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

- Increasing interest among dentists in dental history.
- Encouraging dental schools to develop historical collections on dentistry, and to offer adequate instruction in dental history.
- Developing a broader understanding of the facts of dental history among the leaders in dentistry in order to aid them in their attempts in solving important problems in dental education and practice.
- Stimulating more thorough and comprehensive research in dental history, thereby extending the boundaries of dental knowledge, giving substantial support to growing professional culture.
- Creating an authoritative body to which important questions relating to dental history could be referred for factual verification.
CONTENTS
Vol. 57, No. 2, Summer/Fall 2009

Editorial: “Value Added”...Without the Tax 43
David A. Chernin, DMD, MLS

A Letter from the President 44
Morton G. Rivo, DDS

The Evolution of the American Dentist, Part I - Amalgamation: 1776-1840 45
David A. Chernin, DMD, MLS

Dr. Arthur Davenport Black: His Contributions to Dentistry 68
Jack W. Gottschalk, DDS

The Era of Whiter Teeth: Advertising in American Dentistry 1910-1950 75
Stine Grumsen, MA

The Root of Dental Anatomy: A Case for Naming Eustachius the “Father of Dental Anatomy” 85
Gregory W. Bennett

Dental Postcards XLII 89
Arden G. Christen, DDS, MSD, MA
& Joan A. Christen, BGS, MS

Dental Trade Cards XXVIII 92
by Theodore P. Croll, DDS
& Ben Z. Swanson, Jr., DDS

From the Archives: Vol. 2, Nos. 5 & 6 93

Dentistry on Stamps 97
Hannelore T. Loevy, CD, PhD
& Aletha A. Kowitz, MA

Book Shop
Editorial
“Value Added”...Without the Tax
David A. Chernin, DMD, MLS

In March 1953, the newly organized American Academy of the History of Dentistry issued a one sheet, double-sided Bulletin to “provide news of interest to dental historians.” From its inception, every piece of page real estate was utilized to print reference resources for our expanding membership. As I peruse the subsequent issues of the Bulletin, and later, the Journal of the History of Dentistry (JHD), I am still astonished by the tremendous wealth of knowledge residing between its covers. The editorial leadership provided by Drs. Denton, Washburn, Ring and Loevy recognized the necessity, and their own responsibility, to ensure that our publication became a valuable member benefit. These Editors strived to expand and enhance the quality and integrity of our publication, using all their available resources.

The value to our readership varies with the heterogeneous nature of our membership. For collectors, our journal is both a reference resource and a channel through which to publicly catalogue their collections of equipment, instruments and artifacts highlighting the creativity, ingenuity and inventiveness found within dentistry. For members interested in dental biography, the JHD’s extensive biographical archives provide the foremost resource surpassing any other print or electronic media. For dental and social historians, our journal is the vehicle in which their ideas and research findings can be presented for review. The JHD provides a forum with latitude for scholarly historical papers that seek to explain current issues through historical insight into our professional, social, political and economic relationships.

From the Academy’s perspective, the Journal is a resource to expand of our online AAHDwiki. The ability to re-format and integrate text and image content from the JHD contributes to our expanding web-based compendium of dental history.

While other dental journals may publish “historical” papers, our Journal is solely devoted to a peer review process by which dental historians, as well as noted individuals in ancillary fields, provide support and assistance to the Editor. However, unlike our colleagues in medical history, who have a number of publications∗ to submit their papers in a variety of formats∗∗, our journal has struggled to balance the high quality of content with page and word count limits.

Over the past few years, the Journal has received a number of papers exceeding the usual word count that readers have come to expect in each issue. Additionally, the presentations at our annual meetings have generated visual materials worthy for inclusion in our literature. The editorial board has agreed to broaden the scope and depth of acceptable articles. There will be no constraints on the word count nor number of images that a submission may contain. The underlying criteria for future submissions are: 1) use historical methods to expand our understanding of how developments in science, technology, culture and professionalism have affected our profession; 2) rectify inaccuracies in our historical record; 3) review papers.

While there will be additional costs associated with this decision, we will work within the budget assigned to the Journal. We believe that this expanded acceptance of papers will enrich not only our Journal and our Academy, but also historians and the dental profession as a whole.

