The American Academy of the History of Dentistry, a not-for-profit organization founded in 1951, has as its goals the following:

- Creating an authoritative body to which important questions relating to dental history could be referred for factual verification.
- Stimulating more thorough and comprehensive research in dental history, thereby extending the boundaries of dental knowledge, giving substantial support to growing professional culture.
- Increasing interest among dentists in dental history.
- Encouraging both the development of historical collections on dentistry, and the offering of adequate instruction in dental history.
- Stimulating professional discussion of the facts of dental history as an aid in solving problems in dental education and practice.
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bernhard Gottlieb: His Life, His Work, and His Lasting Impact</td>
<td>59</td>
</tr>
<tr>
<td>Bernhard Gottlieb’s Impact on Contemporary Endodontology</td>
<td>85</td>
</tr>
<tr>
<td>by James L. Gutmann, DDS, Cert Endo, PhD (honoris causa), FICE, FACP, FADI</td>
<td></td>
</tr>
<tr>
<td>Dental Postcards LIII</td>
<td>107</td>
</tr>
<tr>
<td>by Arden G. Christen, DDS, MSD, MA &amp; Joan A. Christen, BGS, MS</td>
<td></td>
</tr>
<tr>
<td>AAHD 62nd Annual Meeting: Announcement &amp; Registration Form</td>
<td>108</td>
</tr>
<tr>
<td>From the Archives: Vol. 4, Nos. 5 &amp; 6</td>
<td>110</td>
</tr>
<tr>
<td>Photos from Our 61st Annual Meeting, Vienna</td>
<td>114</td>
</tr>
<tr>
<td>Book Shop</td>
<td>120</td>
</tr>
</tbody>
</table>
Bernhard Gottlieb
(1885-1950)
Bernhard Gottlieb: His Life, His Work, and His Lasting Impact

This biography has been translated, adapted and expanded from the following dissertation: Bernhard Gottlieb: sein Leben, sein Werk—die Bedeutung für die moderne Paradontologie by Leyla Djafari, Dr. med. dent., Medical University of Vienna
Special thanks to DDr. Johannes Kirchner, Dr. Robert Rudy & Dr. David Chernin.

Berisch Gottlieb (renamed Bernhard in 1920) was born on July 14, 1885 in Kuty, Galicia (now a part of the Ukraine), the son of Jewish parents. He attended the public school in Kuty, and graduated in 1905 in Rădăuți (now Romania).

Gottlieb realized early on that he wished to pursue study in the natural sciences, a subject in which he had great interest. At the age of 21, he began his studies in medicine at the University of Vienna. He became a Doctor of general medicine on December 11, 1911.

Upon graduating from medical school, Gottlieb chose to specialize in dentistry, and began as an associate in the practice of Viennese dentist Siegmund Herz. He was also employed evenings doing scientific work at the Anatomical Institute of Julius Tandler.2

Gottlieb served in the Austro-Hungarian Army as the leader of a mobile medic unit from September 1914 until 1916. (Figs. 1 & 2) He was then leader of a mobile dental ambulance until 1918.3

During the war, Gottlieb collected a large number of human jaws that had been histologically analyzed over the years. This material would serve as a kernel for Gottlieb’s studies, and would later be the basis for many scientific investigations by his students.2

After his return from the war, Gottlieb opened a practice in Vienna. Together with his student and colleague, the Hungarian Balint Orban, he set up a practice in the 9th district, on 13 Türkenviertel. Gottlieb’s passion above all else was science, which he pursued in his laboratory next door at 15 Türkenviertel.4

In 1917 he married Stella (Figs. 3 & 4), the daughter of Dr. Siegmund Herz, and they soon had a son, Erich (Fig. 5).2

In November of 1920, Gottlieb applied to the Dean of Medicine at the University of Vienna for habilitation (Ed.: a level of post-doctoral education commonly required for aspiring university educators in Europe). Among other credentials, his application included nine papers he had published on dental topics:5

1. On Etiology and Therapy of Alveolar Pyorrhea
2. Root Canals with Special Regard for Antienzymes
3. Contributions to Histology and Pathogenesis of Alveolar Pyorrhea
4. Some Further Comments on Root Canals
5. Enamel Hypoplasia and Rickets
6. A Contribution on the Etiology of Dental Cavities
7. The Vital Coloring of Calciﬁerous Tissue
8. On the Role of Saliva for the Healing of Wounds in the Mouth
9. Experimental Examinations on the Etiology of Dental Cavities
Gottlieb’s application was bolstered by a letter from Prof. Dr. Rudolf Weiser, of the Professors’ Council at the Department of Medicine, and also then Rector of the University. The April 18th, 1921 letter accompanied Gottlieb’s petition for habilitation. This letter, as transcribed below from the university archive, described Gottlieb’s work, reputation, and personality:

The application of Dr. Bernhard Gottlieb for the permission to be a private teacher of dentistry must be forcefully considered, I believe. The candidate supports his petition with 12 or so publications that show evidence of extensive knowledge of the literature in the field that move along the forefront of current interests in both Austria and abroad. From these same publications, not only does it become evident that Gottlieb takes great joy in his work but also that he has a virtuosic mastery of histological technique and has the ambition, under the excellent leadership of teachers such as Ebner, Schaffer and Tandler, to not only present the results of his work to the professional circles for their pleasure but also that he strives above all else to make his dentistry useful.

There is a list of duties which have been imposed by the editors of dental textbooks since the last decade which must be taken as burning daily questions, without which the researcher pulls himself up to make a shameful world. These daily questions must always be seen as open and undetermined whether the researcher wants to take them up. Gottlieb aspires, by employing ad hoc histological examinations of a broad material and especially with laboriously and cleverly conducted animal experiments, to answer these daily questions. He also puts in critical study of dogmas that have long been known as unpopular when they are often treated in a dilatory manner due to lack of time or desire for comfort.

In the last respect, Gottlieb has worked on areas that are as scientific as they are interesting as they are practical, such as “Etiology and Prophylaxis of Dental Cavities,” in a field that has appeared to be “completely elucidated” in the last decade, yet has been reorganized in a surprising way by an imposing histological series of investigations.

Gottlieb’s greatest accomplishment, however, is the scientific foundation of the Vienna school doctrine: that alveolar pyorrhrea begins with the underlying early shrinkage and atrophy of the alveolar bone and supporting smallest arteries of the maxillary sinus; with development of cysts in the gums, deeply-sedimented plaque and pus production appearing secondarily. From the numerous therapeutic measures, he uses the most sensible, the Robiscek’s surgery and the local mechanical techniques, and only as a third option does he resort to topical medications, which he uses with minimal doses. His results in the last two years have been astonishing. Whether or not this continues, only time will tell.

Dr. Gottlieb’s candidacy is supported with the important facts that are indeed held by the current Prof. Fleischmann at the Institute of the Viennese University, who has long stood the test of time. But one cannot see any other young new blood in this area who possesses the same attributes. In addition, Gottlieb is well-versed in every branch of dentistry—conservative, operative, prosthetic and orthopedic practice—so that he could substitute for any other teacher should the need arise.

He is a persuasive speaker, with much amazement for his subject matter, and an active drive to work as a teacher. Dr. Gottlieb has integrity, an open character and is colleague of comprehensive medical and general education. He is enormously industrious, energetic and is very esteemed in professional circles here and abroad.

In my capacity as a university administrator, I would highly recommend with the greatest support, that this promising and versatile teacher will be a boon not only for the country but especially for the Viennese University.
On December 28, 1921, Gottlieb was named an associate professor at the dental faculty. On June 20, 1925, he earned the title of Dr. Med. honoris causa at the University of Bonn on the occasion of the Rhinefestival.

In the same year, he was chosen as the successor of the retired Dr. J. Howard Mummery at the Commission for Scientific Research by the International Dental Association (FDI) in Geneva.

The time between 1920 and 1930 was to be the most productive period in Gottlieb’s life. During this time, he led the histological laboratory at the dental institute, and developed via this line of inquiry a number of fundamental concepts which would come to be recognized as the worldwide basis for modern scientific research.

Professor Gottlieb and his students—called the Vienna School—yielded boundless success through the results of their research and their lectures at international conferences. Together with his ambitious students, including Balint Orban and Rudolf Kronfeld, he published innumerable microscopic studies on periodontal diseases through the study of human cadavers. His main works were published in the German- and English-speaking world in the 1920s. A list of the most essential can be found on page 69.

At the seventh international dental conference in 1926 in Philadelphia, at which more than 280 publications from 36 countries were presented, the Vienna School dazzled with their representatives, especially Gottlieb, Orban, Stein, Kronfeld and Pichler.

Gottlieb’s “Tissue Changes in Pyorrhea” was a richly-illustrated work about the structural changes that accompany periodontal diseases. The numerous histopathological pages and figures “caused a kind of sensation.”

Gottlieb presented a complete review of the subject: “It is necessary to attend to biology as a whole and not to artificially underestimate it. Although I am glad to speak here about damage to the teeth, I must first begin with their development.”

He showed the physiological dentition and the origin of the periodontium, and brought his histological contributions to this theme.

Further, the publications from Balint Orban (“Nutrition and teeth” and “Histology of the enamel lamellae and tufts”), Georg Stein (“Studies in transplantation” and “Case reports”), and from the oral surgeon Hans Pichler were much discussed in the professional world.

Presiding over the conference in Philadelphia was the president of the Chicago Loyola Dental School, Dr. William Logan. As mentioned, Gottlieb visited Logan in the following years. Logan, himself a physician and oral surgeon, had varied interests and planned to found his own histopathological research unit at Loyola University. He asked Gottlieb to support him with this project. Gottlieb recommended his brilliant young Hungarian colleague, Balint Orban, for this post. Orban thus spent the next two years (1927-1929) in Chicago.

Orban’s first job there was to set up a laboratory with all of the necessary devices. He ordered the most modern equipment (“the best of everything”) such as a microtome, a photomicrograph, a laboratory microscope, a grinding machine and much more. After that, he taught 20 of his faculty colleagues, including the dean, in “Methodology for Scientific Research.”

During this extremely productive time, many projects and studies were brought to life and about 22 publications were written.

After Orban’s return in 1929, Gottlieb sent his young student Rudolf Kronfeld as Orban’s successor to Chicago. Entirely in the style of the Vienna School, the 28-year research activity of Loyola University Chicago was developed, and produced numerous publications, gaining a worldwide reputation for periodontology with the Austrian approach.

