

Alumni Bulletin

SCHOOL OF  
DENTISTRY

Spring Issue 1976

Indiana University

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School of Dentistry  
ALUMNI BULLETIN

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# Indiana University School of Dentistry ALUMNI BULLETIN

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# Principles and Techniques in the Management of Cellulitis

*James H. Dirlam, Associate Professor and Chairman of Undergraduate Oral Surgery*

Any dentist, whether in general practice or a specialty, is confronted occasionally with the patient having a facial cellulitis. He must then determine if he wishes to treat it himself or refer it. Facial cellulitis is not always of dental origin. The differential diagnosis is often obvious, but may be quite difficult.

The condition can be mild or can be life-threatening. Treatment is dependent on the following factors: symptoms, origin of the infection, etiology (type of microorganism), and concurrent systemic disease. The decision to refer or not to refer may also depend on these factors.

## SYMPTOMS

Each symptom is important and may influence our treatment one way or another, but usually it is an evaluation of all symptoms that will determine successful treatment. The old classic symptoms of tumor, color, rubor and calor are still apropos and will be discussed separately, along with others.

### Swelling

The swelling may be small and confined, or it may be massive and involve most of the parapharyngeal spaces. It is usually soft and edematous at first, becoming more firm as pus forms. Pus will be formed anywhere from 24 hours to 10 days. Unless the localization is deep beneath the surface, this will manifest itself as a fluctuance. As it approaches the surface a soft dimple will often be noted in the center of the firm area. When fluctuance is subtle it can often be detected only by bimanual palpation—sometimes by placing one finger intra- and the other extra-orally. The size of the swelling considered alone does not dictate vigorous treatment as much as its location. I am much more concerned about a periorbital cellulitis, other symptoms

being equal, than I am about a submandibular cellulitis because of retrograde venous drainage. Involvement of the infratemporal fossa has the same potential because of the various venous anastomoses with the cavernous sinus. A massive submandibular and sublingual cellulitis that elevates the tongue should receive special consideration because of its potential of respiratory obstruction and spread through the fascial spaces to the lateral-pharyngeal and retropharyngeal areas.

A term which is often used in connection with cellulitis is phlegmon. This is a severe, non-localized cellulitis. An exudate is formed, but it is spread diffusely through the tissues and does not localize. A true Ludwig's angina is a phlegmonous cellulitis.

### Pain

Pain is due to pressure of confined fluid, as within the capsule of a sinus cavity, at the apex of a tooth or in a fascial space. Pain may be very helpful in determining the origin of the infection. It may help us to determine the localization of pus when it is impossible to palpate, thus indicating the proper time for incision and drainage. Pain is all-important in the evaluation of postoperative progress.

### Redness

There will usually be a generalized erythema over the area of cellulitis, increasing as the point of fluctuance is approached. It is due to vascular dilatation as part of the inflammatory response. As the process progresses, the area of fluctuation will become more and more cyanotic, depending on how close to the surface it is. This is due to breakdown of red blood cells by hemolytic bacteria and by stasis of blood flow to the skin over the abscess. If it is very deep within the tissues there may be very little erythema.

### Temperature elevation

The "calor" from the classic symptoms refers to the heat felt in the area of the cellulitis. This is also due to vascular dilatation and is only relative to the surrounding skin. Exposed skin temperature is normally less than the general body temperature.

Temperature elevation can be extremely variable—all the way from 99 to 105° or more — and is not necessarily correlated with severity. A patient in whom all other symptoms indicate a severe process may have a temperature of only 99 to 100°. The reverse may also be true. Children often show a greater pyrogenic response than adults. Also to be considered is the fact that when the patient is first seen he may have been on antipyretic analgesics.

### Systemic symptoms

We must also consider malaise, anorexia, pulse change, etc. What is the general toxic appearance of the patient? How bad does he feel? If he looks sick (pale, cold sweat), has anorexia, and a rapid, weak pulse, he then has a more or less severe process and should be treated as such. The severity of the process may depend more on this category than any other one symptom.

### Trismus

One other symptom which will influence our treatment or complicate our treatment is trismus. Any infection around the muscles of mastication, from whatever cause, can produce a trismus. This complicates the problem sometimes by preventing the removal of teeth and by making the incision and drainage of sublingual infections from the intra-oral approach very difficult. If general anesthesia is planned, intubation becomes a problem when trismus is present.

## ORIGIN OF THE INFECTION

### Dental infection

The most common cellulitis that we deal with about the oral cavity is of dental origin—periodontal, pericoronal or non-vital teeth. The diagnosis of a non-vital tooth as the source of the problem is

usually obvious. X-ray will usually show an area at the apex. However, if the process is very early, the change may be subtle or if the tooth has a lateral foramen the radiolucency may be obscured by the root and the apex may be clear. The usual history is that the patient noted pain in the tooth for a day or so which suddenly subsided at the time when the swelling began. The pain was due to pressure at the apical area which was relieved when the infectious process broke through the cortical plate of bone, allowing expansion into the soft tissues. The tooth will usually remain tender, elongated and mobile. Throbbing pain will return in a day or so as the process is localized and pus builds up pressure in the tissue.

However, all these symptoms relative to the tooth may be lacking. Sometimes we are confronted with the problem in the patient with multiple carious teeth where the source may be any one of half a dozen teeth. In such a situation we may have to use all of our diagnostic tools—X-ray, history, symptoms, including pulp testing with the Vitalometer—to rule in or out the teeth as the source of infection.

In the case of a periodontal or pericoronal abscess the local process may be chronic and produce no symptoms, but may dissect under the periosteum or through the tissues to produce a cellulitis somewhat remote from the offending tooth.

There are many other entities about the jaws that we occasionally must consider in a differential diagnosis of cellulitis.

### Non-specific lymphadenitis

Cellulitis secondary to lymphadenitis is often seen in young children. It involves the submental, submandibular nodes and other nodes in the area. It starts simply as a lymphadenitis, etiology unknown, and progresses to a cellulitis with abscess formation. The same problem can occur in adults; however, pimples or other skin lesions or infected sebaceous cysts can usually be implicated by history or examination. In both situations, the organism is usually a staphylococcus or streptococcus and will clear promptly following incision and drainage, antibiotics or both.

Also to be considered here is the cellulitis produced by submandibular involvement due to tuberculosis, actinomycosis and cat-scratch fever. These entities do not usually produce an acute cellulitis but on rare occasions any of them may have the cellulitis as the presenting symptom and simulate a dental infection.

In reference to tuberculosis, the atypical mycobacteria of which there are four groups (Runyon mycobacteria) should get special consideration. They have a special predilection for the cervical nodes and may be the primary site.

#### **Acute sinusitis**

In severe cases maxillary or even ethmoidal sinusitis can cause a cellulitis that needs to be differentiated from non-vital teeth. The fact that sinusitis causes teeth to be tender adds to the confusion, but this usually causes multiple tender teeth in the area. One must not be misled by the presence of a carious tooth if history, symptoms and X-ray indicate a sinusitis.

#### **Sialadenitis**

Submandibular or parotid sialadenitis should be easy to differentiate but often is not. A history of chronic obstruction, previous acute episodes, purulence from the duct, X-ray of stone, etc. should pinpoint the diagnosis.

#### **Areas of extravasated blood**

Any area about the jaws that has received trauma is prone to infection either by the hematogenous route or through a clinical or subclinical break in the mucous membrane or skin. This is especially true if a hematoma is present.

#### **Postoperative cellulitis**

Postoperative cellulitis deserves special attention because it must be differentiated from postoperative edema. This is often not as easy as one might think because of overlap of symptoms.

Postoperative edema usually increases for 36 to 48 hours before it tapers off and begins to subside. On the first postoperative day there may be little swelling or edema. By the second postoperative day edema may be greatly increased without

causing concern. If by the third postoperative day there is still an increase in swelling, then we think of infection. There may be very little reduction in the swelling between the second and third day; however, there should not be an increase if it is due only to postoperative edema. Edema is usually softer than a cellulitis. If the edema is severe, it may be drum-like, in distinction to the board-like texture of a severe cellulitis.

The term "fluctuance" is not confined to a localized area of pus. There may be a fluctuance due to a hematoma in a postoperative edema. If extravasation of blood or hematoma does occur, resolution will be much slower.

Pain is an important symptom in differentiating edema from cellulitis. There may be severe pain in the early postoperative phase, but it will usually be markedly reduced on the first and second postoperative days, although edema may continue to increase. The patient may be uncomfortable but should not have any great degree of pain. If this pain does not diminish or starts to increase on the second or third postoperative day, then one thinks of infection. We must not forget that the patient who is severely edematous from tooth removal or impaction removal may by the third postoperative day have severe pain from localized osteitis, and may not be developing a cellulitis. When I see a patient on the third postoperative day who is quite edematous and is having pain, I ask (if I did not see him the day before) if his edema is more or less than it was the day before. If he tells me that his swelling has gone down but the pain is increased, then his problem is probably a localized osteitis and should be treated by thorough irrigation and by placing a dressing in the defect. Pain relief should be prompt if the problem is local.

Temperature with postoperative edema can often be misleading. In rare instances, it can go over 100° in the absence of infection. This is presumably due to the pyrogenic factors liberated in the tissues in the process of the inflammation (bearing in mind that this "swelling" is inflammation whether the irritant be the surgeon's trauma or pathogenic micro-

organisms). We must remember also to consider the patient's fluid intake along with climatic temperature if he is an out-patient. Dehydration will elevate temperature. At times merely supervising the patient's hydration with carbonated beverages for an hour or so will dramatically change his outlook and bring the temperature to normal. If an elevated temperature can not be explained on the above basis and other symptoms of infection are not present, then look for a *concurrent problem*, such as a pneumonitis if the surgery was under general anesthesia, or other medical problem.

Trismus following surgical trauma is usually minor and subsides rapidly unless infection is present. Often the trismus that is present postoperatively is a false trismus. The muscle is painful, but if the patient really tries or works with it he can actually open his mouth. When trismus is present following infection the patient can absolutely not open past a given point and cannot be forced past this point. The trismus is slow to subside even after other symptoms of infections have resolved and physiotherapy may even be required for complete return to function.

The white blood count and differential are of little help in differentiating cellulitis from postoperative edema, for there can be a similar leukocytosis in both—remembering again that they are both inflammatory processes. General anesthetic alone will produce a leukocytosis.

The systemic symptoms other than elevated temperature are again most important in recognizing a postoperative infection. General toxicity, anorexia and malaise should not occur with edema. If these are present together with other symptoms, then we undoubtedly are faced with a postoperative infection, remembering of course that an adverse drug reaction or other concurrent problem must be considered.

## TREATMENT

The two basic tools in treatment of infection are surgery and antibiotics. When pus is present it must be evacuated. If a small amount is present it may be absorbed, but this is a slow process and in

the meantime the infection may spread along the fascial planes. It may be walled off only to recur later. Antibiotics do not alleviate the necessity for surgery (evacuating the pus when present and possibly removing the source, such as the non-vital tooth).

There is no contra-indication for removing the tooth at any time if this can be accomplished *atraumatically* and if *anesthesia can be secured*. If removal of the tooth is going to be more than a simple extraction, when there is the possibility of a fractured root and the need for a flap elevation, then the patient should be placed on antibiotics, heat should be applied locally and we should wait for either localization or resolution of the process. It may be indicated that the tooth can be saved for endodontic or periodontal treatment; however, unless the infection is arrested early by antibiotics, drainage is still essential. Opening the pulp chamber is often inadequate. An incision and drainage should usually not be accomplished until fluctuance is noted, whether it be intra or extra-oral. If fluctuance can not be palpated because of its location, time and symptoms may indicate its presence. When after 48 hours or more the patient seems to be static in his progress (no worse but no better) drainage should be considered, which may be accomplished by removal of the tooth. If that is not feasible, then incise and drain.

In postoperative infection drainage is usually accomplished by irrigation of the surgical area, unless pus has localized in an area remote from the original surgery.

Moist heat is always good adjunctive treatment. Intra-orally this can be accomplished with hot saline. The patient must be watched so that he does not misplace the heat. In maxillary cellulitis the heat should be kept away from the eye, for this will tend to increase the periorbital edema. For submandibular cellulitis there is a tendency to allow the hot towel or hot water bottle to lay down on the chest over the sternum. This will increase edema at this area and may be quite frightening. Heat should be discontinued after localization to prevent a skin slough over the area of fluctuance.

When incision and drainage are performed intra-orally, the procedure is usually done over the maximum point of fluctuance. For better cosmetic results extra-orally, the incision should be placed down a centimeter or so into healthier tissue, and dissection is carried up to the pocket. This will give less dimpling or less retraction of the scar than would occur at the maximum point of fluctuance. It may also place the scar more in the shadow of the mandible. The incision need only be long enough for adequate irrigation and drainage—usually between one and two centimeters. This is in contrast to the general surgery concept that the incision should be at least as long as the diameter of the abscess.

Drains are usually not necessary intra-orally if the abscess is well localized and not too extensive. If gauze is used as a drain, it often acts as a plug rather than a drain. Intra-orally it is easy to reopen the incision the following day if further irrigation is deemed necessary. A Penrose drain is usually indicated extra-orally. If localization is complete and irrigation adequate, the drain will have served its purpose in 24 hours and should be removed. If drainage persists, the drain should be left as long as indicated.

Although the antibiotic of choice for cellulitis of dental origin has always been considered to be penicillin, a recent study, by Gabrielson and Stroh<sup>1</sup> concludes that erythromycin might be a better choice. Erythromycin has always been a second choice in cases of history of allergy to penicillin. The most common organism is an alpha streptococcus. In a postoperative infection the chances of having a penicillin-resistant organism seem to be greater. When there is drainage or an incision and drainage is accomplished, a culture and sensitivity should be secured; then if the treatment proves to be ineffective there is something to fall back on. The patient should be placed on an adequate dose of antibiotics and maintained for at least seven days even though symptoms subside. The present penicillin-V preparations have good gastrointestinal absorption. They have the added advantage of being less likely to sensitize the

patient to penicillin, and in the case of the patient with an unknown allergy to penicillin there is much less chance of severe immediate anaphylactic reaction. Very severe reaction can occur, but it does not happen quite as fast as with the parenteral administration. In a very severe cellulitis I feel more secure with parenteral penicillin, with a possible change to oral administration as symptoms subside. If erythromycin is considered, the potential for hepatotoxicity should be remembered. This has not been reported with erythromycin stearate. If the organism is resistant to penicillin and erythromycin there are many other antibiotics to consider and their use should be based on sensitivity tests, mode of administration and side effects. A complete discussion of antibiotic therapy is beyond the scope of this paper.

### Anesthesia

Anesthesia in the presence of inflammation may be a problem. Local anesthesia must be a nerve block away from the field of inflammation. There is no contraindication to infiltration; however, little or no anesthesia will be obtained. It is contraindicated to go through an area of infection into a normal area, as this might transplant infection. Even after the process is fairly well resolved, there may be enough local inflammation to preclude infiltration anesthesia. For maxillary teeth the second division block via the greater palatine foramen may be a method of choice unless there is an inflammation in the area of the foramen. Usually, we are able to give a mandibular block for the lower teeth without violating an infected area. When a tooth has been aching and is tender, the patient's pain threshold is lowered. A block anesthesia must be more profound than usual, but since there is no inflammation in the area of the block it should produce anesthesia. For an incision and drainage, submucosal or subcutaneous infiltration in the area of the incision is usually adequate. The patient may complain of pain when the tissues are spread deeply but this will be minimal. Pre-medication with a sedative may be indicated.

*(Continued on Page 52)*

# Dandelions, Dental Research and the Prevention of Dental Plaque

Simon Katz, Professor of Preventive Dentistry

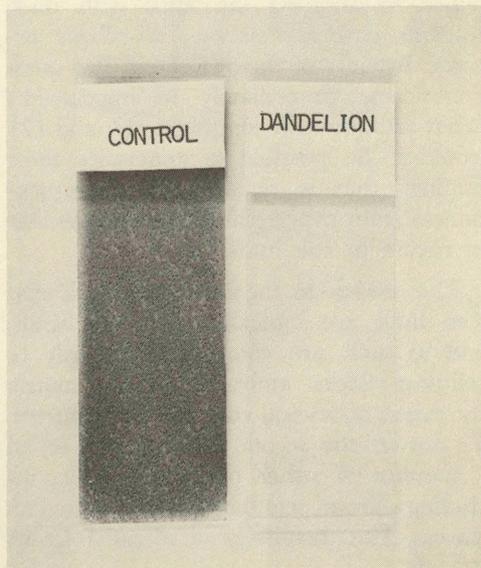
It is frequently said that the Lord moves in mysterious ways, and this report about dandelions confirms once more the wisdom and accuracy of the old saying. For how many times have you breathed a profanity (or two) while straining your back to remove dandelions from your beautiful front yard (and maybe your backyard too) and thinking all the time that in a couple of weeks they would have grown bigger, stronger, and uglier than ever? Wouldn't you be surprised if you were now asked to please save and collect your dandelions for us because they just may contain the elixir of plaque prevention?

Please don't laugh! I'm not kidding! Ongoing research at the Oral Health Research Institute demonstrates that substances can be obtained from dandelions which inhibit *in vitro* plaque accumulation in a most dramatic way. If this sounds too fantastic to be believed, just take a look at the photograph which illustrates this article. It shows two glass slides which were incubated with the arch villain which bears the name *Streptococcus mutans* and would surely be "Number One" if the FBI had a list of the ten most wanted plaque-forming bugs. One of the slides was incubated in a medium containing one-fifth of one percent of a chemical fraction obtained from dandelions, the other in the same medium devoid of this fraction. What do you have to say now?

Incidentally, our research demonstrates that chemicals can be obtained from a variety of plants which drastically reduce, and even eliminate, *in vitro* plaque growth. The list of plants or plant products which have been tested so far includes oat hulls, spinach, buckeye tree leaves, dandelions, peanut shells, lettuce, cabbage, corn leaves, corn husks, turnips, and grass. (Just a minute, please! We're experimenting with plain lawn grass, not the grass used in some weird cigarettes. On second

thought, it just could be that "pot" might yield anti-plaque fractions even more effective than those derived from common grass. But for goodness sake, let's not think of that possibility.)

Although these are initial *in vitro* results and there is no assurance at this time that the same effect will be obtained *in vivo*, the School of Dentistry can be proud of these discoveries on at least two counts: (1) they were made in one of the School's laboratories, and (2) even more important, most of the dandelions came from the exuberant, luxurious and juicy dandelion "field" which leads a hardy existence on the edge of the parking lot across from the IUPUI Purchasing building on New York street. To give credit where credit is due, it is only fair to recognize that Dr. Bradley Beiswanger's sons contributed part of the dandelions, and that the grass used in the initial experiments was mowed by my own son, Victor. In fact, I am convinced that, should these findings result, through continuing research, in a system or systems useful for the control of human



Plaque grown in 24 hours in media with and without the dandelion-derived fraction.

plaque, the main reason will be that the first studies were conducted with Victor-mowed grass.

One may look at this research from yet another perspective: according to the news, last year's Indiana crop reached record proportions (over 500 million bushels of corn, close to 120 million bushels of soybeans, and so forth). It just boggles the mind to think what the crop will be in the future when we add grass, fallen tree leaves, dandelions, and a lot of other selected and assorted weeds.

In a more serious vein (incidentally, why can't Academe be humorous?), these findings are a spin-off of research conducted with oat hulls, the cariostatic effects of which have been known for years. On the basis of existing information that substances obtained from hulls by alcoholic extraction do have antimicrobial properties, and our own observations that under usual laboratory conditions no antibacterial effects could be detected, it was hypothesized that the chemical breakdown of the hulls by a number of reagents (acids, bases, enzymes, etc.) might release and make available the anti-microbial agents said to be contained in the hulls.

Lo and behold, the hypothesis was proven correct: many of the fractions obtained by treating the hulls with these reagents *do have strong anti-plaque activity*. In view of these findings, two questions came immediately to mind: (1) What are the hulls composed of?, and (2) would it be possible to generalize these findings, that is, obtain anti-plaque substances from other plant structures similar in nature to the hulls?

The answer to the first question is that seed hulls are basically plant cell walls, and as such are composed primarily of cellulose fibers embedded in a matrix composed of several complex polypentoses. To answer the second question, we tested a number of other plant cell walls, including those contained in dandelion leaves. The results you already know.

\* The Quaker Oats Company, Chicago, Illinois.

Although the definite chemical nature and mechanism of action of the anti-plaque fractions remain at the time of this writing to be determined, preliminary evidence indicate that the active agents are polysaccharides—that is, sugars—and that they primarily reduce or eliminate the ability of *Streptococcus mutans* (and maybe other organisms as well) to colonize, or form bacterial aggregates. The end result of the process is that the bacteria cannot form adherent plaque. Wouldn't it be paradoxical if it were to develop that dental caries, a disease produced by sugar, can be prevented by another sugar?