∗e.g. Bulletin of the History of Medicine, Journal of the History of Medicine and Allied Science, Journal of Medical Biography and “bulletins” from numerous medical museum/research centers.
∗∗essays, review papers, biographies, pictorials and reprints.
A Letter From the President

Morton G. Rivo, DDS

I am honored to serve as President of the Academy; to be part of an organization devoted to the preservation of dental history in our country and beyond. We are a home for scholars from the ranks of historians, sociologists, ethicists and dental practitioners, all dedicated to documenting our evolution from trade to profession. We are no less interested in observing and recording current events in dentistry. It is our role to prepare the framework for the future of our profession. The past is indeed prologue.

Among our membership, there are those who are fascinated by the historical personalities involved; others interested in the educators, the inventors, the biologists, the skillful practitioners; and still others who revel in studying the tinkerers and the mechanics who have given us our “tools of the trade”. There is, in fact, new evidence that American dentistry owes more to these craftsmen than we have previously thought.

My personal interest in dental history began in an unusual way. I have been a collector of prints and drawings since my college years. I began collecting not dental art, but prints by American and European contemporary artists, many by 20th-century sculptors. I soon understood that the artist and the dentist have much in common. Both vocations require intrinsic talent, an aesthetic sense, and long years of study and practice to develop the skills necessary to succeed.

One day, a New York print dealer called to tell me he had found a 19th-century image of an English dentist performing surgery. I came to the realization that it was possible to combine my passion for fine art images with my daily professional life as a dentist. And so began the search for prints, drawings and photographs which address the themes of dentistry and dental practice.

I have found soul mates in the Academy; other art aficionados who share similar interests. The Academy has created a platform which allows me the opportunity to share these images with like-minded practitioners. It is exciting to be part of the Academy at this time of expansion, reevaluation and rededication. This year we have embarked upon a new program designed to reach out to young dentists and dental students through participation in the American Student Dental Association regional meetings, to be held in Hartford, CT, Indianapolis, IN, and St. Louis, MO, this fall, 2009.

We welcome your increased involvement in the affairs of the Academy. Let me encourage you to share your expertise; to participate in these new regional meetings. Plan now to attend the 2010 Annual Meeting in Indianapolis. Visit our website to view the exceptional program which the Meeting Chair, Dr. Arden Christen, and our Executive Director, Dr. David Chernin have developed. It will be a gala event.

Consider writing and submitting articles for publication in the Journal. Let us know your ideas about programs and meeting locations. If you have computer expertise, we encourage your participation in the development of our on-line reference source, the AAHDwiki. Introduce your friends and colleagues to the Academy. Suggest they join us as members. Feel free to contact me with questions, suggestions and advice. Or, if you prefer, our Executive Director, Dr. David Chernin at the administrative offices in Brookline, MA, will welcome your call, too. I am grateful for the opportunity to serve you.
Since the settlement of Massachusetts in the early seventeenth century there were always persons in the colonies whose occupation as physicians, surgeons, barbers, or the like, enabled them to supply emergency treatment of dental conditions. But the professional practice of dentistry, in the sense of making one’s living substantially from the practice of the dental art, was an extension of the itinerant dental practitioners. The American Dentist began with these practitioners from England and continental Europe immigrating to the American colonies during the third decade of the eighteenth century. Employing similar communication techniques through newspaper advertisements, “tooth drawer, dentist and operators of the teeth” repeated the successful marketing they had utilized in Europe.\textsuperscript{1,2} The continuing growth of the early urban centers along the Atlantic seacoast (Salem, Boston, Providence, New York, Philadelphia and Charleston) facilitated transportation of these itinerant dentists to the growing merchant and middle classes that provided the required population and economic incentive for cross Atlantic travel. As with similar emigration patterns, it may be assumed that a number of dentists settled in America to practice their itinerant vocation as they had in Europe. Dentists became more numerous in the last quarter of that century, and some of them attained considerable reputation. It has been estimated that by the close of the 18\textsuperscript{th} century, there had been one hundred individuals who provided dental services at one time or another. From the first settlement to the close of the 18\textsuperscript{th} century, at least seventy such dental operators left records of their practice.

