

**The History
of the
Oral Health Research
Institute**

by
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2000

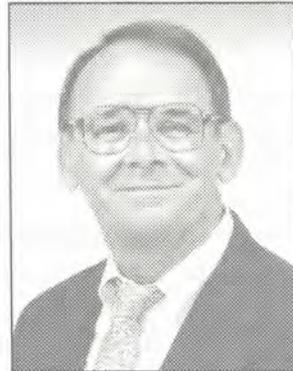
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The History of the Oral Health Research Institute is dedicated to the memory of Dr. Bradley B. Beiswanger for his many years of dedication to the Oral Health Research Institute and its quest for helping others obtain better oral health. He was a dentist, researcher, supervisor, co-worker, and most importantly, a friend.



*Dr. Bradley
B. Beiswanger*

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Kay Rossok

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The Oral Health Research Institute, located for more than 30 years in Indianapolis, Indiana, has served as a major influence in preventive dentistry research throughout the world.

Undoubtedly, the Institute has produced some of the most significant contributions to dentistry that the profession has seen¹. From its early days in Bloomington to its current location on the Indiana University-Purdue University Indianapolis campus, the Institute has provided high quality, timely, and cost-efficient care to those it serves². Though at times the studies and findings have led to controversy, the Institute and its personnel have maintained respected standings in their fields³. Many articles have been written about the studies performed at the Institute, but to date, no in-depth history has been produced. What follows is a look at this very important organization and how it came to be one of the premier dental research facilities in the nation.

The format of this text interjects personal reflections from interviews and a few selected phrases from articles. The statements are helpful in understanding how important the facility is, its research and its staff to those involved. These statements have been italicized and footnoted separately.

Notable Events at the Oral Health Research Institute

- 1945 Joseph C. Muhler, first-year dental student, conducts tests on fluoride in bone and teeth as part of studies in Dr. Harry G. Day's biological chemistry class on the I.U. Bloomington campus.
- 1949 Dr. Arthur W. Radike of the Procter & Gamble Company provides grant of \$5,000 to I.U. to conduct research on the possible use of stannous fluoride in toothpaste.
- 1950 I.U. research team headed by Drs. Joseph C. Muhler, William H. Nebergall, and Harry G. Day discover method for making calcium phosphate more compatible with fluoride and obtain patent for the use of stannous fluoride with this new toothpaste abrasive, calcium pyrophosphate.
- 1952 First clinical trial of stannous fluoride toothpaste begins on school children in Bloomington, Indiana.
- 1954 First scientific publication demonstrating the ability of a stannous fluoride toothpaste to reduce the incidence of dental caries in children.
- 1955 Procter & Gamble introduces the first toothpaste clinically proven to reduce the incidence of dental caries, Crest[®], and continues to conduct clinical studies at I.U. and other sites (Ohio State University, U.S. Navy, U.S. Army).
- 1959 First year of dental school moves from Bloomington to Indianapolis campus and Dean Maynard K. Hine establishes the Department of Preventive Dentistry chaired by Dr. Joseph C. Muhler. The Department is housed in the basement of the I.U. School of Dentistry at 1121 West Michigan Street and on the fourth and fifth floors of the School of Medicine's Medical Science Building. With financial support from Procter & Gamble the staff in the dental school begin mailing thousands of free samples of stannous fluoride to practicing dentists throughout the U.S. for professional topical applications; this program continues for nearly a decade. The department's research laboratories are located with Dr. Muhler in the Medical Science Building.
- 1960 Based on the results of seven clinical trials, the American Dental Association's Council on Dental Therapeutics grants provisional acceptance of Crest[®] for the prevention of dental caries, the first acceptance of a therapeutic dentifrice by this organization.
- 1964 The ADA's Council on Dental Therapeutics grants full acceptance of Crest[®] for dental caries prevention on the basis of 22 clinical trials.
- 1966 Drs. Joseph C. Muhler and Joseph L. Bernier (U.S. Army & Georgetown University) publish a reference book entitled *Improving Dental Practice Through Preventive Measures*. Departmental contributors included David Bixler, Victor Mercer and George Stookey. A second edition of this book was published in 1970 and included an additional departmental contributor, Dr. Simon Katz.

- 1967 Original patent on stannous fluoride and calcium pyrophosphate expires and I.U. Foundation uses \$476,000 in Crest® royalties to begin construction of a new research facility at 410 Beauty Avenue, across the parking lot from the Dental School. The address of the facility was later changed to 415 North Lansing Street.
- 1968 The new facility is named the Preventive Dentistry Research Institute and is formally dedicated on May 22, 1968.
- 1971 Dr. Muhler relocates his office and laboratory to the Fort Wayne campus of Indiana University and takes the name of the Preventive Dentistry Research Institute. Seven faculty members (Drs. Bradley Beiswanger, David Hennon, Simon Katz, Gordon Kelly, James Light, Byron Olson and George Stookey) remained at the Indianapolis facility. The Indianapolis facility is named the Oral Health Research Institute and Dean Ralph E. McDonald names Dr. Ralph W. Phillips as the Director and Dr. George K. Stookey as the Assistant Director.
- 1972 Drs. Katz, Stookey and McDonald publish first hard cover textbook entitled *Preventive Dentistry in Action*. The textbook is widely used in dental schools throughout North and South America and receives a national award from the American Dental Association.
- 1974 Dr. George K. Stookey becomes Associate Director of the Oral Health Research Institute and continues to expand funding base for their research programs that focus on the search for more effective measures for the prevention of dental caries, calculus, plaque and gingivitis.
- 1978 Drs. Simon Katz, James L. McDonald and George K. Stookey publish a textbook entitled *Preventive Dentistry for the Dental Hygienist & for the Dental Assistant*.
- 1981 Dr. Bradley Beiswanger publishes results of a large clinical trial that demonstrates the greater effectiveness of a dentifrice containing sodium fluoride with a hydrated silica abrasive as compared to the original stannous fluoride-calcium pyrophosphate dentifrice. Nearly identical results were simultaneously reported by Walter Zacherl at Ohio State University and Procter & Gamble introduced the current formulation of Crest®, replacing the original formulation.
- Dr. Arden Christen and co-workers obtain a \$50,000 grant from Merrill-Dow to conduct a definitive clinical trial of the use of a nicotine-containing chewing gum as an aid to facilitate the cessation of smoking. Based largely on the results of this study the Food and Drug Administration approved the use of Nicorette™ chewing gum as a smoking cessation adjunct. This served as the beginning of a research program on tobacco cessation and nicotine replacement therapy that continues to this day and has received national acclaim.
- 1982 Drs. Arden G. Christen and Norman O. Harris (University of Texas at San Antonio) publish the first edition of a textbook entitled *Primary Preventive Dentistry*, which becomes widely used in dental schools throughout the Americas. Subsequent editions are published in 1987, 1991, 1995 and 1999.

Contributions to these textbooks were made by several Institute members including Drs. Bradley Beiswanger, Kichuel Park, and George Stookey.

- 1984 Drs. Stookey, Christen, McDonald and Olson collaborate with Drs. Stuart Cohen and Barry Katz in the I.U. School of Medicine and obtain a five-year grant of \$2.5 million from the National Cancer Institute to conduct clinical trials of the efficacy of Nicorette™ chewing gum for smoking cessation in patients in both medical and dental practices.
- 1985 Drs. Bradley Beiswanger and Mark Mallatt report on the successful use of soluble pyrophosphate in a fluoride toothpaste to significantly reduce dental calculus formation and Procter & Gamble introduces the first clinically proven “tartar control” toothpaste known as Crest Tartar Control®.

The Institute takes over management of the research programs involving animals in the School of Dentistry with Dr. Stookey as Director. Two major grants are obtained from the National Institute for Dental Research to develop animal models to study root surface caries and assess the efficacy of measures for the prevention of root caries. The facility, now known as the Bioresearch Facility, is the only facility of its kind at Indiana University that is fully accredited by the American Association for the Accreditation of Laboratory Animal Care and becomes the university’s “show case” for such programs, a position that is still held to this date under the leadership of Janice M. Warrick.

- 1987 Dr. George Stookey is named Associate Dean for Research by Dean H. William Gilmore and the Institute assumes responsibility for the Electron Microscopy Facility.
- 1990 Dr. Stookey and a team of investigators (Drs. Ann Dunipace, Yiming Li, Richard Jackson, and Barry Katz) obtain the first Program Project in school history from the National Institute of Dental Research. This five-year investigation of animal and human studies of the pharmacology of fluoride included clinical studies in Indiana, California, China and Ecuador and was supported by funding of \$3.2 million, the largest grant received by the School of Dentistry. The program also resulted in more than 30 major scientific publications and presentations at scientific meetings and established the internationally recognized expertise of the Institute in this area.

Dr. Stookey coordinates the development of grant application by a group of scientists from the Schools of Medicine (Dr. David Burr), Science (Drs. Martin Zeldin and Wilmer Fife), and Engineering and Technology (Dr. Nasser Paydar) to establish a new Biomechanics and Biomaterials Research Center with funding of \$2.3 million from the IUPUI Research Investment Fund. This Center was instrumental in the development of the current graduate program in Biomedical Engineering and the acquisition of a number of major research grants. Within the School of Dentistry, some of these funds were used to develop a Cell Culture Research Laboratory (later known as the Cariology Research Laboratory) and to purchase a Scanning Laser Confocal Microscope, the first of its kind in the university.

- 1992 The Institute organizes the first annual IUSD Research Day featuring research presentations by students, staff, and faculty in the School of Dentistry. This self-supporting annual event features a keynote speaker and a variety of awards to participants.
- Consistent with the reorganization of the departmental structure of the School of Dentistry, the Department of Preventive Dentistry is consolidated into the new Department of Oral Biology.
- 1993 The Institute leases space in the Walker Plaza, 719 Indiana Avenue, and establishes the Denture Research Facility for the conduct of studies of measures to improve the intra-oral retention of dentures.
- The Institute obtains a major grant from the National Institutes of Health to renovate and expand the Bioresearch Facility in the School of Dentistry; Dr. Stookey was the principal investigator of the grant.
- 1994 Dr. George K. Stookey is awarded a patent for the use on sodium hexametaphosphate as a coating on dry foods for dogs and cats. The patent is licensed to Heinz Pet Products and they begin marketing a snack food for dogs under the name Tartar Check™.
- Dr. Stookey recruits a team of young scientists and, with assistance from Dr. Mostafa Analoui, initiates a major research program to develop new technologies for the very early detection of dental caries. This team initially includes Drs. Masatoshi Ando (Japan) and Andrew Hall (Scotland); other members of this team in subsequent years included Drs. Maxim Lagerweij (The Netherlands), Monique van der Veen (The Netherlands), Andrea Ferreira-Zandona (Brazil), Carlos Gonzalez-Cabezas (Venezuela), Margherita Fontana (Venezuela) and Wolfgang Buchalla (Germany).
- 1995 The Institute's satellite clinical research facility located at 822 East Cottage Grove on the Bloomington campus is officially closed and all clinical trials are conducted at the Indianapolis facility.
- 1996 Dr. George Stookey becomes Acting Dean of the School of Dentistry on March 1st and serves in that capacity through the remainder of the year.
- The first annual Indiana Conference is held on May 15-18 at the University Place Hotel and Conference Center with support through an unrestricted grant obtained by Dr. Stookey from Procter & Gamble. The theme of the Conference is "Early Detection of Dental Caries" and features guest speakers from throughout Europe conducting research on this topic. The Conference is quite successful and serves to establish Indiana University and the Institute as a leader in this research area.
- 1997 Dr. George Stookey becomes Associate Dean for Academic Affairs under new Dean, Dr. Lawrence I. Goldblatt.
- Dr. Stookey is awarded a patent on the use of sodium hexametaphosphate as a coating on rawhide and chew toys for dogs and cats.
- 1998 Dr. George Stookey is named Executive Associate Dean as well as Associate Dean for Academic Affairs for the Indiana University School of

Dentistry. He is also awarded the rank of Distinguished Professor of Preventive and Community Dentistry by Indiana University.