Under dean Hans Pichler, Gottlieb was called to the position of University Professor, or full professor, in December of 1930. Dean Pichler’s letter in support of Dr. Gottlieb expounded further:

Since his advancement to habilitation, Gottlieb has published 27 works. They include histological and biological inquiries, especially about the cementum and its importance for the viability and function of the dentition. Further, with pathology, pathogenesis and the classification of the different forms of alveolar pyorrhea, we have gained an essential clarification.
Finally, his experiments have achieved the goal of clarifying the most important current problem of dental practice: to advance the practice of root canal treatment, and to ground it on a scientific basis.

Since 1923, through Gottlieb’s leadership of the histological laboratory of the dental institute, and his great personal sacrifice of money and time, he has turned it into a research center and school that is known around the world for its extraordinary fruitful and successful activity.

In addition to Gottlieb’s own work during this period, additionally 65 of his students have published significant scientific findings in the worldwide dental literature.

Gottlieb has become known around the world not only as a researcher but also as the mentor of a school, the proteges of which have already received many honors. Most notably, two of his students (first Orban and then Kronfeld) as teachers at one of the most important American schools, the Chicago College of Dental Surgery.

Additionally, he has proven his ability as a teacher, both earlier with his introduction to new dental training courses, as well as proving to be extraordinarily beneficial and almost indispensable. It could be said that through him this practical instruction has been placed into a very scientific groundwork which never could have occurred if this first-rate expert had not been available.

Since his habilitation, Gottlieb has, without break, given lectures about “The Biology of Teeth” and in the last two years he has also given lectures on “Hands-On Training for Gum Disease”

On July 27, 1931, assistant professor Bernhard Gottlieb was finally named a full professor (after a vote of 24 to 5) through the federal ministry for instruction. The Viennese professor had extensive scientific contact with many international associations. Honorary doctorates from the University of Bonn, and from Loyola University, Chicago. Corresponding member of the Royal Society of Medicine London. Honorary Member of the British Dental Association; Nippon Dental Association; Societe D’Odontologie Paris; Allied Dental Council New York; Dutch Dental Society; Hungarian Dental Society; Dental Society Caracas, Venezuela; Dental Society Vienna.

Fellow of the American Academy of Periodontology. President of the Scientific Commission of the Federation of International Dentists (FDI). 1936: Miller Prize of the FDI.

The scientific relationship between Europe and America increased dramatically with the start of the 20th century. The American dental faculties arose in the middle of the 19th century, beginning in Baltimore in 1840, which established a professional and educational path for dentistry.

The first dental faculty in Austria was founded in 1894 under Julius Scheff. Prerequisite for the four-semester program was completing one’s education in general medicine. So it was not surprising that the professors of histology, pathology and anatomy who taught at the university only learned practical skills and manual skills late in their professional careers. The American dentists, on the other hand, were known for their technical abilities and less for their histological background knowledge.

Through the friendly exchange of research results at international meetings with and visits from foreign faculties, both the American and the European disciplines benefited. In 1933, Kronfeld published his Histopathology of the Teeth and Their Surrounding Structures. This soon became a standard text in dentistry. Together with Logan, he published a 48-page milestone, “Development of the human jaws and surrounding structures from birth to the age of 15 years.” Therein, histological preparations (6x8cm format) were shown from human remains that had been prepared according to Gottlieb’s “Celloidin Method.” The Journal of the American Dental Association reported in 1933 that these findings were “a new light on tooth development.”

Kronfeld taught as an ambitious Assistant Professor of Histology and Pathology at Loyola Dental School, and quickly established himself in the Chicago Dental Society (and honorary membership in the International Association for Dental Research [IADR]). Soon after receiving this recognition, he opened his own practice in Chicago, and married an American, Margaret North.

Ten years after Gottlieb’s first encounter with Dean Logan in Philadelphia, Kronfeld and his research team presented their work at the 9th International FDI Conference, which took place in Vienna and was organized by Dr. Orban. Among other things, 200 photo-micrographic images were
shown; a collection that Kronfeld described at the largest of its kind in the US.

Kronfeld's career was tragically cut short in the winter of 1940, just one month before his promotion to President of the IADR. The 39-year-old Kronfeld was found dead in his laboratory under mysterious circumstances. The *New York Times* reported that a coronary thrombosis was the cause of death, but the *Chicago Tribune* believed it to be suicide, as Kronfeld was suffering from a serious and nearly unmanageable illness, multiple sclerosis.

Meanwhile, the political situation in Europe was coming to a head. In March of 1938, two years before Kronfeld’s death, Hitler’s troops marched into Austria. In the same month, there was a new law passed under the regime of Chancellor Kurt Schuschnigg that all members of the University had to provide proof of their Aryan heritage. This anti-Semitic “cleansing policy” lead to removal of 75% of the medical faculty, including nine Jewish dentists. Six of them later emigrated to America: Drs. Bernhard Gottlieb, Albin Oppenheim, Harry Sicher, Balint Orban, Peter Weinmann and Georg Stein. Dr. Fritz Schenk died at the Theresienstadt concentration camp; Dr. Bruno Klein survived and later returned to his old post; the whereabouts of Dr. Berthold Spitzer remain unknown.

Dr. Arthur Black, the dean of Northwestern University whom Orban had met years before, helped secure safe passage for Orban and his family. At Northwestern, Orban took the post of assistant professor. In 1940, after Kronfeld’s death, Dean Logan invited Orban to work at the research unit at Loyola Dental School that Kronfeld had co-founded.

Of the group of emigrant dentists, Orban had the most impressive career. He published numerous articles and books, partially in cooperation with Viennese colleagues Weinmann and Sicher, who also worked at the University of Chicago.

In contrast to his other Jewish colleagues, Bernhard Gottlieb did not go at first to the United States. He initially wanted to stay in Europe. His wife and young son Erich were sent to London for safety while Gottlieb himself fled, with the help of a non-Jewish friend, over the Black Sea to Palestine, with some parts of his histological work in his briefcase.

At the University of Tel Aviv, Gottlieb hoped to continue his research work in a place that not only shared a pioneer spirit, but also a Talmudic ethic. Yet soon he saw that his own enthusiasm alone was not enough to make this happen. There were no facilities, no equipment, to library and no reprieve in this politically unstable place.

After many futile attempts to immigrate into England, Gottlieb at last decided to bring his family to the United States. In the summer of 1940, he came to Ann Arbor, Michigan, where he was employed at the advanced training institute at the Kellogg Foundation. Shortly thereafter, he taught as a guest lecturer at the University of Michigan, and then finally found a place as a professor of Oral Pathology, and leader of the Department of Dental Research, at Baylor College of Dentistry in Dallas, Texas.

Gottlieb struggled in the following years, with limited financial means, and colleagues who were very ambitious, even if they had little scientific experience, to achieve a research profile similar to that of the Vienna School. Gottlieb also struggled personally, feeling isolated from actual scientific endeavors, in part due to his distance from former students and colleagues, and in part due to language barriers and the experience of being a foreigner in a new home. He had reached a time of his life when he would never again enjoy the esteem that he once had at the Viennese clinic.

In addition, Gottlieb’s work, *Biology and Pathology of the Tooth and Its Supporting Mechanism*, published shortly after his arrival in the United States, received mixed critical reviews in the professional world. The work was an English translation of what had been published in Austria as *Zahnfleisch und Zahnlockerung*. An article from the *Journal of the American Dental Association* showed a misunderstanding—typical for its time—of Gottlieb’s research into biological foundations. Gottlieb’s description and definition of the epithelial attachments was dismissively referred to as a “so-called fact.” His work was further ripped apart by restorative influences to not cut the epithelial
attachment in two as a “dogmatic and rather philosophical personal interpretation.”

Before the war, Gottlieb had regularly published with his colleagues Orban and Sicher. From his emigration until his death, there were no further such collaborations.4

At Baylor College, Gottlieb shifted his attention quite strongly to something that he had begun researching in Tel Aviv: caries research. Gottlieb fully grasped, perhaps earlier than others, that the structure of the tooth is a dynamic, living tissue. He recognized that the metabolism of the microorganisms in the mouth had something to do with the state of the enamel, and that the composition of saliva could possibly play a protective role against cavities.

In a diverse series of experiments, Gottlieb treated enamel with various chemicals (silver nitrate, zinc chloride and potassium ferro-cyanate), which, according to his theory, created an insoluble bond with enamel and would thus prevent bacterial infection.39,40

He performed experiments with his colleagues in Texas in small studies that were not financially supported by the government. The results of the silver nitrate study, which he presented in 1947, showed that a group of 25 children after one year had on average .44 cavities each, whereas the average number per child outside the experimental group was 4.2 cavities.41

The research on cavities in the 50s and the 60s, with the potent aid of microscopic tools which Gottlieb had made available to himself, supported his hypothesis. On the basis of the greatly-supported national fluoride study of the U.S. Department of Health and Human Services, drinking water and topical fluoridation were made widely known as prophylactic measures in the late 1940s. Gottlieb’s book, Dental Caries,42 published in 1947, wherein his prophylactic methods and theories about cavities were described in terms of histology, found little attention during this time.

Orban would recognize his mentor’s innovation in the obituary he wrote for Gottlieb: “In the last years of his life [Gottlieb] was occupied specifically with the study of cavities, and he published in this field more esteemed and exciting works. That last result of his research is a book, Dental Caries, which was published in 1948 and had much success.”

His untimely death in March 1950 overshadowed the release of his current research interest involving the dental pulp organ, and specifically his investigations into the role and importance of the cementum tissue.

Gottlieb’s final book, Endodontia, was released a few months after his death in 1950. It was unfortunate that this slender 177-page book became eclipsed by Gottlieb’s death. The material and information therein would eventually provide the path for dental researchers 25 years later. Gottlieb was the first to demonstrate, through histopathological investigation, the fallacy underlying the “focal theory of infection” in dentistry, that teeth with necrotic pulps (“dead teeth”) needed to be extracted.43

Some people vigorously protest that once cementum becomes necrotic, the tooth is lost and the only possible thing to do is remove the tooth. This was the background for the generally accepted claim that prevailed in dentistry that a tooth with a necrotic pulp must be eliminated just as a sequester has to be removed, since the lacunae in the hard tissues of both have lost their cellular content, thus becoming necrotic, and nature has no possibility of reclaiming such tissue. Many misunderstandings have developed on the basis of these fault conceptions, because nobody seemed to care to investigate the histopathology of such conditions and to check by such a study whether or not the vague, completely unfounded conceptions were true. Instead, these statements were repeated and perpetuated until the general practitioner accepted them for facts and governed his attitude in practice accordingly. For this reason a healthy development of root canal technique could not take place, all avenues of progress being obstructed by completely unwarranted prejudices.