The effects of the War of Independence created a paradigm shift affecting all classes, trades and professions. This new awareness of being an “American,” and the exhilaration of independence, would soon settle into the enormous task of constructing a nation on novel notions of law and the development of an “American Society”. There were a number of external factors that influenced and accelerated the growth of dentistry in America, e.g., scientific and technical progress, increase in urbanization of the population and their subsequent purchasing power, to name a few. These and other topics are to be examined in parts II – IV. This paper will examine the initial integration

\textit{This paper was presented at the 58\textsuperscript{th} Annual Meeting of the American Academy of the History of Dentistry, June 11\textsuperscript{th}, 2009 in Chicago, IL.}
of two closely associated groups, which through family, commercial and ideological relationships forged the individuals who would eventually take up the calling of dentistry in the first part of the 19th century.

Dentistry at the Dawn of the United States

American dentistry before 1800 was a combination of British and French dentistry, with some native ingenuity superposed on the foreign basis. One of the earliest documents relating to dental care was a 1734 advertisement of a James Mills, informing the public of the continuation of the practice of the dental Art of the late James Reading (fig. 1, see Appendix). The first recorded mention of the designation “Operator for the Teeth” was by William Whitebread in 1738. His advertisement (fig. 2, see Appendix) emphasized the treatment of “survey of the teeth” (periodontal disease) and the selling of his own nostrums. As previously stated, there was a diverse group of individuals performing dental services as an adjunct to their other occupations. Figure 3 (see Appendix) is a 1740 notice reporting the “Run Away” of a slave named Simon, who was known for his skill in the extraction of teeth. Figure 4 (see Appendix) is a 1741 notice of a runaway indentured Irish servant named John Green, “by Trade a Barber”, who it appears decided to carry off his master’s “instruments to draw teeth”. Individuals advertising their skills in the art of tooth removal were not limited to “trades” that could be readily identified as having some relation with the extraction of teeth. Figure 5 (see Appendix) is an advertisement from 1742 informing the public that a John Hanson, Weaver, in addition to his trade in cloth, has the skill of bleeding and drawing teeth. It is interesting to note that his talents also extend to the care of livestock. The earliest indication of a French practitioner in America is that of a Mr. Anthony Noel, who in 1748 advertised himself as an experienced doctor, skilled in bleeding and drawing teeth (fig. 6, see Appendix). Towards the end of the sixth decade of the 18th century individuals began to migrate to America who limited their occupation exclusively to dentistry. The British influence was represented by such men as Robert Wooffendale (fig. 7, see Appendix), practicing from 1766-1768 and from 1793-1797, John Baker (fig. 8, see Appendix) from 1767-1791, and Andrew Spence, who practiced from 1784 to the end of the century. The French influence was represented by such men as Jean Pierre Le Mayeur, who practiced in America from 1782-1806, and James Gardette, practicing from 1783-1829. Among the native dentists who were not directly influenced by foreign dentistry, were Isaac Greenwood, Sr. (figs. 9 & 10, see Appendix) and Josiah Flagg (fig. 11, see Appendix). There was a scarcity of books on dentistry in the colonies, yet there were some foreign dental works in the country. Benjamin Fendall, a practitioner, quoted Berdmore* in his advertisement; John Greenwood possessed a copy of Hunter’s work on the teeth, which he annotated; and James Gardette probably owned copies of Fauchard, Bourdet, and Bunon.

American dentistry prior to the nineteenth century made no substantial contributions to the knowledge and practice of the art. Previous to the advent of institutional education in dentistry, little writing of any sort was done. Competition based on trade secrets was the rule of the day and resulted in the jealous guarding of all knowledge1,3. There were no laws governing the practice of dentistry (and only a few in medicine). Therefore, there were persons with all sorts of backgrounds practicing. These included physicians and surgeons who practiced exclusively as dentists, or who in small communities necessarily performed the dental services. There were trained dentists from the lower ranks of surgery—barbers, bathers, operators, and experts for the teeth. There were also persons without surgical or dental training, such as craftsmen, mountebanks and charlatans. These different sorts of practitioners indulged in much recrimination and condemnation among themselves, most of which was probably due to competition rather than to any real discrepancy.

*Operator for the Teeth to King George III
in their service to patients.