The investigations reported in this article were started under the support of a commercial enterprise\* and are being continued with support provided by a grant from the National Institutes of Health. Continuing support from NIH is currently being sought. To close I would like to add that what started as a very modest project has now grown to become a very exciting one, in which the talents of a number of people in different areas are being used, and will be used, in a multi-disciplinary approach. It is only fair to recognize here the participation in these studies, which may give dandelions and other assorted weeds a new image and prestige, of Drs. K. C. Park, Chris Miller, James L. McDonald, Jr. and Byron L. Olson, as well as a number of technicians at the Oral Health Research Institute, including Bruce Schemehorn, Therese Burkhard, Mike Swearingen, and others.

It is appropriate to mention that Dr. Richard D. Norman will participate in future studies concerning potential effects of the anti-plaque fractions upon the surface energy of tooth tissues (and thus the adhesiveness of plaque), and to acknowledge the efforts of Dr. Ralph W. Phillips and Dr. George K. Stookey in reviewing and making necessary criticism of the grant applications relative to this work. The numerous photographs that illustrate these applications were the

(Continued on Page 54)



A LOVE-HATE AFFAIR WITH THE DANDELION

# The Pasture is Lush

*John F. Johnston, University Professor Emeritus\**

As I begin these comments, "Retired" has been my happy state for almost five and one-half years. This will be no diatribe; I am grateful to, yet not in total agreement with, the system that arranged, permits, and partially finances my present manner of living.

At Indiana University at the end of my incumbency a department chairman stepped down from his administrative position on June 30th following his 65th birthday, but could remain on the faculty and in his department in an advisory and consultant capacity for five more years, customarily at the same salary. There were other options, but this was most often followed.

The paramount virtue of this plan is that retirement pay mounts rapidly in those five years. Dr. Wells once talked beautifully to me about this building of a reservoir of wisdom and experience within the university. In the academic world where he is learned and famous, as a rule this is true. It may not be the case in a technical area of Dentistry, because everything moves on and away when one ceases to be an active participant. The former person-of-stature can talk in generalities and philosophize, can continue to speak the eternal truths, but he is no longer effective.

A new department chairman can be hampered by having his predecessor around, notwithstanding there being neither attempt nor desire to look over his shoulder. It would be far better for everyone concerned if there were no such inhibitions on his acting independently to innovate radical changes or to continue previous policies. WHAT TO DO AND HOW TO DO IT should be according to the preference of the new man in consultation with senior staff members, and without being aware of the presence of his forerunner. The situation and atmos-

phere should promote a quick, easy, and certain transfer of staff loyalty.

At another Big Ten School of Dentistry, department chairmen stay on until the end of the school year in which they become 67. They are then given a year of sabbatical leave at full pay, during which time they are expected to disappear. Period. Then retirement becomes final. I feel this plan has advantages.

For me the last five years on the faculty were productive, but not because of the advice I gave or the times I was consulted. One textbook was revised and another was written and published. Some input was made in the formalizing of the format of the graduate program, but unquestionably the same decisions would have been made without my comments.

Recently Harper and Row published a book titled "Threshold: The First Days of Retirement." Two quotations seem to be in order. First, "The deep dark scientific secret for leisure time is not to have too much of it and the happiest retiree is the one who discovers he is busier than he ever was." Two, "Even the most mentally agile and broadest acquaintanced individual must come to mental and physical terms with retirement. And if successful, retirement can be the happy culmination of all the experiences, wisdom, trials, and triumphs that have preceded it."

The author has a sort of downbeat theme in his recurrent references to old age, how he misses past occupations, and of bypassed golden opportunities.

Why regret getting older! Why commiserate over the loss of responsibilities when the assumption of most such duties was or would have been only to feed the ego. Accepting retirement and finding that it will induce happiness is dependent for the most part on how well one bows to the inevitable lessening of self-importance, and on not taking ourselves or past accomplishments too seriously, although still recalling fondly to ourselves the exciting and fulfilling years leading to the present.

\* Dr. Johnston, former Chairman of the Department of Fixed and Removable Prosthodontics, retired in 1970.

Do I miss the Dental School and Dentistry? Not at all! I am still invited to attend faculty dinners and some other functions (occasionally as a participant) and I am gratified and pleased by the thoughtfulness that prompts these attentions. But, despite all of the friendly gestures, I am no longer a part of the scene, so I feel out of place. I believe in and respect burned bridges.

I do miss some of the people with whom I worked so closely, so two or three times a month I have lunch with one or more teachers or graduate students. Many former students call when they are coming into town so that we may have lunch or dinner together.

The administration of the school has been most considerate in every way and so have the oldsters in the Partial Prosthodontics Department. Friendliness is there, but by my own choice I have been put on waivers.

Somewhere, and it might as well be here, I must mention two special groups. I refer to those former students who now dare to call me 'John,' put their hands on my shoulders, spray my face with an occasional bit of saliva and say "You old — — —, you don't look a day older!"; and to a smaller group that deviates. They say "My, you sure are holding up well." . . . I really enjoy seeing all of them. Honestly I do.

We have been busy, have not been through periods of boredom more prolonged or intense than when active in school affairs or in practice, and have had to *conform only* to the *normal* guidelines of society. As for those whom we find dull and wearying or incompatible, we can issue grades at once with no thought of "probation."

The first fourteen months following the cutting of the cord were spent in revising a textbook. That was fatiguing, concentrated work, helped by divorce from the school routine, but made harder by the absence of any means of leverage on co-workers.

Just as that ended there were for several months daily trips to New Castle during my mother's last illness. After her estate was settled came this best of all vocations,

and one for which we seem to have an inherent aptitude, real retirement.

There now is time to read. There is the luxury of having time to be reading several books at the same time or to concentrate on one book and follow up all of the sidelines to which it points. The job I held at IU was so absorbing, so constantly expanding, and so demanding that during the fourteen years as department chairman I read only one new book that did not bear on a paper or a book being written or as a reference for updating lectures. My reading now, mostly biography, history, or familiar fiction, may be educational, but that is secondary. I enjoy reading not only for content, but also for style and use of words.

About some things, like the selection of words and phrases, we are still very careful. It should be noticed that not once here do we use "basically" or "I mean" or "you know." Our writing and proof-reading have made us alert to the spoken word in television interviews. Some of the blunders, even by university presidents, are dillies. I buy books and I use the library, which is a ten-block round-trip walk. In the dental journals I look only at the lists of faculty appointments to learn who have replaced my friends and at the death notices.

Our correspondence contributes vitally to our contentment. With very few exceptions we hear from my 96 graduate students at Christmas and other times, and too from many foreign former undergraduates. Most greetings contain notes, some short, many longer. We respond to all of these. We receive announcements of births and weddings, and from those who have taken up the speaking trail there are reports of successes or further invitations. We always send congratulatory notes. If there is an expression of need we send copies of our books to school libraries. There are some contacts with the more recent graduate students and still a regular exchange of letters with three members of the 1952 class. Ours is the second fullest mailbox in Tower 1, Riley Center.

Long distance telephone calls are no novelty and they are most welcome. We hear from one chap about once a month

and his conversation is an invigorating tonic.

One journey that I make each year is to the February dinner of the Indiana University Advanced Partial Prosthodontics Society. These three or four hours on Saturday evening are among the year's nostalgic highlights. I have dinner with other friends Friday night and at lunch on Saturday, so it is a big, big occasion.

Being a devotee of recorded classical music, mostly in the smaller forms. I continue to build programs, with content and length as similar as possible to what would be heard in the concert hall. At present there are above 200 programs. After all have been played the pieces are rearranged into another set of programs. Many more additions will be impossible, for two reasons: First, lack of storage space, and second, I have most of those compositions I can accept. Our Magnavox is seldom cool.

The Cincinnati Reds and IU Basketball are MUST listening and watching. My boys would pick me up for all of the Bloomington BB games, but I simply cannot take it in quantity. I must end the day in a less hectic manner or I cannot sleep or swallow. Unwinding takes a while even after seeing or hearing a game at home. So, it is radio and TV reception (the lesser evil) and do I keep score! When it comes to basketball I am more of a statistician than Ray Maesaka.

Ray, Dyke, and I get down to Cincy, usually for two games each summer, and this year—special—for a ten-inning Series game. Dr. Fred Lee is our host. Over his desk is this motto: "As soon as this rush is over, I'm going to have a nervous breakdown. I *worked* for it, I *owe* it to myself, and *nobody*, but *nobody*, is going to deprive me of it."

I am NOT headed for a breakdown, but I worked for and owe myself AND LAVONNE this final few years of opting for DOING NOTHING constructive, of living a day at a time. The Geritol song says it well: "Live every day, do what you really want to do." This is our choice and we think we have earned that determination.

To those who say "You still have so much to offer" may we remind you that wells run dry, or if the flow continues the fifth gallon is likely to be much like the first one.

So what are the essentials for satisfying retirement for Big John and Lavonne Johnston? I'll tell you. They are (1) solvency; (2) activities that stimulate mentally; (3) activities that fill time pleasantly; (4) some physical activity—mine is walking; (5) occasionally adding a new acquaintance who may become a friend; (6) continued though not necessarily frequent contacts with established friends; (7) taking advantage of some of the available time to become reacquainted with our family; (8) cheerful acceptance of reduced or vanished stature; that is, recognition of the fact that our former world goes on serenely without us, and after the second day wanting it that way.

These criteria we have met.

Lao-tzu, a Chinese philosopher in the 5th century, B.C., defined the concept of "doing nothing" as "holding fast to quietness." Having left an academic world motivated by a mandatory frenetic life style we have had the courage to cling to that quietness that seems to "do" nothing, yet achieves everything we need. We admit that we have slowed down, but speed is in no way vital to our continued performance.

(Continued on Page 42)



Dr. Johnston and Friends.

# The IUSD Biopsy Service: Update

William G. Shafer, Distinguished Professor and Chairman of Oral Pathology

The tissue diagnostic service established in 1949 by the Department of Oral Pathology of Indiana University School of Dentistry has been used by increasing numbers of dentists every year since its inception. As can be seen in Figure 1, only 150 specimens (of which 4 were oral cancer) were processed in the fiscal year ending May 31, 1950, as contrasted to 4,392 specimens (of which 98 were oral cancer) in the fiscal year ending May 31, 1975. A case load of over 4,500 specimens is projected for the current fiscal year.

The oral biopsy is not used solely to detect cancer, but to diagnose any piece of tissue removed from the mouth, benign or malignant. It has been a firm recommendation of the American Dental Association for a number of years that every piece of tissue removed from the oral cavity for whatever purpose (e.g. gingivectomies, apicoectomies, hyperplastic tissue reductions, etc., as well as incisional or excisional biopsy specimens) should be sent to the laboratory for micro-

scopic examination by a qualified oral pathologist. The modern practice of dentistry requires such a regimen. Examples of the types and numbers of benign lesions seen in the last fiscal year are shown in Table I.

TABLE I

Incisive canal cyst	50 cases
Dentigerous cyst	309
Odontogenic keratocyst	48
Peripheral giant cell granuloma	18
Pyogenic granuloma	61
Periapical granuloma	311
Apical periodontal cyst	357
Mucocele	284
Benign tumors	
Papilloma	138
Lipoma	35
Myoblastoma	5
Neurofibroma	10
Ameloblastoma	12
Odontoma	39
Mixed salivary gland tumors	27

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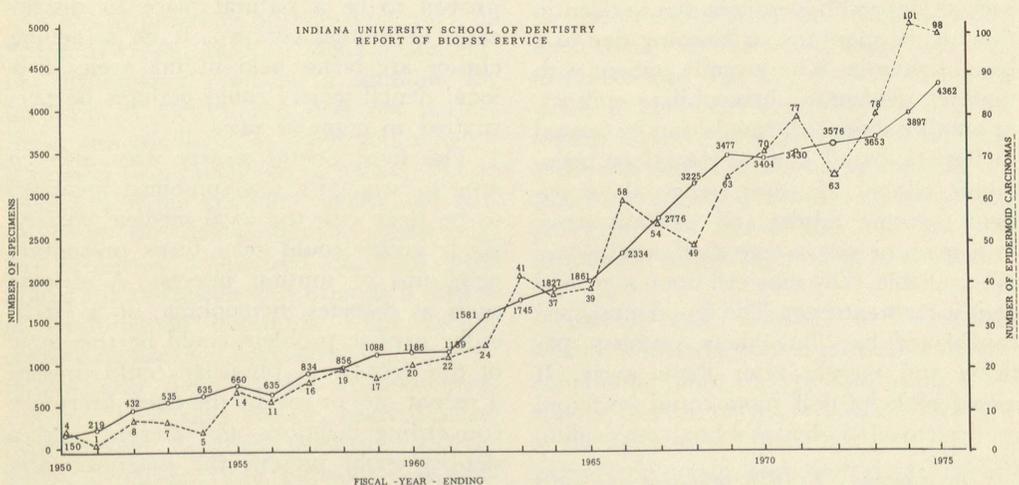


Fig. 1. Graph showing increasing use of IUSD biopsy.

# Oral Medicine and the Clinician

*James A. Cottone\**

Evaluating the status of a patient who is on multiple drug therapy and/or has a complicated medical history often poses a challenge to the dentist. A patient who was recently seen at the dental school listed the following medications: Allopurinol, Atarax, Co-Pyronil, Hexavibex, Hygroton, Librium, and Mycifradin. The medical history was equally complex. Another patient suffered from hypertension, potassium deficiency, diabetes, and thyroid deficiency; he had also had a recent hospitalization for a gall bladder removal. Cases like these emphasize the point that a medical consultation is sometimes desirable, if not mandatory prior to dental treatment. Good lines of communication between dental and medical practitioners should be available, and should be used often.

Patients with severe medical problems are more likely to walk into your office than ever before. The older patient is now more likely to lead a longer, more productive life, even though he may have heart disease, hypertension, endocrine disorders, or any of a number of degenerative diseases. Such patients may also have a predisposition towards developing various oral lesions due to their medical condition, such as gingival hyperplasia due to dilantin therapy, or spontaneous bleeding due to a blood dyscrasia. The juvenile patient with diabetes, leukemia, hemophilia, epilepsy, or another serious disease is usually treated in hospital-based general dental or pedodontic clinics. However, when these patients become adults and perhaps move to a town or city where such services are not available, they may call upon a general dentist for treatment. Too few dentists feel capable of handling these problem patients and merely refer them away. It would be helpful if room could be found in the crowded dental school curriculum

for additional preparation to deal with such patients, but that is unlikely.

Yet education is the key to the problem. One immediate question concerns how a dentist already in private practice can best prepare himself to deal with the patient who has unusual medical problems. One basic suggestion is for the dentist to start taking blood pressure readings on all patients. The equipment and the time involved are both minimal, and the procedure is easy to learn. Furthermore, the dentist is in an excellent position to find undetected cases of hypertension, as surveys have shown that more people make regular visits to their dentist than to their physician.

In conjunction with this, the dentist can participate in hypertension or oral cancer screening clinics in the area. These are both excellent places to meet medical colleagues and learn from them. In Indianapolis, the Little Red Door (Marion County Cancer Society, Inc.) holds a monthly Oral Cancer Screening Clinic at the dental school. It is staffed by members of various departments from the Medical Center including maxillofacial prosthetics, oral medicine, oral pathology, oral surgery, otolaryngology, and plastic surgery. It has proven to be a natural place to discuss cases of mutual concern. If no screening clinics are being held in the area, your local dental society could perhaps be persuaded to organize one.

The local dental society may also be able to arrange a few combined meetings to be held with the local medical society. Each group could take turns presenting programs of mutual interest. A disease such as diabetes, hemophilia, or a particular cardiac problem could be the topic of the evening. A physician could present a recent case or review the latest literature concerning diagnosis and therapy and a dentist could present the diagnosis and management of oral manifestations and dental disease for the same condition. Other topics of mutual interest such as

\* Dr. Cottone, a 1972 graduate of Tufts University School of Dental Medicine, is a second-year resident in Graduate Oral Diagnosis/Oral Medicine.

nutrition or public health could be presented by an authority in that particular field. Community projects and screening clinics could be planned and discussed at these combined professional meetings.

Formal continuing education courses are also helpful, as here the entire emphasis is on learning. Most courses offered by the hospital-based dental programs include discussions in the area of oral medicine and management of the patient with special medical problems. Many continuing education programs offered by medical schools are also open to dentists; one phone call will usually place an interested dentist on the mailing list. Often these continuing education programs in medicine are sponsored by a pharmaceutical firm and are offered on a complimentary basis or at minimal cost. A recent two-day seminar in Indianapolis dealt with hypertension and benefited both physicians and dentists present.

Another useful step is for the dentist to make note of the medications and medical problems his patients have and refer to the PDR and a general medicine or pathology book for further information about them. He should have a recent oral pathology text handy so that he can note any oral manifestations. The dentist can then inform the patient of the potential for developing these manifestations. He can also institute preventive therapy as required to avoid the dental sequelae.

Medical programs on television, such as "Marcus Welby, M.D.," "Medical Center," or "Emergency" can be a stimulus for learning. A viewer who does not understand the condition or medications being discussed can refer to a book. Some members of the graduate faculty and students at the dental school occasionally use problems dramatized on these programs for discussion and even as a source of examination questions. Some recent conditions televised have involved hysterectomies and their various consequences, epilepsy, Hodgkin's disease, heart disease, hypertension, hepatitis, leukemia, mastectomy, alcoholism, and pulmonary embolism. All dental practitioners need to understand more than the basic pathology involved with these illnesses, as the associated

emotional problems can precipitate various conditions which are often oral in nature. The general public is learning more about medicine from these programs and there seems to be no reason for the professional man to shun them.

However, one may ask what can be done right now for those dental patients with unexplained ulcers, hyperplastic gingiva, acute or chronic temporomandibular joint pains, or other unexplained lesions which may point to a more complicated problem than is immediately apparent. One solution may be to make use of the services of the Oral Medicine Clinic at the dental school which is staffed by residents of the graduate Oral Diagnosis/-Oral Medicine program. Here the patient with the difficult medical history, the combined medical-dental problems, or undiagnosed lesions is often seen. Many of these patients have already seen their own dentist, perhaps plus other practitioners, and are referred to the clinic by both dentists and physicians. Consultation with the various dental and medical specialists is readily available in the Medical Center environment and the cases seen in the Oral Medicine Clinic frequently receive this type of management.

A recent case referred to the clinic involved a 51-year-old woman with erosive lichen planus. After a biopsy and a series of appointments, the patient accepted the diagnosis of lichen planus but withheld the information from her family, letting them think that she would slowly succumb to cancer and that any therapy employed would improve her condition but only for a short while. The progression of her case eventually directed attention towards the patient's unusual marital and emotional problems. The patient has since received psychiatric counseling and is now improving.

Another case involved a 54-year-old woman who was contemplating temporomandibular joint surgery due to an acute episode of pain on the left side of her face in the summer of 1975. She was seen by several physicians and dentists at Barnes Hospital in St. Louis before being referred to the Oral Medicine Clinic. A diagnosis

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# A Bizarre Case of 'Dens in Dente'

*E. Byrd Barr and David J. Kilgore,  
Assistant Professors of Oral Diagnosis/Oral Medicine*

The "dens in dente" may be defined as a developmental variation which is believed to arise as a result of an invagination in the surface of a tooth crown before calcification has occurred.<sup>1</sup> This condition is sometimes called a "tooth within a tooth."

Permanent maxillary incisors are the teeth most frequently involved but other teeth, including molars, are occasionally affected.<sup>1</sup> Pulpal and periapical infection are often associated with this condition as the invagination in the crown often forms an enamel-lined cavity projecting into the pulp. The cavity is connected to the external tooth surface and when defects occur in the cavity wall bacteria can invade the pulp.<sup>2</sup> In such a case inflammation and infection invariably occur, with pulp necrosis following.<sup>3</sup>

Coronal invaginations (Fig. 1) are classified into two types: superficial (those limited to the tooth crown) and deep (those which extend into the root).<sup>4</sup>

Superficial invagination is found in 3% to 10% of maxillary incisors, with population differences likely. Oehlers believes that this occurrence is very rare among blacks. There appears to be no sex difference and the incidence is the same bilaterally. Deep invagination affecting the root is much rarer, according to Poyton and Morgan (approximately 0.24%), with the maxillary lateral incisors most frequently involved.<sup>4</sup>

According to Pindborg, the dentin and enamel of the "outer" tooth are normal whereas the enamel covering the invagination is defective, especially at the bottom of the invagination. Enamel as well as dentin can be entirely missing in some areas, creating a direct opening from the bottom of the invagination to the pulp of the "mother" tooth thus allowing bacterial invasion. Pulpal and periapical infection may occur any time after tooth eruption.