Additionally, Gottlieb was adamantly opposed to the use of caustic medicaments in endodontic treatment.43

The most important break which has to be made with strong tradition is that we must realize that we are not permitted to use in root canal treatment any heroic drugs which could possibly offend the connective tissue. This must be made a rule without exception.
While present-day books on endodontics have greatly expanded in length, Gottlieb’s *Endodontia* is an elegant, clear and sufficiently illustrated monograph.

These last two books, *Dental Caries* and *Endodontia*, need to be viewed as a window into which we can begin to appreciate the direction of Gottlieb’s focus: namely, a reparative biological approach to the treatment of dental disease. We remain truly indebted to this great man and his tireless efforts to shed the light of truth on the inconsistent vagaries (“unwarranted prejudices”) so commonly on display in chairside dental practice.

The following is a list of publications that Gottlieb published during his time as a professor at Baylor University (all by Gottlieb B unless otherwise noted):44

- Invasion of micro-organism into the body through enamel and dentin compared with that through epithelium and connective tissue. *J Houst Dist Dent.* 1948; 20(3):1-4.

**Gottlieb’s Death & Legacy**

“Bernhard Gottlieb died in the night between the 16th and 17th of March of 1950 at the age of 65 in Dallas, Texas. A few days before his death he suffered from a slight stroke from which he seemed to be recovering. Yet a few days later he passed away without pain. He continued his work up until his last days and only with effort could he visit with friends in the hospital after his stroke,” wrote Balint Orban in his obituary.2

Gottlieb was survived by his wife Stella and his son Erich, who had recently begun to study at Columbia University in New York.45

Orban: “As the most important work of Gottlieb, we must discover the epithelial appendage, the works on the biology of the cementum, about enamel lamination and cavities, diffused atrophy of alveolar bones, periodontal pyorrhea and alveolar atrophy, experimental works about root canals and experimental investigations about changes in tissue, generated through great effort.”2

“Generally known are his works about the development of the teeth, which are first in the line of studies of the epithelial appendage, enamel and cementum. As such, Gottlieb can be verified as the first who found the organic that the enamel outer layer and the enamel-cementum-border reaching the epithelial appendage grow together, that the process of dental retardation is discontinued without dependence on the enamel-cementum-border.”

“(…) for decades, Gottlieb studied diseases of the periodontal tissue. He has given us important theories and practical instructions based on his school in the field called periodontosis.”

“(…) a recapitulatory presentation of the problems of the periodontium can be found in his book, Periodontia, which was nearly finished at the time of his death.”
“(...) Shortly before his death, Gottlieb was able to write a book, *Endodontia*, with provides much scientific evidence that “dead teeth” can be removed from the organism without any harm if done in a proper manner.”

“(...) in 1947, his book Dental Caries was published, in which he dismissed instructor Miller’s chemical parasite theory and advanced his own theory of parasites and cavities, according to which bacteria enter the internal part of the tooth through infection, and thus he devised a unique method of obliterating these invasions through the impregnation method of the teeth with inorganic salt.”

“One can truly say that few researchers have had such an influence over the science of our subject as Gottlieb has had. He must be regarded as the founder of the biological way of thinking in dentistry. Yet he was not only a histologist and histopathologist, but also a great practicing dentist. He gave all new technical innovations his full attention and when he could couple a method with his biological principles, he had no problem mastering them.”

“When he wanted to know something, Gottlieb did not guess; he observed and conducted experiments; but only after that did he argue! Dentistry was a passion for him.”

“Gottlieb was an outstanding teacher and lecturer and at the same time he was a superb practitioner.”

“As a person, Gottlieb as on as high of a level as he was with his scientific and practical endeavors. Understanding, wellness and especially generosity were his motives. For his colleagues he would put himself out on a limb in every situation and would do everything for them that was possible for him. He was tireless and his spirited energy was unfailing. Gottlieb has become an ideal for dentistry. His spirit will live on in his written works and through his students.”

“A Dallas dentist more than a year ago told Dr. Gottlieb, ‘After you are dead, you will be a famous man.’ ‘The price is too high,’ he replied.”

For his untiring spirit of research and his dedication to teaching, Gottlieb was honored posthumously by the Baylor College of Dentistry. A memorial plaque and his bust (Fig. 6), which are placed in the Hall of Fame at the University, help us to remember Bernhard Gottlieb today.

**References**

1. Letter recognizing the conferring of Dr. Gottlieb’s medical degree, with acknowledgment of the name change from “Berisch” to “Bernhard.” From Niederösterreich government, July 6, 1920. (see Appendix 2)


3. Typed curriculum vitae attached to Gottlieb’s application for habilitation. Document held in the Archives of the Medical University of Vienna. (see Appendix 5)


5. A list of Gottlieb’s publications at the time of his application for habilitation. Document held in the Archives of the Medical University of Vienna. (see Appendix 7)

6. Transcript of April 18, 1924 letter from Rudolf Weiser in support of Dr. Gottlieb. Document held in the Archives of the Medical University of Vienna.

7. Confirmation of Gottlieb’s habilitation. 1921. Document held in the Archives of the Medical University of Vienna. (see Appendix 8)
8. Varia. Z.f Stom. 1925; p. 662.


10. Handwritten listing of Dr. Gottlieb’s publications from 1913-1921. Document held in the Archives of the Medical University of Vienna. (see Appendix 11)

11. Listing of Dr. Gottlieb’s publications up to 1934. Document held in the Archives of the Medical University of Vienna. (see Appendix 12)


19. Transcript of a December 1930 letter from Dean Hans Pichler in support of Dr. Gottlieb. Document held in the Archives of the Medical University of Vienna.

20. Document showing the vote tally for Dr. Gottlieb’s appointment to Full Professorship. Document held in the Archives of the Medical University of Vienna. (see Appendix 13)

21. Transcript of a listing of Dr. Gottlieb’s international academic accolades and recognitions. Document held in the Archives of the Medical University of Vienna.


24. Kronfeld R & Logan WHG. Development of the human jaws and surrounding structures from birth to the age of fifteen years. JADA. 1933; 20:379.


49. Letter, dated April 20, 1982, from Prof. Ruth Jones, nominating Dr. Gottlieb to be commemorated in Baylor College of Dentistry’s Hall of Fame. (see Appendix 17)
Partial Listing of Publications by Gottlieb & the Vienna School, 1921-1934

1921: The epithelial appendage at the tooth • German Journal of Dentistry
The root canal • German Journal of Dentistry
Alveolar atrophy and alveolar pyorrhea • Medical Clinic
Cementum exostosis, enamel drip and epithelial nidus • Zeitschrift für Stomatologie (ZfS)

1922: Histological examinations of a healed tooth fracture • ZfS
Oral hygiene • ZfS
Alveolar atrophy and alveolar pyorrhea • Medical Clinic
Cementum exostosis, enamel drip and epithelial nidus • ZfS

1923: Periodontal pyorrhea of rat molars • Quarterly Journal for Dentistry
The histological structure of guinea pig molars • ZfS
The diffused atrophy of alveolar bones • ZfS

1924: The principles for stump preparation • ZfS
The case of an apparent shortening of an upper lateral incisor • ZfS
The treatment of the so-called alveolar pyorrhea and other periodontics • ZfS

1925: The changes to teeth and jaw from experimental canine rickets • ZfS
The case of an apparent shortening of an upper lateral incisor • ZfS

1926: Periodontal pyorrhea and alveolar atrophy • Progress of Dentistry

1927: Fractures and Luxations of Teeth
The gingival margin • Section of Odontology
Tissue changes in pyorrhea • Journal of the American Dental Association
Periodontal pyorrhea and alveolar atrophy • Progress of Dentistry
The margin fit of gold inlays • ZfS

1928: The Dunlop method • ZfS
Periodontal pyorrhea and alveolar atrophy etiology • Progress of Dentistry
The problem of the root canal • ZfS

1929: The treatment of periodontal pockets • Progress of Dentistry
Biological control of root canal treatment methods • German Dental Weekly Report

1930: Changes to the periodontium after surgical diathermia • ZfS

1931: Tissue changes through overworking with special consideration of age and constitution • ZfS
Gum cysts and retarded dentition • Progress of Dentistry
What can we do with prophylactics against teeth falling out and which therapeutic measures are available to us? • Viennese Clinical Weekly Journal
The effects of trioxymethylene on enamel • Dental Review
How does chronic gum inflammation arise and how does it lead to teeth falling out? • Viennese Clinical Weekly Journal

1932: The Problem of Root Canals • ZfS
Periodontal Pyorrhea and Alveolar Atrophy • Progress of Dentistry

1933: Root Canals with Living Dental Pulps • ZfS
Treatment of roots in teeth with vital pulps (Tratamiento de raices en dientes con pulpas vivas) • La Odontologia

1934: Tissue Changes
Gum Inflammation and Loosening of Teeth
Appendices

Appendix 1. Gottlieb’s rigorous handwritten notation.

Appendix 2. Letter recognizing the conferring of Dr. Gottlieb’s medical degree, with acknowledgment of the name change from “Berisch” to “Bernhard.” From Niederösterreich government, July 6, 1920.

Appendix 3. Proposal for the theme of Gottlieb’s postgraduate study (habilitation).
Appendix 4. Prof. Weiser's request for Gottlieb's habilitation.
Abschrift!

Elg.No.1 zum Habilitationsgesuch
des Dr. Bernhard GOTTLEIB.

Curriculum vitae.


Gleich nach der Promotion widmete sich der Geformte der Zahnheilkunde und arbeitete gleichzeitig wissenschaftlich am I. Anatomischen Institut.

Die allgemeine Praxis übte derersele vom Anfang bis zum heutiger Tage immer in Wien aus.

Vom September 1914 bis 1916 war Gefertigter Leiter einer mobilen Krankenhaltstation und dann Leiter einer mobilen Zahnambulanz bis zum Jahre 1918.

Wien, im November 1920.

Dr. B. Gottlieb e. h.
Beilage Nr. 3 zum Habilitationsgesuch des Dr. Bernhard Gottlieb.

Revers!