A feline dental care product utilizing the 1994 patent is introduced by the Heinz Pet Product under the name Nature's Recipe Tartar Control Feline Crunchy Treats™.

- 1999 The 4th Annual Indiana Conference is organized and hosted by Dr. George Stookey on the theme "Early Detection of Dental Caries II." Again it features a series of presentations by scientists from Europe as well as the Far East and it establishes the Institute as the world's leader in research in this area.

Dr. Domenick T. Zero comes to Indiana from the Eastman Dental Center and the University of Rochester as Director of the Oral Health Research Institute and Professor and Chairman of the re-established Department of Preventive and Community Dentistry.

The Oral Health Research Institute marks 50 consecutive years of research sponsorship from The Procter & Gamble Company.

Purina Mills introduces a series of seven commercial diets coated with sodium hexametaphosphate to reduce the formation of dental calculus in primates (monkeys, lemurs, baboons, etc.) housed in zoos.

- 2000 Dr. George Stookey is awarded a grant of \$1.65 million from the 21st Century Fund, a new program established by the Indiana Legislature to develop and market new technology in Indiana. This two-year program is designed to complete the development of quantitative light fluorescence for the early detection of dental caries and introduce the system to practicing dentists. Another part of the program is to support the development and application of a novel system for assessing color and quantifying color changes; this latter research is under the direction of Dr. Mostafa Analoui.

Information compiled by Dr. George K. Stookey and Kaylene Rossok, LDH, with resources from:

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Crest®

The Oral Health Research Institute is internationally known for its quality, expertise, and production in the field of research. Despite its history in numerous other areas of research, many individuals have associated the Institute with the introduction of Crest® toothpaste in the middle 1950s.



*Joseph C. Muhler
1947*

Let us journey back to Bloomington, Ind., during the year 1945. Joseph C. Muhler was a first year dental student in Dr. Harry G. Day's biological chemistry class. Dr. Day selected a few students, including Joseph Muhler, to conduct laboratory tests on fluoride in bone and teeth.

In the 1940s, research had shown that fluoride was a probable preventive factor for dental caries, but student Joe Muhler decided to conduct further research to determine the anticariogenic differences between various fluorides. He tested several compounds and found that stannous fluoride was the most protective⁴.

Over time, Muhler tested more than 600 fluoride compounds⁵. Again, laboratory tests demonstrated that stannous fluoride was more protective than other fluorides⁶. Dr. Muhler's research was performed on rats, as a rodent's caries development and progress is similar to that occurring in humans⁷. The laboratory tests performed by Dr. Muhler set the precedent for the clinical trials [that followed]⁸.

Once it was established that stannous fluoride was a highly effective cavity-fighter, researchers discovered another problem. Stannous fluoride was inactivated by a component of toothpaste itself⁹. The research focus was now on producing a fluoride compound that could be incorporated into, but not inactivated by, a dentifrice formulation¹⁰. A team of researchers from Indiana University worked diligently to solve this dilemma. Three principal participants were IU faculty members Dr. Joseph C. Muhler, Dr. Harry G. Day, and Dr. William Nebergall¹¹. Eventually, they were successful in solving this perplexing problem by finding a heating process compatible with the product¹².

As stated by Dr. Muhler in an article in the *Indiana Alumni Magazine*, "In this context, the contributions of the graduate and post-graduate students must not be



*Dr. Joseph C. Muhler
(center) and his
associates test more
than 600 fluoride
compounds as part
of his laboratory
research.*

left out. For example, a significant breakthrough in our work occurred because of a student of Prof. Nebergall. That student, whose name I cannot recall, accidentally left the calcium phosphate in the oven too long one night so that the temperature in the fatal four-hour period rose to 1200 degrees instead of the prescribed 900 degrees¹³."

"I'm sure that you should be familiar about the serendipitous evolution of Crest[®] toothpaste done in Bloomington by mistake. You cannot patent fluoride, but you patent the abrasive. The abrasive Muhler used was not as effective as it could be because it would bind-up some of the fluoride. What came out, through someone not taking something out of an oven, was an abrasive that was more compatible."

Professor Charles J. Palenik (S1)

In 1950, the IU team and Procter & Gamble worked together to develop a fluoride paste¹⁴. The next step, in 1952 and 1953, was to test the product on human subjects¹⁵. Procter & Gamble became interested in the research being conducted at Indiana University and offered financial support¹⁶. The company decided to sponsor a field test of a fluoride dentifrice (later to be named Crest[®]¹⁷). According to Dr. Harry G. Day, "This first clinical study of a dentifrice containing stannous fluoride proved to be a landmark in preventive dentistry¹⁸."

The 1952 clinical tests of fluoride toothpaste were conducted in Bloomington, Indiana¹⁹. "Virtually every child in Bloomington and more than 4,000 I.U. students helped in the testing program that led to the perfection of the first dentifrice ever to win professional endorsement [of the American Dental Association] as an effective agent of dental care²⁰." These studies were the largest field studies of their time for dental research²¹. The results of these studies were published in 1954, followed closely by the test marketing of Crest[®] in Columbus, Ohio²².

In 1955, Procter & Gamble began marketing Crest[®]²³. Indiana University, owner of the Crest[®] patent, then entered into a long-term agreement with the company to use the patent²⁴. Royalties from the sale of Crest[®] were later utilized to build a research facility in Indianapolis which was dedicated in 1968. This connection resulted in that building being nicknamed "The House that Crest[®] Built²⁵."

ADA Approval

Crest[®] toothpaste was given provisional approval from the American Dental Association in 1960²⁶. This approval made Crest[®] the first dentifrice listed by the American Dental Association as an effective decay-preventive agent²⁷. The A.D.A. then granted full approval of Crest[®] in 1964²⁸. The Council on Dental Therapeutics had considered the clinical data and reclassified it from a Group B to a Group A dentifrice. It also authorized use of a statement in advertisements displaying the Council's Seal of Acceptance²⁹. Within two days of this endorsement, Procter & Gamble stock rose 11 points. Ten months later, Crest[®] replaced Colgate[®] as the leading dentifrice on the market³⁰.

Throughout this entire process, Dr. Muhler readily admitted that for optimal decay prevention, fluoride toothpastes needed to be used in conjunction with fluoridated community water supplies, improved nutrition, and better oral hygiene³¹. Dental research, over the years, continued to show the benefits of fluoride in different mediums³².

Bloomington

The Oral Health Research Institute was not the original name given to that area of the Indiana University School of Dentistry which was devoted to dental research³³. It had two names prior to 1972. First, the area was known as the Department of Preventive Dentistry. On July 1, 1968, the Indiana University Board of Trustees voted to change the title to the Preventive Dentistry Research Institute³⁴.

Until 1958, the Indiana University School of Dentistry basic science faculty members were located on the Bloomington campus³⁵. Research was conducted in half of a quonset hut at the corner of Jordan Avenue and Seventh Street³⁶. When faculty transferred to the Indianapolis campus, the Department of Preventive Dentistry remained in Bloomington. It was finally relocated to Indianapolis one year later³⁷. Dr. George K. Stookey, former Director of the Oral Health Research Institute, assisted with this move. In a 1990 interview for the *Alumni Bulletin – School of Dentistry, Indiana University*, Dr. Stookey described this event, “I hauled the rats in their cages, and everything else, in my car!³⁸” The research area was then located in the basement [room B-19] of the Indiana University School of Dentistry at 1121 West Michigan Street³⁹.

Indianapolis

In 1967, after being within the confines of the School of Dentistry for several years, construction began on a new research facility⁴⁰. Royalties from the sale of Crest[®] were used to build the facility at 415 Lansing Street⁴¹. No tax money was used to build or equip the \$400,000 [\$476,000] structure⁴². In the May 19, 1968 edition of *The Indianapolis Star*, it is stated, “The research in the new laboratory will continue the preventive dentistry revolution which began nearly two decades ago⁴³.” On May 22, 1968, the new Preventive Dentistry Research Institute facility was dedicated⁴⁴. A dedication ceremony was held in conjunction with a symposium with seven guest speakers, many renowned in the dental community, participating. These seven included Dr. Joseph L. Bernier, Dr. A.W. Radike, Dr. John E. Buhler, Dr. Clifton O. Dummett, Lawrence Galton,



The Preventive Dentistry Research Institute Dedication, May 22, 1968.

Preventive Dentistry Research Institute

Dr. Raymond E. Rothhaar, and Phillip Pate⁴⁵. Following speeches, a panel discussion on new concepts in preventive dentistry was moderated by Dr. Joseph C. Muhler⁴⁶. "When the Institute was dedicated in 1968, it provided an opportunity for all preventive dentistry researchers to be housed under the same roof for the first time. Researchers previously had been scattered just about everywhere: in Bloomington and at the medical sciences building, dental and medical schools, and State Board of Health⁴⁷."

Additional figures involved with the Preventive Dentistry Research Institute at this time included Dr. Maynard K. Hine, Dean of the Indiana University School of Dentistry, and Dr. George K. Stookey, Assistant Director of the Preventive Dentistry Research Institute. The Director of the Institute in 1968 was Dr. Joseph C. Muhler⁴⁸. He remained in this position until 1971. Dr. Muhler's declining health, combined with other concerns, caused him to move the Institute to the Fort Wayne campus of Indiana University in 1972, closer to his home in Sturgis, Michigan⁴⁹. Dr. Muhler requested that the name "Preventive Dentistry Research Institute" be transferred with him to the Fort Wayne location. Thus, the Indianapolis location was renamed the "Oral Health Research Institute⁵⁰." To this day, the two institutions remain separate entities with a common purpose—to assist in developing new ideas and technologies for preventive dentistry⁵¹.



Dr. Ralph
W. Phillips

"I remember as a really young boy coming out here with him when this building was brand new. He [Dr. Brad Beiswanger] was really excited that they had this new facility. For at least several years, my brothers and I just assumed that the name of this place was the new building. That's how we heard it referred to and that's what we called it. We said, 'Oh, Dad's at the new building.' Like the Chrysler Building or the Empire State Building, to us this was the New Building. He would bring us here sometimes. Actually, he was probably babysitting us. He worked a lot, but he brought us here with him a lot. I was familiar with this place for most of my life."

AJ Beiswanger (S2)

Dr. Muhler's departure left a void in the leadership of the Institute. In 1971, Dr. Ralph W. Phillips, faculty member at the Indiana University School of Dentistry, was appointed Director⁵².

The Oral Health Research Institute

Dr. Stookey's Leadership

The Oral Health Research Institute was under the leadership of Dr. Phillips until 1981, when Dr. George K. Stookey was named Director. Dr. Stookey remained the Director [until September, 1999]⁵³. The Institute thrived under his leadership. "Today the Institute is virtually bursting at the seams of its modest-sized quarters. . . ."⁵⁴

Much of the success of the facility may be credited to a combination of Dr. Stookey's philosophy of service and the high quality of staff it has employed. Dr. Stookey believes that there are three basic goals the organization must fulfill. They are to provide a high quality service, in a timely manner, and be cost-efficient while doing so⁵⁵.