The purpose of this report is to call attention to this dental anomaly and to

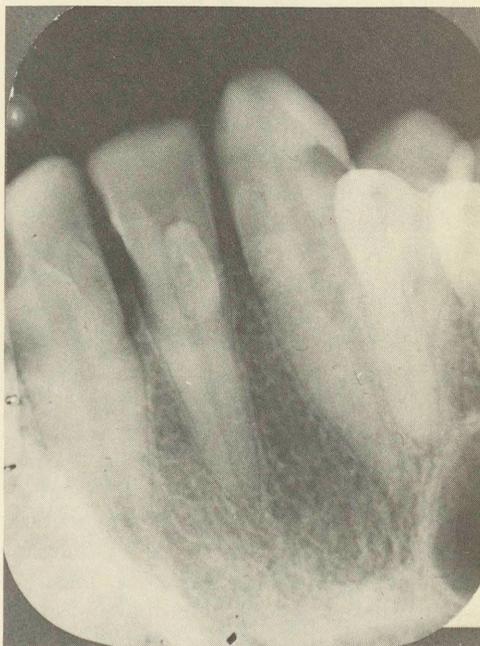
describe the management of an unusually severe variant.

## Case Report

On July 24, 1974 a 13-year-old black male was brought to the Oral Diagnosis Emergency Clinic at Indiana University School of Dentistry. The patient complained of swelling and pain in the area apical to the left maxillary lateral incisor. His medical history was uneventful. A panoramic radiograph was ordered as well as a maxillary occlusal and periapical view of the area (Figs. 2 and 3).

A large radiolucent area was found above tooth #10 involving the maxilla. A diagnosis of "dens in dente" was made from the radiographs.

The patient was referred to Long Hospital Oral Surgery Clinic for treatment. On the same day a local anesthetic was infiltrated in the affected area and 8.0 cc of sanguinous fluid with purulence was aspirated and an iodoform gauze drain was sutured into place.



**Figure 1** Radiograph showing superficial invagination.

The histologic diagnosis of the aspirated fluid was: Maxilla, aspirant containing extravasated red blood cells, acute and chronic inflammatory cells, bacterial and possibly actinomycotic colonies and necrotic debris.

On August 13, 1974, the patient was admitted to Riley Hospital, and under general anesthetic the maxillary lesion was enucleated and #10 was removed. The lesion had destroyed the labial plate of maxillary bone in the area. At the same time #11 was endodontically treated. The lesion did not enter the maxillary sinus or the nasal cavity. When the extracted tooth was examined clinically, the root structure had the appearance of a hollowed-out bowl.

Teeth #23, 24 and 25 were endodontically treated at the same time because of periapical pathology.

Histologic examination of the soft tissue removed from the surgical site showed large aggregates of inflammatory cells consisting of an almost pure culture of plasma cells. There was abundant granulation tissue and chronic inflammation. Several of the multisectioned specimens had a cyst-like structure with stratified epithelial lining. In most areas, epithelium was absent. Pathological diagnosis: Upper jaw, radicular cyst with chronic inflammation.

Gross examination of the extracted tooth supported the radiographic diagnosis of dens in dente.

The patient returned on August 20, 1974 to have sutures removed along with part of the iodoform gauze placed during surgery. The operated area appeared to be healing satisfactorily and the patient had no complaints. The patient was seen again on August 27, 1974, when the remaining drain was removed and the cavity irrigated. A new iodoform gauze drain was placed. The tissue was healing well with no signs of infection. On September 3, 1974 the patient returned to have the drain removed. The operated area was continuing to heal satisfactorily, and the patient was dismissed until September 11, 1974. At that time healing was still progressing normally.

Another follow-up on October 24, 1974 revealed good healing. However, a defect

was noted in the maxillary labial bone above the #10 area where the lesion had destroyed the labial plate. On April 10, 1975 another panoramic radiograph revealed good bone fill in the surgical site.

The patient was recalled to the Oral Diagnosis Clinic on January 19, 1976 for additional radiographs (Fig. 4). The radiolucent area noted is attributed to the bony defect and some fibrous healing in the area. The patient is asymptomatic and the tissue appears normal and healthy. The labial depression was palpated and felt normal.

A temporary partial denture was constructed to replace the missing tooth and the esthetics were very satisfactory. The upper lip covered the bony defect created by the lesion. A follow-up is scheduled in six months.

We felt that this case of "dens in dente" was unique due to the size of the lesion that was caused by the unusual malformed tooth. This helps to emphasize the need for periodic thorough examinations and

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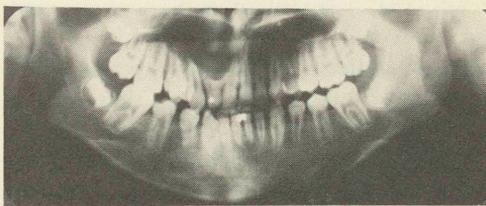


Figure 2 Panoramic radiograph.

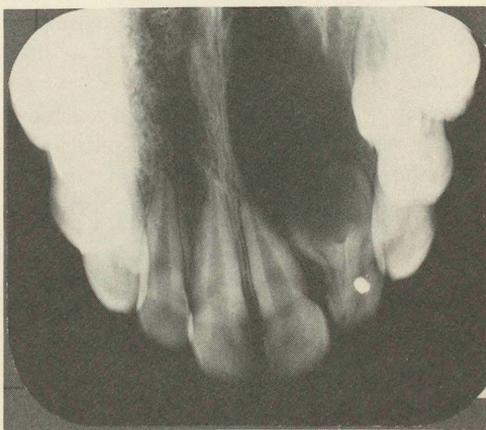


Figure 3 Maxillary occlusal view of affected area.

# The Electron Microscope in Dentistry

*Lawrence I. Goldblatt, Assistant Professor of Oral Pathology*

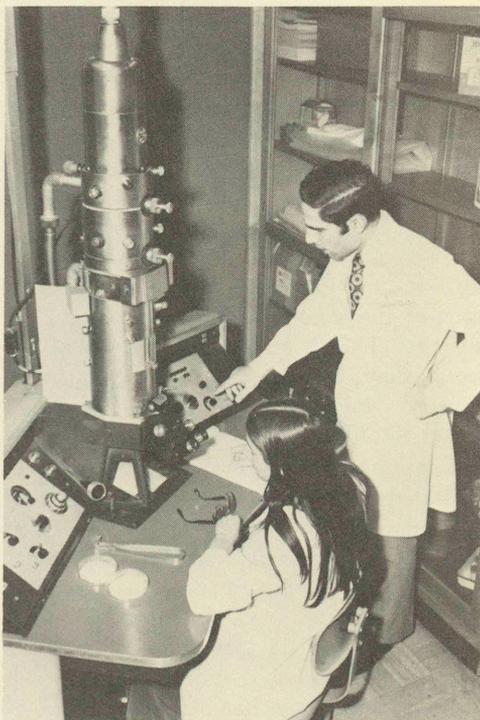
The examination of biological tissues has become very sophisticated since the days when clinical and gross anatomical studies were the only means available. The electron microscope represents one of the more advanced tools for tissue examination available. This article reviews the principles behind the electron microscope, its advantages over the light microscope, and the areas where it is finding most use in dentistry in general and at IUSD in particular.

The theoretical basis for electron microscopy (EM) must be attributed in large part to the work of Ernest Abbe, a German scientist who worked in the latter part of the 19th century. Abbe emphasized the importance of resolving power of a microscope. The resolving power (resolution) is the ability to distinguish two separate objects a given distance from each other. The greater the resolving power of an instrument, the closer together two objects can be and still be distinguishable as two separate objects by the microscope. Abbe determined that the resolution of an instrument could be improved by (1) passing the light through a medium which refracts or bends the light as little as possible, and (2) using light with as short a wavelength as possible. According to Abbe's data, the best resolution that can theoretically be obtained using visible light with oil immersion lens is approximately 0.2 microns, or about the size of a bacterium.<sup>1</sup>

Using Abbe's principles to achieve greater resolution as well as magnification, the modern EM was developed. Instead of using visible light, the energy form is a beam of electrons, tiny units of energy with an extremely short wavelength, thus increasing resolution. Instead of atmosphere or immersion oil as a medium, the electrons pass through a vacuum, providing the least possible refraction or bending of the beam, and thus increasing resolution even further. Instead of using glass lenses to focus the energy, electromagnets

act as lenses, bending, diverging and converging the electron beam as desired. Thus the EM is in most of its essential functional components quite analogous to the standard light microscope (LM).

The techniques and equipment involved in processing tissue for EM are also very similar to those used for LM. Tissue must be fixed immediately, dehydrated, infiltrated and embedded in a plastic embedding medium (instead of paraffin). The embedded tissue is then cut into thin slices with a special microtome. Sections must be cut extremely thin (approximately 1500 Angstroms (0.15 micron) thick instead of 7 microns thick as in the case of paraffin sections for LM) so that the electrons can pass through. The tissue is placed in the EM and examined visually, and electron micrographs are taken of fields



The author demonstrates features of the transmission electron microscope to Dr. Monique Michaud.

meriting detailed study, using the microscope's built-in photographic system.

The entire system described so far is also known as transmission electron microscopy (TEM). This system is essentially an extension of light microscopy, enabling the investigator to see further into the cell, identifying subcellular components which approach the size of large molecules.

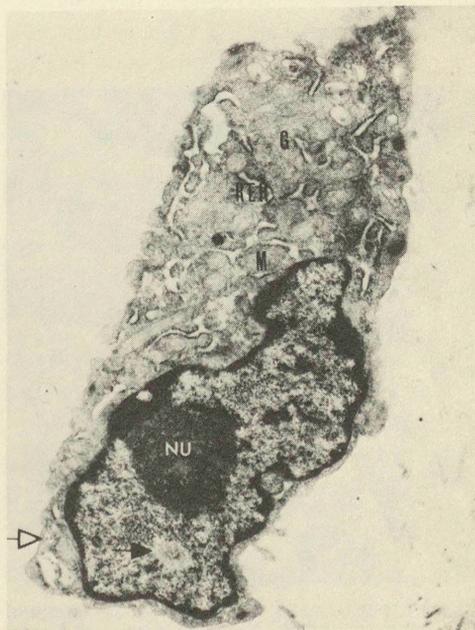
As ideal as TEM might seem, it suffers from at least one important drawback: the depth of field is extremely small. With TEM, just as with LM, one can examine only one very thin plane of tissue at a time. In order to obtain an appreciation of the appearance of an entire red blood cell, for example, one would need to examine 47 serial sections with TEM.

A solution to the problem of depth of field was approached with the design and construction of the first scanning electron microscope (SEM) in 1938. Instead of passing electrons through the specimen as in TEM, the SEM employs an electron beam which is scanned across the metal-coated surface of the specimen, exciting secondary electrons which are in turn collected and transformed into an image on a cathode ray tube very similar to a television receiver. The image of the specimen is reproduced on the receiver, point for point, producing great depth of field and imparting an excellent appreciation of the surface characteristics of the specimen in what appears to be three dimensions.<sup>2</sup>

TEM has found virtually unlimited use in both anatomical and pathological studies. Every area of study previously investigated by LM can now be investigated further with TEM, relinquishing more secrets to the superior magnification and resolution of this new experimental tool. SEM, on the other hand, has been most useful in the study of surfaces of organs, tissues and individual cells, yielding a three-dimensional appreciation of the specimen at relatively high magnification and resolution.

In dentistry, both TEM and SEM have been used for a number of years. TEM has been used mostly in the study of soft tissue anatomy and pathology. Specifically, a number of commonly occurring oral

diseases such as lichen planus,<sup>3</sup> hyperkeratoses,<sup>4</sup> giant cell granuloma,<sup>5</sup> various odontogenic cysts<sup>6,7</sup> and tumors,<sup>8,9</sup> and salivary gland tumors<sup>10,11</sup> have been studied with the TEM. One of the most discouraging problems encountered by the pathologist desiring to study a particular lesion with TEM is the very stringent requirements for rapid thorough fixation of the tissue. The ideal situation is for the pathologist to be at the dental chair or in the operating room at the time of surgery to take the tissue directly from the surgeon, reduce it to very small pieces and immerse it immediately into an EM fixative. For most tissues glutaraldehyde is used as the primary fixative, followed by post-fixation with osmium tetroxide. Because the resolution and magnification of the TEM are so great, any tissue autolysis produced by delay in fixation or use of an improper fixative will render the tissue unsuitable for EM examination. Although formalin-fixed (and even paraffin-embedded) tissue has been studied by TEM, the results are not nearly so informative or reliable as with ideally fixed tissue. Thus, if the dentist suspects

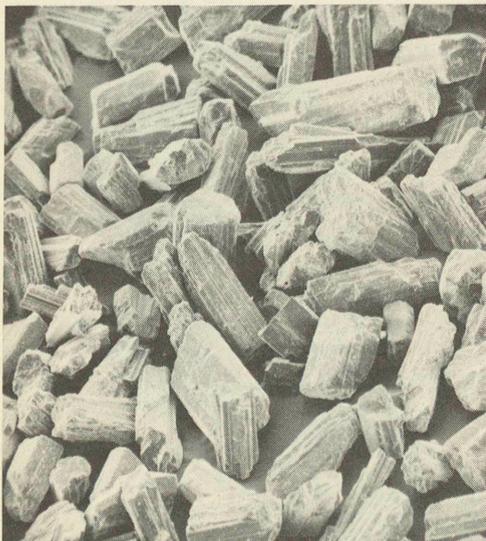


TEM micrograph of a fibroblast-like cell from an odontogenic myxoma. Orig. mag. X10, 200.

that the tissue he plans to remove might be of interest to study ultrastructurally, he should notify the pathologist so that he can be present at surgery to properly and rapidly mince and fix the tissue for EM. In this way the clinician can make an invaluable contribution to the TEM study.

SEM, on the other hand, does not carry such exacting requirements for special fixation. SEM requires only routine fixation, which is followed, however, by careful dehydration of soft tissue specimens in a special drying apparatus. The specimen is then coated with a thin layer of metal and is ready for viewing in the microscope. SEM in dentistry has been used primarily in the study of dental abnormalities such as amelogenesis imperfecta,<sup>12,13</sup> in investigating relationships between microorganisms, plaque and tooth structure,<sup>14</sup> and in operative dentistry<sup>15,16</sup> and dental materials studies.<sup>17,18</sup>

The EM Laboratory at IUSD is located in the laboratory section of the Department of Oral Pathology, room B28 in the North wing of the dental school. This facility houses an RCA EMU 3H transmission electron microscope, a Porter-Blum MT-2 ultramicrotome and a fully-equipped photographic darkroom for the development and printing of electron micrographs.



Powder particles of stone X400. Courtesy of B. Giammara and R. Neiman, Science of Dental Materials, R. W. Phillips, W. B. Saunders Co.,

At the Indiana University School of Dentistry the principal thrust in EM investigation in the Department of Oral Pathology recently has been in the TEM of neoplasms of the oral cavity. Current research involves the ultrastructure of human odontogenic and oral mucosal neoplasms as well as the ultrastructural characteristics of preneoplastic changes in the oral mucosa of experimental animals. In addition, the Department of Oral Microbiology has used the TEM to investigate the effects of various enzymes on bacterial cell surfaces. Although the School of Dentistry does not own its own SEM, studies have been conducted by the Department of Endodontics (in cooperation with I.U. Bloomington) using the SEM to evaluate the efficacy of various endodontic techniques. Also, the Department of Dental Materials, (in conjunction with Purdue) has used the SEM in studies of the structure and mechanisms of corrosion of dental restorative metals, as well as abrasive wear patterns in composite resins.

In summary, then, electron microscopy has played a definitive and constantly expanding role in dentistry and dental research. Although much has been done, the surface of EM research possibilities in dentistry has scarcely been scratched. An entirely new dimension in knowledge awaits those investigators with the interest and perseverance to go after it. It will take a great deal of effort by both the clinician and the basic researcher to achieve this goal, and at IUSD we feel we are making a beginning.

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# Isaac Furnas: Pioneer, Farmer, Physician

Maynard K. Hine

Isaac Furnas, the great-grandfather of Dr. I. Lester Furnas, teacher of prosthetic dentistry at Indiana Dental College from 1910 to 1920, was born at Newberry, South Carolina, in 1795. Members of the family were devout Quakers who were strongly opposed to slavery, so in 1826 they moved to Indiana. Isaac purchased from the government 160 acres of land 15 miles west of Indianapolis for \$1.25 an acre. He cleared the land and became a successful farmer. Somewhat later his wife became "debilitated," and he took her to Indianapolis to see a physician. The doctor advised him that his wife would require more treatments, but since the trip to Indianapolis from his farm was such a long and tedious one, he decided to attempt to treat his wife himself. He bought a book entitled "The Practice of Medicine on Thomsonian Principles" and studied it carefully. He then noted his wife's symptoms and began treating her. She immediately recovered.

News of his success traveled rapidly throughout the neighborhood, and when neighbors became ill, they immediately came to him for help. He wrote in his diary: "At last I saw that I must quit trying to farm and practice medicine, too. So I took my hand from the plow and took up the practice of medicine, which I attended to closely for 30 years." He traveled by horseback and had calls as far north as South Bend and as far south as Louisville, Ky.

"Doctor" Furnas left a small notebook of some of his "better receipts," which are of interest. The book incidentally was dated "7th month of 1849." The first "receipt" in this Quaker's book was entitled "Woman's Friend" and is as follows:

- "1 oz. of oil of Annis
- 1 oz. of oil of Cloves
- 1 oz. of oil of Cinnamon
- ½ oz. of nerve powder
- ¾ oz. of Goldenseal
- ¼ oz. of sinecasnake root

1 quart of alcohol  
1 pint of brandy  
Good for female weaknesses."

Another was for "Inflamed Sore Eyelids":

"Take 2 oz. vial, fill it half full of water, the balance with whiskey, then add a lump of vandy greese (?) about the size of a pea.

Application: Close the eyelids and bathe the eyelids 3 times a day."

His formula for a cancer plaster is as follows:

"Take equal parts of red oak and white oak bark both inside and outside, half bush of each, the same quantity of red corncobs, burn them all together on some clean rock, put the ashes into a pot, boil the ashes till the strength is obtained. Let it settle, pour off the lye. Clean the pot, put the lye back, add a handful of poke-root washed and scraped clean. Boil till the strength is extracted, take out the roots, boil over a slow fire till it becomes about as thick as thin tar. Bottle for use.

"Application: Take lint or cotton, roll one end to hold in the fingers, put some of the above medicine on the other end and apply it to the cancer. Don't let the plaster quite cover the cancer for it will kill at the sides as well as inward. This plaster should stay on ten minutes. Then apply another new one every ten minutes; from forty to sixty is enough to kill any cancer. When the last plaster is taken off, wash the place with milk and warm water, then anoint with sweet oil, then apply some healing plaster. Dress it twice a day, wash and anoint with sweet oil each time it is dressed. In about ten days, if any of the cancer appears not sufficiently killed, apply a little of the plaster again, then wash and anoint as before.

"N.B. It is best to anoint with oil around the cancer before the plaster is put on. 2nd Mo. 11th 1850 Isaac Furnas"

(Continued on Page 42)

# Surgical Treatment of Chronic Temporomandibular Joint Dislocation: Report of A Case

*Robert Sexton, Assistant Professor of Oral Surgery*

The temporomandibular joint is peculiar, for a synovial joint, in that the articular surfaces are fibrocartilage or fibrous tissue instead of hyaline cartilage. Usually the joint gives evidence of remodeling, resorption of articular tissue and bone in one area, and addition in another, which is accentuated by the change in bite as teeth are lost.<sup>1</sup> This is the only joint of the human body that can be dislocated without the action of an external force. The dislocation is often bilateral, and the displacement is always anterior.<sup>2</sup>

Many methods, both surgical and non-surgical, of treating chronic recurring dislocation of the temporomandibular joint have been used with varying degrees of success. This paper describes a relatively simple surgical approach and presents a case report.