As was consistent with the delivery of dental care in Europe by the beginning of the 19th century, the dominance of “families” produced a limited number of skilled clinicians. In particular, the Greenwood, Flagg, Parmly and Spooner families offered instruction, either by direct family ties or to individuals who had married into these families. While the initial progenitors did not acquire formal (for that period) medical education, they were competent and resourceful adherents to improvements in the selection of dentistry as their calling. In addition, there existed a number of medically trained individuals who limited their care primarily to afflications of the mouth and teeth.

While a number of dentists came from the larger urban centers (e.g. Greenwood, Flagg) the majority were from the rural areas. These individuals, either through necessity or ambition, traveled to the urban centers to acquire the skills and additional knowledge to advance their position in the new republic. Their success, partly due to advantageous apprenticeship and native talent, produced a group of highly determined and clinically successful clinicians who became recognized and respected by the established medical profession. Although medical practitioners had agitated years earlier for their own professional respectability and advancement, American writers on dentistry seldom expressed such aspirations in print. In contrast to the cooperative spirit in medicine, the few books and articles written before 1839 (about 59 books had appeared and approximately 88 articles) usually contained the customary condemnation of the ignorant and irresponsible itinerant practitioner. The literature and case reports rarely made any constructive suggestion as to the ways in which the practice of dentistry might be improved.

An exception to this general reticence was supplied by L.S. Parmly in a small book published in 1819 entitled, Practical Guide to the Management of the Teeth (fig. 12):

“In examining the progress of the improvements in the different branches, it is to be observed with regret that the Dental Art has not kept pace with many others of less real utility. One cause of this slow progress of dental science is that the subject has not hitherto been considered as forming an essential part of professional education. Hence, the practice of it has generally been considered in no higher light than a mechanical occupation or trade. A great improvement of this department of surgery will depend on pointing out to society the importance of preventing diseases of the teeth; as well as their connection, in almost every instance, with the general state of the health and preservation of the system.

Nothing can tend so much to accomplish this object as an institution for the exclusive promotion of dental science. The wants of society, as well as the disposition of the present enlightened period so favorable to the universal diffusion of knowledge, demand such an institution; and such, we flatter ourselves, we are authorized shortly to anticipate, when this noble art will be rescued from that degraded state in which it has long remained in the hands of ignorant practitioners, or mercenary pretenders, who have in a great degree made it a monopoly.”

This call for formalized education was echoed by Eleazar Gidney five years later in another small book, entitled, A Treatise on the Structure, Disease and Management of the Human Teeth. In that book the same passage, with its promise of a course of lectures shortly to be given,
was repeated almost verbatim without attribution.

In 1836, Shearjashub Spooner (fig. 13) published *Guide to Sound Teeth*, his discourse encompassing the opinions of past and current medical and dental authorities. Spooner represented the best in the clinical and intellectual achievement of the American “surgeon dentist,” corresponding with and visiting most of the leading dentists of his day. By the time of his publication he was cognizant of plans for the profession, as he states in his introduction:

> But, in order to secure the above favorable results to community, it is imperiously necessary that the “augean stable” [after the legendary Greek king Augeus, who did not clean his stable for thirty years] of this profession should be “cleaned;” the profession should be as much protected and fostered, as those of medicine and surgery. Every man, before being permitted to practice it, should serve a requisite term of pupilage, and pass an examination before a competent board of surgeon dentists.

One thing is certain; this profession must either rise or sink. If means are not taken to suppress and discountenance the mal-practices of the multitude of incompetent persons, who are pressing into it, merely for the sake of its emoluments, it must sink; for the few competent and well educated men, who are now upholding it, will abandon a disreputable profession, in a country of enterprise like ours, and turn their attention to some other calling more congenial to the feelings of honorable and enlightened men.

We are happy however, in believing that a great change for the better will, in a few years, take place [author emphasis]: *for experience is the best tutor, though often a hard one, for it generally brings with it, a corrective.*

**Early Attempts at Structured Dental Education**

As early as 1787, a Dr. Foulke had placed a notice in the *Maryland Journal and Baltimore Advertiser* that he would deliver lectures to pupils on medical subjects. These would include five lectures on “the Formation, Diseases, and Operations of the Teeth in order to enable country practitioners to become useful and expert Dentists” (fig. 14, see Appendix).