"Dr. Stookey has a pretty good system. The thing has run pretty much the same over the years; more clinical now."

Richard Farnham (S3)

The focus of the Institute over the past three decades has changed. In 1962, research was centered on calculus prevention, plaque prevention, tobacco stains, and fluoride compounds. Today, interest has expanded to testing products, such as whitening toothpastes, dental floss, and toothbrushes, and oral care items for animals⁵⁶. One of the areas that is receiving much attention is the early detection of dental caries. The goal of this work is to discover a treatment that will enable teeth to never need restorations⁵⁷. Other health care issues receiving attention at the Institute include the development of smoking cessation therapies, anti-microbial agents, and demineralization/remineralization of enamel⁵⁸.

Studies

Preventive dentistry has greatly improved since the days of Dr. Muhler and the fluoride tests in Bloomington. Products as well as techniques have evolved. The Oral Health Research Institute is the only institution that has the three methods of product testing required for American Dental Association acceptance available in one organization⁵⁹. These three procedures are: animal testing, laboratory analysis, and human clinical trials⁶⁰. "...the Oral Health Institute is one of the largest dental research centers in the nation. . .⁶¹" The Institute is self-supporting, with studies primarily funded by government grants or corporate contract testing⁶². "Though it is attached to a tax-supported institution, the facility is pretty much self-sustaining⁶³." In the early days of the Preventive Dentistry Research Institute, funding came from grants from Procter & Gamble and from the National Institute for Dental Research⁶⁴.

"The Oral Health Research Institute is essentially a free-standing institute, both literally and fiscally, which is devoted to sponsored research in a variety of areas of great importance to the dental profession. Almost 100% of the funds that are required to carry out the functions of the Institute and pay its employees are derived from extramural research funding and have been, in essence, since its creation. So, while it is independent of the School of Dentistry, it is closely linked to its mission and it operates in such a way that the investigators there have as their primary mission, research."

Dean Lawrence I. Goldblatt (S4)

One example of corporate support is the long-standing relationship that the Oral Health Research Institute has had with Procter & Gamble. Nineteen ninety-nine marked the 50th consecutive year of sponsorship by the company⁶⁵. This association led to the manufacturing of another significant preventive care product: Tartar Control Crest[®]. The product was tested and released on the market in 1985⁶⁶.

"I think Tartar Control Crest[®], a study that we did in Bloomington...was very significant. At the time, it was just another study because we had dabbled with some anti-calculus products before. When they came to us to test this particular product, it had soluble pyrophosphates as the active ingredient. The study was to go two or four months. It had about 250 people in it. There was about a 27-28% reduction in mouth calculus formation, which was significant. The rest is history... that went on and Procter & Gamble has made millions of dollars off of that. That was the very first anti-calculus toothpaste out there on the market."

Dr. Mark E. Mallatt (S5)

"In 1985, Dr. Beiswanger's team conducted one of the first two studies on products that reduce dental calculus formation. 'We worked on that one for over 20 years,' he [Dr. Beiswanger] says. 'At first we found agents that reduced calculus really well, but had many side effects. Finally, we came up with a formula that reduced dental calculus but was innocuous in other ways.' The product became Crest[®] Tartar Control toothpaste, containing soluble pyrophosphates."

*Alumni Bulletin—School of Dentistry
Indiana University, Summer 1990 (S6)*

A variety of products have been analyzed at the Oral Health Research Institute over the years. The Institute puts products through rigorous laboratory testing prior to clinical trials on human subjects. "Products cannot be placed into clinical trials until they have been safety tested in the lab for use by humans⁶⁷." The Oral Health Research Institute does contract testing for approximately 95% of the companies that manufacture toothpaste and who seek the American Dental Association acceptance⁶⁸.

Another significant toothpaste ingredient tested at the Oral Health Research Institute was Procter & Gamble's sodium fluoride formula Crest[®]. The sodium fluoride was found to be more palatable and it did not cause the tooth stain that sometimes resulted from the use of stannous fluoride. Also, the addition of sodium fluoride was more cost-effective⁶⁹.

"Sodium fluoride, I believe, is a cheaper fluoride to add to the toothpaste. They could also go with a silica abrasive instead of a calcium pyrophosphate abrasive, which was cheaper to purchase. But there was also some clinical data that indicated that sodium fluoride was as effective as stannous fluoride. And sodium fluoride doesn't have some of the problems of stannous fluoride, such as staining around margins as well as [an undesirable] taste. Stannous fluoride had a pretty bad taste. Sodium fluoride doesn't have that problem."

Bruce R. Schemehorn (S7)

Other Studies

Although probably best known for its work with toothpastes, the Oral Health Research Institute has been involved in many other interesting studies. Community water system fluoridation, fluoride rinse programs, topical fluoride application, and fluoride vitamins are modes of fluoride supplementation that have been tested statewide, nationwide, and worldwide by the Institute⁷⁰.

A few of these studies are "notorious" around the Institute.

One such study is affectionately called the “dirty diaper study.” “Anyone working at the dental school in the late ’60s is not likely to forget, [this project] from an olfactory perspective...⁷¹”

“Probably the most disgusting study... was a company in Evansville who wanted to fluoridate their brand of baby vitamin. So his [Gary Wood] job was to run around and pick up all the diapers, all the contents, and anything else you could throw in there, then take all this ‘soup’ and actually burn it and ash it, because at that time that was the only way to measure the free fluoride.”

Professor Charles J. Palenik (S8)

Bruce Schemehorn recalls, “Gary [Wood] went out and collected diapers. We were looking at fluoride in vitamins and how much would be taken up and how much would be excreted. We’d give the infants fluoride supplements. We knew how much went in, then to find out how much came out, we’d collect their dirty diapers.

“We’d go back after a few days and collect all the diapers that the mothers saved for us, fill the back of the van and drive in here. Gary used to have horror stories of how that smelled, especially in the summer. Back then they didn’t have air conditioning in a lot of the trucks and vans⁷².”

This program was started with Mead Johnson Nutritionals™ to see if fluoride could be added to infant vitamins without interfering with vitamins or the metabolism of the fluoride. The project lasted three years and expanded to determining the metabolic rate of fluoride and the amount being ingested⁷³.

A few examples of other interesting materials tested for various effects on fluoride and caries include cereal, cocoa, potato skins, and dandelions. Dr. Simon Katz, from Argentina, was in charge of several of these unique studies⁷⁴.

“...he [Dr. Simon Katz] was around looking at plant extracts to see if there were some anti-caries properties with different plants. There really are, in fact. What he was trying to do was find out what plant had the greatest percentage of this chemical. He was going around collecting plant leaves. Leaves filled every place. The whole back storage room was filled with bags of leaves. He would come in and he’d grind them up and extract the agent from them. It was just funny. There were just leaves all over the back of this place. You’d just see leaves blowing all over the hall and everything else. It was really terrible. It’s funny now to look at it. At the time they were pretty mad at him, but now it’s funny.”

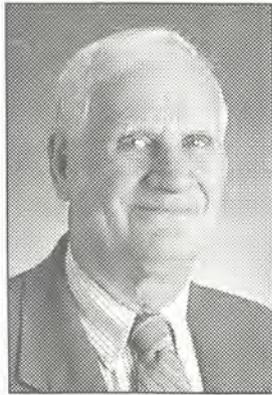
Bruce R. Schemehorn (S9)

“Probably the most interesting thing at that time was that this building was probably half-filled with breakfast cereals, [a cereal] with Phosphates. That was when Phosphates were being added to cereals for preventing caries in children. [Cases of cereal] were everywhere.”

Professor Charles J. Palenik (S10)

In addition to fluoride research, the Oral Health Research Institute has played an active role in the development of techniques to decrease tobacco usage. Primarily

through the efforts of Dr. Arden G. Christen, Professor of Preventive and Community Dentistry at Indiana University School of Dentistry, and his associates, new methods for combating nicotine dependency have been developed, including nicotine-containing chewing gum, nicotine patches, and other non-nicotine containing medications and delivery systems⁷⁵. Dr. Christen has been involved in tobacco research since 1980.



Dr. Arden
G. Christen

Today, the Indiana University Nicotine Dependence Program is one of the most successful and nationally known programs in its field⁷⁶. "Most of these [tobacco-related] projects have been conducted at the IU dental school's Oral Health Research Institute⁷⁷."

Dr. Christen states, "The most important thing that we've done is what's called 'NRT' -Nicotine Replacement Therapy. That's the simultaneous use of nicotine patches and gum (or various other forms of nicotine) to help smokers quit smoking or using smokeless tobacco. We're still testing variations of these combinations to this day and over the year⁷⁸."

Dr. Christen became interested in nicotine research while serving as an Air Force Dental Health Officer at Brooks Air Force Base in San Antonio, Texas, in 1969. He observed some oral changes in one of his patients due to tobacco usage. As an ex-smoker, Dr. Christen could relate to the difficulties involved in quitting the habit and was able to advise the patient. He also advised the football and baseball team members at his daughter's college to stop using smokeless tobacco⁷⁹.

"Many dentists have observed that various tobacco products are associated with an array of oral and perioral conditions in their patients." (S11)

Dr. Stookey taught a preventive dentistry course at the base two times a year. Interested in Dr. Christen's work, he asked Dr. Christen to become an employee of the Institute. After coming to IU in the fall of 1980, Dr. Christen chose to continue his focus on tobacco and its effects on the oral cavity. He felt strongly that patients needed to be informed about the hazards of tobacco⁸⁰.

"Conditions, disease, and causative agents which directly affect the oral cavity and surrounding tissues should be of primary interest to dental professionals⁸¹."

"When I first came to IU, Dr. Stookey asked me what area I would like to focus my research efforts in. He indicated that when you became dental school faculty, you had to show involvement in service, research, and teaching. I told him that I was interested in tobacco research, which took him back somewhat because at that time we really weren't doing tobacco research here. But he warmed up to the idea because it was a hot new arena. I made a contact at an American Cancer Society meeting with someone from Dow Chemical. I asked this physician (who was a pulmonologist) what he was doing. He told me he was working with a 'new fangled' nicotine gum, which was being called NicoretteTM. I said, 'Well, has anybody tested that for the effects that it may produce on the mouth?'

He said, 'No.'

So I said, 'Don't you think they should?'
And he said, 'Yes.'

He put me in touch with the company and about two weeks later, we had a \$50,000 grant. That sort of kicked things off. That was in about '81. We did several early studies from about '82-'85 or so, and have been doing tobacco studies steadily since."

Dr. Arden G. Christen (S12)

Nicotine Replacement Therapy (NRT) is not only for smoking cessation. It is designed to help patients eliminate all forms of tobacco usage, including smokeless (spit) tobacco. As stated before, "NRT" combines the use of a nicotine patch and some other form of nicotine, for example, gum⁸². One gum, Nicorette™, was tested at Indianapolis. It was found to be an effective aide in smoking cessation, with few adverse oral or systemic effects⁸³. The nicotine patch is a Federal Drug Administration-approved transdermal delivery system for nicotine that assists patients with overcoming their nicotine addictions⁸⁴. "This medicated gum [or patch system], prescribed by dentists and physicians, is used in conjunction with a structured behavioral program and phased out over a period of several months⁸⁵." Nicotine Replacement Therapy is now firmly established throughout the world's smoking-cessation market⁸⁶.