In a true dislocation of the temporomandibular joint, there is movement of the condylar head and disk out of the mandibular fossa anteriorly over the articular tubercle where it is held by spasm of the muscles.<sup>1</sup> If the external pterygoid muscle continues to contract after a maximal opening, it will hold the condyle on the anterior slope of the eminence as the mandible begins to close, thus making dislocation unavoidable.<sup>3</sup> Recurrent dislocation is usually associated with hypermobility of the mandible and a steep articular eminence.<sup>3,4</sup> Each time dislocation occurs, there is further rupture and stretching of the capsular ligament, which aggravates the condition and leads to further recurrence.<sup>3</sup>

All methods prior to 1951 were aimed at restricting the opening movements or building up a higher articular tubercle or its substitute to prevent a luxation.<sup>5</sup> However, since a steep and high articular tubercle impedes the free forward and backward glide of the condyle, in cases of

habitual luxation this obstacle should be removed.<sup>5</sup> The Norwegian investigator, Myrhaug, in 1951 was the first to describe the removal of the articular eminence to treat chronic dislocation of the mandible.<sup>2</sup>

Six years later, Irby in the United States advocated removing the articular eminence when chronic recurring dislocation of the temporomandibular joint is not responsive to conservative treatment.<sup>6</sup> No alteration of occlusion or other undesirable postoperative sequelae have been reported. This procedure has the additional advantage of being less time-consuming and probably being associated with less morbidity than other surgical approaches to the problem. Condylectomy is still frequently performed, but it is usually not recommended for the treatment of dislocation.<sup>3</sup>

Although the procedure advocated here removes the major obstruction to forward and backward movement of the condyle head, it had been noted that condyle excursions are considerably less after surgery. This is probably due to the formation of a connective tissue barrier in the area from which the bone was removed.<sup>4</sup>

The surgery consists of removing the articular tubercle with mallet and chisel, as Myrhaug wrote, "until nothing is left to hamper a smooth forward and backward glide of the condyle, leaving the articular disc in situ." The normal shape of the temporomandibular articulation presents a shallow glenoid fossa and a low flattened articular tubercle.<sup>5</sup>

## REPORT OF A CASE

An obese 30-year-old Caucasian female was seen September 26, 1974, in the oral surgery clinic at the Indiana University Medical Center with a five-year history of chronic recurring temporomandibular joint dislocation. The patient had been institu-

tionalized for some time for schizophrenia with psychotic depressive reactions and suicidal tendencies. In the several weeks prior to her first clinical visit she had experienced numerous episodes of temporomandibular joint dislocation that had required professional help in reducing.

At her first visit she wore a modified elastic Barton Bandage which had been placed at the institution and was ineffective. Oral examination revealed an edentulous maxilla with maxillary denture and missing bilateral mandibular molar occlusion. The temporomandibular joint was dislocated at the time of observation with a hypermobile left condyle. The dislocation was reduced manually and a plaster of Paris Barton Bandage placed. Pre-operative temporomandibular joint films which had been taken September 30, 1974, and sent with the patient revealed a flattened left articular eminence, and translation of the mandibular condyles was limited bilaterally. Steep articular eminences of the zygomatic processes of the temporal bones and deep glenoid fossae were also present. There was no evidence of a destructive process involving bony structures or joint structures of either joint.

In view of the patient's history of chronic recurring temporomandibular joint dislocation with recent episodes occurring more frequently, it was felt that conservative therapy would be unproductive, and bilateral temporomandibular joint eminectomies were scheduled for the following week.

Upon admission, the patient's medications consisted of Cogentin 2 mg. B.I.D., Mellaril 100 mg. B.I.D. and H.S., and Valium 5 mg. T.I.D. In addition to the patient's mental disability, significant medical history included a history of drug overdose and alcohol abuse, rheumatic heart disease without murmur, an allergy to penicillin, and a total hysterectomy six months earlier. Physical examination revealed the patient to be a satisfactory candidate for a general anesthetic.

The following morning, under a narcotic general anesthetic, bilateral temporomandibular joint eminectomies were performed through pre-auricular incisions approxi-

mately 2.5-3:0 cm. utilizing skin creases. Care was taken to identify the large superficial temporal vessels and retract them posteriorly. Again great care was exercised in dissection medially to the temporal bone and anterior-inferiorly to the articular eminence. Primarily blunt dissection was used and the soft tissues were retracted anteriorly and held by suturing with a #0 black silk suture to the sterile drapes. The temporal fascia and the temporomandibular ligament were excised horizontally. Branches of the seventh nerve and auriculotemporal nerve were not visualized. The periosteum was excised off the eminence, and a 4 mm. osteotome and mallet were used to excise approximately 5 mm. of the eminence.

The surgery site was closed in layers, beginning with the periosteum, with the skin being closed with seven #5.0 black silk sutures. No drains were placed. A pressure bandage was then applied. The same basic procedure was carried out on the opposite side. The anesthesiologist was able to manipulate the mandible freely under the sterile drapes. Total surgery time was two hours, fifteen minutes. The patient tolerated the procedure well and was taken to the recovery room in satisfactory condition. The estimated blood loss was less than 50 cc. Before the patient left the recovery room she could voluntarily wrinkle her face and eyebrow bilaterally. There was no motor interruption of the facial nerve on either side.

The patient was placed on a regular diet the following day, and encouraged to exercise chewing. Discomfort and edema were minimal. She noted a slight paresthesia of the left upper lip and left eyelid on the second postoperative day, but was discharged in good condition on the third day with minimal edema and negligible pain. One week postoperatively the skin sutures were removed and the patient complained of some pain in the left temporomandibular joint, but no incidence of dislocation. A partial ptosis of the left eyelid was present. When she was seen the following week, the muscle weakness had completely resolved. She was functioning well with little restriction of movement upon wide opening and lateral excursion.

She was to have returned at two and four month intervals, but instead was cared for postoperatively by the institutional dentist. He provided her with a new maxillary denture and mandibular partial denture, with full gold crowns on the mandibular right bicuspid and cuspid, and mandibular left cuspid.

#### COMMENT

Bilateral excision of the steep articular eminences of the zygomatic processes of the temporal bones has a sound biological basis for the treatment of chronic dislocation of the mandible in which conservative treatment has failed. Careful surgical technique and knowledge of the temporomandibular joint anatomy are imperative for successful treatment.

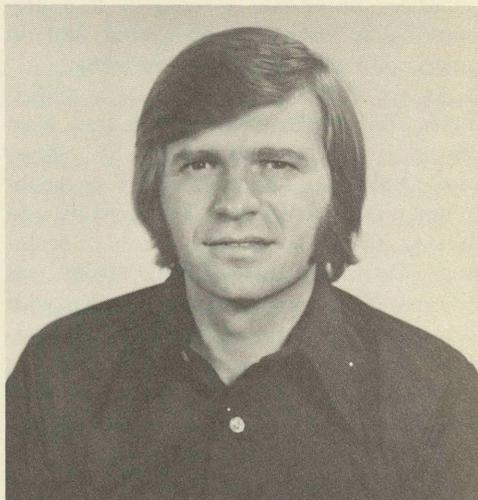
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Fall teaching conference.

## Alumnus Presents Gift To Pedodontic Department



Dr. Ron Eichel

At the February meeting of the Indianapolis District Dental Society Dr. Ron Eichel, a pedodontist practicing in Atlanta, Georgia, presented a program on "Nitrous Oxide Analgesia." Dr. Eichel is a graduate of the University of Tennessee College of Dentistry and received his Master's degree in pedodontics at Indiana University School of Dentistry in 1969. Following his excellent presentation he handed his check for his honorarium and expenses to the Chairman of the Department of Pedodontics, Dr. Paul Starkey, and asked that he purchase something needed for the Department. He commented that he was very grateful to Indiana University and to all the School and its faculty for what they have meant to him in his profession and that he could not accept any money for making the presentation. A fine intra-oral camera has been purchased and is in daily use by the grateful faculty members.

# A Compliment and Two Challenges To Dentistry in Indiana

*Charles W. Gish, President*

There are three areas I want to relate to you in this article—first a compliment, and then two challenges to the dental profession in Indiana. This observation post of mine tells me many things about dentistry, many of which are highly complimentary activities for the dental family. One is that you give of your time and yourselves for the benefit of your community and your patients. I know of no other group or profession which gives as much time, money, and effort to their community as dentistry. Oh, there are probably a few who live by the “buck #1” philosophy but most have learned the great values in life and truly contribute to the image of dentistry.

When dental services are referred to as “expensive,” “inefficient delivery,” or “hard to obtain,” etc., it usually comes from an uninformed source. I know of no other group or profession, be it attorneys, bankers, engineers, auto workers, plumbers, electricians, or Congressmen, or any other group who have done more to improve their services and given more to community improvement than dentistry. Some of the publicity we have received in news media and other publications have set forth an image of dentistry which is not complimentary but we certainly have no reason to agree with adverse accusations or be apologetic.

However, we need to maintain a positive attitude and give credit to what dentists have contributed to health and well-being. We have nothing to hide and certainly recognize dental disease as a big problem. This doesn't mean that hard work hasn't been performed or accomplishments achieved, for they have been. Indiana has improved dental health greatly over the last 10-15 years. But we need to push so hard beyond the four walls of our office on the total front for good dental health that the entire country recognizes our philosophy through demonstrable results.

This brings me to the second point of this article—challenges to dentistry. I believe strongly that Indiana is on the right approach to most effectively and efficiently improve the dental health of the people of Indiana. We need, however, to periodically regroup, re-emphasize and perhaps even launch a “crash” program against dental disease. This doesn't mean “Joe, do it,” but—YOU! Each of you needs to practice: good recall and surveillance, use of fluoride prophylactic paste, use of topical fluorides as indicated, patient education for good homecare, and your continued good restorative procedures. You need to have a motivational impact in your community to see that people practice good dental health and assume their own responsibilities. You need to motivate them so that if they have questions about dentistry or dental health, they will *want* to come to you, or to dentistry, for the answers.

Your community water supply should be fluoridated; your school should have a dental health education program, and a fluoride preventive program such as the fluoride brush-in; and your people should use a fluoride dentifrice. You should continually negotiate this impact as dentistry's responsibility in placing various components of a broad package for good dental health where each belongs. This includes dental treatment in the dental office, as needed for disease which does occur. There is no delivery system I know of that is as good as the one provided through your offices. Your offices provide the best system of distribution, quality of treatment, and control of costs to the patient because you have their concerns firsthand, since you and only you are accountable for your work.

Please take a look at your community and your practice and assure yourself that you are presenting dentistry's total talents

*(Continued on Page 55)*

# Notes from the Dean's Desk . . .

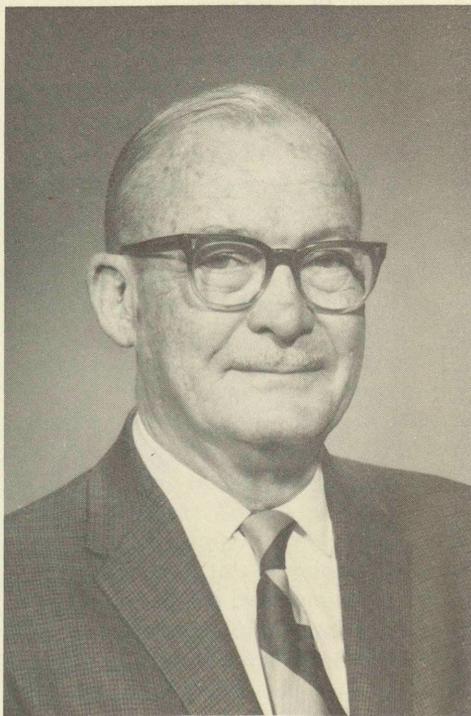
*Ralph E. McDonald*

Since I last reported to the Alumni, Indiana University School of Dentistry has suffered a great loss in the death of two of our long-time faculty members.

Dr. G. Thaddeus Gregory passed away on October 4, 1975. Dr. Gregory was born in Union City, Indiana, and was a 1928 graduate of the School of Dentistry. Following graduation, he completed his internship at the Indiana University Medical Center and for three years served full-time on the Oral Surgery faculty at the School. Dr. Gregory was active in organized dentistry and served as president of the American Society of Oral Surgeons, the Great Lakes Society of Oral Surgeons, and the Indiana Society of Oral Surgeons. He was a diplomate of the American Board of Oral Surgery. He will long be remembered for his pioneer work in the classification of impacted third molars and development of the tooth division technique for removal of impacted teeth. Many of his students remember his invaluable teaching of the technique for block anesthesia. Students will also recall the lighted view box which he developed and is located on the second floor of the Dental School. This view box was in continuous use for over thirty years and the students spent many hours reviewing the slides in preparation for Greg's famous oral examination and his "fifty slides in fifty minutes" quiz. A statement by a former colleague of Dr. Gregory, Dr. J. B. Carr, certainly recalls to memory our idea of Greg: "Dr. Gregory was a polished gentlemen and a skilled operator."

Dr. Estell E. Morris, Director of the Oral Surgery Clinic at Marion County General Hospital, recently renamed Wis-hard Memorial Hospital, passed away on December 3, 1975. For many years, Dr. Morris contributed half-time to our teaching program and joined the faculty on a full-time basis in September, 1975. He was vacationing in Florida when he was

stricken. During World War II, Dr. Morris served in the Army in the North African and European Campaigns and received the Purple Heart at the Battle of the Bulge. Following his discharge from the service in September, 1945, he enrolled in Indiana University to complete his A. B. degree in chemistry, and received his dental degree in 1953. After graduation from Dental School, Dr. Morris completed his Oral Surgery training at the Medical Center. During his 25 years in Oral Surgery, Dr. Morris served his profession with distinction as a practitioner and a teacher. He was a past-president of the Indiana Society of Oral Surgeons and at the time of his death was President-elect of the Indianapolis District Dental Society. Dr. Morris, a native of Pellville, Kentucky, is survived by his wife and three daughters.



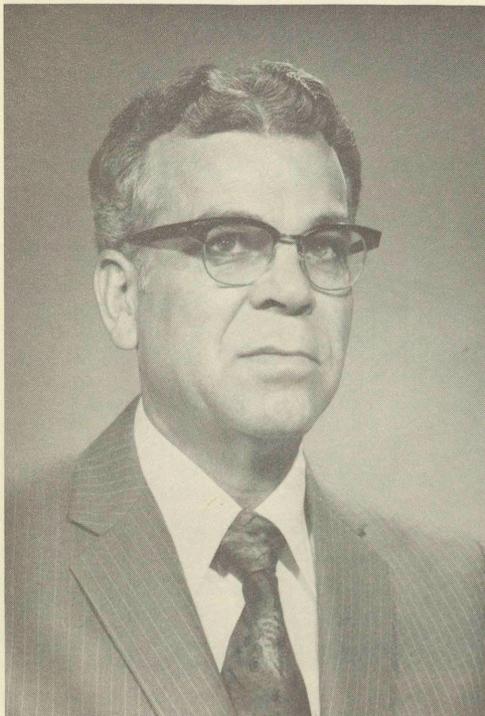
Dr. G. Thaddeus Gregory (1906-1975)

## Greetings from Bea Gordon

Many of you may wonder what happened to Bea Gordon following the closing of the College Inn in December, 1974. The following greeting from Bea appeared in a recent issue of the School of Dentistry Newsletter.

Greetings and best wishes to my friends at the Dental School. It's been over a year since I closed the Inn, but what memories! I'll never forget the wonderful going away party all of you gave for us.

I really enjoyed my long vacation from December to September and then accepted a job at St. Augustine Home for the Aged on West 86th Street. I do all the salads and desserts for 196 people. Sister Margaret is in charge of the kitchen. She has a wonderful sense of humor and loves to listen to all my corny jokes. Esther is the dishwasher and all around helper. Karen is head cook and does the meats and diets—Betty cooks all the vegetables.



Dr. Estell E. Morris (1920-1975)

The first day at work was really unbelievable. I started at 8:00 and worked till 4:30. All day long it was "Do this—no, not that" and so on. At 4:00 p.m., Karen said, "Bea, you look tired. Why don't you sit down and rest and maybe you can do something for me." So I thought, what can I do in 20 minutes

—do a soft shoe tap—tell a few jokes or maybe, just maybe, I could relax. Are you ready for the next line? "Bea, would you crack 270 eggs for Wednesday's breakfast?" Now, I never saw this many eggs laid out at one time, except once, and they were in an incubator and most of them were already cracked. As soon as I got home, I called Sandy Manion and related the events of the day and when I got to the 270 eggs, she cracked up and was still laughing when I hung up. She said, "I'm glad you only had 20 minutes left or the hens would have to work overtime."

Sister Margaret works so hard helping and planning to feed so many. The ones who live there are called residents. Carmel, Loretta, Ruth, Hilda, and Jack (residents) all come down and prepare all our vegetables and fruits. They are jewels.

In her spare time Sister Margaret tells jokes. My favorite is the one about a monk who was captured by cannibals and thrown into a pot. After boiling for 5 hours, the cook complained to the Chief that the monk was still tough. The Chief said, "Of course he is, you idiot, you boiled him and he's a Friar." If any of you folks are thinking of retiring, come to St. Augustine's. The Sisters go all out to make you comfortable. The Home is immaculate, the food delicious (especially the salads and desserts) and you can't beat the wonderful care you receive from employees and Sisters. When I retire, I'm going straight from the kitchen right up to my room. The qualifications are that you have to be over 60 and poor, and boy, do I qualify.

I sure miss all the gang at school, but Sarah and Sandy and Isabell Poor keep

me informed, so I still feel I belong. Thanks again for the wonderful memories.

Bea

### Faculty, Student and Alumni Recognition

The School of Dentistry faculty and students continue to bring honor and prestige to their school.

Assistant Dean James E. Vaught has been notified that the Trustees of the American Dental Association approved his appointment as a consultant to the Council on Dental Education and the Commission on Accreditation. Dr. Vaught's work as a Director of Dental Auxiliary Education and innovative teacher in expanded duties has received considerable national attention.

Dr. William G. Shafer has been notified by the American Cancer Society that his department has been awarded a Clinical Fellowship. The Fellowship will allow Dr. Shafer and his faculty to identify an outstanding dental graduate to participate in the post-doctoral oral pathology program.

Dr. Timothy J. O'Leary has been named President of the American Academy of Periodontology. He also serves as President of the American Board of Periodontology and as co-editor of the *Journal of Periodontology*.

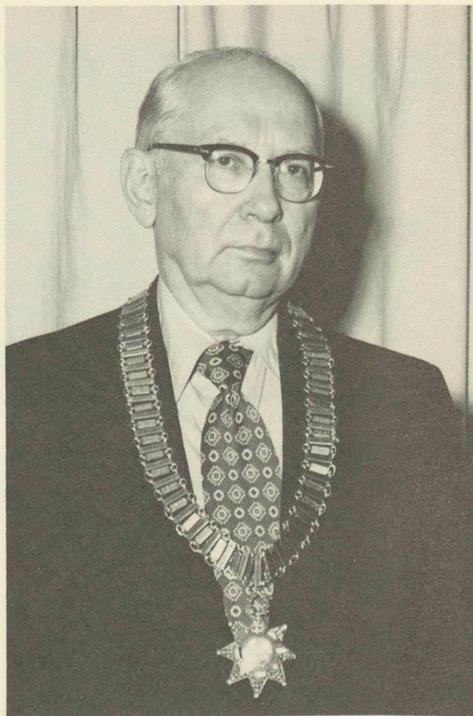
Dr. LaForrest D. Garner is completing his term as President of the National Chapter of Omicron Kappa Upsilon. The organization has an active program to promote scholarship and academic programs in schools. The annual meeting is held at the time of the American Association of Dental Schools Session.

Dr. Carlos L. Suarez-Vazquez, who completed his master's program in Operative Dentistry in 1967, has been appointed Dean of the School of Dentistry at the University of Puerto Rico. Dr. Suarez-Vazquez, a 34-year-old graduate of the School of Puerto Rico, becomes one of the youngest Deans in Dentistry.

Dr. Maynard K. Hine, former Dean of the School of Dentistry (1945-1968), has been named President of Federation Dentaire Internationale. Dr. Hine, first Chancellor of Indiana University-Purdue Uni-

versity, Indianapolis, was unanimously elected President of FDI at its 75th annual meeting. The organization, whose members represent more than 300,000 dentists, is a federation of dental organizations in 70 countries with headquarters in London. Dr. Hine is the seventh American to be elected President of FDI. He also was presented with the American Dental Association's Distinguished Service Award at the annual session. This is the highest award given by the ADA to a dentist, and it honors Dr. Hine's contribution to dentistry and the ADA. Dr. Hine continues to be active as Executive Associate of the Indiana University Foundation and Special Consultant to President John M. Ryan.

Dr. Ralph W. Phillips, Associate Dean for Research, has been appointed to an eight-man commission, charged by the Massachusetts Dental Society with evaluating the efficiency and, in particular, the conclusions of the Forsyth Dental Center Study on new duties for dental hygienists. The future of this somewhat



Dr. Maynard K. Hine, President, Federation Dentaire Internationale; Recipient, Distinguished Service Award, American Dental Association

controversial program will be determined by the commission members. Dr. Phillips' book, *The Elements of Dental Materials*, has recently been translated into Italian, the sixth language in which the book is now available.

Dr. Phillips was keynote speaker at the annual meeting of the Netherlands Dental Association, Utrecht, Holland. He was presented with a special award for distinguished contributions to the dental profession. In addition, he has been named charter member and member of the Board of Directors of the newly formed American Academy of Esthetic Dentistry. He also has been reappointed consultant to the Commander, U.S. Army Medical Research and Development Command.

Dr. Morris Stoner, Professor of Orthodontics, was elected President-elect of the Great Lakes Society of Orthodontists at a recent meeting of the group.