L.S. Parmly announced in his 1820 book that he “undertakes to qualify gentlemen of liberal education for practice as dentists, on the following terms:

- For practice in London…$1000
- In any other city of Great Britain or America…700
- For foreign practice…500

These terms apply solely to a finished course of instruction, including every particular, of the Art with which he is acquainted.”

Eleazer Parmly taught dentistry to several of his relatives, as well as to Solyman Brown. Between 1835 and 1840, several pupils were trained by Joshua Tucker and Daniel Harwood. Samuel Sheldon Fitch, in the preface of the 1835 edition of his *A System of Dental Surgery*, declared that he had spent the last two winters delivering “courses of scientific and demonstrative lectures upon the principles and practice of Dental Surgery.” Prominent dentists were undoubtedly giving dental instruction throughout the United States.

The matter of crediting the individuals who initiated some form of formal dental instruction was a subject of considerable discussion in the mid 20th century.

An early experiment in offering dental instruction by an established education institution was that of the University of Maryland, carried on at least from 1823 to 1825. During these years Horace H. Hayden, a respected and scholarly dentist, upon the invitation of the faculty of the Medical School gave courses concerning the teeth. These lectures consisted of a historical sketch of dental science followed by a presentation of the physiology and pathology of the teeth. They were probably intended to furnish the general practitioner with the necessary background for the treatment of dental ills, and especially to aid the physician practicing in a community where there was no regular dentist.
It is not at all certain that Hayden’s lectures had any great significance for the professional development of dentistry. They did indicate some recognition, upon the part of a medical school, that dentistry was worthy of inclusion in the program of medical education and that a dentist was competent to give such instruction. At the time, as Hayden later declared, a member of the medical faculty announced to students of the school that, “a knowledge of the subject was essentially necessary and useful to a practitioner of medicine, but which had not been, hitherto, recognized or taught in the medical schools.”

The course was presumably not open to student dentists and not intended particularly for medical students who contemplated devoting their practice to dentistry, although a student who heard the lectures referred years later to “those engaged in tooth pulling, filing, and filling,” and “Dr. Hayden’s attempt to enlighten them.”

Attendance at the lectures was apparently voluntary, for they were merely recommended to medical students. They were probably not enthusiastically received by prospective physicians for only a few students availed themselves of the opportunity, and at least one student who attended them remembered, long afterwards, that they were “very speculative and unsatisfactory.”

Among the attempts to provide some sort of instruction in dentistry by the preceptorial method, was the work of John Harris at Bainbridge and other towns of Ohio. During the years 1825 to 1827, he gave private instruction to students desirous of passing the examination required by law for the practice of medicine in that state or of entering medical school. Some of his pupils, at least by 1827, became interested in dentistry, as was also their teacher then, and they undoubtedly learned their dentistry in part from him. “At that time,” declared James Taylor, “he had three or four students, two of them whom followed his example in the pursuit of dental knowledge, I being one of them.”

John Harris was a conscientious and able teacher. Taylor said of him that he “delighted in imparting instruction to his pupils, devoted much time to their interests, and prided much in their advancement in medical knowledge.” Above the superior teaching he offered no doubt distinguished his work from that of many other dentists engaged in similar undertakings, but the project was substantially the old preceptorial system and could hardly be regarded in any sense as a true school of dentistry.

Schools for the training of dentists were also contemplated in the late 1830s. In Kentucky a bill for the enactment of a charter was introduced in the legislature, January 17, 1839, but did not become law. Doubtless several other aborted attempts were made in various parts of the country to found some sort of institution for dental instruction, but, if so, none of them succeeded.

As a culmination of all these tentative attempts to improve the character and reputation of dentistry and the catalytic personality of Chapin Harris, three events took place in 1839-1840 which established dentistry on a definite institutional foundation. These events were the publication of a journal devoted entirely to dental interests, the first issue of which appeared in June 1839; the founding of a school for professional dental education which received its charter February 1, 1840; and the organization of a dental association of national pretensions, the organizing meeting of which was held August 18-20, 1840.