"Between 1982 and 1984, an FDA-approved pharmaceutical agent (Nicorette™ gum) was developed as a smoking cessation adjunct. Subsequently, an investigation of this nicotine-containing product was called a 'pivotal study' by the FDA." (S13)

Generally, a smoking cessation study will last approximately six weeks, although some have lasted up to a year⁸⁷. Occasionally, the smoking cessation studies will combine the Institute and the Indiana University School of Dentistry with the Indiana University School of Medicine to provide the necessary research sources. One such study lasted five years and was funded by the National Institutes of Health. It was considered a major study comparing smoking cessation practices of physicians in Indianapolis with private practice dentists in Indianapolis⁸⁸. [Since the early 1980s, more than \$3.5 million in tobacco-related research has been accomplished at the Institute and the School of Dentistry.]

The nicotine studies conducted at Indianapolis are unique in that the Indianapolis site is one of only about 25 locations in the United States that conducts this specific type of tobacco cessation research⁸⁹.

The scope of research done at the Oral Health Research Institute has expanded over the years to a number of other frontiers. Originally, the primary focus was on cariology⁹⁰. During the period that the Preventive Dentistry Department was housed in the basement of the dental school, laboratory tests were almost strictly fluoride analysis⁹¹. There were instances when the Institute actually made its own toothpaste⁹².

“What I can remember from the old days is that things, such as Crest® and prophy pastes, were actually formulated in the back of the Oral Health Research Institute. They actually made them and stuffed them in the tubes. Some of the research product was made here.”

Professor Charles J. Palenik (S14)

Today, a portion of the laboratory studies involve remineralization and demineralization of tooth enamel, where laboratory staff actually perform studies concerning toothpaste and acid challenges⁹³. There are also laboratory studies for product abrasion⁹⁴.

“One of the things that really was important here was the development of abrasion testing for root surfaces. Also important was that huge numbers of mechanical toothbrushes that have been tested here, toothbrush design things of this nature.”

Professor Charles J. Palenik (S15)

The Divisions

The Oral Health Research Institute is currently divided into five basic components: the clinical research group, the preclinical research group, the *in-situ* denture chip and telemetric plaque pH models group, the cariology research laboratory, and the animal research facility (Bioresearch facility)⁹⁵. In addition, the Institute has a denture research facility and an electron microscopy facility located in other areas on the IUPUI campus⁹⁶.

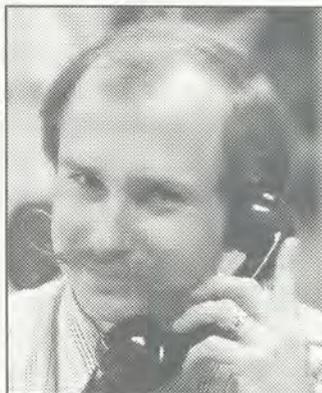
The Institute also maintained a facility in Bloomington at 822 Cottage Grove from 1959 until 1995⁹⁷. Some of the studies conducted in Bloomington led to well-known products on the market, including Tartar Control Crest® and Chlorhexidine (Peridex®)⁹⁸. Although the clinic officially closed in 1995, studies had not been conducted at the Bloomington facility since the late 1980s⁹⁹.

The preclinical phase of any study is necessary before a product can be tested on humans. Dr. Ann J. Dunipace has directed the preclinical portion of the Institute since 1985¹⁰⁰. Instruments, such as the hard tissue microtome, are utilized to study the mineral content of teeth. A.J. Beiswanger explains, “It’s a very precise saw. It uses a diamond-edged brass blade to produce super-thin sections out of pieces of human tooth that we x-ray to look at relative mineral content¹⁰¹.” The staff of the preclinical division was able to develop a successful laboratory model used in research conducted today. There are variations of the model, but no other facility conducts research exactly like the Oral Health Research Institute preclinical model¹⁰².

A.J. Beiswanger continues, “... with team effort that took a lot of determination and effort, we were able to develop a successful model for the studies that we now do. It wasn’t a sure thing, however. We weren’t always sure that we would be able to come up with a model that would work. But we did, and that’s been a really good feeling. There was some pay-off for all our effort. There are variations of it around. Nobody does it exactly like we do and one of the reasons they don’t is because they can’t. We can actually do a few things that a lot of places can’t do in the way we pro-

duce and analyze specimens. It just feels like we've got a little edge that we deserve because we've been at it for so long¹⁰³."

Closely related to the preclinical area is contract testing¹⁰⁴. Bruce R. Schemehorn directs this portion of the Institute. His position as Director of Contract Testing involves interacting with the sponsors who wish to participate in product testing. Schemehorn helps design the research protocols for the sponsor, as well as make sure the protocols do what the sponsor requests¹⁰⁵. He describes the different types of equipment utilized in the laboratory as follows:



*Bruce R.
Schemehorn
circa 1980*

We have a lot of interesting instruments back there that I think of. We have, for example, machines that brush teeth under controlled circumstances. If we just brush it by hand, the pressure varies. The speed varies. So that machine's able to control all of that.

"We have machines that will stir 25 or 30 beakers of solutions at a time, in which we do our treatments. We have pH meters and milli-voltmeters that measure acid concentrations and fluoride concentrations in solutions.

"We have drills that we use to drill holes in the teeth and remove the powder that comes out to analyze for fluoride. These are micro-drills, only 200 microns or so across. We drill a hundred micron deep hole. It's very small hole. We have sectioning equipment that will section 100 micron-thick sections of tooth. One hundred microns is about the size of a hair, so it's very, very thin pieces that we look at with microradiography.



*An atomic absorption
spectrophotometer
was used to analyze
samples for calcium
and other minerals.*

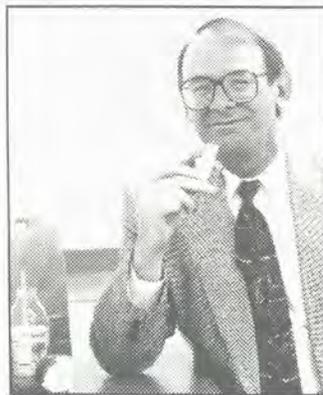
"We have a lot of specialized equipment... We're also working a lot now with lasers and laser detection of very early caries. These are lesions that are not even visible by radiographs or by the naked eye at this point¹⁰⁶."

Products are no longer mixed in the Institute's laboratory. Sponsors supply the test products after being mixed at a "Good Manufacturing Practices Facility." Laboratories and manufacturers must now adhere to stringent regulations and practices¹⁰⁷. Facilities must also follow FDA [Food and Drug Administration] and OSHA [Occupational Safety and Health Administration] standards. The FDA has set guidelines for how laboratory studies are supposed to be performed and the Institute adheres to them as closely as possible¹⁰⁸.

The Institute also has the ability and expertise to manage small and large sized clinical study groups. After remodeling the facility a few years ago, eight dental

operatories were installed¹⁰⁹. Patients (panelists) are compensated for their participation in studies, but they must comply with the study procedures. Many of the panelists are employees on the IUPUI campus¹¹⁰.

"For each clinical study the Institute initiates (and it's not unusual for several to be running at one time), the call goes out to anywhere from a few hundred to a few thousand 'volunteer' patients. What might be a research coordinator's nightmare in some institutions is a finely-tuned and well-controlled system here, due in part to a computerized patient pool of more than 4,000 persons."(S16)



*Dr. Bradley
B. Beiswanger*

The clinical portion of the Institute was for many years under the leadership of the late Dr. Bradley B. Beiswanger. Dr. Beiswanger was instrumental in directing many of the studies conducted at the Institute¹¹¹. He was a very intelligent, dedicated researcher and well-respected within the dental research community¹¹². After Dr. Beiswanger's death in 1998, Dr. Roger Isaacs and Melissa Mau, Associate Director of Clinical Research, stepped in to assist in running the clinical studies¹¹³. This requires knowledge and experience in the research requirements. "All clinical studies are conducted under GCP [Good Clinical Practices] and FDA regulations and guidelines¹¹⁴."

One of the primary focuses of the Institute recently has been the early detection of dental caries. Dr. Stookey was instrumental in organizing an annual conference of dental scientists and educators held in Indianapolis starting in 1996. The goal of the Indiana Conference is to provide a forum to review and discuss current issues in caries detection¹¹⁵. "The need for measures capable of accurately detecting dental caries at a very early stage of development has been recognized for many years. The availability of such methodologies, coupled with the current knowledge of the caries process, could permit more effective control and possible reversal of very early lesions...¹¹⁶"

A few examples of methods in early detection of dental caries being tested include fibre-optic transillumination, electric conduction detection, light-scattering, and laser-fluorescence¹¹⁷. The Institute's Confocal and Scanning Electron Microscopy Facility applies microscopy techniques to early detection of dental caries. This method includes collecting information through fluorescent or reflective samples for two-or three-dimensional image analysis¹¹⁸. According to Dr. Stookey, the Institute hopes to continue research in this area by running clinical trials and developing treatments so that teeth no longer require restorations¹¹⁹.

Another area that the Oral Health Research Institute has been actively involved in is infection control research. Charles Palenik, Assistant Director of Infection Control Research and Services, explains that this is a relatively new part of the Institute that includes sterilization monitoring and research contract testing¹²⁰. Although not officially a part of the Institute, this area works closely with the facility. Offices for this department are located within the confines of the Institute's building¹²¹.

"We are not really basic scientists (eg. molecular biologists). We're not part of Oral Health per say, but we live and interact with them. We do what probably can best be termed 'applied research.' That means that you do testing and development of products and equipment for companies. You try to find out answers to very basic questions for practitioners. This is in deference to something like big-time Molecular Biology. We do use micro-organisms and things of this nature. I would think that probably 10 to 15% of our activities are directly in relationship to Oral Health, in other words supporting some of their clinical studies or some of the more basic research needs."

Professor Charles J. Palenik (S17)

The Institute employs several people, supervised by Sharon Gwinn, who are in charge of infection control and sterilization for the facility. These staff members assist the Infection Control Research and Services Department with monitoring OHSA and CDC [Centers for Disease Control] compliance¹²².

Another relatively new part of the Institute is a denture research facility, located in Walker Plaza in Indianapolis. It is designed to test and compare the effectiveness of denture adhesives¹²³. The studies run at the Denture Research Facility are generally time-intensive, but the facility provides a comfortable atmosphere for volunteers. Participants have access to a wide-screen television, sofa, recliners, reading and game rooms, a piano, computers, and a dining room¹²⁴.

Jodie Crawford, Clinical Research Coordinator, describes the facility, "We test denture adhesives using an apparatus that measures how hard you can bite before your upper denture becomes dislodged. You're biting on your front teeth and it's an apparatus that measures the biting pressure until the upper denture (the adhesive) gives out...We run almost continuous studies looking for new formulations...The panel that we use is about 70 seniors. There are a few younger people too. They have to be there all day long. Your baseline evaluations are to see what it takes to remove their denture with no adhesive in place. Then with the product in, they bite...they may be at the facility...for 16 hours. They have really become a tight-knit group¹²⁵."

There are so many products that the Institute has been involved with that it would be difficult to list them all. But the Institute has been notably influential in the discovery of the anti-microbial product Peridex^{®126}.