Der Gesollte erklärt sich bereit, Herrn Dr. Bernhard Gottlieb für den Fall, daß ihm die venia legundi für Zahnheilkunde verliehen werden sollte, die Räumlichkeiten und das Material des zahnärztlichen Institutes zur Abhaltung der Vorlesungen zur Verfügung zu stellen.

Wien, im November 1920.

[Signature]

Prof. Dr. Rudolf Weiser.
Appendix 7. Attachment to the application for the habilitation. A list of Gottlieb’s publications at the time of application.

Elge, Nr. 5 zur Habilitationssuch des Dr. Bernhard Gottlieb.

Verzeichnis der wissenschaftlicher Arbeiten des Dr. Bernhard Gottlieb.

1. Zur Ätiologie und Therapie der Alveolarpyorrhöe.
2. Die Wurzelbehandlung mit besonderer Berücksichtigung des Anti-
   ferments,
3. Beiträge zur Histologie und Pathogenese der Alveolarpyorrhöe,
4. Einige weitere Bemerkungen zur Wurzelbehandlung,
5. Szemelzhyepoplasie und Rhachitis,
6. Ein Beitrag zur Ätiologie der Zahnkaries,
7. Die vitale Färbung der kalkhaltigen Gewebe,
8. Ueber die Rolle des Speichels bei der Heilung von Wunden in
   der Mundhöhle,
9. Experimentelle Untersuchungen zur Ätiologie der Zahnkaries.

Vi en, in November 1920.

[Signature]
Bundesministerium für Inneres und Unterricht
Auftragsamt
Wien, 1., Minutenplan Nr. 5

wien, am 16. Dezember 1921.

Z: 24523/I-Abt. 2.
Habilitation des Dr. Bernhard Gottlieb für Zahnheilkunde.

An
das Dekanat der medizinischen Fakultät der Universität

in

"I E".

Ich erteile dem Beschluß des Professorenhäusern der medizinischen Fakultät der Universität in Wien auf Zulassung des Dr. Bernhard Gottlieb als Privatdozent für Zahnheilkunde an der genannten Fakultät die Bestätigung.

Die Beilagen des Verhiebes folgen im Anschluß mit Ausnahme des curriculum vitae und des Vorleseprogrammes mit den Er- suchen zurück, die Personalsendestelle des Genannten anher vor- zulegen.

Der mit der Leitung des Unterrichtsamt besraute Vizekanzler:

Vizekanzler:

MÄRZISCHES DEKANAT
präs.: 28. Dez. 1921/22

Konzept

Zl. 386 aus 1930/31

An

Herrn Professor Dr. Hans PICHLER

in

W i e n.

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Der ständige Ausschuss hat in der Sitzung vom 4. Feber 1931 beschlossen, s i e um Abfassung eines Gutachtens über den für die Verleihung des Titels eines a.o. Professors in Aussicht genommenen Privatdozenten Dr. Bernhard GOTTLIEB zu ersuchen.


Gleichzeitig gestattet sich der gefertigte Dekan, eine Abschrift des Punktes 3 und 4, Abt. IV der Geschäftsordnung zur Darnachachtung zu übermitteln und ausdrücklich zu bemerken, dass dieses Gutachten zunächst nur den Zweck hat, den Ausschuss über die wissenschaftlichen Leistungen des Dozenten und über die Würdigkeit aufzuklären und dass dies noch nicht bedeutet, der Ausschuss werde den Betreffenden auch schon zur Titelverleihung beantragen.

Grassberger c.h.
dzt. DEKAN

Konz. Beilagen!

Appendix 9. Dean Hans Pichler's written request for opinions regarding Dr. Gottlieb's qualifications, in anticipation of his being awarded the title of Full Professor.
Vor- und Zuname: Dr. Bernhard Gottlieb

Geboren am 14. Juli 1885 in Kesty

Studiengang: Die Volksschule in Kesty absolviert, 1905 in Radau in Württemberg.

Doktor der gerührten Heilkunde

promoviert am 11. Mai 1911 in Württemberg

(eventuell Nestrifikation)

Habilitation für praktische Heilkunde

an der universitäten Fakultät in Württemberg (bestätigt mit MKUE vom 18. XII. 1927)

Berufstätigkeit vor Erlangung der Professur:

Appendix 11. A handwritten listing of Dr. Gottlieb's publications.
Appendix 12. Listing of Dr. Gottlieb’s publications up to 1934.
Appendix 13. Document showing the vote tally for Dr. Gottlieb’s appointment to Full Professorship.
An

das Bundesministerium für Unterricht

in

W i e n

Auf Grund des beiliegenden Berichtes des Professors

Ich beehre mich, das Bundesministerium für Unterricht zu ersuchen, diesem Antrage zustimmen zu wollen.

Konv. Beilagen

dst. De k a n.

Herrn
Professor Dr. Bernhard GOTTLEIB

in Wien.


I. v. d. dzt. Dekan:

Conv. Beilagen.

Appendix 15. Dr. Gottlieb’s notification of his appointment to Full Professor.
Appendix 16. Notification of Dr. Gottlieb’s appointment to Full Professor. 1931.
Appendix 17. Letter nominating Dr. Gottlieb to be commemorated in Baylor College of Dentistry's Hall of Fame. 1982.
Bernhard Gottlieb’s Impact on Contemporary Endodontontology

James L. Gutmann DDS, Cert Endo, PhD (honoris causa), FICE, FACP, FADI
Diplomate, American Board of Endodontics
Professor Emeritus, Baylor College of Dentistry
Texas A&M Health Science Center, Dallas, Texas

This paper was presented at the 61st Annual Meeting of the American Academy of the History of Dentistry, October 6th, 2012, in Vienna, Austria

Bernhard Gottlieb, physician and dentist, was born in 1885 in Kúty, Galacia (later Czechoslovakia). He received his doctor of medicine degree from the University of Vienna and a doctorate in medical dentistry from the University of Bonn. He belonged to a group of Viennese scientists who originated periodontics, orthodontics, pedodontics, endodontics, and oral surgery. In the 1930s he began to address in the European sector, root canal treatment in teeth with a vital pulp; following his immigration to the United States, he settled in Texas, in the position of professor and head of the Department of Pathology and Research at Baylor College of Dentistry. Gottlieb wrote many scientific articles and textbooks and is responsible for the beginnings of oral histology as a distinct scientific discipline within dentistry. His initial investigations focused on the periodontium and resorptive activity identified during orthodontic treatment. However, his continued research interests, which are rarely highlighted, focused on teeth and pulps that had undergone trauma and teeth that presented with necrotic pulps. Moreover, his most important legacy may lie in his establishment of the foundation for tissue engineering within dentistry, through his research on the impact of hard tissue elements such as bone, dentin and cementum on the formation of new tissues (regeneration). As stated by Dr. Gottlieb, “This seems to be the goal for which science should strive in endodontia.”

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jlg@histdent.org
Introduction

Berisch Gottlieb (renamed Bernhard in 1920)\(^1\) (Fig. 1) was born on July 14, 1885 in Kúty, Galacia (later known as Czechoslovakia).

As a youth, Gottlieb displayed an avid interest in the natural sciences. He began his studies in medicine at the age of 21 and received his doctor of medicine degree from the University of Vienna in 1911. He chose dentistry as his area of specialization, becoming associated with the Ordination of Viennese Dentists of Siegmund Herz, while pursuing simultaneous employment at the Anatomical Institute of Julius Tandler.\(^1\) While serving in the Austro-Hungarian Army from 1914 to 1916, he had the opportunity to obtain a large amount of human jaws. These specimens would serve him and his students in many investigative ways after he established his own dental practice and histological laboratory, with his student and colleague Balint Orban, at Tükenstraße 13/15 in Vienna.\(^2\)

After receiving an appointment in 1921 as an associate professor at the dental faculty in Vienna, he earned a Doctorate of Medicine of Dentistry (honoris causa) from the University of Bonn. During the years from 1920-1930, he belonged to a group of Viennese scientists who originated periodontics, orthodontics, pedodontics, endodontics, and oral surgery. Along with his students Balint Orban and Rudolf Kronfeld, Gottlieb published numerous histological studies on the biology and pathology of teeth and their supporting mechanisms,\(^3\) and periodontal disease using the human remains he had gathered during the war. For his work on periodontal disease\(^4\),\(^5\) and the exhaustive evaluation of resorption during orthodontic tooth movement,\(^3\),\(^7\) he and many of his students received global recognition and acclaim. For example, Madelene Marshall, in her presentation before the Annual Meeting of the Medical Library Association at Yale University in March 1946 on some influential books in the history of dentistry,\(^8\) made comments and cited Gottlieb as follows, “Periodontitis is pyorrhea to the layman. According to one well-known radio commentator ‘four out of five have it.’ The apostle of scientific investigation of periodontitis was Bernhard Gottlieb of Vienna, whose paper ‘A Contribution to the Histology and Pathogenesis of Pyorrhea Alveolaris’ was read at the annual meeting of the Austrian Stomatologists in Vienna in 1919” (and published in 1921).\(^4\)

However, Gottlieb’s investigations did not stop there, as he gradually began to investigate the biology of the dental hard tissues, enamel and cementum (in particular with Orban)\(^3\) along with the histopathology of the teeth and supportive structures (with Kronfeld).\(^9\) In the early 1920s, and with greater intensity in the 1930s, he began to address in the European sector the topic of root treatment in teeth with a vital pulps. (“Wurzelkanalbehandlung bei lebenber Pulpa;” “Tratamiento de raices en dientes con pulpas vivas;” “Le traitement de canaux à pulpe vivante”).\(^10\)-\(^12\)

Gottlieb’s Endeavors into the Problem of Root Canal Treatment

Prior to 1920, Gottlieb published two articles relative to management of root canals: “Die Wurzelbehandlung mit besonderer Berücksichtigung de Antifermins” (“Root canals with special regard for antienzymes”) and “Einige weitere Bermerkungen zur Wurzelbehandlung” (“Some further comment on root canals.”)\(^16\),\(^17\) During the next 8-10 years the majority of his investigations and publications focused on the impact of disease on the entire periodontium (gingival tissues, periodontal ligament, cementum and supporting bone), with a minimum of 25 publications.\(^1\) Then, in the late 1920s...
and early 1930s he began to publish manuscripts that focused more on his investigations into “Das Problem der Wurzelbehandlung” (The problem of root treatment), with a focus on refuting the then-current philosophies of focal infection and elective localization.