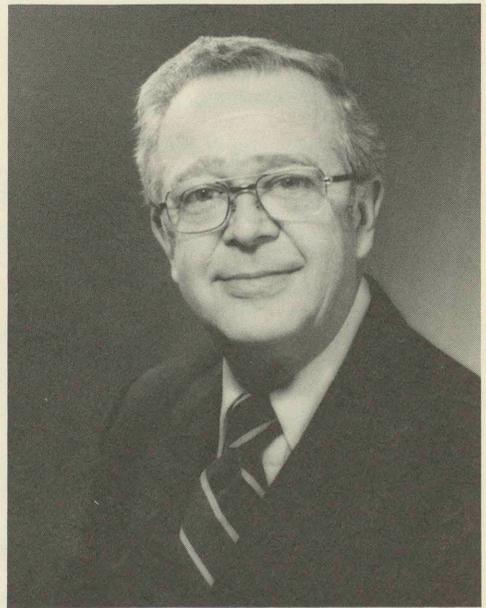
Mr. Jeffrey Blair, President of the Senior Class, has been active in the student section of the American Association of Dental Schools. Mr. Blair organized a conference for representatives of schools in the Ohio Valley Region. The workshop, held at the School, was designed to discuss the art and science of teaching. Schools represented included Northwestern, Ohio State, and the Universities of Kentucky, Michigan, North Carolina, and West Virginia. The meeting was a great success and as a result of this program, Mr. Blair has been invited to participate in a panel discussion at the annual meeting of the American Association of Dental Schools to be held in Miami.

The Council on Dental Education of the American Dental Association is implementing a comprehensive dental curriculum study of all United States Dental Schools, in cooperation with the American Association of Dental Schools. The project director has invited Mr. Rocklin D. Alling, a third year student at Indiana University, to serve as a student member of the coordinating committee. Mr. Alling's responsibility will be related to the development of a portion of the survey that deals with students.

Miss Linda L. Smith, fourth year dental student, recently attended a meeting of the

Executive Board of the Student National Dental Association in San Francisco. Linda was named recording secretary of the organization. Linda was also able to visit several schools on the West Coast, and upon her return she said, "Getting an opportunity to see other dental school facilities has really been an immeasurable experience. It also has served to reinforce my appreciation of Indiana University School of Dentistry."

Dr. Charles L. Howell, Assistant Dean at Indiana University School of Dentistry in 1961-1964, and Dean of Temple University School of Dentistry from 1964 to June, 1975, has been named Dean of the Ohio State University College of Dentistry. Dr. Howell was President of the American Association of Dental Schools in 1973-74, and is a former President of the American Association of Public Health Dentists. He also served as a member and Chairman of the American Dental Association's Council on Dental Research. Prior to being appointed Assistant Dean at Indiana, Dr. Howell served as Director of the Dental Division of the Indiana State Board of Health. Dr. Howell brings additional honor to himself and to Indiana University in his new appointment.



Dr. Charles L. Howell, Ohio State University College of Dentistry

Dr. Ronald S. Ping has announced his plan to retire July 1, 1976. Dr. Ping joined the Oral Surgery faculty of the School of Dentistry in 1949. He served as chairman of Oral Surgery until 1974, when he was given the responsibility of developing the clinical program in dental therapeutics and pharmacology. His memberships include the International Association of Oral Surgeons, Great Lakes Society of Oral Surgeons, and the Indiana Society of Oral Surgeons, which he served as President in 1956. Dr. Ping continues to be an active pilot, holding a commercial license, and he has been a member of the Civil Air Patrol since 1966. In recent years, Dr. Ping has been quite active in the Murat Shrine. He was President of the Concert Band in 1975 and currently is Vice-President of the Flying Fezzes. Dr. Ping is completing a distinguished teaching

career at Indiana University and we wish him and Nellie happiness in retirement years.

### Main Clinic Modernized

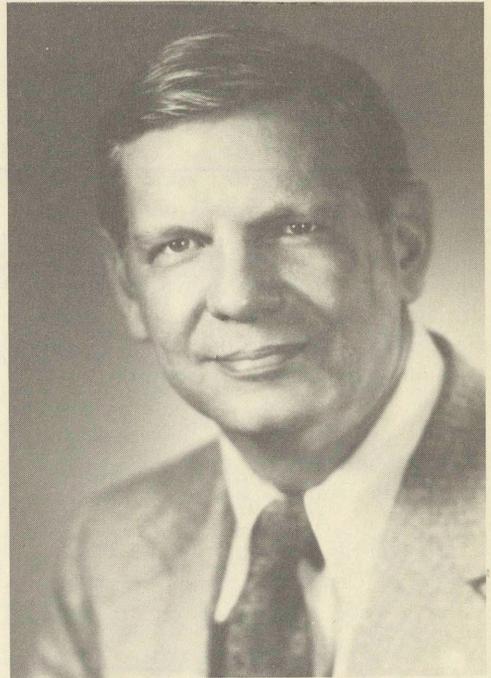
In the fall issue of the Alumni Bulletin, I made a progress report on the modernization of the "Main Clinic." I am pleased to report that the project is complete and the students (and faculty) are enjoying the new facility. The lowered ceiling, new lighting, air conditioning and soft music contribute to the comfort and efficiency of all who utilize the clinic. Dr. Marvin Schmidt and Dr. Maurice Lord contributed months of planning and research in equipment design and arrangement. The next generation of students and faculty owe considerable thanks to these two talented part-time teachers.



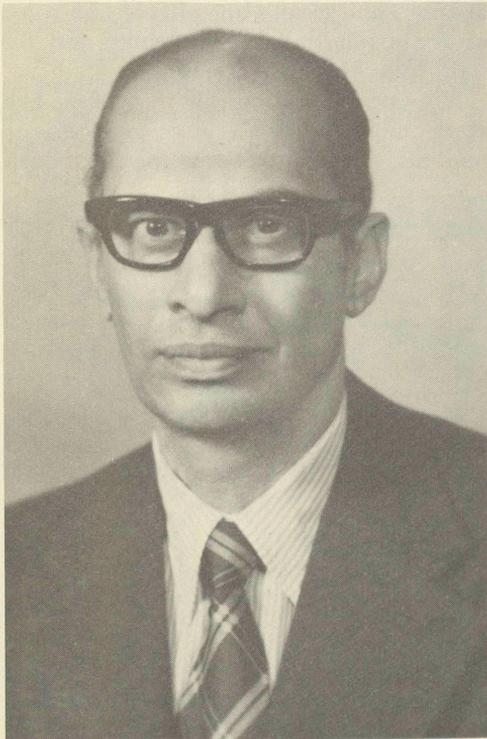
"Main Clinic"—I.U.S.D.



**Dr. Ronald S. Ping to Retire**



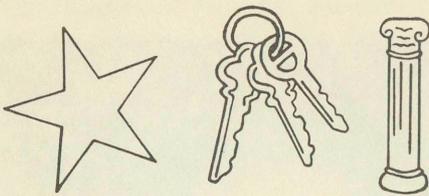
Dr. Charles C. Alling, professor and chairman of the department of oral surgery at the University of Alabama at Birmingham, has been appointed chairman of the American Society of Oral Surgeons special committee. As committee chairman, Dr. Alling will represent the 3,000-member national surgical specialty organization in the development of several special projects, including the development of a glossary of current oral surgery procedures and terminology. He received his D.D.S. from Indiana University in 1946 and completed his residency training at the University of Michigan. His son, Rocklin, is a third-year student at Indiana University Dental School.



Dr. Mohamed Daoud El Tannir, who received his M.S.D. from Indiana University in 1956, is serving as Dean of the Faculty of Dentistry at Cairo University.



**Board of Directors Meeting  
Fall Conference.**



*Paul E. Starkey*

Once again in this column we want to give recognition to an individual who adds an important dimension and makes a significant contribution to the overall mission of the School of Dentistry.

The faculty of Indiana University School of Dentistry is indeed fortunate and extremely proud to claim an artist as one of its members and colleagues. He is Dr. Rolando A. DeCastro.

His contributions to Indiana University School of Dentistry are unique as he provides a wide variety of artistic services. His signature,

*R. A. DeCastro, dmd, msd*

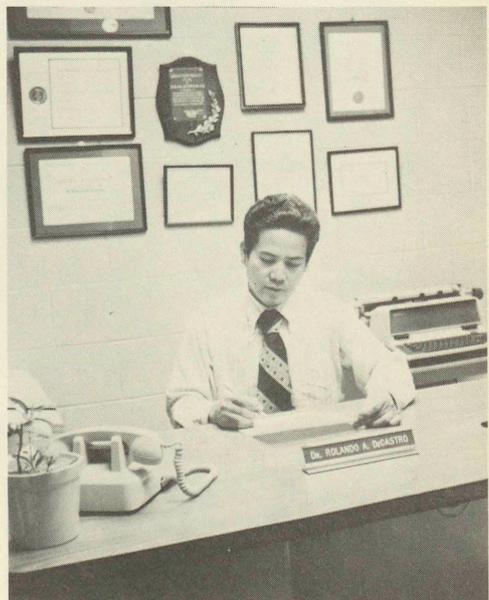
has become familiar and whenever one sees an illustration in a textbook or paper authored by a member of the faculty of Indiana University School of Dentistry, he also expects to find that signature.

Dr. DeCastro was born in the Philippines on November 23, 1929. He completed secondary school (high school) at Arellano Memorial College in 1949 and then received his dental degree, D.M.D., from Manila Central University College of Dentistry in April, 1953. After practicing dentistry in a suburb of Manila from then until 1956, he joined the staff of United Drug Company, Incorporated and also continued his practice. He became the project coordinator for the United Drug Company, and one day while in the large library of the Company, he picked up a book written by Dr. Frank Netter, a physician and medical illustrator for Ciba Pharmaceutical Company. From the time he was a little boy, Dr. DeCastro had loved to draw. He was greatly impressed by the illustrations of Dr. Netter and thought it time for him to actively pursue his dream

of devoting full time to the profession as an artist.

From a picture of Dr. Netter in the library book, Dr. DeCastro made a sketch which he included in a letter he wrote to Dr. Netter asking advice regarding a career as a medical illustrator. Dr. Netter liked the sketch and encouraged him, so he wrote to Dr. Maynard Hine, who was then president of the American Dental Association, asking if there was a potential for the use of his talents with the American Dental Association. Dr. Hine inquired for him but there was nothing available. The correspondence between Dr. DeCastro and Dr. Hine continued until one day Rollie appeared at the Dental School in Indianapolis and Dean Hine offered him a job as dental illustrator. The faculty and the staff have benefited ever since.

His talents were quickly recognized and appreciated and Rollie was swamped with requests for illustrations for textbooks,



Dr. DeCastro at his desk.

scientific publications, and teaching, for caricatures for presentation to participants to our teaching conferences and other events. The list could go on and on.

He designed the Indiana University School of Dentistry's 50th anniversary continuing education exhibit which won an award at the American Dental Association annual meeting in Washington, D.C., in 1974. His daughter, Vangie, also an artist, did much of the work in preparing the exhibit. Dr. DeCastro was appointed assistant professor of oral anatomy in 1971. He received his M.S.D. Degree at Indiana University School of Dentistry in 1973, and was appointed Director of Art in 1974. He was promoted to associate professor in 1975. Among his assignments is the teaching of a course in dental anatomy to dental assisting students, and a module instruction, "Planning and Producing Posters," for dental auxiliary groups.

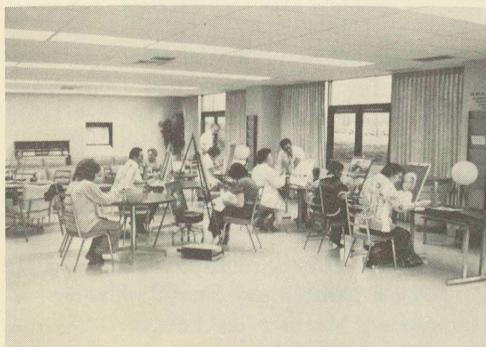
One of his exciting activities has been the development of the Indiana University School of Dentistry Art Club which began in 1970 and meets weekly. Nearly 80 members of the faculty and staff have participated in this Club and have produced more than 200 paintings which are frequently displayed in the Dental School and the Union building. They attest to much enjoyment reaped from this opportunity.

In the lobby of the new wing of the Dental School there is a partially completed mural which he is painting and which is approximately 6½ feet high and 28 feet long. It is a pictorial history of dentistry. The canvas alone costs \$500 and

was purchased by the Indiana Dental Association. The first 10,000 years are now in place and in color. This is a monumental piece of work which Dr. DeCastro devotes his Saturdays to, and he has already spent nearly two years at it and predicts it will take another year and a half to two years to complete.

Considerable research went into the planning for the mural. Dr. Jack D. Carr and Dr. DeCastro visited the Smithsonian Institution, the National Library, the National Archives and the National Art Gallery in their pursuit of historical information to use in planning the mural. Through a friend of Dr. Carr, a retired Admiral, they met Dr. Jackson, who is in charge of the Smithsonian's technology department. He gave them the privilege of digging into the files of his department and taking as many photographs as they wished. They collected references and examined the Smithsonian's historical exhibit on dentistry. Dr. DeCastro studied with a very critical eye the Smithsonian Institution's Hall of Petroleum Mural which measures 31 x 56 feet. He also studied the works of the masters in the National Art Gallery and the U. S. Capitol.

Many of the models for the painting are members of the faculty and staff and we all enjoy watching its progress. Dr. Rolando DeCastro adds an artistic dimension to our School and our faculty is proud to claim him as a colleague. But, he says he will feel very proud too, when he receives his American citizenship this bicentennial year.



A busy evening session for the Art Club.



Dr. DeCastro at work on the first section of the mural.

# Dental Auxiliary Education

*James E. Vaught, Assistant Dean for Dental Auxiliary Education*

Since the Fall issue of this Bulletin, a great amount of effort has been expended by the staff of the School of Dentistry in the completion of an accreditation site visit. The Council on Dental Education of the American Dental Association conducted the week-long visit in January, 1976. Hundreds of students pass through the classes, labs, and clinics of I.U.S.D. and as graduates enjoy the privilege of taking National and State board examinations for licensure or certification. The right to sit for National and State examinations is reserved for graduates of accredited educational programs.

Perhaps many graduates have never realized what is required of an educational institution to receive approval as an accredited program. The periodic evaluation of programs is conducted every seven years. A date for the visit is assigned nine months to one year in advance. Survey manuals and requirements and guidelines for accreditation are forwarded to the administrative offices of the institution. Detailed and specific information is prepared and submitted for the committee's review.

Areas covered include a description of the parent institution (Indiana University); the program budget; the program administration (flow charts, etc.); methods of faculty recruitment, promotion, tenure, etc.; methods and types of faculty appointments, salaries, fringe benefits, etc.; teaching assignments for each faculty member, including a breakdown of their total time commitments; a detailed investigation of the curriculum as to content, sequence, training aids, methodology, and methods of evaluation; the physical facility including lecture rooms, laboratories, clinic space, faculty and administrative space, and student lounge and locker space; the library and study aids; and the admissions policy for selecting students. Every course offered in the curriculum is written up according

to a specified format of course objectives, topical outlines, references, etc. Preparation for such a comprehensive evaluation requires the effort of every faculty and staff member. When all the required documents, exams, outlines, minutes of standing committees, etc., have been prepared they are sent to the consultants who were assigned by the Council on Dental Education.

The actual site visit is conducted over a four-day period. Two days are devoted to the dental hygiene program and two days to the dental assisting program. During this time a series of conferences are scheduled in which the visiting consultants may seek and exchange information with those who are responsible for the various areas listed above. Although it is an exhausting and expensive procedure, it is most worthwhile and helpful in maintaining a high quality educational program. You should feel justifiably proud of your faculty and staff of the School of Dentistry. Their efforts were clearly outstanding and special commendation was extended in their behalf to Dean McDonald by the visiting committee in their final conference. The exact results of the visit will not be known until after the May 1976 meeting of the Council on Dental Education in Chicago. You may expect the results to appear in the Fall 1976 issue.

## DENTAL HYGIENE

*Evelyn Oldsen*

The second semester is always a busy time of the year. Along with scheduled classes the students are preparing table clinics for presentation at the annual Table Clinic Day at the School of Dentistry, and studying for National Boards. In addition to the usual activities, students from all Indiana programs are to host the District V Junior American Dental Hygienists' Association Meeting on February 28 and 29 in Nashville. This project has involved their participation in planning the Meet-

ing and leading discussion groups for all students representing the dental hygiene programs in Indiana, Kentucky, Michigan and Ohio. Twenty-five schools are represented in this four-state area and the meeting should offer an exchange of ideas and help promote future interest in the Association.

A recruitment day for prospective dental hygiene applicants is another event the students are planning. Their major purpose in this project is to meet with prospective applicants and talk with them on an informal basis and explain the dental hygiene program to them. The students are very enthusiastic about this project and it should be very worthwhile.

Graduation, taking state board examinations, and beginning that "first" job are uppermost in the minds of the second year students. Let's all welcome them into the state and component associations as recent graduates.

## DENTAL ASSISTING

*Marjorie H. Carr*

The Dental Assisting Admissions Committee accepted 30 students for the 1975-76 class at the Indiana University School of Dentistry. While the majority of the members of the class are from the Indianapolis area, other towns represented are Anderson, Bloomington, Brazil, Carmel, Franklin, Lebanon, McCordsville, Martinsville, Mooresville, Winchester and Zionsville.

Class Officers were elected in September, as follows: President, Lorna Henry-Indianapolis; Vice-President, Liz Richards-Bloomington; Secretary, Karen Hardesty-Indianapolis; and Treasurer, Sheryl Fornoff-Mooresville.

The following students made the Dean's List for the first semester: Julia Burke, 3.77; Cheryl Sternberg, 3.77; Sandra Isenhower, 3.53; Nancy Mills, 3.53; and Jayne Revell, 3.53.

One of the most valuable experiences for the dental assisting student is her participation in clinical chairside assisting. In the first semester she averages 3 hours per week in either Radiology, Undergraduate

Periodontic or Graduate Pedodontic clinics. In the second semester, however, she spends 18 hours per week in clinical participation. The time assigned in each of the following clinics varies depending upon the availability of undergraduate and graduate dental students to assist: Operative, Crown and Bridge, Complete Denture, Endodontics, Periodontics, Riley Hospital (children with medical problems), Robert Long (Oral Surgery), Orthodontics, and Oral Diagnosis. Radiology, Undergraduate and Graduate Pedodontics are continued on the same assignment basis as the first semester.

For the past three years our Dental Assisting students have contributed their expertise in giving toothbrushing and oral health home care instructions to the patients and members of their families appointed to the Pediatric Clinic at Wishard Memorial Hospital. This program was initiated and is being carried on in cooperation with the Office of Volunteer Services at the hospital.

This year we have added one more extra-mural experience at the request of Dr. Joseph Nickel, Chief of Dental Services, Veterans Hospital, West 10th Street, Indianapolis. This dental program employs a staff of seven dentists, six residents, one hygienist, nine assistants, three lab technicians and two secretaries. Our dental assisting students are rotated through patient services involving four areas: Endodontics, Periodontics, Oral Surgery and General Practice.

We feel that these experiences will afford our students valuable opportunities to continue to improve their chairside skills, even though it is too soon to assess the results.

## DENTAL AUXILIARY EDUCATION IUPU at Fort Wayne

*George C. Smith*

The best news from Fort Wayne is *accreditation*. Following two years of hard labor, many prayers, sleepless nights, etc., it was all over in two days. However, the results made it all worthwhile since both Dental Assisting and Dental Hygiene programs received full accreditation as of

December 20, 1975. Not only is it good to have that recognition, but due to the many changes made during the last two years, things seem to be much better organized and running much more smoothly, a fact many of the recent graduates can appreciate. This is a special note of thanks to all who have participated and tolerated the trials and tribulations during the transition, including students, administration, and especially the hard working faculty. A good job well done!

The next big change at Fort Wayne should be most evident by August, 1976. By that time, our dental clinic will have acquired a new look. The changes include: relocation of the receptionist area; complete revamping and expansion of the radiography area; a new sterilization area; and partial replacement of the dental units and chairs. The new chairs will be lounge type and the units will be replaced with dental carts. If you haven't guessed by now, it is all very exciting.

Another bit of excitement experienced here at Fort Wayne has been the first continuing education course in expanded duties. It is sponsored by the IUSD Department of Continuing Education and taught by Dr. Jack Showley of Indianapolis. Eleven dental assistants and dental hygienists are enrolled and things seem to be progressing quite smoothly. Plans are to offer similar courses in the future, all of which will be coordinated with those being conducted in Indianapolis. The next class is anticipated next fall.

## DENTAL HYGIENE

*Gloria Huxoll*

While you are reading this, you perhaps will not remember the sub-zero weather and ice-clad roads that we were having at the time of writing this article. In spite of the weather, our dental hygiene and dental assisting students are adding to the success of the Isaac Knapp Dental Society's participation in National Children's Dental Health Week. A local TV station caught two dental hygiene students in the "act" of classroom dental health education and from this viewer's bench, it was very well done.