Dr. Mark Mallatt states, "Chlorhexidine had been around for years in Europe, maybe 25 years, a very effective broad-spectrum anti-microbial ingredient. The FDA would not let this product into this country because it had some problems associated with it, such as parotid swelling, it tasted bad, and it stained the teeth. The reason it stains is because it works. We can't have a good anti-microbial that doesn't stain. What the stain is, is just the plaque. It's the bacterial cell wall breakdown. I see the stain where the plaque is, which makes it difficult to run a double-blind study sometimes.

"We decided to test it in London, Ontario, Canada. Brad and I and Roger Isaacs and others went up to Canada quite frequently over a two-year period. With that study, we had three different groups: a Chlorhexidine group, a placebo, and then an intermediate Chlorhexidine subset that had an anti-stain formula added to it. The anti-stain ingredient, whatever it was, also made the chlorhexidine ineffective. It finally got



Courtesy of Heinz Pet Products

down to two groups. That was a good study. A lot of Institute people had a hand in that. With the final product, there was a real reduction in dental plaque and gingivitis and the presence of bleeding sites.

"That study, along with a study conducted by Vince Segretto in San Antonio, Texas, were key studies. Brad and I went down to San Antonio a lot¹²⁷."

Animal Studies

The animal facility [Bioresearch Facility] has been fully accredited since 1967. One of the major contributions to come out of this area has been the development and successful application of a rat caries model that evaluates the effects of fluoride dentifrices¹²⁸. At one time the animal rooms were housed in the Institute's building.

The location has since been moved to the fifth floor of the dental school¹²⁹.

Many products, both for human and animal dental care, have been tested at this facility. Dr. Stookey was awarded a patent in 1994 for a product that reduces tartar build-up in dogs¹³⁰. After licensing the product, Heinz Pet Products, based in Bloomsburg, Pennsylvania, began selling it under the name Tartar CheckTM. A feline dental product by Nature's RecipeTM, was made available in 1998¹³¹. Purina Mills, Inc. recently began marketing tartar-preventing diets for zoo animals under the trade name MazuriTM with DentaguardTM¹³². The animal care facility does approximately \$300,000 worth of research per year for agencies, above and beyond the National Institutes of Health grant-related work and other programs¹³³. The facility also tests products for the animals at the Indianapolis Zoo¹³⁴.

Funding

Funding for research done at the Institute is secured primarily from grants and corporate contract testing¹³⁵. Each year approximately \$5 million in research funding is received by the School of Dentistry, much of that from the Institute¹³⁶. Dr. Stookey has played a key role in securing funding. According to Dr. Chris Miller, in a 1998 article in the *Indianapolis Business Journal*, "He [Dr. Stookey] has been the most productive [researcher] in bringing in outside funding to our school over the past 10 years¹³⁷." Over a period of time, Dr. Stookey has generated approximately \$30 million, primarily in the form of grants¹³⁸.

The Institute also assists dentists throughout the nation with preparing unusual or inventive ideas and dental products for testing and patenting. Jude Wilkinson has joined the Oral Health staff to help expedite the process¹³⁹. Jude is a graduate of the Indiana University School of Law in Bloomington¹⁴⁰.

"For many years the Institute ran almost entirely on proprietary or contract work, Procter & Gamble being the major one. It was then that Simon Katz and George Stookey started to get some NIH money. So the vast majority of other funds that have come into Oral Health has been primarily from 'for profit' sources."

Corporate sponsorship is not limited to dental-related research. Large companies, such as Eli Lilly, have utilized the abilities and expertise of the Institute staff¹⁴¹. Dr. Mark Mallatt relates an example of this: "I don't know if you knew this, but Eli Lilly came to the Institute and asked us to recruit a bunch of people for a clinical trial. They came because they knew we were successful at recruiting people. They were testing a drug called fluoxetine as an anti-smoking drug. It was mainly a medical study, but we didn't have any physicians on our staff. We had to recruit a physician. Dr. Robert Rohn was who we recruited to actually examine the people.

"Fluoxetine later became Prozac[®], used to treat depression and not as a smoking-cessation agent. It is one of their more familiar products. The Institute had a key study that had nothing to do with dental products¹⁴²."

The variety of research performed at the Institute keeps staff busy and the pace is swift. It is what they thrive on¹⁴³.

The Addition of Fluoride

Research into the safety and efficacy of fluoride has been a primary focus of the Oral Health Research Institute since its beginning. The result of fluoride research has led to the decreased need for dental restorative work throughout the Western world¹⁴⁴.

Fluoride has been made available to consumers by its addition to a variety of mediums: toothpaste, professional topical fluoride applications, vitamins, and community water systems. Although the addition of fluoride to toothpaste was first accomplished in the 1940s and 1950s, further research is still necessary to determine the safe use of fluoride, especially in high-risk populations¹⁴⁵.

Over the years, the Institute has conducted many studies into the different effects of fluoride. One such study tested a stannous fluoride dentifrice on plaque formation and gingivitis¹⁴⁶. A team of researchers headed by Dr. Bradley Beiswanger studied 549 subjects for six months in a double-blind study. The results of this study supported the belief that stannous fluoride provided an important adjunct to the prevention and control of gingivitis when used in conjunction with regular personal oral hygiene techniques and professional care¹⁴⁷.

Fluoride-vitamin supplements are another avenue for the delivery of fluoride. They have been found to be effective in decreasing dental caries in children living in areas without fluoridated water¹⁴⁸. In the 1970s, Institute researchers conducted a study to evaluate the effectiveness and safety of fluoride vitamins for children living in communities with fluoridated water systems. The study questioned whether fluoride supplements would provide added protection or cause an increase in fluorosis in the children from these areas¹⁴⁹. The resulting article, published in the *Journal of the American Dental Association*, stated, "The results of the dental caries examinations tend to indicate that both supplemental fluoride regimens were effective in providing added anticariogenic benefits in primary teeth beyond that received from the suboptimally fluoridated drinking water. In addition, the fluorosis indexes obtained in this study indicate that additional fluoride, up to 1.0 mg per day, resulted in a statistically significant

Fluoride

increase in the prevalence of fluorosis but did not cause cosmetically unacceptable fluorosis. On the basis of this investigation, we suggest that levels of fluoride supplementation can be safely ingested by children residing in areas where the water supply contains 0.6 to 0.8 ppm fluoride¹⁵⁰.

Because anti-fluoridationists continue to be active in their communities, the addition of fluoride to anything remains a controversial subject for many people¹⁵¹.

Fluoridation—The Controversy

Fluoridating community water systems in Indiana cities has proven to be a major source of contention for both private citizens and dental professionals. Arguments against fluoridation have included the possibility of birth defects, gastrointestinal problems, genito-urinary problems, respiratory problems, and cancer¹⁵². "It has been claimed that fluoride is responsible for almost all major human diseases...¹⁵³" Of these, the two most controversial appear to be the carcinogenesis and the genotoxicity effects of fluoride¹⁵⁴. An article in the *Journal of the Indiana State Dental Association* spoke of a common belief of citizens. "If fluoride is put in the water, it'll ruin all the car batteries, and besides if the good Lord had thought fluoride was necessary in the water, He would have put it there!¹⁵⁵"

The controversy over fluoridation continues even today¹⁵⁶. Research has been done over the years to determine the adverse effects of fluoride. An article published by Dr. Yiming Li, formerly with the Oral Health Research Institute, states, "...two reports concluded that no trends in cancer risk in humans could be associated with the consumption of fluoridated drinking water¹⁵⁷." Dr. Li goes on to say, "The results have been published, and the collective data indicate that fluoride, as tested in the form of sodium fluoride, is not genotoxic¹⁵⁸."

Still, the controversy continues. "As the decade of the '90s got under way, public attention was once again directed at the safety of drinking water fluoridation¹⁵⁹." Connersville still refuses to fluoridate the water system¹⁶⁰.

The Institute, in conjunction with the Indiana State Department of Health Dental Division and the Indiana Dental Association, has long played an important role in developing fluoride programs throughout the state¹⁶¹.

"In the early fluoridation days, Indiana was among the first states to really get in on the fluoridation program. There was a classic study done in Grand Rapids, Michigan, in 1945, which was meant to go six to eight years. Three other cities also at that time, in the '40s, began fluoridating. They were matched with control cities. In Grand Rapids' case, it was Muskegon, Michigan; similar population, similar make-up. In the late '40s, when that data was starting to come in, a significant difference between the two cities, as far as the caries prevalence to the tune of about 60 to 65 percent had occurred. So it didn't take Indiana long to jump on the bandwagon. As a result, Fort Wayne in 1951 was the first city in Indiana to begin fluoridating. Indianapolis and Huntingburg soon followed.

"Under Chuck Gish's reign as director, (and he was a very good director, a very aggressive preventive dentistry-minded director of the State Department of Health,) more and more cities and towns began fluoridating. This continued under Vic Mercer and Chuck Smith's

outstanding leadership. George Stookey was also very helpful with this, so – yes, there was a lot of collaboration. Cluck Gish was an examiner with us in 1978 on that initial Connersville study, which was really a key study.”

Dr. Mark E. Mallatt (S19)

Because of their association with Indiana University, the Preventive Dentistry Research Institute, the Oral Health Research Institute, or the Indiana State Department of Health, many people have been called upon to testify, over the years, as to the benefits of providing fluoride for humans. In the early days of the fight for fluoridation, Dr. Harry G. Day was often drawn into public discussions and decision-making in the public water fluoridation issue¹⁶².

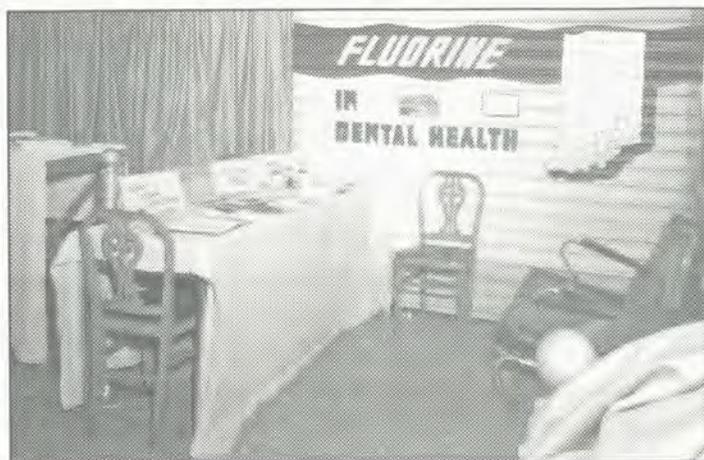
Dr. Muhler was called upon to speak as an advocate of fluoridation and was often included in some heated public debates. One such experience was recorded in the *Evansville Indiana Courier* [December 4, 1959]: “The largest crowd to attend a City Government meeting in several years Monday fought the second round of the current fluoridation battle¹⁶³.” The article continued, “Public debate on the matter followed a pattern established last Monday, with opponents of fluoridation contending the compound slowly poisons its users.”

“To fight the contention, advocates of fluoridation mustered a group of medical authorities that included Dr. Joseph Muhler, professor of biochemistry at the Indiana University Medical Center¹⁶⁴.”

The article went on to say that many of the protesters felt community water fluoridation would amount to medication. Dr. Joseph Coleman of the Health Board disagreed stating that fluoridation merely compensated for the lack of natural fluoride in the water¹⁶⁵. Dr. Stookey is now the person asked to speak about fluoride. “Certainly, Dr. Stookey is renowned for his studies in fluoride¹⁶⁶,” stated Sue Kelly, Assistant Director of Clinical Research.