“For many years it has been realized that the problem of the pulpless tooth cannot be considered solved until it can be demonstrated scientifically and indisputably that a pulpless tooth can be rendered harmless to the body beyond a shadow of a doubt.”

His final endeavor reflected the culmination of his diligent efforts, codified for the clinician in a textbook entitled Endodontia, published in 1950.

Reviewing Gottlieb’s efforts to address the problem of root treatment, as he saw it, many issues come to mind that continue to have an impact on present-day endodontic treatment philosophy (both nonsurgical and surgical and that went beyond that of merely root canal procedures), and for which he may not have received appropriate acknowledgement or credit. These areas are as follows and each will be discussed in depth:

- Tooth resorption and tissue responses
- Issues surrounding dental caries and vital pulp therapy
- Importance of asepsis during root canal procedures
- Position of working length relative to tissue response
- Use of a suction technique to clean root canals
- Advocated impregnation of dentin with bacteriocidal agents
- Induction of cementum apically during root treatment
- Presence of sclerotic bone being the result of long-term irritation
- Impact of periapical curettage on healing

**Tooth Resorption & Tissue Responses**

The etiology, prevention and management of resorption of tooth and bone (Zahn und Knochenresorption) have been a clinical challenge for decades. In the late 1850s this process was erroneously identified as absorption. Wadsworth, in 1876, addressed this issue in response to tooth replantation and transplantation with regards to protection of the periodontal ligament, lest the tooth undergo absorption: “I look upon any cutting, or even scratching or bruising, as so many wounds injure and render less certain the result; and every portion of periosteum remaining on the tooth should be carefully encouraged to remain, as it is of vital importance.”

The term “absorption” remained in use to characterize the destruction of the tooth by clastic cells until the American Dental Association carefully defined the difference between absorption and resorption.

In the late 1800s, W.F. Thompson presented a lengthy treatise on replantation before the International Medical Congress. He focused on the pericemental tissues “as upon the condition of this tissue replantation is wholly dependent for its success”. Early animal experiments by Fredel in 1887 and Scheff in 1890 addressed further the role of the periodontal ligament in the “absorption”
process. Needless to say, there was controversy that surrounded this concept, including the use of the proper terminology. In 1932, in the United States, Becks and Marshall clarified these concepts for the dental profession in a paper entitled, “Resorption or absorption?”

In 1931, Gottlieb and Orban published a text entitled “Die Veränderungen der Gewebe bei übermäßiger Beanspruchung der Zähne” (Fig. 5) in which they detailed the tissue changes in animals following orthodontic tooth movement and characterized the nature of the resorptive process.7 (Fig. 6) In doing so they described in depth the nature of the osteoclast and its activity on the root, along with subsequent replacement resorption and ankylosis (Fig. 7). This was followed by a text in 1933 that addressed the inflammation of the periodontal tissues and the loosening of teeth (“Zahnfleischentzündung und Zahnlockerung”),29 which addressed further, the problem of tooth and bone resorption due to the periodontal disease process (Fig. 8). These in-depth histological studies provided a sound understanding of the process of resorption for the dental profession, which today still provides a major challenge within the overall scope of endodontic management.30,31

**Issues Surrounding Dental Caries and Vital Pulp Therapy**

Gottlieb published his extensive treatise on dental caries in 1947, which represented a culmination of many years of research and clinical investigation.32 In doing so he delved deeply into the impact of the carious process on the various layers of tooth structure, discussing the unique response of each tissue to this invasion disease; in particular the development of a hypercalcified line in the dentin (currently identified as the calcitrophic line) that served to block the ingress of bacteria and their byproducts from the dental pulp while allowing the pulp cells to secrete reparative or reactionary dentin (Fig. 9):
Bernhard Gottlieb's Impact on Contemporary Endodontology

Fig. 6. Histologic specimen from Gottlieb’s work that depicts significant lateral tooth resorption on the left with multiple clastic cells, the presence of the periodontal ligament in the center and bone on the right. Note the presence of osteoblasts (upper line on the right) and osteoclasts (lower line on the right). Reproduced from Die Veränderungen der Gewebe bei übermäßiger Beanspruchung der Zähne. Leipzig: Georg Thieme Verlag, 1931.

Fig. 7. Histologic specimen from Gottlieb’s work that depicts large, multinucleated clastic cells adjacent to tooth structure (right). Reproduced from Die Veränderungen der Gewebe bei übermäßiger Beanspruchung der Zähne. Leipzig: Georg Thieme Verlag, 1931.

Fig. 8. Title page of Zahnfleischentzündung und Zahnlockerung. Berlin: Berlinische Verlagsanstalt, 1933.

Fig. 9. Human tooth specimen showing A) dentin, B) caries, C) hypercalcified line, D) secondary dentin, E) predentin, F) odontoblasts, and H) dental pulp. Reproduced from Gottlieb B. Dental Caries: Its Etiology, Pathology, Clinical Aspects and Prophylaxis. Philadelphia: Lea & Febiger 1947.
It has been emphasized that pulp exposures by progressing caries or during cavity preparation may be reduced to a minimum if we utilize newly available knowledge concerning dental caries. Any deeply carious cavity should be desensitized by impregnation (authors note: use of antiseptic agents — see details in section on impregnation below), and under a temporary filling enough secondary dentin will form so that cavity preparation will be made less hazardous. The most common way in which a pulp is exposed in cavity preparation is through the peeling out of all decalcified leathery dentin, whereupon the red spot of the exposed pulp appears. The knowledge that decalcified dentin can be salvaged by impregnation and the placing of a temporary filling for a few months will save a great number of pulps from exposure.22

Gottlieb also determined how the very nature of the tooth structure (tissues) could be used in response to pulpal exposures. For example, Gottlieb’s approach to vital pulp therapy was prompted by research done by his student and colleague, Balint Orban, who was encouraged by publications from Newirt in Prague to spread dentin powder on exposed pulps to stimulate hard tissue formation22,33 (Fig. 10) The positive result obtained encouraged Gottlieb to use this technique in the “handling of fresh noninfected exposures of the pulp.” The dentin powder could be mixed with fat as well as with a cement, or as will be discussed later in this paper, using a sulfathiazole salve. A 50-50 mixture of cement and dentin powder provided the best results.

“To be acceptable for this purpose, a material must satisfy two requirements: first, it must be resorbable, and second it must stimulate the connective tissue to form new additional hard tissue which will replace it.”22

Gottlieb was keen on pulp preservation, especially the use of both partial pulpotomies and complete pulpotomies when it would allow for pulpal healing to occur: “Pulpotomy is indicated in cases where the apical part of the root has not yet formed. In such cases it is our duty to keep the uninjured apical part of the pulp alive in order to enable it to finish root formation.”22 (Fig. 11)

As mentioned above, this approach to pulp therapy was evident not only with the use of a complete pulpotomy, but also with a partial pulpotomy as evidenced in (Fig. 12 A-C).

“Take a sterile round bur, which is larger than the opening in the dentin, in order to prevent laceration of the pulp; enlarge the opening and remove the peripheral part of the exposed pulp as far as it appears to be damaged.”22

Ironically, Gottlieb was never given credit for proffering this technique, as the credit to which fell later to Mimior Cvek following his publications in 1978, and is now referred to as a Cvek Pulpotomy.34 However, later research did indicate that a partial pulpotomy may be an adequate treatment for young permanent molars with a carious exposure,35 an issue for which Gottlieb expressed some concern.22
Importance of Asepsis During Root Canal Procedures

To prevent infections of the exposed pulp and/or periapical tissues through the root canal, Gottlieb was adamant about the use of aseptic techniques:

It should be a rule, without exception, that no root canal work be done with first isolating the tooth with the rubber-dam, whether the operation is concerned with the removal of a vital pulp or with the treatment of a necrotic pulp...Root canal work is done in order to prevent infection of the connective tissue surrounding the tooth or to eliminate an already existing infection...Complete asepsis is indispensable, including the preparation of the materials which we are going to use...The maintenance of sterility in every step is of the same decisive importance as it is in the major surgical operation.22
Position of Working Length Relative to Tissue Response

In the early part of the 20th century, the actual positioning of the root canal procedures apically was controversial.\(^{36,37}\) Gottlieb was quite adamant about where to terminate these procedures, especially in the presence of a vital—yet possibly inflamed—pulp, indicating that “surgical common sense forbids it” (that is, going past the apical foramen). He indicated that there are healthy tissues at the point of severance apically and therefore the use of caustic drugs was prohibited, files must not penetrate the foramen (the present-day concept of patency filling), and any damage to the periapical tissues may well prevent the healing of these tissues with cementum.\(^{18}\) He published his findings in 1928 and presented them at the 8th International Dental Congress–FDI in 1931 in a special session (Fig. 13) that featured world-class authorities who addressed the controlling of root canal treatment procedures.\(^{18}\) (Figs. 14A & B)

“Once a piece of foreign material has penetrated through the foramen, no favorable condition of any kind can induce the closure of the entrance by the formation of a hard wall.”\(^{22}\)

Based on the histologic findings presented at the Dental Congress in 1931, Gottlieb and co-workers indicated that:

“...on the basis of the results obtained in the experiments described it is our opinion that a pessimistic attitude towards the efficacy of root canal treatment is unwarranted.”\(^{18}\)

This biologically-proffered position was echoed again shortly after Gottlieb’s passing in 1950, at the First International Conference on Endodontics, which took place in Philadelphia under the leadership of Louis I. Grossman at the 8th International Dental Congress–FDI, in Paris in 1931, that focused on the specifics of root canal procedures. Ironically, it was at the same congress that Rickert & Dixon proffered their “Hollow Tube Theory” that impacted greatly on the concept of root canal filling. (Rickert UG, Dixon CM. The controlling of root surgery. 8th Int Dent Cong 1931; Section 111A:15–22).
the University of Pennsylvania in 1953. At that conference, an international group of clinicians and scientists agreed on ten basic principles of success in root treatment procedures, two of which were:\(^*38\)

“Traumatic injury to the surrounding (periapical) soft tissue should be avoided at all times. To this end, instrumentation stops should be used and instruments should be confined entirely within the root canal.”

“...the canal filling should seal the apical foramen, and that if the apical millimeter or so of the canal is filled with healthy living tissue, the root canal filling should terminate at this level rather than at the apical foramen.”