This is the time of year when high school students are reaching out to discover what the future may have in store for them. Our dental hygiene faculty has spoken to several high school groups and presented information on dentistry and all of our auxiliary programs.

Twenty first-year students received their caps with a single lavender ribbon, symbols of professional readiness, on January 11, 1976. Dr. Donald Glassley, '53, a Fort Wayne dentist, was guest speaker for the capping ceremony and placed "food for thought" in the minds of the guests as well as the students when he discussed the importance of nutrition to good body health as well as oral health.

Second year dental hygiene students are working hard on requirements; their expanded functions course; preparing their educational materials for their Practice of Community Dental Hygiene in Wabash, Indiana; and review books are being kept open until late hours preparing for the National Board on March 29, 1976.

Connie Clair, second year student, was the recipient of the Ruth White Award. She received a plaque and \$25.00 from the Isaac Knapp Dental Auxiliary. This award honors Mrs. Ruth White, who has been a dental assistant for her husband and also very active in the dental profession. Connie received the award for "Outstanding Dedication to the Dental Profession." She is a certified dental assistant also.

Four dental hygiene students, two from each class, received DUKE'S Day Scholarships of \$250.00 each. The grateful recipients were Mary Bacon and Cathy Beal, second year, and Kibby Calhoun and Susan Schenher, first year students.

## DENTAL ASSISTING

*Hilda Nofzinger*

Twenty-one Dental Assisting students will be graduating May 14.

Two students, Sue Incontro and Diane Williams, have received scholarships from the Julia A. Southard Scholarship Fund, and three students, Leann Byanski, Rita Horne, and Patty Walls, have been awarded DUKES Day Scholarships.

All of the students participated in National Dental Health Week. Going in pairs to the city schools, either two dental assisting students or one dental assisting student and one dental hygiene student, they presented "Tooth Town, U.S.A." and the brushing technique to third grade students.

## DENTAL LABORATORY

*John R. Winings*

During Spring semester the second year dental technology students are again participating in an intra-mural and an extra-mural program. Students select a specialty (such as crown and bridge) in each of these areas. In the extra-mural experience students are assigned to commercial and office dental laboratories for approximately eight hours per week. This gives students some practical experience and much insight into the profession. In the intra-mural experience, students work in the campus laboratory approximately twelve hours per week and construct cases that are sent in from various institutions. It is felt that both of these experiences add considerably to the student's training.

In conjunction with these two courses, each student is required to write a research paper in the corresponding area. This requires the student to study the latest research in some depth, and it relates closely to the prosthetic areas in which the students are working.

## DENTAL AUXILIARY EDUCATION AT SOUTH BEND

*Alfred Fromm*

Since this is my last contribution to the Alumni Journal as director of Dental Auxiliary Education in South Bend, I have not asked my supervisors to write for this edition. I wanted the space all to myself so I can reflect upon what was accomplished in South Bend. The decision to resign did not come easily.

In 1969, when Dr. Ralph Schimmele called me and asked if I would take what was then called the assistant directorship of the South Bend program, I thought long

and hard about it since my first love was pedodontics. But then where can a man my age start a new career? It was a challenge and I accepted. Dean Ralph McDonald encouraged me, and between Dean McDonald and Dr. Schimmele I was given a program with a supervisor in Hygiene and one in Assisting. Along with these supervisors were the students in each program, who had been picked prior to my arrival. There were seven in Hygiene and eight in Assisting. I will to the end of my days remember these classes. As I sit here writing this article I can look with pride at the plaque reading, "Thank you Dr. Fromm—from the Magnificent Seven"; this, from the first Hygiene class in the history of Indiana University at South Bend; and then there is the plaque from the assistants that also can be seen from where I sit.

A year later we were accredited by the Council on Dental Education, and I treasure the letter commending our presentation. From these humble beginnings we grew to where each year we have been accepting the maximum number of students our facilities will permit. This usually is twenty-two hygienists and twenty-five assistants.

I can take only partial credit for these accolades. The groundwork was laid by Dean McDonald and Dr. Schimmele. They too are responsible for the success of the programs here. Acting as a search committee, Dr. Schimmele picked well the nucleus of our faculty.

There are not too many professions in which the knowledge of the students can be measured against other institutions conferring the same degree. We in dentistry and its ancillary programs can by virtue of National Boards compare our students' knowledge at the end of their schooling with other schools offering the same degree. In Assisting we can do the same thing since all graduates take Certification exams. Throughout the years our graduates at Indiana University in South Bend have ranked in the top third in the nation. This certainly is a tribute to our faculty. All this, I feel, has been accomplished by the leadership given dental auxiliary programs in Indiana by Dr.

Ralph Schimmele. I am sure he can look back with pride at what he has accomplished in the State. Almost like a "mother hen" he would correct the mistakes of his directors. Visits by him were looked forward to by the faculty and the directors. Never having been in academe, and never truly having to work from a budget, I can remember the year we almost ran out of money with three months of the academic year left. I still can hear the opening statement by Dr. Schimmele over the phone, "Al, South Bend is bankrupt". Well, we managed to survive, and from this incident I learned how to live within a budget.

It is with melancholy that I leave the friends I have made in the dental school faculty through my association with Indiana University. They all made me feel as though I were an alumnus of Indiana University, and in truth I depart feeling that way.

It has also been a pleasure working under the leadership of Dr. Vaught. I had been at Indiana University only a very short time when he took over the program. Naturally some of the ideas put into execution were different from what had been done up until then, but time will no doubt prove the worth of these changes.

I have many people to thank outside of dentistry, who helped make this program a success. This could not have been accomplished without the support and understanding of the administration on the South Bend campus. Locally we have gone through some trying times in recent years. What with autonomy, and two Deans of Faculties, it has not been easy; yet through all of this I have always had an ear at the top level that would listen. Chancellor Wolfson has always been most cooperative, and some of the success of this program must be attributed to his wisdom in helping me deal with the administrative problems that arose.

And so now I say farewell to my faculty and alumni. May the success of this program continue.

## DENTAL AUXILIARY EDUCATION AT NORTHWEST CAMPUS

*Edward W. Farrell*

Dr. Danilo Orescanin assumed duties as Chancellor of IUN on September 29. He has brought with him an impressive educational and work experience background and already we are becoming aware of his many plans for IUN's future. The dental program has thus far enjoyed full cooperation from all at IUN and we look forward to working with Dr. Orescanin in the future.

On January 1 we were most pleased to add to the faculty of our dental hygiene program Miss Ruth Hopman from Prairie State College. She received her Bachelor of Science degree from Loyola University in 1975. Ruth's work experience includes private practice as well as teaching at Prairie State College. We welcome Ruth to our ranks.

Work continues on the renovation of our building and hopefully the completion date is close at hand. In the meantime, classwork is being presented to 10 dental hygiene students and 12 dental assistant students utilizing classroom and lab space that was made available on the main campus.

On Wednesday, January 21, the ten dental hygiene students along with Emily Carr, Dental Hygiene Supervisor, were guests of honor at the monthly dinner meeting of the Northwest Indiana Dental Society. The Dental Society has been extremely helpful and supportive of our program and for this we extend our heartfelt thanks.

Twelve new dental assisting students were admitted to start on January 12. By going straight through the summer sessions we anticipate that they will finish their educational year in August in time for a new class to start in September.

The first dental hygiene capping ceremony took place on Sunday, January 18. We were most pleased to have with us for the occasion Vice Chancellor of I.U.P.U.I. John C. Buhner as guest speaker. Dr. Buhner had formerly served as Acting

Chancellor at IUN and played a strong supportive role in the dental program becoming a reality at this campus. In addition, we were honored to have Dean McDonald and Assistant Dean James E. Vaught with us for the festivities. Locally Chancellor Danilo Orescanin as well as the President-elect of the Northwest Indiana Dental Society, Dr. Paul Stephens, were present.

## DENTAL HYGIENE

*Emily H. Carr*

January 18 was an exciting day for the first dental hygiene class when they received their caps at a ceremony held in the Academic Building on the campus here at I.U.N. Approximately 100 persons were in attendance at the ceremony and reception which followed in the Student Union Building.

The students honored at the ceremony were Cynthia Bushemi and Mary Shimko from Merrillville; Cheryl Garfield from Crawfordsville; Sandra Clear from Winchester; Janelyn Creamer from Connersville; Margaret Rivera, Carla Vander Wall and Kathleen Williamson from Gary; Sarasue Robb from Munster; and Judy Uhlar from Hobart.

The dental hygiene and dental assisting students participated in the observance of National Children's Dental Health Week by distributing posters and educational materials to the 30 elementary schools in the city of Gary. This project was organized by Ruth Hopman of the dental hygiene faculty.

The class is planning for the District V JADHA Workshop which will be held in Nashville, Indiana on February 28-29. Northwest Campus will assist the other campuses in Indiana in hosting this year's program.

## DENTAL ASSISTING

*Jennifer J. Hays*

On January 8, 1976 the Dental Assisting Program began classes for its first twelve students. Their capping ceremony

is May 7, 1976 and their commencement will be August 20, 1976.

The class will be attending one session of the Chicago Dental Society's Mid-Winter Meeting and also participating in the Indiana Dental Association's State Meeting in May.

## DENTAL AUXILIARY EDUCATION AT EVANSVILLE

*Gordon Kelley*

The Evansville dental auxiliary programs are completing their first five years and we should all be quite proud of our accomplishments. We began our programs without a clinic or a laboratory and have succeeded in moving up the ranks to full accreditation. The path has had its pitfalls and we have changed our ideas many times, as well as our faculty.

We are now preparing for our third and final dental auxiliary program, dental laboratory technology, and will have a complete facility before we accept our first students. The program is anticipated to begin in August, 1976; however since we have not hired a supervisor at this time we cannot finalize our curriculum or publish a descriptive brochure.

The senior dental hygiene students are actively participating in our first course in expanded functions. We are following the ACORDE system and are very pleased with the way the students are progressing. Perhaps our graduates this year will be able to help their dentist employers in some new area.

This year we reorganized both of our radiology curricula and are very pleased with the results. The dental assisting students receive their instruction in the fall and the hygiene students enroll in the spring. The dental assisting students are assigned to our hygiene clinic during the spring and expose and process all the first year hygiene films. This method has relieved a space problem and is creating excellent practical experiences for the assisting students. The assisting students are assigned to our clinic in place of one dental office rotation assignment. During the clinic periods when the senior hygiene

students are treating patients the assisting students work as chairside assistants. We may just create a new demand for dental assistants in the Evansville area after our hygiene students graduate.

## DENTAL HYGIENE

*Catherine Cade*

The dental hygiene faculty and students are pleased with a tremendous increase in difficult clinic patients. These are being provided from the community and on a weekly basis from the Job Corps, Camp Breckenridge, Kentucky.

We are anticipating more meaningful experiences in the fall with extra-mural sites at Fort Campbell, Kentucky, Army base and Job Corps center at Camp Breckenridge.

We have 14 students in our first year class and 12 in our second year class. One of our senior class students is Robert Ankrum, who will be our first male graduate. He is anticipating pursuing his new career this summer.

## DENTAL ASSISTING

*Nancy Heavrin*

We have 18 of the most enthusiastic students looking forward to careers in dentistry. On December 14 we held our second annual Capping Ceremony with Mrs. Stella Evans, past president of the Evansville Dental Assistants Society, giving the charge to the class.

In February, graduation pictures will be made for the first time on this campus. We are looking forward to having a composite of the class published in the fall, 1976, Alumni Bulletin.

The dental assisting curriculum has undergone some modification this past semester and the practice management course has been completely revised. All of the changes have shown encouraging results. This summer we will offer an expanded functions course to our graduates.

With the recent changes in the ADAA By-laws on membership, we are formulat-

ing a program to be offered to working assistants wanting to become certified.

This year we will again be graduating three students with our new Associate in Science Degree.

The coming of graduation also means the coming of applicants to be selected for the 1976-77 class. Each of the applicants counseled with thus far is of excellent quality. We will again this year be using the Dental Assisting Aptitude Test, the personal interviews and hopefully, the newly formulated Rating of Candidates presented to the Dental Assisting Administrative Council by Dr. Leonard Koerber.

## ISAAS FURNAS

*(Continued from Page 23)*

Interspersed in this notebook are recipes for Hickory-nut Cake, Feather Cake, Cornstarch Cake, etc.

Isaac Furnas died in 1880 and is buried south of Bridgeport, Indiana, on the farm which he originally bought from the United States Government.

Isaac's grandson, Miles J. Furnas, as Majority leader of the Indiana Senate, was helpful to dentistry in many ways, particularly during the struggle between dental advertisers in Indiana and organized dentistry. The contributions of Isaac's great grandson, Dr. I. Lester Furnas, have been described in an earlier article in the Dental School Alumni Bulletin.

The book Isaac Furnas used to prepare himself to practice medicine was given to the Dental School Library by his great grandson, I. Lester Furnas.

## THE PASTURE

*(Continued from Page 14)*

Not long ago I heard it said that the perfect setting for retirement would be affluent anonymity. Much can be said for this idea.

We are looking forward to our fifty-fourth anniversary in 1976. We know so well that we will be greatly blessed to celebrate this momentous date together.

# The Bookshelf

*Mrs. Helen W. Campbell, Librarian*

We are always asking for documents pertaining to the history of the Indiana Dental College or the Indiana University School of Dentistry. Alumni have responded with diplomas, class pictures, historical sketches, etc., and we are constantly on the alert for any item of local historical interest. For that reason, we were excited to find a paper included on a Northwestern University Dental School acquisition list for July-August 1975 which gave as the author "Frederic R. Henshaw," and was entitled "Dentistry, a Profession for Women." In a letter to Miss Minnie Orfanos, Librarian at NUDS, we asked for a Xerox copy of Dr. Henshaw's article, because a search of our records had failed to produce any indication that we had ever had a copy of this work. Dr. Henshaw had been Dean of both the Indiana Dental College and Indiana University School of Dentistry, serving in that capacity from 1914-1938. The article itself is undated but the letters from women dentists which are attached, and to which he refers, are all dated in April, 1918. World War I and the shortage of male dentists may have been the impetus for the preparation of this article, but it is interesting that the Indiana Dental College had one woman graduate in 1916 and then none at all until 1922. Is it possible that Dr. Henshaw's paper, which we quote in its entirety, recruited that 1922 graduate?

## DENTISTRY

### *The Profession for Women*

In choosing a method of earning a livelihood certain questions should receive any woman's consideration. First, she should ask herself, Am I fitted physically, by education and temperamentally to make a success in this work? Second, Is the work such that I can become interested in it, so that life will hold some enjoyment for me even in gaining my living? Third, Is there need of my services in this line of work? Fourth, If I am successful in the pursuit

of it, will I be compensated sufficiently for my labor and according to my needs?

The first question may be answered in this way: Any woman of average physical condition, capable of earning her living in any other walk in life where she is brought into competition with men, can practice dentistry successfully so far as her physical condition is concerned. In fact, the practice of dentistry is much less of a physical strain than is nursing, teaching, or most office positions. Educationally, all prospective dental students must have a high school diploma or its equivalent, so that feature adjusts itself automatically. It takes the same temperament for success in the practice of dentistry that it does in any pursuit where you are in contact with others. A pleasing personality and the ability to make friends is an asset, but not an absolute necessity. With them, you will succeed more quickly and have a larger measure of success. Success in dentistry is the result of patience and painstaking work, as it is in any other pursuit.

In answer to the second question, no one but the physician, and then in no greater measure, can have the satisfaction from work well done that the dentist has. The relief of pain, the conservation of health and appearance, are daily duties. There is no monotony about it, as no two mouths present identical problems. It is constructive labor and the goal is the health and well-being of your patient. It will hold your interest.

To the third question the answer is decisive. There is a great and growing demand for prophylactic—disease-preventive—dentistry and an equal demand for more dentistry for children. Both of these specialties present unlimited opportunities for women. Women are peculiarly and particularly fitted by centuries of instinct and training for practicing them. Women are more dextrous in delicate operations than men—speaking generally. And women succeed with children where men

utterly fail. The ordinary channels of activity for women are crowded. There are already plenty of trained nurses, and the life is a hard one. Stenographers, clerks and office girls are a drug on the market. School teachers are being turned out by normal schools by the thousands. But there are only a few women practicing dentistry and we know of none who are not doing well. It is the greatest opening for women we know of today.

In answer to the final question, a dentist—a woman—should net from \$1200 to \$10,000 per year, according to her ability and her location. \$1200 a year net would be about the limit in a small, country town. \$10,000 per year would be a large and remunerative practice in a large city. \$2400 to \$3600 per year would constitute a good average. Compare even the lowest of these estimates with the earnings of women in other pursuits and note the difference in favor of dentistry.

Read the following statements of a number of women who are at this time engaged in the practice of dentistry, who are enjoying the esteem of their communities, and who, with the satisfaction of serving humanity, have also the satisfaction of serving well their own interests and financial advancement.

INDIANA DENTAL COLLEGE  
FREDERIC R. HENSHAW, Dean  
INDIANAPOLIS, IND.

\* \* \* \* \*

To interject a modern note, in the past year only one woman has written a thesis for a Master's degree in dentistry at Indiana University. Her thesis abstract is among the following:

**AN IN VITRO STUDY OF  
STREPTOCOCCUS MUTANS  
PLAQUE INHIBITION BY  
STREPTOCOCCUS FAECALIS**

David Borsky

This study investigated the nature of *Streptococcus mutans* plaque inhibition by *Streptococcus faecalis* when grown in mixed culture in liquid medium. The method used for the *in vitro* plaque assay consisted of serial transfer

of nichrome wires with adherent *S. mutans* plaque for five consecutive days with subsequent dry plaques weight determination.

The inhibitory principles appears to be both cell-bound and free. The extracellular inhibitor has a molecular weight greater than 10-12,000 as determined by dialysis of the *S. faecalis* cell-free spent media. Boiling the *S. faecalis* filtrate before using it in the plaque assay system indicated that the cell-free inhibitor is both heat-stable and probably not a protein. *Streptococcus mutans* plaque production was seen to be particularly sensitive to sucrose depletion (less than 1%) and increased acidity. No dextranase activity was found when preformed *S. mutans* plaque was incubated in *S. faecalis* cell-free spent media. The extracellular inhibitor probably prevents *S. mutans* plaque formation, instead of causing its degradation once formed. When samples of mixed cultures of *S. mutans* and *S. faecalis* were grown on solid media, the viability of *S. mutans* indicated that killing was not the mechanism for *S. mutans* plaque inhibition.

**THE RELATIONSHIP OF STATIC  
CREEP TO MARGINAL BREAKDOWN  
IN AMALGAM: A CLINICAL  
EVALUATION**

Michael A. Cochran

This study was an attempt to further elucidate the role of static creep in the performance and longevity of the clinical amalgam restoration. The static creep of a single commercial dental amalgam was altered by changing the trituration time. Laboratory tests showed that trituration times of 5 to 18 seconds produced amalgam samples of low and high creep, respectively, without significantly affecting the other physical properties of the alloy. On the basis of the laboratory results, a clinical study was conducted using paired, class II restorations of the high and low creep samples.

Three different evaluation techniques were used and evaluations were made of the 68 restorations at baseline and 6- and 12-month intervals. A definite trend toward greater marginal breakdown in the 18-second, high-creep restorations was noted at the 6- and 12-month evaluations. The study will continue and yearly evaluations will be made to determine if this trend will continue.

To date, the results of this study support the findings of other researchers in that the restorations of the high creep alloy show a greater propensity for marginal breakdown than do restorations with the low creep alloy. The data thus indicate that the static creep test may be a good predictor of the clinical serviceability of commercial amalgam alloys.

## AN EVALUATION OF THE FROZEN SLAB MIXING TECHNIQUE ON THE PHYSICAL PROPERTIES OF CERTAIN DENTAL CEMENTS

Charles Coghlan

A method was devised to evaluate the effect of the "frozen slab" mixing technique on the physical properties of a zinc phosphate, zinc silicophosphate, hydrophosphate and polycarboxylate cement. Those properties studied were the setting time, compressive strength, tensile strength and solubility.

Standardized mixing procedures were employed using predetermined powder/liquid ratios. Setting and working times were increased for all cements when mixed on glass slabs chilled to  $-15^{\circ}\text{C}$ . All cements kept on the cold slab were still unset after 32 minutes.

Compressive and tensile strengths were adversely affected by the "frozen slab" technique. All cements gave parallel reductions of the two strengths on the order of 20 per cent except the polycarboxylate which exhibited only a 5 per cent reduction in tensile strength. The polycarboxylate exhibited the highest tensile strength while its compressive strength was one half the others tested.

Solubility samples were prepared and placed in 0.001M acetic acid at pH4. Solutions were changed daily and solubility was determined by the gravimetric method. The solubility of all cement was adversely affected. The zinc silicophosphate exhibited the highest and the polycarboxylate the lowest solubility of the cements tested.