Another belief that many citizens against fluoridation held was that it was a “communist plot” to mass medicate the population. An article in the *Journal Indiana Dental Association* concerned a fluoridation hearing in Terre Haute, Indiana¹⁶⁷. “Organized medicine is Public Enemy No. One; communism is only No. Two – and they both use the same tactics, Fear, Fallacy, and Fluoridation¹⁶⁸.”

“All ground water has fluoride in it. It’s the 13th most abundant element in nature. It’s in the Earth’s crust, in rocks, and minerals. So all ground water has fluoride in it, whether the well is 50 feet deep or 100 feet. Water pouring over these rocks and minerals is going to leach



The early days of the dental health booth providing fluoride education at fairs, events around Indiana.

out some of the fluoride. We have a lot of areas in Indiana which have naturally occurring optimal fluoride at one part per million. My well in Plainfield is 1.02ppm. You're getting fluoridated water because God put it there."

Dr. Mark Mallatt (S20)

There are also ethical issues of fluoridation that have been of concern. Kathryn A. Atchison addressed this area in an article published in the *Journal of the American College of Dentists*. She states, "There are four basic principles of ethics which are fairly universal in their acceptance as guides for decision-making. These are beneficence, autonomy, veracity, and justice¹⁶⁹." Atchison explains that beneficence requires that one abstains from injuring others, but encourages one to promote what is good for others. Autonomy is defined as respect for persons¹⁷⁰. The principle of veracity is that one is honest in his/her dealings with others. Finally, justice is providing a person with what is deserved¹⁷¹.

Two chapters are dedicated to fluoride toxicity and the ramifications of fluoridation in the book *Fluorine and Dental Health: The Pharmacology and Toxicology of Fluorine*, authored by Dr. Joseph C. Muhler and Dr. Maynard K. Hine¹⁷². Fluoride toxicity, due to grossly excessive fluoride intake, has been linked to dental fluorosis (mottled enamel), growth retardation, osteosclerosis, problems with deposition of fluoride in bones, thyroid problems, hemoglobin problems, and kidney problems¹⁷³.

The chapter dealing with the legal issues of fluoridation relates that the courts have had little difficulty determining that a municipality has the power to act to protect the public health and welfare¹⁷⁴. The author maintains certain rights are protected by the Fourteenth Amendment to the Constitution, protecting personal liberties only against state action taken without due process of law¹⁷⁵. Another concern is that fluoridation interferes with one's freedom of religion, as fluoridation may be considered mass medication¹⁷⁶. In summary, the author states that some states have held that fluoridation does not infringe on one's constitutional rights¹⁷⁷.

Many members of the dental community are supportive of fluoridation and believe that fluoride is still one of the best decay preventive measures available¹⁷⁸.

Dr. Mallatt states, "It's been around for a long time and people aren't dropping in the streets because of fluoride. You can't live on this planet without ingesting fluoride. I think you're hearing more of it right now because the Internet is full of anti-fluoridationist propaganda. I think it's interesting that you have over 100 health organizations that endorse fluoridation: from the American Medical Association, to the ADA, to WHO, to the CDC, to the Surgeon General. There's always going to be a few people, the vocal minority, that still think it's a communist plot, that it's a rat poison, that it causes constipation in your dogs and rusts your pipes. That's not going to go away¹⁷⁹."

The Oral Health Research Institute conducted statewide fluoride surveys with the Indiana State Department [Board] of Health, beginning in the 1950s¹⁸⁰. They have continued for the past four decades, with results from the fourth (1992-1993) survey presented by Dr. Mark Mallatt to the American Association for Dental Research¹⁸¹. The Institute conducted the entire survey in 1981-82¹⁸². "In the last 25 years, the decay rate has declined by nearly 70 percent, and it continues to decline... most Hoosiers

have access to optimally-fluoridated water now because of the fluoridation program initiated by the Indiana State Department of Health in 1951¹⁸³." The optimum fluoride level in community water systems is 0.7 to 1.2 parts per million¹⁸⁴. Dr. Mallatt continues, "Today, with the exception of Connersville, which chooses not to participate, all of Indiana's cities of 10,000 or more have optimally fluoridated water¹⁸⁵."

"I'll say this about Indiana's fluoridation program. I consider it probably the premier fluoridation program in the world. And I mean that! I get up before people and unabashedly say that. The reason I say that is because we have about 98% of our people that are on city water lines receiving fluoridated water.

"In some states, it's mandatory. In Indiana, we've been successful just by recruiting towns and cities to fluoridate. That 98 percent probably comes out to about 4,066,000 people. That's a pretty good track record."

Dr. Mark E. Mallatt (S21)

It is important to continue studying the use of fluoride and the Institute has been by conducting a five-year comparative study in three Indiana communities, Connersville, Lowell, and Brownsburg¹⁸⁶. This "Program Project" looked at the effects of fluoride on persons with impaired physical functions¹⁸⁷. It was funded by the National Institute of Dental Research¹⁸⁸. During the second year of the study, four communities in China were added¹⁸⁹. Life-long citizens of Shunyi and Nongan counties in China participated¹⁹⁰. Dr. Stookey was pleased with this project, as he felt it promoted a good working relationship with researchers in other countries¹⁹¹.

"I've also done quite a bit in Connersville, Indiana, with the program-project which looked at the effects of fluoride. I've done another project in Connersville dealing with early carious lesions and detection of these early carious lesions..."

"Connersville is the only remaining city of any size in Indiana that is non-fluoridated. Although, they are getting a halo effect of fluoride from where they are getting their food and drink processed. A lot of times there's fluoride in the water used in those companies.

"They have, within the county, maybe 16,000 to 18,000 people. There are a couple of small pockets in Southern Indiana, but even added altogether, they wouldn't come up with 16,000 people. It's really the only test-site we have left in Indiana.

"We did several studies in Lowell, Indiana, because at the time they had too much fluoride in their water. They were the only town in Indiana that had an excessive amount of fluoride. We looked there to see if there were any detrimental effects of the fluoride. We checked blood chemistry. Of course, we examined the teeth. We looked at SCE, which was checking to see if there were any genetic differences. Lowell was very unique because the people who lived on private wells had no fluoride in their water and the people who lived in town had four times too much.

"We could examine people who were in the same geographic area exposed essentially to the same environment, except for their water, and look to see if they had any detrimental effects.

"We also compared Lowell to Connersville to look at the difference between a non-fluoridated



Jodie Crawford
circa 1980

and highly fluoridated area.

"Brownsburg was a part of that study. That was our 1ppm town, it again was compared between Connersville and Lowell."

Sue A. Kelly (S22)

The Institute also occasionally conducts other studies outside of the continental United States. Jodie Crawford, explains the importance of such a study¹⁹². "The study we did in Puerto Rico was for a product that was thought to reduce decay. If you want to study a disease, you have to find a population who has the disease. Otherwise it's like trying to test diabetes medicines on people who don't have diabetes. There aren't many places left that still

have a big problem with decay in the continental U.S., especially in children, which is how we do caries studies. So to find a site that did not have natural or artificial fluoridation, Puerto Rico was something we decided to look at and they had a very high caries rate... There's not a lot of treatment being done, especially in the central mountain region, which is where we worked. If you have a lot of disease, you can use fewer people to do a study. You're looking for differences between groups. The more disease, the easier it is to find the differences if they exist.

"The study itself lasted four years. There was a year of feasibility studies just to see if we could even do it, with the language barrier, and could we find local people to help us, would schools allow us in, and so on. We spent a year just setting things up before we actually started it.

"It started with about 4,000 and ended with about 2,500. Over four years, we lost quite a few subjects. People moved out of the schools (and for various other reasons). We had a pretty high dropout rate.

"...We were working with the University of Puerto Rico Dental School, under the direction of Dr. Augusto Elias, who's licensed in Puerto Rico... He's a native Puerto Rican, but he came to Indiana to do his graduate studies. When we were looking for sites, Dr. Stookey thought of him. It just so happened that he had just sold his practice and was wanting to do something a little different. He had taken a job at the University of Puerto Rico in research, so it just kind of all fell into place, like magic¹⁹³."

Fluoride Rinse Programs

Community fluoridation is not the only area of fluoride research in which the Oral Health Research Institute has an interest. The Institute has for many years conducted a fluoride rinse program in several of the 92 Indiana counties. A total of 57 counties and 48,401 school children participated in the 1998-99 school year¹⁹⁴.

The rinse program was initiated more than 30 years ago by the Preventive Dentistry Research Institute. Researchers at the Institute developed a product that could be self-

applied by kids at school¹⁹⁵. The program was also accepted by the Army and used to treat young men during the Vietnam War. In time, the program changed to using a rinse¹⁹⁶.

Faculty and Staff

Author's Note: There is no way to adequately list all those who have been a part of the Oral Health Research Institute for so many years. Their contributions to the health care field have been innumerable. The following is a "cross-section" of both former and current staff members that sheds light on the outstanding people associated with this unique organization.



People

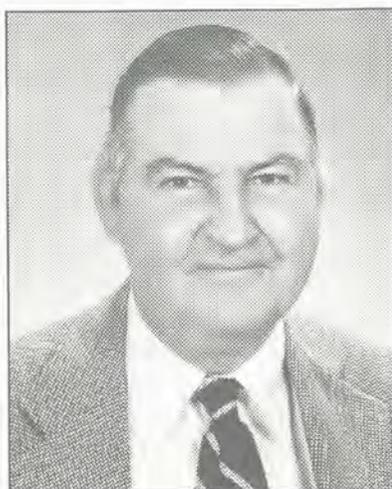
Currently, the Oral Health Research Institute employs approximately 50 full-time faculty and staff members. Depending on the size of a study, the Institute may also utilize approximately 100 temporary employees¹⁹⁷. Those employed by the Institute work hard together¹⁹⁸.

"People get along well together. In the old days, there used to be a lot more socialization, it seemed like. We'd go out and have a drink or something after work on Friday nights, that kind of stuff. We'd have parties occasionally. We don't seem to do that much anymore. That probably is just a function of society in general. We're just too busy to do that kind of stuff anymore. We all have kids now and added responsibilities."

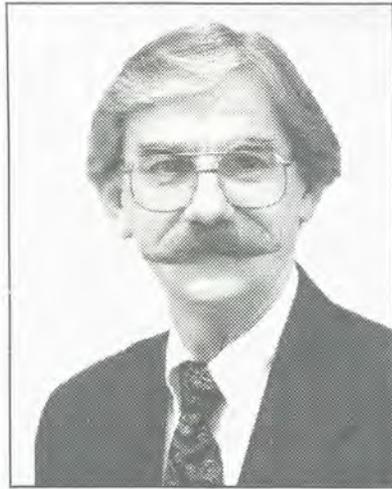
Bruce R. Schemehorn (S23)

There are many key players in the Institute's history. One of the most influential was the late Dr. Joseph C. Muhler. Much of the history of Dr. Muhler's association has been previously discussed in this monograph. But to exclude him from the list of "characters" associated with the Institute would be negligent.

Dr. George K. Stookey has been involved with research since applying for a job with Dr. Muhler in the summer of 1957. Dr. Muhler hired George Stookey, a then recent graduate with a degree in chemistry from of Indiana University, to do fluoride analyses in his lab for a dollar an hour¹⁹⁹. The not-yet-doctor Stookey had intentions of attending dental school that fall. In time, Dr. Stookey decided to heed the advice of Dr. Muhler



Dr. Joseph C. Muhler



Dr. George K. Stookey

and pursue a career in research²⁰⁰. He received his Ph.D. in Preventive Dentistry in 1971²⁰¹.