The issue of where to terminate all root canal procedures still remains controversial, with empirical dictates driving current clinical treatment.\(^*38,40\) Ironically, no mention of Gottlieb’s efforts in promoting these biological principles were made at this initial conference in 1953 and his contributions to the principles of endodontics were not even recognized. Even though he had provided significant research to support the science of endodontics (endodontology) there is no mention of him in the early 1940’s during the organization and formation of the present day American Association of Endodontists (AAE) (originally the American Root Therapy Association, and later the American Society of Endodontists).\(^*41\) Ironically, Gottlieb’s student and colleague Balint Orban was the first editor of the *Journal of Endodontia* in 1946, which was the official voice of the AAE (Fig. 15).

**Use of a Suction Technique/Apparatus to Clean Root Canals**

One of the biggest challenges during contemporary root canal procedures is to achieve complete removal of the tissue debris, dentin chips and bacterial substances from the root canal system. This challenge is not new, and Gottlieb recognized it in the 1930s. To achieve this goal, he used the Seidner drainage and flushing apparatus (Fig. 16)\(^*42\) to remove the debris subsequent to pulp extraction (extirpation) and especially after canal instrumentation:

The power for suction is supplied by a water suction pump...There are electric suction pumps...that are recommended for this purpose, and there are also foot driven pumps for those colleagues who must economize. Years ago I constructed a special...
suction arrangement attached to the dental chair. The attachment is made to the main water pipe and serves for the Seidner suction apparatus as well as for suction tubes, used during surgical operations. Should the suction power prove insufficient at any time, make sure that the tiny opening of the apparatus are not clogged.22

(Author’s Note: this type of apparatus, contemporarily modified, is used today to provide apical negative pressure within the root canal system, while pulling the debris coronally—EndoVac® Irrigation System—SybronEndo, Orange, CA, USA.)43,44

Gottlieb was adamant that this type of irrigation system be used during all root canal procedures because of the limitations of mere instrument removal of debris from the canal and that the action of instruments within the canal would result in additional debris being formed, especially due to the opening of small irregularities in the canal morphology that harbored pulp tissue.

“Drainage after pulp extraction has proved quite beneficial for the reason that after widening of the canals, tissue shreds still remained therein of in niches, which are gathered up and removed. Therefore drainage by suction after pulp extraction should not be neglected.”14

From a historical perspective, Gottlieb’s thought process regarding the true cleaning of the root canal system was both visionary and vastly superior to most clinicians and researchers of that day. However, sadly, his concepts were not readily espoused and carried into the 21st century until approximately 2007-8,43,44 and even evaluative research into the effectiveness of this process, which did not take into account Gottlieb’s contributions, has occurred only recently.45

Advocated Impregnation of Dentin with Bacteriocidal Agents

The routine provision of root canal procedures in the first third of the 20th century was somewhat limited, due to the overwhelming impact of the focal infection and elective localization theories espoused by Hunter,19 Billings20 and Rosenow.21 Concern focused on the presence of bacteria in the root canal system and the inability to eliminate them. Needless to say, the tools and techniques of root canal treatment were inferior to what is available today; however, many clinicians were able to achieve success in spite of the claims that all teeth with necrotic pulps and/or the presence of a periapical lesion must be extracted because of their contribution to systemic, degenerative...
diseases. Gottlieb understood the microbiological challenges that the clinician faced during root canal procedures as it related to both infection of the root canal and the presence of bacteria in the periapical tissues. While many clinicians just extracted the teeth, he advocated the use of canal and periapical “sterilization” through the use ionization with an aqueous iodine solution. This process took multiple visits.

The philosophy behind ionization is as follows: When exposed to the direct electric current, the iodine ions of the salt solution will move toward the positive pole, which is toward the apical region. The ions themselves are chemically not active but carrying along with them the iodine molecules and these combine with the necrotic protein around the apex forming a nontoxic compound of iodine with protein. We consider this combination of the protein of the necrotic material with iodine a detoxication of the periapical region, and the clinical application of that concept has proved to be very useful. When we dismiss the patient before ionization we may expect that the patient will have trouble, evidenced by pain, and we have seen hardly a patient where this did not occur.

Gottlieb’s ionization method enabled the impregnation of the aqueous iodine solution into the dentin (Fig. 17) in addition to penetrating “side branches” (accessory canals) (Fig. 18), thereby neutralizing any tissue or infection within these anatomical irregularities (Fig. 19). In contrast and contemporarily, the issue of bacteria in the dentinal smear layer created during canal enlarging and shaping, persistent bacterial in the dentinal tubules and both necrotic debris and bacteria in accessory canals has received a great deal of attention.

The use of chelating agents for smear layer removal have been advocated for the past 50 years. While root canal procedures focused heavily on the use of phenolic compounds during the latter half of the 20th century for disinfection, e.g., formocresol, camphorated mono-chlorophenol, metacresyl acetate, etc., recent developments have supported the use of 2% chlorhexidine subsequent to smear layer removal and solutions to both remove the smear layer and kill bacteria deep in the dentinal tubules. Gottlieb’s principles of managing root canal treatment issues were fundamentally sound, and his vision for positive outcomes, based on both biological and clinical parameters, were somehow lost—both in the vaults of history, and today in the hype of technology.

**Induction of Cementum Apically During Root Treatment**

Ideal healing apically has been the goal of all root canal procedures for years. However, achieving that goal on a predictable basis has been elusive due to the wide range of treatment philosophies and materials that have been used to enlarge, shape, clean, disinfect and obturate the root canal system. Likewise the apical positioning of these procedures has been highly controversial, and mostly empirically directed and supported. As stated by Kronfeld, one of Gottlieb’s students, “The healing processes after removal of a pulp occurs in the tissue immediately adjacent to the point where the pulp is severed. It is, therefore, of great importance to retain the vitality of these tissues in order to make healing possible.”

![Fig. 17. Ionization apparatus used by Gottlieb. Reproduced from Gottlieb B. *Dentistry in Individual Phases: I. Treatment of Root Canals*. Monograph. Tel Aviv: Haaretz Press 1938, 1940 (English).](image)
Gottlieb was a firm believer in the biological control of healing through the use of specific procedures designed to achieve predictable outcomes. He was adamant against the use of arsenic to necrotize a pulp prior to removal, and indicated that many teeth had been damaged along with the surrounding apical tissues due to the use of arsenic (Fig. 21).

“However, regardless of its other effect, arsenic damages the pulp tissue from which we expect a healing at the point where we severed the removed pulp. Necrotizing the pulp prior to its removal contradicts every recognized surgical concept, and the use of the method should be discarded.”

In 1928, along with colleagues Schwartz and Stein, Gottlieb published research that dealt with the implantation of root-treated apices in the backs of rats. The tissue response apically and adjacent to accessory canals was viewed histologically and the conclusions drawn from these studies indicated that, “The great variety of the cases which had been treated and controlled by us leads us to believe that this biological way of controlling methods of root-canal treatment is reliable for its purpose.” However, Franz Schreier, from Prague, challenged the scientific method of Gottlieb and co-workers, especially as it related to infection control, tissue response and control of variables (“Factor X,” as Shreier referred to it). In his conclusion, Schreier asked, “Finally, are such complicated experiments necessary or even useful?” Balint Orban, another Gottlieb student, came to the defense of Gottlieb and co-workers in a paper published in 1929 in Dental Cosmos.

Every problem which can be found in the paper of Schreier could be worked out experimentally without speculation...Criticism without background is dangerous, superfluous and valueless...Schreier asks at the end whether it is at all necessary to make such experiments. There are, as he states, many satisfactory methods of root-canal treatment. By what intuition Dr. Schreier knows that a method is satisfactory, I do not know. I only ask why so many teeth are still extracted if we have satisfactory methods to treat them?
Fig. 20. Cementum deposition in the apical portion of the root canal several years after pulp removal and root canal filling. G, gutta-percha; C, cementum; C', cementoid deposited directly on the gutta-percha; CT, periodontal connective tissue invaginating into the apical foramen. This response amplified the dictate to retain all root canal procedures within the confines of the root, so that a natural closure with cementum could occur. This approach to treatment was supported strongly by Gottlieb and Kronfeld. Reproduced from Kronfeld R. Histopathology of the Teeth and Their Surrounding Structures. Philadelphia: Lea & Febiger, 1933.

Fig. 21. Evidence of significant pulpal and tooth destruction following the use of arsenic in the pulpal space. Reproduced by permission from Gottlieb B, Barren S, Crook H. *Endodontia*. St. Louis: The C.V. Mosby Co. 1950.

Fig. 22. Tooth to be ground to obtain dentin particles for pulpal management. Reproduced from Gottlieb B. *Dentistry in Individual Phases: I. Treatment of Root Canals*. Monograph. Tel Aviv: Haaretz Press 1938, 1940 (English).

Fig. 23. Gathering of dentin powder to be mixed with sulfathiazole salve for pulp treatment. Reproduced from Gottlieb B. *Dentistry in Individual Phases: I. Treatment of Root Canals*. Monograph. Tel Aviv: Haaretz Press 1938, 1940 (English).
Gottlieb’s method for achieving apical healing with cementum was simple. He used dentin from teeth that had been ground fine and sterilized (Figs. 22 & 23). After mixing the dentin powder with sulfathiazole or restorative cement, it was applied to the apical portion of the root canal prior to obturation. The success of his approach was demonstrated in animal models (Figs. 24-26) and was clinically advocated for patient use in his monograph published in 1938. Although not having the molecular biological investigative capabilities available today, Gottlieb’s concept was to induce healing through the use of substances (calcium salts and protein matrices—for which the dentin was not to be sterilized with heat, to prevent the destruction of the proteins) within the dentin. Today we know these proteins as specific growth factors, such as bone morphogenic proteins, fibroblast growth factors, insulin-like growth factors, epidermal growth factor, etc.; in addition to dentin matrix collagenous and non-collagenous proteins, such as dentin sialophosphoproteins, osteocalcin, bone sialoproteins, serine-rich phosphoproteins, dentin matrix proteins, and so forth. The latter of these has been identified in the induction of cementoblasts and the formation of cementum. In essence, he had begun the concept of tissue engineering to promote predictable healing (regeneration) following root canal procedures. While some authors had identified other materials, such as ivory and bone powder for the induction of hard tissue, Gottlieb focused on dentin powder, but indicated that there were two requirements for any material to be successful: “…first, it must be resorbable, and second, it must stimulate the connective tissue to form new additional hard tissue which will replace it.”