It was recommended that cements be mixed above the dew point and multiple mixes be used to insure optimum physical properties.

## CLINICAL AND MICROSCOPIC PULP RESPONSE TO A COMPOSITE RESTORATIVE MATERIAL

David M. Dickey

The object of this study was to evaluate the histologic response of the pulp to a new resin-bonded quartz-filled composite restorative material. An attempt was also made to find correlations between subjective symptoms and objective clinical tests; and pulp response as determined by microscopic evaluation.

In a stringent test, intentionally deep Class V cavities were made in 176 human teeth with a high speed turbine handpiece and a no. 37 inverted cone bur. No coolant, base or liner was used. Control materials were silicate cement and zinc oxide and eugenol. The composite resin was used in 94 teeth; 43 were filled with silicate cement; and 39 with zinc oxide and eugenol, in an approximate 4:2:2 ratio. Half of the teeth were extracted at 10-14 days (Interval I) and the remainder at 28 to 32 days (Interval II). Twenty-seven teeth were excluded from the histologic analysis because of exposure, fracture, or other reasons.

Subjective symptoms were recorded in any teeth causing postoperative patient discomfort and objective tests with radiographic examination, percussion, cold, heat and electricity were performed on each tooth prior to cavity preparation, and again prior to extraction.

The results of the histologic analysis revealed that zinc oxide and eugenol elicited a mild response in almost all instances. The results also indicated that the irritational qualities of the composite restorative material were comparable to those of silicate cement. With judicious use of a liner or base material in deep cavities, it should be a safe, effective restorative material.

The radiographic examination was not helpful in determining pulp status and subjective symptoms provided a limited contribution to this end. Although they did not all correlate well, the objective clinical pulp tests were considered the most helpful in assessing the histologic condition of the pulp. Abnormal response to heat and increasing degrees of pulpitis were directly correlated. Response to the electrical test invariably indicated pulp vitality which was subsequently demonstrated microscopically.

## EFFECTIVENESS OF ORAL HYGIENE INSTRUCTION TO PARENTS OF PRESCHOOL CEREBRAL PALSY CHILDREN

Roland R. Ditto

The lack of an effective method for teaching oral hygiene procedures to parents of handicapped children prompted this investigation. Seventy-nine preschool cerebral palsy children were randomly distributed according to age and sex into three groups. The parents of these groups received the following instruction: Group I—written instructions for a detailed approach to oral hygiene maintenance in the home as if the child were without handicap; Group II—written instructions for a specialized approach to home oral hygiene maintenance with emphasis on two people providing the care, and mouth propping for access and stability of the arms and legs; Group III—no specific oral hygiene instructions.

Each child in each group received a thorough oral examination and deposits of dental plaque were disclosed, numerically scored and recorded. Each parent of the three study groups participated in a written examination of dental knowledge at each visit. After each examination, the correct answers were given to the parent by both a verbal and written response. Parents and children returned at 90-day intervals.

Variables such as transportation, surgery performed during the period of study, deteriorating health in the child, parental apathy about dental problems, and change in family job or location, reduced the sample from seventy-nine to fifty-four subjects, with data being obtained for pre- and post-examination periods. Both test group of parents significantly improved

their dental knowledge scores after ninety days. However, none of the children decreased their plaque enough to show statistical significance. Perhaps there was some motivational improvement in the Group II parents, as they returned for the examination at a better rate, judged to be significant as compared to the other groups.

Further investigation is recommended either to study the technique by itself without a time interval between scores or to evaluate the factors of intelligence, economic level, gravity of medical situation, and sibling support as they offset changes in behavior. Until then, it appears on the basis of this study that it is possible to increase the parent's knowledge of oral health but that changing the behavior of the parent actually performing the task is much more difficult.

### SEALING PROPERTIES OF FLUORIDE-CONTAINING PIT AND FISSURE SEALANTS

Sigfus Thor Eliasson

Laboratory studies suggest that adding fluoride to pit and fissure sealants may be beneficial since it reduced the solubility of enamel and increases its fluoride content.

This investigation dealt with the sealing abilities of pit and fissure sealants containing various amounts of fluoride. The effects of thermal stress and storage time on microleakage, using radioisotope<sup>45</sup> calcium chloride (<sup>45</sup>Ca), were studied. Three BIS-GMA materials (Nuva Seal, Epoxylite 9075, and S. S. White experimental sealant) and one cyanoacrylate material (Johnson and Johnson experimental formula #132) were used. The sealant materials, containing 0, 3.5, 5, 10, and 15 per cent NaF, were applied to occlusal surfaces of sound extracted human molars. For each material, 200 teeth were sealed. The specimens were stored in water for one week and three months before microleakage was assessed. Additional specimens stored for the same intervals were subjected to thermal cycling 2500 times. The temperature baths were held at 15° C and 45° C.

The three BIS-GMA materials were superior to the cyanoacrylate sealant in sealing ability. The data indicated that adding sodium fluoride to the three BIS-GMA sealants did not alter their sealing qualities. All three BIS-GMA sealants containing sodium fluoride in amounts varying from 3.5 to 15 per cent demonstrated sealing ability that ranged from good to excellent, and was comparable to that of the controls of the respective materials. With the cyanoacrylate material, leakage was markedly increased by the addition of fluoride, by storage time, and by thermocycling. The Nuva Seal system appeared to have certain advantages over other materials tested. Its sealing ability was excellent, it was easy to apply, and the fluoride remained in suspension longer. With

the other three fluid materials, the fluoride particles were difficult to maintain in suspension.

This in vitro study suggests that the BIS-GMA pit and fissure sealants containing 3.5 to 15 per cent NaF should not fail because of microleakage.

### AN EVALUATION OF TETRACYCLINE STAIN REMOVAL BY BLEACHING VITAL RABBIT INCISORS

Patrick A. Fleege

This study evaluated the effectiveness of bleaching tetracycline-stained teeth by measuring the loss of fluorescent intensity from teeth that were bleached.

Nineteen male New Zealand white rabbits, with 58 incisors stained with oxytetracycline and 16 incisors as unstained controls, were used. Three rabbits were sacrificed to determine whether the tetracycline stain was comparable between incisors in the same jaw. Of the remaining 16 animals, 6 were bleached once and 10 were bleached twice. One maxillary and one mandibular incisor were bleached in each jaw with 30 percent hydrogen peroxide and heat for ten minutes per tooth; the other incisors were protected with a rubber dam. The animals were sacrificed 24 hours after the last bleach. The fluorescent intensity of 374 select ground sections 100±5 microns thick from the incisal, middle and gingival thirds of the teeth were measured with an ultraviolet light microscope coupled to a television electronic measurement system. These measurements were statistically analyzed by t-test, and observations correlated.

The dentin of tetracycline-stained maxillary incisors which were bleached twice and the dentin in the incisal one-third of the mandibular incisors which were bleached twice had a significantly ( $P \leq 0.001$ ,  $P \leq 0.005$ ) lower tetracycline fluorescent intensity than the dentin of unbleached tetracycline-stained teeth. The greatest loss of fluorescent intensity of tetracycline occurred in dentin closest to the dentino-enamel junction and varied from about 150 to 350 microns from the outer enamel surface. Clinical Kodachromes indicate that the loss of tetracycline pigment is associated with the loss of tetracycline fluorescence; The ground sections showed that the tetracycline fluorescence was never totally removed by two bleaches.

### COMPARISON OF TISSUE REACTION TO SILICONE AND CHROMIC CATGUT SUBDERMAL IMPLANTS IN THE RAT

E. Kent Fritch

Soft tissue reactions to silicone, chromic catgut, and a composite alloplastic implant of the combination silicone and chromic catgut material were compared in the rat. The silicone

implant was biocompatible and biostable, while the chromic suture material was biodegradable, eliciting its typically moderate and even at times moderate to severe tissue reaction. The composite implant reacted with the combined super-imposed tissue reactions of each individual material. Of 75 implants studied, one implant was extruded, while three others had abscess formation thought to be related to bacterial contamination, or some other unknown factor. Stabilization of the implant occurred significantly by connective tissue capsule formation around the implant and ingrowth through the fenestrations in the implants. No actual microscopic evidence of absorption of the chromic within the implant and subsequent tissue ingrowth into the channels of the implant can be reported from this study.

The concept of a biocompatible implant, both biostable and biodegradable, is important to the reconstructive specialties of medicine and dentistry. Future development of composite alloplastic implants is invaluable for the needs of mankind.

#### **AN IN VITRO EVALUATION OF A UV LIGHT ACTIVATED RESIN SYSTEM**

**Charles J. Goodacre**

A new resin system involving polymerization through exposure to ultraviolet light has recently been introduced. The system utilizes a pit and fissure sealant (Nuva-Seal) as a liner for a composite restorative material (Nuva-Fil). This study involved an in vitro evaluation of the system on the basis of pertinent testing methods.

The manipulative process was investigated and the results showed that 30 seconds of exposure to an UV light polymerized the Nuva-Seal to a depth greater than would be employed clinically. Ninety seconds of UV light exposure was required to cure the Nuva-Fil to a 1.5 millimeter depth. A curing depth of 2 millimeters was difficult to achieve.

The permeability tests using dentin slabs demonstrated that the Nuva-Seal film is impermeable to sodium chloride, sodium fluoride, and phosphoric acid.

The enamel adhesion tests indicated that the Nuva-Seal enamel bond is similar to that produced when an unfilled resin is placed over etched enamel. Tensile testing of the Nuva-Fil/Nuva-Seal dumbbell specimens demonstrated that a bond between the two materials does occur. The Nuva-Fil Knoop hardness was comparable to other composite resins.

The Nuva-Seal film was readily abraded by a toothbrush and abrasive whereas the composite was more resistant to this type of abrasion. The Nuva-Fil wear produced by enamel was slightly greater than that produced on another composite, Adaptic.

Immersion in <sup>45</sup>Ca showed that etching of the enamel improved the marginal seal when

the composite was employed alone. Four techniques of placement of the Nuva-Seal liner with the composite were tested. When the Nuva-Seal liner was placed over etched enamel in conjunction with Nuva-Fil, the results were superior to those produced when the liner was employed without an etch. A Nuva-Seal liner under other restorative materials produced leakage results comparable to a conventional cavity varnish.

#### **THE EFFECT OF TRAUMA AND ONCOGENIC AGENTS ON THE ODONTOGENIC TISSUES IN THE ALBINO RAT**

**Stanley A. Hirsch**

An attempt was made to induce odontogenic neoplasms in rats by physically disrupting the developing mandibular incisors and then subjecting the dental tissues to treatment with various oncogenic agents: aniline, arsenic, asbestos, beryllium, DMBA, hair and nickel. Fifty-three weanling Wistar albino rats were used. At four days of age all animals received trauma to the base of the incisors. Subsequently, 37 animals received implants. One-tenth ml of a single agent was injected into each side of the mandible through bur holes made in the cortex at the base of the incisors.

Radiographic and histologic examination revealed that the mandibles obtained from the animals of different groups were similar. The materials implanted had no demonstrable tumorigenic effect on the dental tissues. Odontoma-like lesions were encountered in four animals and probably resulted from proliferation of continuously developing dental tissues at the base of impacted incisors. One animal exhibited a proliferation of myxoid tissue at the base of an incisor that was compatible with an odontogenic myxoma. Nearly one-third of all the animals were infected with microorganisms suggestive of Actinomycetes. The gross findings were analogous to cervico-facial actinomycosis in man and support the notion that trauma may precipitate such infections.

Adnexal and odontogenic tumors were compared in terms of histogenesis. The possible influence of inductive interactions in preventing neoplasia in the odontogenic apparatus was discussed.

#### **EFFECT OF MYCOPHENOLIC ACID ON WOUND HEALING OF RAT SKIN AND BUCCAL MUCOSA**

**Robert P. Langlais**

This study evaluated the effect of orally administered mycophenolic acid on wound healing of rat skin and buccal mucosa. Mycophenolic acid is a new investigative drug currently being clinically treated for its effectiveness against refractory psoriasis. Normal and methotrexate treated controls were used for com-

parison. It was hypothesized that since these drugs interfere with cell reproduction, healing would be adversely affected or delayed. The results indicate that therapeutic, non-toxic doses of mycophenolic acid and methotrexate, given orally to rats, exerted no appreciable effect on wound healing either grossly or at the level of the light microscope.

### **A CEPHALOMETRIC SKELETAL AND DENTAL ANALYSIS OF SELECTED BLACK AMERICAN CHILDREN IN THE INDIANAPOLIS AREA**

**Jeanne L. McDonald**

This study was conducted to obtain hard-tissue cephalometric standards for Black American children of twelve years of age. A sample of twenty-four Black American children from the Indianapolis area (thirteen boys and eleven girls) was analyzed and compared with the existing Denver (Caucasian) sample of comparable age.

A total of thirty-eight skeletal and dental measurements were taken and analyzed statistically. Comparisons were made between Black males and females; Black and White males; and Black and White females.

There were only eight measurements that showed no statistical difference from the White standards for both males and females: cranial flexure angle, gonial angle, mandibular plane angle, A-B(OP), A-B(FH), A-Pg(OP), Y-axis angle, and cant of the occlusal plane.

There were no significant differences between Black males and Black females.

All the linear measurements were significantly larger for the Black sample, except for the chin button (which was significantly smaller in the Blacks).

There was a proportionally larger increase in the mandibular body over the ramus of the mandible in the Black sample; there was a proportionally larger increase in the lower facial height over the upper facial height.

In the Black sample, the nasal floor converged upward anteriorly with respect to Frankfort Horizontal. The denture bases and lower face were more protrusive in Blacks; the incisors were more flared and bodily forward.

Black patients, therefore, should not be compared to standards set up for Caucasians, but to a set of standards based on normals of their own ethnic group.

### **IN VITRO STUDIES ON MARGINAL LEAKAGE OF TEMPORARY SEALING MATERIALS AS USED BETWEEN ENDODONTIC APPOINTMENTS ASSESSED BY Ca<sup>45</sup>**

**John E. Marosky**

Several new temporary restorative materials have been produced in recent years. A study

of six commercially available products was undertaken to evaluate the relative sealing ability of each. These cements are all used as temporary restorations during endodontic therapy, and in this investigation their microleakage was compared.

The cements tested were Temp-Seal, Cavit, zinc oxide and eugenol cement, zinc phosphate cement, I.R.M., and Duralon. The cements were placed in endodontic access openings in single rooted extracted human teeth. Sixty teeth were used for each cement. These were divided equally. One-half (30) were tested after three days and the other half after 10 days. Each group was separated once more. One-half of the three day specimens were held at 37°C and the remainder were thermal cycled with a temperature differential of 40°C (10°C-50°C).

Leakage was detected through the use of radioactive Ca<sup>45</sup> by producing autoradiographs of each specimen. Examples of various amounts of leakage were chosen and identified as no, slight, moderate, and severe leakage. A numerical value was given to each, with no leakage being "0", slight "1", moderate "2", and severe "3". Three interpreters assessed each autoradiograph and compared it with the previously selected examples. Each autoradiograph was assigned a value according to the scale and averages were made from the three individuals.

The cement with the least microleakage was Temp-Seal, followed in order by Cavit, zinc oxide and eugenol cement, zinc phosphate cement, I.R.M., and Duralon. As time increased, leakage increased, and thermal cycling reduced the sealing ability of all the cements tested.

Further investigation is needed to compare manipulative variables, resistance to abrasion, hardness, and other factors. The results of this study did indicate a trend concerning the sealing qualities of the six cements compared. It would appear that those materials showing the best results under these test conditions might also produce the most satisfactory restorations for the practitioner.

### **A CEPHALOMETRIC STUDY OF VELAR STRETCH IN 8 AND 10-YEAR-OLD CHILDREN**

**Arthur P. Mourino**

This investigation examined the prevalence, relative magnitude, and selected components of velar stretch in normal-speaking 8 and 10-year-old children. For twenty 8-year-old and twenty 10-year-old children, lateral cephalometric films were obtained under three conditions: (1) subject at rest, (2) subject sustaining the vowel /u/, and (3) subject sustaining the voiceless fricative /s/. The cephalometric films were traced on acetate paper and specific radiographic measurements were made to des-

cribe important facets of velar stretch in children.

Data were obtained on the resting length of the soft palate, the antero-posterior depth of the pharynx, and the prevalence of velopharyngeal closure and/or the degree of velopharyngeal opening observed during selected speech utterances in normal-speaking 8 and 10-year-old children. Such information is expected to be useful to dentists, speech pathologists, and physicians who use lateral headplates to assess velopharyngeal adequacy.

Velar stretch per se was not observed in all 40 normal-speaking children. During the production of /u/, 36 children (90%) exhibited velar stretch; for /s/, 32 children (80%) manifested stretch. Paired-comparison t-test results showed that the length of the soft palate measured during speech was significantly greater than its resting length in both 8 and 10-year-old children. Moreover, significantly more total velar stretch was found during the production of the vowel /u/ than during the production of the consonant /s/ in both 8 and 10-year-old children. Although there was a significant increase in the length of the entire soft palate during the functional activities of speech, no significant increase in the anterior portion of the soft palate was associated with speech.

Analysis of variance techniques showed that 10-year-old children exhibited significantly greater velar stretch during both /u/ and /s/ utterances than did 8-year-old children. In addition, 10-year-old children exhibited significantly greater velar height and greater velar length characteristics during both /u/ and /s/ utterances than did 8-year-old children. Correlation procedures were used to examine the relationships between velar stretch and other commonly employed cephalometric measures. These analyses indicated that although velar stretch was significantly correlated with a number of commonly employed cephalometric measures, the amount of velar stretch was not well predicted by any single cephalometric measure used in this research.

## THE EFFECTS OF VARIOUS CHEMICAL AND PHYSICAL TREATMENT ON THE CONTACT ANGLE OF ENAMEL AND DENTIN

Yoshihito Ochiai

The significant contribution of surface chemical studies of fundamental dental problems, such as adhesion of restorative materials or plaque accumulation on the tooth tissue, is a matter of record. This study involved an evaluation of the reactivity of the tooth tissue, principally as determined by contact angle measurements.

In order to investigate possible factors affecting the variation of the wettability of human teeth, determinations were made on the following: fluoride content, crystallographic condition

(Ca/P ratio), morphological considerations (surface luster) and organic matter in very thin layers of human enamel. The influence of chemical reagents (phosphoric and citric acids, NaF, SnF<sub>2</sub>, oxidizing and reducing agents, silver compounds and coupling agent) on the surface energy of human enamel and dentin was studied. Various fluoride solutions were employed in order to investigate what mechanism might be involved in the interaction between the fluorides and the tooth surfaces, using different treating methods (topical, mechano-chemical and ultrasonic). These treatments were evaluated by the scanning electron microprobe and by contact angle measurements for each treated surface. Adhesion of resin and the penetration of dye (methylene blue) were also studied for fluoride-treated tooth surfaces.

The human tooth surface may be covered by proteinaceous material and this organic phase may originate from the tooth itself. Altering or removing the organic matter from the tooth surface is suggested as an efficient method to obtain better adhesion. The contact angle measurement is a very rapid method for monitoring most surface modifications and their resultant effects on adhesion.

Mechano-chemical treatments with chemical reagents increase the wettability of tooth tissue more than topical applications do. Both mechano-chemical and ultrasonic treatment of the tooth tissues with fluorides increase the wettability of the surfaces. Only those dentin surfaces treated ultrasonically with SnF<sub>2</sub> show the maximum bonding and protection from dye penetration.

## CLINICAL, RADIOGRAPHIC AND HISTOLOGICAL STUDY OF ENDODONTICALLY TREATED RETAINED ROOTS TO PRESERVE ALVEOLAR BONE

Robert L. Reames Jr.

The purpose of this study was to determine whether new bone would form coronal to retained endodontically treated roots. Two *Macaca speciosa* monkeys were used. The right mandibular central and lateral incisors, second bicuspid, and first molar were treated with conventional endodontic procedures. Contralateral teeth were extracted to serve as a control and to permit measurement of differences in bone loss. With the aid of surgical flaps and high speed burs, the endodontically treated teeth were amputated coronally and reduced 1-2 mm below the alveolar crest. Clinical and radiographic examinations were conducted at six, 12, and 20 week intervals using photographs and intra and extra-oral radiographs. Following sacrifice, block sections were removed, fixed, decalcified and embedded in paraffin. Serial sections seven microns thick were prepared and stained with hematoxylin and eosin  
(Continued on Page 56)

# Alumni Notes

*Cleona Harvey, 335 S. College St., Bloomington, In. 47401*

Well, hello again, to all of you! From the winter we have been having, it seems spring won't ever get here—but it will, we know! And how about some more letters and cards from all of you? They aren't getting here as they should! You know if we don't get the news from you, we can't pass it on to your classmates. And they (and we) DO enjoy hearing from all of you! So let's get out those pens and pencils and send in some news for the next issue of the Dental Alumni Bulletin!