Dr. Stookey was named Associate Director of the Oral Health Research Institute in 1974²⁰². He was appointed Director of the Institute in 1981 and it thrived under his [Dr. Stookey's] leadership²⁰³.

Dr. Stookey has devoted many hours over the years to the Institute. Bruce Schemehorn has worked with Dr. Stookey since 1973. He has witnessed Dr. Stookey's dedication first-hand²⁰⁴.

"My first job was working with George Stookey. He taught me how to do the cleaning test, the examinations on that test. I spent many hours in his office looking through a microscope and just doing basic laboratory work...It's kind of interesting how, when I started, he was working 18-20 hours per day. I never came early in the morning or I never went home at night when he wasn't here. He would come in at three, four o'clock in the morning and he'd work till eight, nine, ten o'clock at night, just constantly²⁰⁵."

Dr. Lawrence Goldblatt, Dean of the Indiana University School of Dentistry, has been equally impressed with Dr. Stookey's leadership²⁰⁶.

"All of their studies are extremely carefully conducted. They're, of course, very ethically performed and nothing at all is ever done that could possibly harm a patient. I have personally been involved in only a small amount of the investigative activity over there...I was really, really impressed by the incredible resources, expertise, and organizational ability that they have over there, particularly directed by Dr. Stookey²⁰⁷."

Another one of the leaders for many years at the Oral Health Research Institute was the late Dr. Bradley B. Beiswanger. A renowned researcher, Dr. Beiswanger was described as a highly respected, intelligent "individualist²⁰⁸." At the time of his death, Dr. Beiswanger was a Professor of Preventive and Community Dentistry and Associate Director of Clinical Research²⁰⁹.

"I'd say he was one of the smartest men I've ever known. He was an excellent teacher...He just had a way of teaching you things that you remembered. He was very unpretentious. If you saw him in a shirt and a tie, you knew something was up. He didn't care what people thought about him. I don't mean that in a bad way. He just didn't put on airs and I admired him a lot for that."

Jodie Crawford (S24)

Dr. Beiswanger's son, Andrew "AJ" Beiswanger, has worked at the Institute for more than 15 years. AJ enjoyed working with his father, and when asked about working so closely, stated:

"It was really good. It was really great! I saw my dad every day. I don't know how many adults see one of their parents every day, unless they live with them, and I didn't... I know that I inherited a lot of what I am from him. He was a perfectionist, and I am, too, for good or bad. It was good to work with him, because I could talk to him whenever I needed to. He could find me if he needed something. There was a lot of contact, I think, that there might not have been otherwise. It was easier just to go see him than to just intend to contact him or call him or something else. It was easy to just walk over to his office. He had quite an office... an aquarium... One wall of his office was a giant wallpaper mural of the planets and stars²¹⁰."

AJ reflected on his reputation as a researcher. "I think that his reputation helped give the Institute a good reputation. Since he was a perfectionist, he had a great reputation among his peers. He was, I found out, one of a few people who had the ability to... judge the severity of gingivitis with the naked eye. He was really, really good at that. I think he was really good at a lot of things. He was a really conscientious researcher. His ethics were really high. His standards for accepting and doing studies right were high. I think he helped generate a good image and a great reputation with the Institute, with everyone else's input and it has perpetuated. I think that was probably the most significant²¹¹."

The loss of Dr. Beiswanger [in 1998 due to cancer] left an incredible void in the Institute's staff, not only as a researcher, but also as a friend. Dr. Mark Mallatt, long-time friend and associate of Dr. Beiswanger, stated, "Brad was a free spirit, a very capable, a very smart guy, probably a genius. Fun to work with and he'd inspire people to achieve and do things. He pushed himself hard, too. He was a hard worker. I would like to see the conference room named after Brad Beiswanger. Brad was a good friend. I was at the point that I knew most of the dental indices. I could do gingivitis and plaque, or stain, or caries, or soft tissue, calculus, whatever. So when I left, he was a little upset. Nonetheless, that didn't affect our friendship. Yes, he was disappointed, but I had to do some things too. After 15 years, I was tired of looking at bleeding gums all day. I had to expand my horizons, you might say. I still went back to help them with occasional studies and we stayed very good friends²¹²."

"Everybody probably has memories of Brad and some of his antics...he is missed very much."

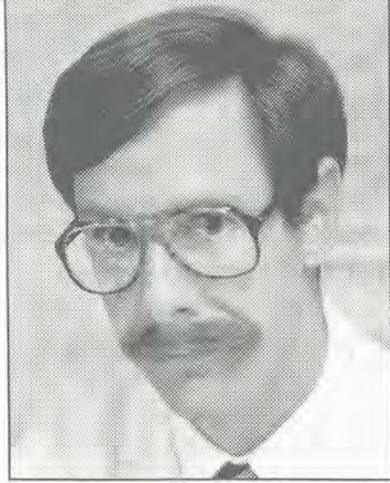
Sue A. Kelly (S25)

Many people have been involved over the years with the Oral Health Research Institute and several have remained employees for a long time. In addition to those mentioned above, Melissa Mau, Sharon Gwinn, Jodie Crawford, Gerald Wood, Richard Farnham, Jean Richmond, Dr. Ann Dunipace, Bruce Schemehorn, Janice Warrick, Dr. Byron Olson, Charles Palenik, Dr. James McDonald, Jr., Dr. Kichuel Park, and Dr. Arden Christen have been involved with the Institute for more than 20 years²¹³. Countless others have been loyal employees of the Institute over the years.

Another in the list of "characters" that worked at the Oral Health Research Institute was the late Dr. Simon Katz. Dr. Katz was from Argentina and became involved with the Institute in the 1960s²¹⁴. Charles Palenik worked closely with him and considered Dr. Katz his mentor²¹⁵. He describes him as follows:



Janice Warrick



Gerald Wood



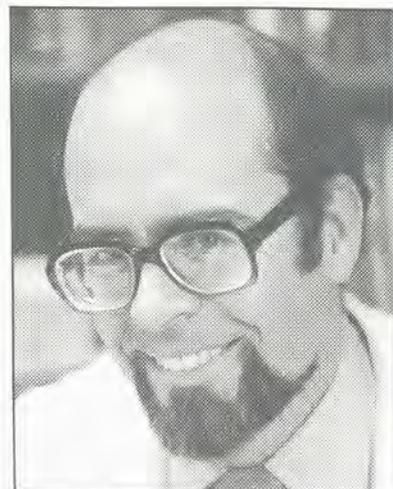
Dr. Richard Jackson



Jean Richmond

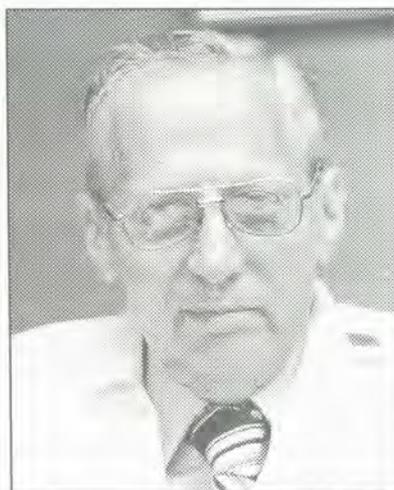


Sharon Gwinn



Dr. James McDonald, Jr.

"He was free thinker and that was his strongest point. He could really take a proverbial bank of information and think very clearly about objectives, measure the options. His basic interest was fluoride. Later, he and I got interested in chocolate, actually in cocoa. It was known that you could give the same amount of sugar and get so many caries in a rat. But if you gave the same amount of sugar in chocolate form, pure chocolate, you got much lower rates. The caries seemed inhibited. What it turned out to be was a chemical that's similar structurally to caffeine, (it was called theobromine) that's present in cocoa. We tried to extract that and do some things with it.



Dr. Simon Katz

"Then we learned there were other anti-microbial substances that were in all sorts of plants. Simon got a little carried away. We had potato skin and dandelion extracts and all other sorts of plant substances. Unfortunately, the thing that always held Simon back was his health. He was a walking miracle. He had an osteotomy and heart problems. But, he was always up to something. In 1986, he and I spent a good part of the summer with his wife in Seville, Spain. Simon was a big hero over there. Somehow, he was busiest in his sabbatical year helping the Spaniards to fluoridate their water. In fact, they wanted to name the fluoridation station in Seville after him but he wouldn't put up with that. So he really was influential in that area²¹⁶."

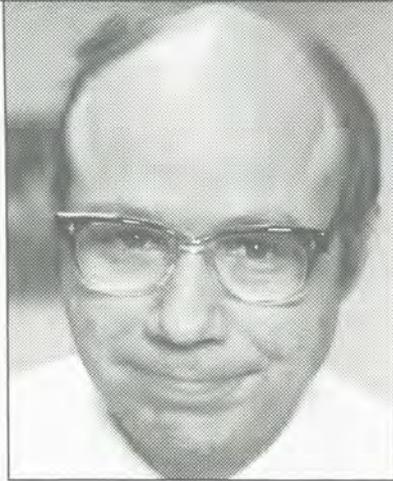
The staff at the Oral Health Research Institute are a very diverse group, with a variety of educational backgrounds²¹⁷. Sue Kelly, summed up working at the Institute by saying, "It's been a good environment to work in. I personally have had a lot of freedom to work on my own, to work at my own pace, sometimes at a quicker pace. It's dictated by the work. It's been a tremendous place to work²¹⁸."

Bruce Schemehorn adds, "I've enjoyed it. You don't get rich working here, but you do have a good time and work some, too. You have some freedoms that you may not have in industry. I've enjoyed working for Dr. Stookey all these years...I've met a lot of good people and made a lot of good friends throughout the world. Actually, I've really done a lot more traveling than I ever thought I would do when I started. I've been around the world lecturing and attending meetings.

"It's been a good 25 years. I don't know if I would change things or not. I supposed you'd always change a little something here or there, but right now I'm just satisfied with the way things are going²¹⁹."

"There have always been...individualists at Oral Health. There's a special type of camaraderie there, among this interesting mixture of people with a variety of interests. Their legendary Christmas parties have been colorful and entertaining. Some of the research subjects come back for the annual Christmas Party. One character is invited back yearly to play his guitar."

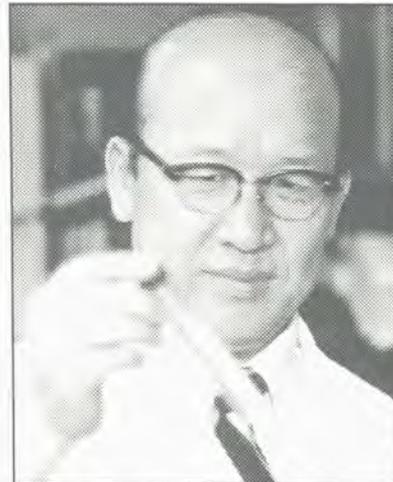
Dr. Arden G. Christen (S26)



Dr. Byron Olson



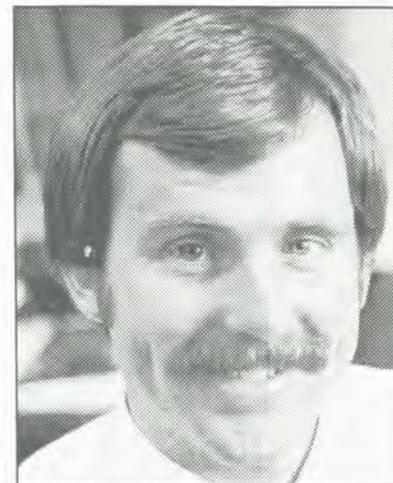
Dr. Grant VanHuysen



Dr. Kichuel Park



Charles Palenik



Dr. Mark E. Mallatt



Melissa Mau

Memories

Author's Note: A facility that has been in business for more than 30 years is going to have a couple of amusing stories in its history. Staff members were kind enough to offer a few of those memories and stories for your enjoyment. Their cooperation and sharing is greatly appreciated.