**Presence of Sclerotic Bone Being the Result of Long-term Irritation**

Gottlieb went to great lengths to clarify a concept that even today is controversial: the presence of sclerotic bone around a root end (condensing osteitis, chronic focal sclerosing osteitis), and whether or not a root canal procedure is indicated. While teeth exhibiting this radiographic appearance may respond normally to sensibility tests (Fig. 27), it does not eliminate the possibility of a slow diffusion of irritants from a degenerating pulp that stimulates a calcific response. This can occur in both a tooth with a presumed vital pulp or in a tooth that has been root treated but has not been properly debrided or disinfected. This response is not indicative of an infection, but rather a long-term response to chronic inflammation, primarily from residual bacterial endotoxins.

We know that any damaged tissue attracts calcium salts...The tissue around an infected place is damaged by the diffusing toxins and that damaged tissue attracts calcium salts and becomes highly calcified...Sclerotic bone my form in connection with some pulpal trouble in a neighboring tooth...Sclerotic bone is always the result of some irritating process.

With this recognition and understanding of the process when present around a root apex, Gottlieb felt that if the case “can be handled no objection can be found against doing the work.” Contemporarily, many clinicians tend not to view the sclerotic bone as a problem and in doing so may not identify many teeth with degenerating pulps that should be treated. However, condensing apical periodontitis (condensing bone found around the root apex) is in response to a chronic pulpitis, was identified by Gottlieb over 50 years ago, and should be managed with a root canal procedure.

**Impact of Periapical Curettage on Healing**

Gottlieb was well aware of the fact that not all non-surgical root canal procedures would be successful and indicated that,

When we do not succeed in conservative treatment of an infected root canal, that is, when the periapical rarefaction in the x-ray does not disappear after a reasonable time allowing a lamina dura around the apex to become re-established, or when the periapical rarefaction appears at the time of treatment too large to expect that root canal treatment will induce the granulation tissue with its necrotic inclusions to be eliminated by phagocytes, we must have some further therapy in reserve.
Fig. 24. Following the placement of a cement-dentin mixture and compacting with a blunted gutta-percha cone, histologic evidence apically shows significant healing with cementum (arrows) over the apical foramen. Reproduced by permission from Gottlieb B, Barren S, Crook H. *Endodontia*. St. Louis: The C.V. Mosby Co. 1950.

Fig. 25. Similar result apically using the cement-dentin mixture to fill the root canal with a heavily layering of cementum over the apical foramen. Reproduced by permission from Gottlieb B, Barren S, Crook H. *Endodontia*. St. Louis: The C.V. Mosby Co. 1950.

Fig. 26. Biologic healing of the apical foramen following the use of the cement-dentin mixture. Reproduced by permission from Gottlieb B, Barren S, Crook H. *Endodontia*. St. Louis: The C.V. Mosby Co. 1950.
Gottlieb’s major concern focused on the presence of residual or necrotic tissue in the end of the root canal or periapically and the possibility of what was referred to at that time as anachoresis; although he was not fully convinced that this did occur. The concept of anachoresis was promulgated by Robinson and Boling in 1941, and it suggested that microorganisms that have gained access to the bloodstream would tend to localize in a damaged pulp or periapical tissues. It is of not less importance to make sure that we do not leave necrotic material around the apex. If it is left there it will soon be infected from the bloodstream even if it is rendered sterile before filling the canal, an assumption which is extremely hard to justify. Therefore, we feel that it is advisable to approach such material surgically, exposing the apex by means of a flap operation, and to remove all necrotic tissue around the apex.

As opposed to today’s treatment regimen, Gottlieb was opposed to apical root resection (apicoectomy) because he favored retaining a seal of cementum of the dentinal tubules, especially if the pulp had been necrotic or in the presence of a longstanding periapical lesion. It is unreasonable to cut infected tubules open by removing the apex and thus expose the opposing connective tissue to the numerous outlets of the opened infected dentinal tubules...it was decided to omit cutting off the apex and to respect the layer of cementum which keeps the outlets of the dentinal tubules closed, leaving it as the only hard tissue to contact the adjacent connective tissue of the flap...

The clinical experience of a number of years with periapical curettage justifies its recommendation. (Fig. 28)

Gottlieb may have been influenced by other studies that discussed the protective component of cementum and his own investigations relative to how well cementum can seal over the dentinal tubules, especially in the presence of non-infected dentin.

Gottlieb was extremely keen on this approach to the management of teeth with persistent periapical lesions. In his advocation of this treatment he lashed out at the concept of focal infection and the damage it had done within the dental profession.

Where we cannot perform [curettage] and the conservative treatment proves unsuccessful, it is not recommended to make compromises. Our slogan should not be wait and see. It must be liquidation. Either we can perform root canal work resulting in re-establishment of bone around the apex, a veritable lamina dura, or we must extract the tooth. If that procedure had been followed as a rule without exception, the great damage which the era of focal infection has inflicted on dentistry could have been avoided.

Perspectives on Gottlieb’s Contributions to Endodontics

Many consider the evolution of contemporary endodontic practice in the latter half of the 20th century to have been ushered in by Dr. Louis I. Grossman, who was considered as the “Father of Modern Endodontics” in most endodontic circles. There is no question that his contributions were impacting. However, much of the biologic basis for the evolution of endodontics belongs to Gottlieb, even though many authors in their attempts to provide either a brief or expanded history of this specialty have failed to identify and credit Gottlieb for his immense contributions, or for that matter even mention Gottlieb within the history of the endodontic specialty. In general terms his scientific and clinical efforts had great impact upon:
Present-day concepts of tissue engineering (regeneration)

An in-depth understanding of the carious process and pulpal response

Expanded concepts on root canal irrigation methodologies

Disinfection of the root canal and dentinal tubules

The biological assessment of our procedures and their outcomes

Histopathological investigations of pulpal and periapical disease and tissue responses to treatment modalities

A reinforcement of clinical asepsis in the fight against focal infection and tooth retention via root canal procedures

Using the scientific method to solve clinical problems

Anyone who peruses Gottlieb’s body of work will realize that he influenced many aspects of dentistry and the reader’s focus would probably be initially on periodontal diseases. However, as detailed in this manuscript, his areas of expertise were vast and all-encompassing. Although Gottlieb’s contributions to the understanding of tooth anatomy, tooth function and soft tissues were significant, his greatest legacy may have been in his careful inquiry into the scientific challenges that all of dentistry posed in the first half of the 20th century, especially as it had to fight the overwhelming dictates of the focal infection theory. Furthermore, his career and the careers of his students and colleagues who worked with him both in the Vienna School of Medicine and at various universities in the United States, enriched the scientific foundations of dentistry, and perhaps even more significantly, helped to lay the foundations for a vigorous research enterprise in the United States at a time when all of dentistry was laboring under the guise of a trade as opposed to a clinical health care science. In 1981, he was the first individual recognized in the newly established Baylor College of Dentistry (presently a component of Texas A&M University) Hall of Fame, with a plaque honoring his memory (Fig. 30). A good portion of his histopathological work has been preserved at Baylor (Figs. 31 & 32) and is still drawn upon for student lectures (personal communication, Dr. John Wright, Chair, Department of Oral Pathology, [Figs. 33 A & B]) and research studies. Furthermore, he was highlighted in a publication on Pioneer Jewish Texans in 2011: a lasting tribute to gentleman and a true scholar who influenced so much our present day concepts in endodontology and endodontics.

Prof./Dr. Bernhard Gottlieb had a vision for dental education already in the early 1930s, shortly after the Gies Report. His vision to establish a dental school in Jerusalem was presented before the Alpha Omega Convention in New York in 1945 about the importance of a dental school in that region. Sadly, he passed away in March 1950 in Dallas only a few months prior to the Hebrew University Board of Governors agreeing to open a dental school. The School was finally opened in 1953 with the tremendous support of the Alpha Omega Fraternity: Hebrew University–Hadassah School of Dental Medicine and was established as an independent faculty in 1965. Finally, a glowing recognition for...
Prof/Dr. Gottlieb came on July 1, 2004 when the dental clinic at the Medical University of Vienna, became the Bernhard Gottlieb University Clinic of Dentistry (*Fig. 34*), the Universitätsklinik für Zahn-, Mund- und Kieferheilkunde GesmbH.

*Fig. 29.* Professor Gottlieb at work in his office at Baylor College of Dentistry. Reproduced by permission, Baylor College of Dentistry. *Baylor Dental Journal,* 1985.

*Fig. 31.* Recently identified from storage, the histologic and radiographic materials that form the bulk of the Gottlieb Collection at Baylor. Note on the shipping box his initials—B.G. These were the containers that Professor Gottlieb used to ship his valuable research materials from Vienna to Palestine and onto the United States in the 1930s. Some of the materials have been used routinely for teaching in both Oral Pathology and Periodontology at Baylor with a small selection used in Endodontics. Furthermore, a small portion of Gottlieb’s collection is being used for research by Dr. Thomas Diekwisch at the University of Illinois, College of Dentistry.

*Fig. 32.* Box of large glass slides from the Gottlieb collection used to teach oral pathology at Baylor.
Fig. 33A & B. Examples of the quality of Professor Gottlieb’s histological work performed in Vienna that provide amazing depth and detail even after 75-plus years.

Fig. 34. Composite of advertisement materials used at the time of naming and dedicating the dental clinic in Vienna in honor of Prof/Dr. Bernhard Gottlieb.
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67. Gies WJ. Dental Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching. 1926.


Dental Postcards LIII

“Kiss all the girls for me.”

This full-color lithographic US postcard portrays a pale, swollen-faced fellow wistfully gazing at two attractive young ladies. The two women are being held in a romantic embrace by a handsome, well-dressed young man in a black bowler hat. The face of the mournfully-suffering observer is draped with a cloth tied firmly on his left side. His distended cheek reveals an obvious dental abscess. Pitifully posed, this male observer is obviously out of the romantic picture, but wishes his friend well: “Kiss all the girls for me.” The scene takes place in front of a huge boulder in what appears to be a well-groomed city park.

This intricately detailed card has a gold-toned border. Postmarked August 14, 1910, it was sent by “M.R.E.” to Miss Lanette Line, RFD #1, Gosport, Indiana. Affixed to the upper right inside corner is a green one-cent US stamp (Franklin, Scott #A 138, issued 1908-1909).