Before leaving this group of individuals, we must remember that this cadre of “surgeon dentists” continued to advance the practice of educating a select group of individuals who demonstrated not only superior dexterity but also an understanding of the necessity for additional professional growth and development. Furthermore, they realized the necessity of advancing an awareness of dentistry’s social responsibility and, consequentially, raise the respectability of dentists in the eyes of the medical community and general population. This group of dentists very much strived to incorporate and encourage the education and training of dentists within the scope of medical education and scientific advancements.
Defining a Dentist

Prior to 1850, the federal census did not supply data on dentists. C.N. Pierce estimated that there were approximately 250 practicing dentists in 1825. Identification of the majority of these dentists has been documented through known preceptor-preceptee relationships and newspaper advertisements. Thus we may infer that the majority of practicing dentists by 1825 could trace their “dental knowledge and techniques” to the founding core of the above-mentioned group. Table 1 represents data collected and assembled from various sources and is visually presented by Chart 1.

Table 1: Comparison of Dental School Graduates with Total Reported Number of Dentists by US Census

<table>
<thead>
<tr>
<th>Year</th>
<th>Population*</th>
<th>Number of Dentists*</th>
<th>Increase in Number of Dentists (cumulative preceding decade)</th>
<th>Increase in Number of Dental Graduates (cumulative preceding decade)***</th>
<th>Percent of Dental School Graduates Represented by the Increase in Dentists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1825</td>
<td>11,000,000</td>
<td>250**</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1850</td>
<td>23,191,879</td>
<td>2,923</td>
<td>2,673</td>
<td>98</td>
<td>4</td>
</tr>
<tr>
<td>1860</td>
<td>31,443,321</td>
<td>5,606</td>
<td>2,683</td>
<td>370</td>
<td>13</td>
</tr>
<tr>
<td>1870</td>
<td>38,558,371</td>
<td>7,839</td>
<td>2,233</td>
<td>690</td>
<td>31</td>
</tr>
<tr>
<td>1880</td>
<td>50,155,783</td>
<td>12,314</td>
<td>4,475</td>
<td>1,673</td>
<td>37</td>
</tr>
<tr>
<td>1890</td>
<td>62,947,714</td>
<td>17,498</td>
<td>5,184</td>
<td>4,978</td>
<td>96</td>
</tr>
<tr>
<td>1900</td>
<td>75,994,575</td>
<td>29,665</td>
<td>12,217</td>
<td>12,362</td>
<td>101****</td>
</tr>
</tbody>
</table>

*United States Census  
**** Discrepancy probably due to inclusion of students from foreign countries.

Chart 1: Percentage of Dental School Graduates Represented in the Increase of Total Dentists

- **Percentage of Dental Graduates**
  - 1850: 4%
  - 1860: 13%
  - 1870: 30%
  - 1880: 37%
  - 1890: 96%
  - 1900: 100%
the census number. However, the total number of “dental graduates” is inflated. For the period 1841-1860, approximately 30% were “honorary degrees” with Baltimore generously bestowing these upon one third of its 450 graduates. While attempts were made by the Association of Colleges of Dentistry (1866-1870) to curtail this habit, it would continue through the following decades. Furthermore, to account for the exponential growth for the period 1880-1900, we must consider the effects of the “diploma mills” which were plaguing both medicine and dentistry at this time.

Table 2 compares the total number of graduates from all the established schools based on 20 years of practice, with the total number of recorded dentists in the census year. The correct estimate of the percentage of “academically educated dentists” probably falls between the data from Table 1 at the high end and the data from Table 2 representing the low end. Explaining the increase in practicing dentists over these 60 years becomes problematic. We are unable to attribute the significant increase in individuals reporting “dentistry” as their occupation based on “graduates” of existing dental schools or the preceptor-preceptee mode of education. The data presented in Tables 1 and 2 indicate that the majority of individuals who reported dentistry as their occupation entered the profession via different routes.