"There were many days we would leave that lab (as we called it then) at 6:00 a.m., but we wouldn't get back until 6:00 in the evening. There were times that Brad and I only looked at x-rays. I mean all summer long. Sometimes I wouldn't go to the office for a couple of weeks at a time, because I'd...just sit home and read x-rays all day. When you're following 6,000 kids for three years in a caries study and taking x-rays on them almost every year, you generate an awful lot of films to read²²⁰."

Dr. Mark E. Mallatt

"We were always six months behind in our analysis on rat bones. We had some fun, too. [One time], we froze Dr. Stookey's cup of coffee. There was a little bit of joking and carrying on, but we were pretty serious."

Richard Farnham (S27)

"It's been a heck of a ride for 18 years because we've done so many different things...Sharon [Gwinn] told me that we had a full-time hygiene position open and she thought I should have an interview with Dr. Beiswanger. I had never met him before. I'd worked with Dr. Mark Mallatt, so he set it up for me to have this interview... I was thinking, 'Oh man, this guy's gonna be scary.' He's the director of clinical research. I'm kind of nervous, coming in for my interview."

"Dr. Mallatt takes me in to meet him and Brad is sitting in his office (he had long hair at the time, and he had a goatee, and he had on a tie dyed T-shirt, and he had incense burning in the room)...I am trying to be all prim and proper. He's listening to his music, he simply said, 'Are you strong? Can you lift heavy equipment? If so, you're hired!' We had some pretty interesting trips throughout Indiana. We were working in Tell City one time, and there were two carloads of us. We were staying in Owensboro, Kentucky, just across the river from our study sight. It's about a 40-minute drive...At the end of the day, we started to tear stuff down, pack stuff up. I went to the ladies room and when I came out, both cars were gone. They both thought I was in the other car and they left me at a school. A teacher finally had to drive me to Owensboro, Kentucky. That's the problem with more than one vehicle²²¹."

Jodie Crawford

"I remember, as a kid, riding a skateboard around in these polished halls. I don't know if my dad knew we did that or not...probably not. Often, he didn't know what we were up to."

"I remember that he traveled quite a bit and when he came back, he always brought something for us kids, such as interesting souvenirs. He continued to do that his whole life."

"A lot of the departments at Oral Health...have expanded over the years. As they did, they needed more space. What's most surprising to me now are the many functions we used to have that aren't here now. Other things have taken their place. There only were a few operatories"

back in the old days. Where most of the operatories are now was the storage room. What's now the storage room was the dog facility – way back in the back of the building. The room where the oral [microbiology] secretary sits now used to be the room where we had the incinerator. Dr. Miller's office was the feed preparation room.

"It's really strange for me sometimes to walk through here and realize how much it's changed. It seems like there aren't a lot of people who remember all those old things. It makes me feel old sometimes. There are only a few people around to whom I can say, "Hey, you remember when this was the dog examination room rather than these offices?"

"It's a unique and unusual place. There are some people here who wouldn't be comfortable anywhere else. For some people, this is their other home. My dad was a fixture here. He was part of what was good about this place.

"His illness resulted in his missing work, and when he was absent, everybody asked about him all the time. We told him that everybody was asking about him. He would come in when he could – when he felt well enough and when he had the strength. Everybody was so glad to see him and I think that went right straight to his heart. I know he appreciated that... Even when he was in the depths of his illness in his last few days, he wished that he could be here. He would rather be here than not. He just felt like this was his place to be.

"I really appreciate all that the staff here did. It was very touching. A lot of people made offers of assistance of any kind that we needed. I think that was out of loyalty to my father²²²."

A.J. Beiswanger

"In the early 1980s, an impressive mid-week blizzard had blanketed the ground in Indianapolis with over a foot of drifting snow. Wind chills were extreme and driving conditions were impossible. Although the heavy snow had forced many local schools and businesses to close, some of us still managed to get to work at Oral Health – including Dr. Stookey. How he had made it out of his far north, rural driveway, no one knew--but nevertheless – he was on the job. The few of us who made it to work wore blue jeans, heavy coats, gloves, warm hats, and snow boots.

"Under these deteriorating conditions, a woman came trudging into Oral Health with the sad tale that she had gotten hopelessly stuck in a snowbank in front of our office. She asked if someone could help her get back on the two-rutted road so that she could go home. Dr. Stookey cheerfully and generously volunteered to help extricate her car. Fortunately, he had a snow shovel and he was appropriately dressed for the occasion. In a short time, the car was out of the snowbank, and Dr. Stookey had come back into the office. The formerly-stranded lady, grateful for the help she had received, decided to come into the office to thank her benefactor. Unable to find Dr. Stookey (who was elsewhere in the building), she spotted me and said, 'Would you please thank that nice janitor for helping me to get out of the snowbank?' I agreed to do so²²³."

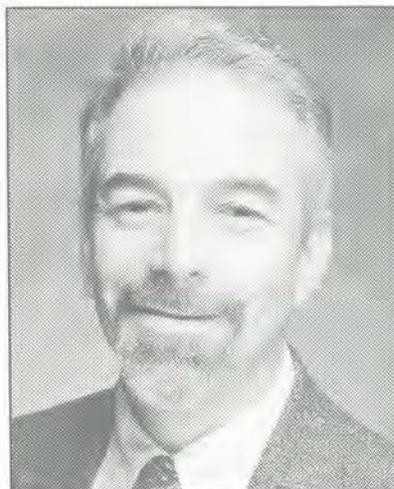
Dr. Arden G. Christen

"Dr. Jim McDonald could tell you some of the funny stories that occurred when animals got loose in that building. Jim tells the story of Woody's [Gerald Wood] pet raccoon that got loose and wreaked havoc in the building."

Dr. Arden G. Christen (528)

The future of the Oral Health Research Institute holds much promise for the field of dental Research, as it enters the new millennium.

The Institute welcomed a new director with the appointment of Dr. Domenick Zero, effective September 1, 1999. He was formerly with the University of Rochester, Eastman Department of Dentistry, in New York²²⁴. Dr. Zero brings many years of research experience²²⁵. He will undoubtedly be an asset to an already superior organization.



Future

*Dr. Domenick Zero
Current Director
of the Oral Health
Research Institute*

Dr. Stookey previously stated that the Institute hopes to continue to pursue early caries detection, with the goal of eliminating the need for restorative dentistry²²⁶.

Dr. Stookey has written a proposal to reinstate the Department of Preventive and Community Dentistry within the Indiana University School of Dentistry²²⁷. The proposal states, "The faculty of the Institute have continued their teaching and academic responsibilities for the undergraduate dental, dental hygiene, and dental assisting programs as well as the graduate dental programs...the vast majority of the costs of the research activities and personnel within the Institute are externally funded. As a consequence, the structure, administration, and faculty appointments and assignments of the Institute are unique in requiring a great deal of flexibility and rapid responsiveness to research opportunities and requirements. Nevertheless, our new curriculum has led to an increasing involvement of the faculty of the Institute in the education of our dental students as well as increased exposure of the dental students to our formally-trained scientists. These developments in the evolution of the Institute and its relationship to the rest of the structure, function and people of the School of Dentistry indicate strongly the appropriateness of the restoration of departmental status to the Institute²²⁸."

Staff members have various viewpoints on the future focus of the Institute. Sue Kelly agrees with the focus on early detection of dental caries. "I think a main focus will be the early caries detection method. In research, a caries study requires thousands of kids and three to four, maybe five years to do a complete study. Where, if there were early detection methods, you wouldn't need the number of kids anymore or the amount of time.

"I think though that these areas will be a focus because that's where our expertise is. Certainly, Dr. Stookey is renowned for his studies in fluoride. I think that is his intention, to keep that a primary focus. Of course, we have privately sponsored studies, but they still focus on that. The partial denture study that I do is about remineralization and demineralization and the effects fluoride has on this.



*The Oral Health
Research Institute
today.*

"From my perspective, that would be a continued area of emphasis for the Institute²²⁹."

Charles Palenik expressed his viewpoint as, "There are exciting new opportunities, such as Karen Yoder's fluoride investigations in Tanzania ... There are still a lot of studies to be done, many in overseas locations. They are mainly, I think, in the smaller countries not big ones.

"The technology has improved greatly to conduct early caries detection studies... The sophistication in computer research and new materials and equipment will make these studies possible²³⁰."

"What I see in the future is a time when the Research Institute is physically a part of the dental school. When we become a wing of the dental school, there will not be this artificial separation between the two.

Since prevention is changing, and the scope of dentistry is becoming refined, research now is becoming more sophisticated and challenging. We now have more molecular biologists, PhD/MD/DDS researcher types that have been hired in recent years. Things are evolving.

We want to keep stimulating other faculty members to become more interested in dental research. The Oral Health Research Institute is only one block away from the dental school, but that one block is a long way. Sometimes it is just easier not to go to the next building."

Dr. Arden G. Christen (S30)

Dr. Lawrence I. Goldblatt, Dean of Dentistry, Indiana University School of Dentistry sums up the future of the Institute by stating, "... the issue of curriculum relates to the fact there are now more opportunities for our colleagues who are principally researchers and investigators to be involved in teaching. For example, problem-based learning tutors can serve as valuable resource people in the new curriculum... Research will remain their primary function, but certainly they can contribute in many ways to our teaching program.

"In the future, I envision that relationship to stay similar, but because of their expanding teaching role, I think a very healthy increased intermixing of exposure of our students to both the scientists who work chiefly at the Institute and faculty members who work here will occur. It's a great opportunity for the Institute personnel to interact with our other faculty. They can learn a great deal from each other. Interestingly, our new curriculum is achieving all these kinds of side benefits, in addition to what it's designed to do.

As far as the physical building is concerned, the Oral Health Research Institute was built in 1968. So, it's an old building. It was built as a temporary building. The truth is, it's really beginning to physically deteriorate. It is our hope for a new building to replace the Institute, because we're just not sure how long that building is going to be able to be useful. It has a finite life span. We are hoping to incorporate it into the School of Dentistry building proper if we can expand our space. It would be good for everybody. While dental research will have its own area, it can still be integrated into our building. While it's relatively easily accessible now, it will be much more in the traffic flow if it can be within this building or within a contiguous space...

"I think that the vision and energy that led to the establishment of the Oral Health Research Institute at Indiana University, its ongoing leadership, and the work that it has done for these many years has been an integral part of what has driven the excellence of this School of Dentistry. Part of its attractiveness lies in its relative independence from the rest of the school and yet a healthy inter-dependence occurs. It has made a huge mark on oral health (on the knowledge of oral health), and I anticipate that it will continue to for years to come. I think it's been an absolutely indispensable part of our growth here at Indiana and I look forward to seeing it continue in a healthy state for a long time to come²³¹.

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**denotes included in text*