The lightly penciled message reads: “Friend Lanette, Please don’t think hard of me for this is the very first opportunity I’ve had to answer your card. Taft is just fine. He comes over three times a day regular and lays down by my feet until I get ready to feed him. Answer this.”
Opening Address
Dr. Staci N. Gaffos

Friday, October 18th
Panel Discussion #1
Moderator: Sheldon Peck, DDS, MScD
§ Dentists, dentistry, medicine & public perception
§ Conflicts and controversies in organized dentistry

Panel Discussion #2
Moderator: David A. Chernin, DMD, MLS
§ Solo, group, corporate: the changing structure of dental practices
§ Scholarship: information vs. knowledge

Saturday, October 19th
Panel Discussion #3
Moderator: James Gutmann, DDS, Cert Endo, PhD (honoris causa), FICE, FACD, FADI
§ Technological and aesthetic advancements in patient care
§ Improved dental diagnostics: implications for patients and practitioners

Panel Discussion #4
Moderator: Andrew I. Spielman, DMD, PhD
§ Dental education after the Gies report
§ Evidence-based dentistry: what do numbers really say?

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Dr. Frank & Phyllis Orland Memorial Lecture
David A. Chernin, DMD, MLS

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ILLUSTRATIONS OF EARLY DISSECTION

The New York Times for April 11 published an illustration reproducing an ancient fresco (of the 4th century of the Christian Era) in a recently discovered catacomb in Rome, which, according to Dr. Curt Roskauer and other experts, depicts an anatomist, his demonstrator, and his students at a dissection of a human body. According to the article, this painting demonstrates that dissections of human beings were performed nearly a thousand years earlier than historians have generally believed. This statement should probably be understood to apply to Western Europe, where the earliest known human dissections are in the late 13th century in Bologna. However, there appears to be some evidence that the Greek Herophilus, about the year 300 B.C., performed human dissections in Alexandria, Egypt.

THEORIES OF ERUPTION

Under the title "Tooth Development and Eruption," Benjamin Dienstein (Journal of Dentistry for Children 23:51-62 Jan.-Mar. 1956) gives a critical and historical account of the various views as to why the teeth erupt. The history he divides into five periods; namely, the observational period (650 B.C.-151 A.D.), the anatomical period (1543-1687), the histo-anatomical period (1687-1884), the physiological period (1884-1927), and the experimental period (1927 and onward).

TEN YEARS OF THE AMERICAN ACADEMY OF DENTAL MEDICINE

The April 1956 Journal of Dental Medicine is a commemorating issue, celebrating the tenth anniversary of the founding of that journal and of the American Academy of Dental Medicine. The historical summary of the Academy activities is by William M. Greenhut (11:131-142). Historical articles on the Journal are by Allan N. Arvins and Irving Yudkoff (11:49-50) and J. Lewis Blass (11:118-130).

TEETH OF COLONIAL AMERICANS

To the Journal of the History of Medicine and Allied Sciences, (11:221-224 April 1956) Bert G. Anderson contributes a note on "Teeth of Colonial Americans." The note calls attention to Gentleman's Progress: the Itinerarium of Dr. Alexander Hamilton, a travel account by a physician written but not published in 1744, and since issued in 1907 and again in 1948. Hamilton ascribed the "scurbutic gums" of the Dutch in Albany, New York, partly to their "constant diet of salt pork in the winter."
Pioneer Dental Educator in Scotland

J. Menzies Campbell will deliver an address before the Royal College of Surgeons of Edinburgh, May 31, 1956, celebrating the hundredth anniversary of the inaugural lecture of a course by John Smith (1825-1910), outstanding pioneer British dental educator, on Physiology and Diseases of the Teeth.

Death of Pioneer Laboratory Man

Dental Laboratory Review (31:48 May 1956) announces the death of Samuel G. Supplee, at the age of 77 years, February 26, at Dunedin, Florida. Supplee was a pioneer technician, inventor, and originator of the closed mouth technic of taking oral impressions. He published an important article on this method of impression taking in Dental Digest 20:561-571, 1916.

Bulletin of the Societe d'Histoire de la Pharmacie

A copy of Revue d'Histoire de la Pharmacie (144:No. 148 March 1956) has been received at the editorial office of the Bulletin. In its news items from America, it mentions the establishment of the Academy of the History of Dentistry, the monthly publication of the Bulletin, and the editorial address.

Early Use of Amalgam

A. Porter S. Sweet, editor of Dental Radiography and Photography has contributed to that publication (29:4-9, 1956, No. 1) an article on "The Amalgam War." The earliest alloys and amalgams used in the filling of teeth are merely alluded to in this article and are generally very little understood by historians of dentistry.

For several reasons it is difficult to date the first use of amalgams in dentistry. The earliest amalgams, introduced as early as 1818, were quite different from the amalgams used today. Some of those were not silver amalgams but amalgams of alloys with a low fusing point. In the early references it is not always possible to determine what is the composition of the amalgam mentioned. Furthermore, the method of using the early amalgams was not the same as in the present technic. The fusible metal amalgams were usually made with Newton's or Dercet's metal, for which several formulas existed, containing lead, bismuth, and tin. The amalgam was made up in small ingots, from which a piece of the required size was broken off, and when placed in the cavity, softened with a hot instrument and adapted. These ternary alloys melted at between 91° and 95° C. B. W. Wood, a dentist, after 1850, added cadmium and produced alloys fusing at between 45° and 70° C. Silver amalgams were in use at least by 1828.
THE CRAWCOURS IN ENGLAND

The activities of the notorious Crawcour brothers and their introduction of amalgam into America are well known, but the history of their practice in England is less familiar. From a letter of J. Menzies Campbell to The Glasgow Herald, June 11, 1956, the following about the Crawcour brothers is quoted:

The originals were Barnet Crawcour (1776-1834) and his younger brother, Moses (d. 1858). In 1805 the former was practising in the Strand, London, visiting Plymouth and Exeter (where he consulted in a grocer's shop in High Street). In 1813 both brothers were in practice in Norwich, and among their numerous activities was attending the poor gratis from 8 till 10 a.m.

Dr. Campbell continues with a paragraph on their American escapade, which is here omitted, and he concludes:

Soon they were forced to flee from America and return to Britain. In 1847 Moses and other brothers were located in the west end of Edinburgh and indulged in an extensive advertising campaign for filling teeth with "Royal Asiatic Puzzolana"—otherwise the discredited amalgam. They also carried on for a time, an extensive trade in supplying artificial dentures fitted with incorrodable teeth—"rendering it impossible to distinguish them from the natural ones."

MORE ABOUT THE RECENTLY DISCOVERED FRESCO

In reply to the article "Illustration of Early Dissection in the May Bulletin, Curt Proskauer has written the following to the editor:

This interpretation has aroused a great interest and also some opinions divergent from my interpretation saying that the central figure is Christ the Healer or Christ the Physician. Letters from the discoverer of the catacomb who is the head of the Pontifical Commission of Sacred Archaeology, from the Director of Christian Art, Princeton University, and from the Curator of Medieval Art, Metropolitan Museum of Art, New York say that it is not possible that the central figure is Christ. They gave many reasons for this opinion. I wrote a short article for the Bulletin of the History of Medicine explaining how I evolved my theory based on the then known historical and art facts.
Concerning your publication in the Bulletin I have to say that I stated only that this fresco was the first documentary and visual proof that dissections for teaching purposes were made about 1000 years earlier than until then was known. I know, of course, that Herophilus and Erasistratos are said (it is not actually known, only known through second hand mentioning) to have performed dissections. These dissections had been made only for their own knowledge, not for teaching purposes as the fresco shows.

PROSPECTIVE HISTORY OF MASSACHUSETTS SOCIETY

The Massachusetts Dental Society, in connection with its one hundredth anniversary celebration in 1964, is considering the writing of a history to be published at that time, according to a report by the chairman of the history committee, Dr. Ivor P. Muzzy.

THE UTRECHT DENTAL MUSEUM

A more complete account of the Utrecht Dental Museum than that given in the Bulletin for March is by F. E. R. de Maar, the curator, in The Dental Delineator 7:14-15 Spring 1956. From a stock of 95 specimens, the curator offers to any museum a Morrison Long Range dental chair manufactured by the S. S. White company in 1872 (see illustration), in exchange for an equally interesting specimen.

HISTORY OF THE POST CROWN

In an article entitled "Richmond Crown or Post Crown?" (Corona Richmond o perno moncone?) Rivista Italiana di Stomatologia 11:329-358, Rocco Maria Pizzitutti and Alberto Zannoni come to the not very startling conclusion that the Richmond crown is now obsolete. The development of the post crown is traced to the present.

The historical account begins with the erroneous statement that the earliest post crown was made by Fouchard in 1816. Fauchard, of course, did publish the earliest description and earliest illustration of a post-crown in 1728. The "Fouchard," in question, is probably one Touchard who flourished early in the nineteenth century and published a pamphlet on an obturator in 1814. This pamphlet is ascribed to Fauchard in the list of Gidney's books lent to the editors of the American Journal of Dental Science in 1839. The name Touchard has caused confusion among historians. It is easy to understand how in the days before manuscripts were typed and when the name of Fauchard was well known among dentists, the name Touchard should be misread.
Photos from our 61st Annual Meeting, Vienna

L: DD Dr. Johannes Kirchner  
R: Dr. David A. Chernin

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R: Dr. Staci Gaffos,  
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Presentations and Panel Discussions
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L-R: Ms. Ramona Bause; Dr. George Bause; Dr. Leena Peck

L: Dr. Jelena Dumancic
R: Mr. Zoran Dumancic

L-R: DDr. Johannes Kirchner; Dr. Lieselotte Kirchner; Dr. Leena Peck; Dr. Sheldon Peck.
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L-R: Dr. David Chernin; Ms. Maggie Chernin; Ms. Judy Ehrlich; Dr. Marc Ehrlich

Dr. James Gutmann; DDr. Johannes Kirchner

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Translated by Anna C. Souchuk, PhD
Published by Steven Potashnick, DDS
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There have been a number of English language articles about the toothpick, J. Menzies Campbell’s 1952 paper (Campbell JM. Toothpicks and toothbrushes. Dent Items of Interest. 1952;74: 295-305.) is of particular note. However, Der Zahnstocher und Seine Geschichte eine kulturgeschichtliche kunstgeschichtliche studie (The Toothpick and its History: A cultural-historical and arts and crafts study) remains the premier reference resource. We must congratulate Dr. Potashnick for the time, effort and cost in providing this English translation.

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by Dr. Barbara E. Mattick

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By John M. Hyson, Jr.,
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