Just in case some of you have not heard: Did you know Dr. Hine had been elected President of the Federation Dentaire Internationale in October 1975? And received the American Dental Association's highest award, the Distinguished Service Award, at their annual meeting in October? And served as Interim Editor of the Journal of Dental Research upon the death of Dr. Mitchell? Just wanted you to know that man DOES keep busy!

Evelyn, you will all be pleased to hear, I'm sure, is feeling much better—in fact, she is talking about working in the yard this spring. I seem to be the invalid now! But I know with the prayers and good thoughts of all you wonderful people I shall be feeling much better soon!

And now for news of the

## Class of 1917

Deceased: Dr. Raymond G. Shepherd, Springfield, Ohio, June 17, 1975.

## Class of 1923

Deceased: Dr. Ivan C. Watts, Logansport, November 20, 1975.

## Class of 1924

Deceased: Dr. Lucas F. Kunkel, Boca Raton, Florida, July 31, 1975.

## Class of 1925

Deceased: Dr. Charleston B. Cox, Indianapolis, July 8, 1975.

## Class of 1926

Deceased: Dr. Howard Maesaka, Honolulu, Hawaii, August 24, 1975.

## Class of 1927

Deceased: Dr. Virgil N. Key, Princeton, February 2, 1975.

## Class of 1928

Deceased: Dr. G. Thaddeus Gregory, Indianapolis, October 3, 1975.

## Class of 1931

Deceased: Dr. Lawrence Ginther, Michigan City, July 18, 1975.

Deceased: Dr. Ralph E. Wilson, Gordo, Ala., February 18, 1975.

## Class of 1937

Deceased: Col. James M. Enmeier, Newport News, Va., April 28, 1975.

## Class of 1940

Deceased: Dr. Marion A. Shaw, Lebanon, July 21, 1975.

## Class of 1946

Deceased: Dr. Harold E. Matlack, Salisbury, Md., September 9, 1975.

## Class of 1953

Deceased: Dr. Estell E. Morris, Indianapolis, December 3, 1975.

Deceased: Dr. Richard H. Reinking, Cameron Park, California, December, 1975.

## Class of 1954

Received a cheery Christmas greeting from

Dr. and Mrs. Robert C. Johns  
6709 Pontiac Drive  
N. Little Rock, Ark., 72116,  
sending us "warmest greetings from

Arkansas," and reporting that the hunting and fishing are still excellent in Arkansas and it is a lovely spot for sightseeing. Dr. Johns says, *Ruth and I are thinking of retiring from the service and practicing a little prosthodontics either in Arkansas, Florida or Arizona . . . Say hello to everyone at I.U. for us.*

#### Class of 1957

We received a lovely Christmas greeting and their "yearly Christmas Letter 1975" from

Dr. and Mrs. Waldo S. Scales  
160 Marine Street  
St. Augustine, Fla., 32084

reporting *Waldo has been busy as usual with his dentistry, his construction company, and with his land speculation. He has devoted most of his free time building a road into a beautiful piece of wooded land with two lakes on it out west of town, and bringing us up to date on the activities of their family—which we enjoyed very much!*

#### Class of 1958

Dr. and Mrs. Tom Childes sent us a beautiful Christmas greeting—their address is 3713 Brown Ridge Rd., Bloomington, Ind. 47401. They also had heard I had fallen and cracked a rib, and Sue offered to do some of my Christmas shopping for me—and believe me, I gratefully accepted!

#### Class of 1961

Deceased: Dr. Ronald J. Schoeps, Lehigh Acres, Fla., September 16, 1975.

#### Class of 1965

Received a good wishes card from  
Dr. and Mrs. Jim McGuire  
2938 Ramble Road  
Bloomington, Indiana 47401.

#### Class of 1967

Deceased: Dr. Stephen Slavin, Muncie, November 10, 1975.

#### Class of 1968

Received such a cheerful Christmas card from

Dr. Geraldine Chan  
556 Princeton Street  
New Milford, New Jersey 07646

She reported she had run into Dominic Lu at a meeting; he is in Pennsylvania now, having his own office. She also reported she is busy trying to set up her own office.

#### Class of 1970

We received Christmas Greetings from  
Dr. and Mrs. R. Howard Beastall  
531-B Birch Circle  
Pearl City, Hawaii 96782.

They reported they had just returned from three weeks in New Zealand and Australia; they enjoyed every minute of it. Their oldest daughter is now in kindergarten and is taking hula lessons; they attended her first recital and reported it was a great thrill to see her perform.

#### Class of 1971

We received our Missionary Letter as usual from

Dr. and Mrs. Virgil Ullom  
Box 90-B

Port-au-Prince, Haiti, West Indies  
We thoroughly enjoy reading of their activities, and of the wonderful work they are doing.

#### Class of 1972

Dr. Bogan shared with us—and we wish to share with you—a letter from

Dr. and Mrs. Bruce Clem  
530 Fairfield Drive  
Wabash, Indiana 46992

in which they report that a lot has happened in their one year and four months in Wabash. Dr. Bing Fowler has joined Bruce and Dr. Marvin Wright as an associate in the practice. He and his wife, Wanda, moved there in June. Dr. Wright and Bruce have been working in their newly constructed 10-chair dental clinic for about two months now . . . *it has certainly been quite an undertaking, but well worth it*, Dr. Clem says. Ann reports,

None of us want for things to do, including me. Between doing some substitute teaching off and on, teaching two piano lessons a week, tutoring a couple of children and working with Girl Scout leaders, I strive to be a halfway decent wife and mother, also. Bruce, too, has been trying his hand at some teaching. The vocational school here offered a dental assistants program and the dentists in town have shared in the various areas of instruction. He's trying his carpentry skills at making a toy box for Sean. Of course, Sean keeps our teaching techniques fresh—particularly our patience, when his curiosity and learning are progressing faster than we can keep up with him . . . One of the lessons he's taught us that we'd like to share with you for the holidays is to 'see as a child sees the joy and wonder of Christmas.' May your blessings of the New Year be plentiful.

Deceased: Dr. Charles Valentine, Indianapolis, October 6, 1975.

### Class of 1975

Becka Snider shared with us a letter she received from

Dr. Cleo Walker  
1941 B Lexington  
Halsey Village  
Great Lakes, Illinois 60088

and we take pleasure in quoting some of it:

*Just a few lines to say hello and that I miss you and all my other friends I made while I was there in school . . . The Navy way of life is a real experience. I'm getting a lot of training . . . I'm also an active member in the Academy for General Dentistry, and up for election to be treasurer for our particular vicinity. I just finished a five-week rotation in Oral Surgery under Dr. Hillenbrant and he is fantastic.*

*I'm taking a correspondence course out of Washington, D.C. on "Diagnosis of Lesions of the Oral Mucosa;" I know Dr. Tomich would be proud of me! I have been selected to go to Walter Reed Hospital in February for a graduate course in Oral Diagnosis. Last but not least I'm wanting to complete my degree program*

*at the University of Evansville and will take correspondence courses from them starting in January after they look over my I.U. transcript to determine just what they want me to complete to fulfill their requirements . . . Tell all concerned I said hello and that I wish to be home soon. My future plans are sort of indefinite but I am thinking of trying to get into a specialty program in the Navy or King Memorial Hospital in N.Y. in the field of Oral Surgery. But 1977 isn't right around the corner, so I still have a little time to weigh and evaluate!*

### PRINCIPLES

(Continued from Page 8)

#### Resolution

Resolution of the cellulitis depends upon the stage at which adequate treatment is started. Twenty-four hours after treatment begins, there may be little or no change in the swelling. There should be no increase in the swelling, unless we have some superimposed surgical edema from the removal of a tooth or an incision and drainage procedure. In 24 hours temperature should be down near normal and the patient should feel much better. Often a patient obtains almost immediate relief from release of the pressure by incision and drainage or removal of a tooth. Trismus, if present, will often not show much improvement in 24 hours and may take a week or so to resolve.

#### Reference

1. Gabrielson, M. L., and Stroh, E. Antibiotic efficacy in odontogenic infections. *J Oral Surg* 33: 607, 1975.

### BIOPSY

(Continued from Page 15)

As the use of the biopsy service has expanded over the years, it has become apparent that increasing numbers of younger dentists are availing themselves of this service. Many of these are men who have established practices in states other than Indiana but prefer to send their tissue specimens back to Indiana to this laboratory. As a matter of interest, we have

compiled data showing the number of dental offices which have utilized this biopsy service during the year from January 1, 1975 to December 31, 1975. As can be seen in Figure 2, besides the 276 offices in the state of Indiana which used this service, offices in 21 other states including Alaska and Hawaii have been served by the dental school facility.

### ORAL MEDICINE

(Continued from Page 17)

of myofascial pain dysfunction syndrome was made and therapy has since improved her condition without the need for facial surgery.

A third case involved an elderly woman who was referred to the clinic with an asymptomatic firm mass in the left buccal mucosa and a history of oral cancer in the family. The medical history and oral examination indicated a need for a sialogram of the left parotid gland, which was performed. The case was subsequently discussed with members of the radiology department at Indiana University Hospital

and a diagnosis of a radiolucent sialolith was made. Surgery was not indicated at that time due to the patient's age and the status of the salivary gland. However, the patient was relieved to know the relatively innocuous nature of the problem.

A 29-year-old man was referred to the clinic with an ulcerated, friable exophytic lesion of the right maxillary molar area. Both the patient and the referring practitioner were concerned about the possibility of cancer. A biopsy was performed and a giant cell granuloma was diagnosed in the pathology report. Serum calcium levels were subsequently measured on three different days to rule out hyperparathyroidism. As the serum calcium levels were normal, the remainder of the lesion was surgically removed.

Many other cases involving possible genetic problems, pemphigus, moniliasis, aphthous and herpetic ulcers, major and minor salivary gland problems, temporomandibular joint disturbances, allergies and a multitude of radiolucent and radioopaque lesions have been referred to the clinic for diagnosis and/or treatment. All patients seen in the Oral Medicine Clinic

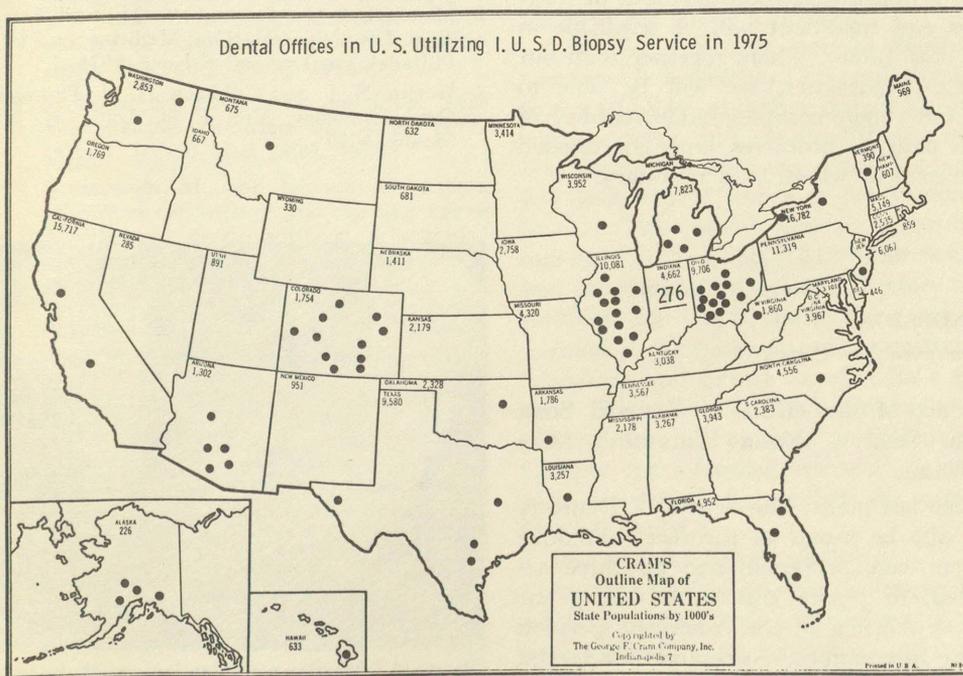


Fig. 2. Distribution by states of dentists using biopsy service.

are then referred back to their own practitioner for the remainder of their dental treatment. In addition, patients are referred from the Department of Radiation Therapy, before beginning their course of treatment for head and neck cancers, to receive a comprehensive oral examination, dental treatment, and instruction in post-therapy oral care. Also, a complete recall list is maintained on all patients with possible premalignant lesions so that these patients may be regularly monitored in addition to seeing their own private practitioners.

Oral medicine is an area of dentistry which is actively attempting to make known and to make available the benefits of medical science as they apply to the dental situation. Progress has not always been rapid, although advances in many areas have been made at the Indiana University Medical Center and elsewhere. For example, it is possible to use diagnostic tests such as sialograms, biopsy, culture, and the various extraoral radiographic projections with minimal cost at the clinic. Then specialists in that particular field are usually available for consultation with a minimum of inconvenience.

It is hoped that more methods of diagnosis and treatment will be available in the near future. Then, together with our medical colleagues, we will be able to achieve a more complete understanding of each patient's problems, with coordinated management where it is necessary.

## DANDELIONS

*(Continued from Page 10)*

product of the effort of Richard Scott (alias Scotty), Alana Fears and Mike Halloran.

One last point: the School of Dentistry can also be proud of the fact that three papers were proposed, and all three accepted, to report this work during the March meeting of the American Division of the International Association for Dental Research.

## 'DENS IN DENTE'

*(Continued from Page 19)*

adequate full-mouth radiographs. Because of the lack of perforation of the nasal cavity and maxillary sinus, it was evident that the lesion was slow-growing and had been present for a long time.

The antrum was smaller on the affected side due to the fact that the sinus does not become completely pneumatized until puberty and the presence of the cyst in the area prohibited normal development.

The patient's dental history, examination and radiographs indicated that he had been seen and treated a number of times before. If a more careful examination had been performed previously, this lesion would not have been as extensive and proper treatment could have been rendered without subjecting the patient to hospitalization.

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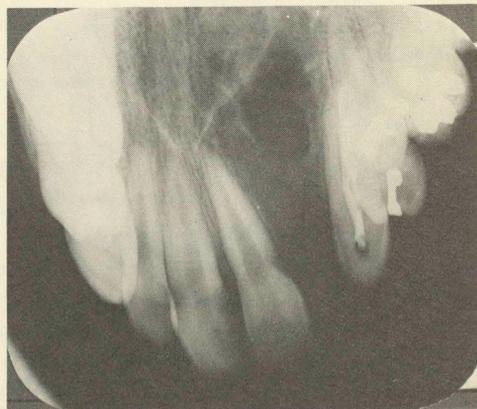


Figure 4 Maxillary occlusal view of healing site.

## ELECTRON MICROSCOPE

(Continued from Page 22)

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## A COMPLAINT

(Continued from Page 27)

in your area. Some funds are available for community fluoride equipment (up to \$2,000) through the Indiana Dental Association and the Dental Division Indiana State Board of Health. Assistance for self-application of fluoride is available through Oral Health Research Institute-Indiana University School of Dentistry. Rural schools with their own water supply can be helped. Check for your needs; don't let sense be given away to nonsense.

The third point that needs to be emphasized is your membership in our Indiana University School of Dentistry Alumni Association—and this is a challenge, too. A great number of you are paid up but many have not yet sent in the 1976 dues. Please make out your check for \$10 to I.U.S.D. Alumni Association now. They need you and certainly all of dentistry in Indiana needs to work together. An inadequate state budget for the dental school has resulted in too great a dependence on federal funding to maintain the basic part of the dental program. Loss of Federal funds, or the school's inability to accept them because of unrealistic restrictions and controls is also a problem.

I would also urge you to become a Century Club member. You can give \$100 to the I.U.S.D., and thus deduct \$50 from your state tax, and file the \$100 contribution on your federal tax which is another \$35 deduction if you're in the 35 percent bracket. The result is you are giving \$100 and it costs you only \$15. The benefits and good feeling of being a Century Club member are worth more than this.

Another purpose of our Association is friendship and getting together for a good time. The Annual Fall Conference is planned for this purpose at Bloomington Campus for a football weekend, so please plan to attend September 30 through October 2, 1976.

To close on a lighter note:

A young bride phoned a newspaper food editor and inquired, "How long do you cook a roast?" "Just a minute," replied the busy editor. "Thank you very much," the caller said as she hung up.

## LIBRARY

(Continued from Page 49)

for microscopic examination. Unstained sections were selected for viewing the procion vital dye markings under a fluorescent microscope.

Clinically, coverage by soft tissue seemed to be quite successful, except in two areas of communication with the oral environment. This correlated with the microscope appearance showing direct communication and down growth of surface epithelium to the amputation sites. Radiographic evidence of bone formation was observed and then confirmed through histological examination. As expected, the appearance of bone radiographically lagged behind actual osteoid formation depicted microscopically. Even though epithelium and inflammation commonly occurred over the amputation sites, their presence did not seem to affect bone formation. Osteo-cementum occasionally formed over the cut dentinal surface. The normal pattern of disuse atrophy of the periodontal ligament was apparent.

It was concluded that bone will form coronal to amputated endodontically treated roots; however this is not a predictable occurrence. Further long-term studies in progress might help in determining the ultimate fate of the retained roots. Deepening the amputation sites to at least 4-5 mm might possibly help in the predictability of bone formation. Extreme care must be taken to remove all the crevicular epithelium, because its implantation seems to provide a logical explanation for the band of epithelium present.

## AN INVESTIGATION OF INTER-MAXILLARY TOOTH MASS DISCREPANCY: A NEW APPROACH

James E. Williams

This study investigated the incidence, amount, and location of intermaxillary tooth mass discrepancy in a sample of malocclusion cases. Obtaining accurate tooth measurements was a primary concern of the investigation. Interproximal separation was achieved in each case prior to the taking of a silicone rubber impression. Individual tooth dies were then produced from the impression and measured with direct reading instruments. A model of occlusion was adopted as a reference for evaluating tooth mass problems.

Each case demonstrated some tooth mass discrepancy. The discrepancies in the posterior segments were generally very minor and of limited clinical significance. Larger discrepancies were found in the anterior segments. Most of these were small enough to be managed by

clinical manipulation of tooth position, but approximately one-fifth were large enough to have significant effects on occlusion.

The labio-lingual thickness of incisors was found to have considerable potential in affecting the anterior occlusion.

Statistical analysis revealed no difference in the amount of tooth mass discrepancy between males and females. Likewise, there was no difference between Class I and Class II malocclusion groups.

An anterior ratio and "Anterior Percentage Relation" were calculated and they compared favorably with the results of the original investigators. The malocclusion cases had a wider range of values than those cases of excellent occlusion.

Right-left tooth size asymmetry was investigated. The results indicated that the problem is not nearly as great as previously reported.

Following are more candid shots from our friend, Jack Carr.





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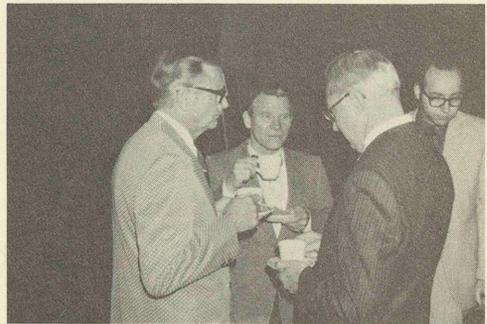
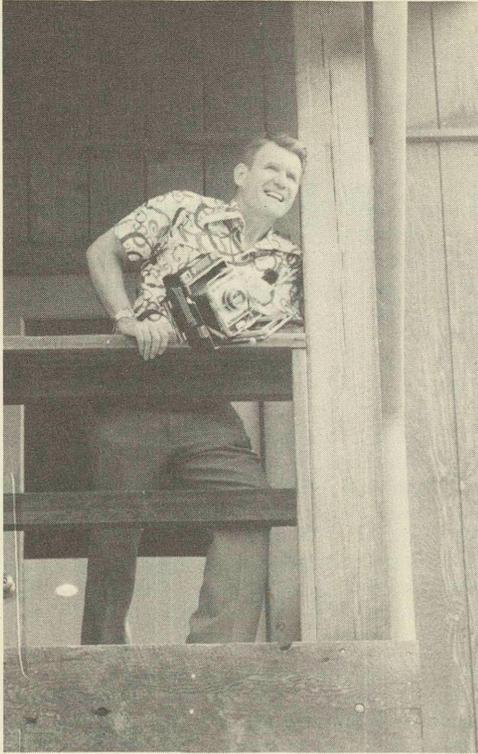
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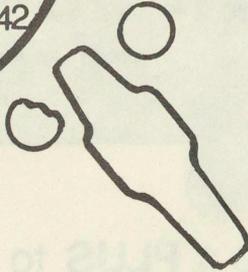
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