a part-time staff member at the dental school in Indianapolis. Congratulations, Dr. Cirgin, and best wishes for your success.

Dr. John W. Green, 615 Magnolia Street, New Llano, Louisiana, 71461 also gives us his telephone number—318-238-1023. He said: "My wife and I send 'warmest' regards to the people in your office from the tropical paradise of southwestern Louisiana. Keep up the good work, and best wishes."

That is a lovely note on which to conclude Alumni Notes. Don't forget us—please write—be good to yourselves—God bless you all.

DENTISTRY'S IMAGE

(Continued from page 22)

2. Minimize criticism of other dentists since experience proves that it rarely accomplishes its intended purpose, and may affect the general image.
3. Make fair charges for dissemination of professional advice as well as for definitive services rendered.
4. Demand that those concerned with governing organized dentistry concern themselves with any propaganda which will improve the public's image of a deserving profession.

PAST-PRESIDENT'S MESSAGE

(Continued from page 23)

parts, intramural and extramural. For a number of years now an X-L program has been in operation for the senior students. X-L refers to extra learning experience to provide the opportunity for the student to excel. Once the student has been cleared by the faculty sometime during his senior year to enter this program, he is able to elect to take a number of these courses. They range from opportunities to do research, to attend formal lecture courses, and clinical experience with difficult cases. The intramural portion of this new curriculum would consist primarily of the X-L Program, revised and expanded. The extramural program will provide opportunities for the student to spend a number of weeks in the private practitioner's office. I understand that this opportunity may exist in his hometown or perhaps at any city in the state. He may spend several weeks as an expanded duty auxiliary followed by serving as a dentist under the supervision of that private practitioner. The program is designed to bridge the gap between undergraduate education and practice.

MICROBIOLOGY

(Continued from page 19)

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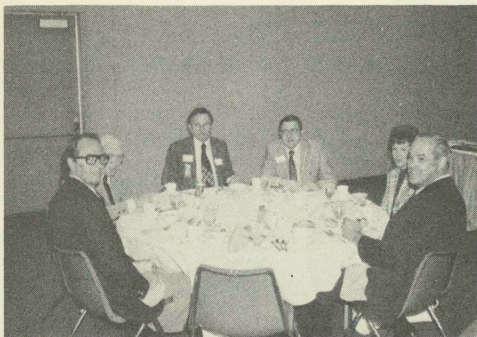
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THE BOOKSHELF

(Continued from page 66)

AN INVESTIGATION OF THE SETTING EXPANSION OF A REFRACTORY DIE MATERIAL

Theodore T. Wilson

This study investigated the effects of three clinically relevant variables on the setting expansion of a refractory die material. The variables were liquid/powder ratios (13 cc, 14 cc, and 16 cc), impression material thickness (3 mm, 4 mm, and 6 mm), and two impression materials (mercaptan and silicone).

A stainless steel die of a crown preparation and a M.O.D. onlay type of preparation posi-

tioned to simulate a three unit bridge was used as a control. From this stainless steel master die, refractory die models were made and accurately measured for horizontal and vertical setting expansion.

The data were statistically analyzed to determine if these variables affected the setting expansion of the refractory die material. An analysis was made comparing each group to the control as well as a comparison of intergroup differences.

It was shown that there cannot be a single figure given for the setting expansion of this material because it is not uniform. The results also indicate that the setting expansion may now be better predicted because it depends significantly on the environment that exists and this consists of the configuration of the preparation, the impression material used, and the configuration of the impression trays.

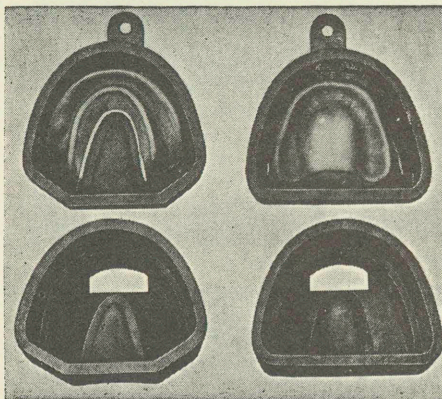
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