Table 2: Number of Dental School Graduates Within the Total Reported Number of Dentists by the US Census, 1860-1900

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Dentists*</th>
<th>Number of Dental School Graduates (cumulative preceding 20 years)**</th>
<th>Percent of Dental School Graduates in Total Number of Dentists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>5,606</td>
<td>632</td>
<td>11</td>
</tr>
<tr>
<td>1880</td>
<td>12,314</td>
<td>2,608</td>
<td>21</td>
</tr>
<tr>
<td>1900</td>
<td>29,665</td>
<td>20,076</td>
<td>67</td>
</tr>
</tbody>
</table>

*United States Census  

Chart 2: Percentage of Dental School Graduates Represented in the Increase of Total Dentists

Percentage of Dental Graduates (assuming 20 years of practice)
Elucidation

An explanation of the skewed discrepancies in the data requires us to appreciate the state of dental care and the services that an individual would have sought out for his dental needs. The majority of the American population sought dental care from two groups. The first were the “exodontists”: tooth pullers and the occasional physician who developed an interest in providing tooth extraction as part of their medical practice. Then, there was the “dentist” or “surgeon–dentist”, those who not only extracted teeth but provided basic oral hygiene therapy and tooth replacement. This latter group required additional instruments and materials other than the simple forceps that was usually employed by the former. This need for specialized instruments and materials brought the dentist into working relationships with various craftsmen, who had the skills or access to materials that the dentist utilized in his operations in the mouth or in the fabrication of replacement teeth.

As an example, Paul Revere provided gold and silver materials to Isaac Greenwood, Sr. Furthermore, in the case of Revere, among his various callings was his ability to repair and fabricate sets of artificial teeth (fig. 15, see Appendix). In addition, his advertisement of 1770 boasts his ability to “fix them [teeth] as well as any surgeon–dentist who ever came from London”; and also mentions his skill in cleaning teeth (fig. 16, see Appendix). The identification of General Warren’s body after the Battle of Bunker Hill was made possible by Revere’s identifying the “teeth” he had made for him.

Most of the materials with which the dentist has worked throughout the centuries have been borrowed from various crafts and arts which have been familiar and proficient with these materials from the most ancient times. Dentistry has in small measure modified and improved them, and applied them to its own purposes, usually employing the techniques of manipulation belonging to the arts from which the materials were adopted.

These materials were partly the therapeutic substances which were derived from the domain of the pharmacist and the physician. The others were hard materials employed in those fields of technology with which the dentist had greatest contact—the jeweler, the enameler, the goldbeater, the foundry man, the cutler, etc.

Thus the dentist had various contacts with many types of craftsmen, and in a large measure he was dependent upon these skilled trades for materials, tools, and procedures. It was this cross-pollination of Dentistry and the Craftsmen of the time that advanced the American Dentist.

Craftsmen and Their Relationship to Dentistry

The Goldsmiths, Silversmiths and Jewelers

In several ways dentistry was indebted to this craft. Most of the processes involved in prosthetic work—such as swaging, soldering, casting, alloying, welding, wire drawing, and metal rolling—belonged to the art of the goldsmith and silversmith. The materials used were those of jewelry, and these were often procured by the dentist from the jeweler. The dentist would sometimes employ the services of the jeweler, either sending work to the latter or bringing him into the dental laboratory. Moreover, when the ranks of dentistry were invaded by craftsmen, jewelers more than any others were likely to be those taking up the dental art.

The Watchmaker

This highly specialize artisan developed and utilized the majority of the tools that early dentists would modify and employ for their own set of instruments. The required manual dexterity, a working familiarity with metals and limited working environment provided excellent skill sets to facilitate movement into the dental field.

The Enameler

Enameling on metal was introduced into dentistry for aesthetic purposes by Fauchard in 1728, and continued to be employed for prostheses for about one hundred years. Fauchard and his successors borrowed the enameling process from
contemporary art and industry, and probably made no contribution to its technique. Fauchard consulted some of the enamlers whom he considered the best of their time, before he attempted to apply enameling to dental prostheses. He, as well as all other eighteenth-century dentists who produced enamel pieces, made use of the enamler to perform that part of the work.

Some of the unsolved problems of enameling were important to the dentist. Not enough was known at the beginning of the nineteenth century to produce satisfactory alloys with the same coefficient of expansion as the enamels, or to control the volume changes of the various enamels so that they harmonized with each other. Deformation of the metal plate, splitting of the enamel, and detachment of the enamel from the plaque sometimes took place both in the jeweler’s and the dentist’s work.

The Founder

The foundry man, though not always distinguished from the particular industry in which he worked, such as bellmaker, jeweler, etc., was responsible for the making of molds and for the casting of metals such as iron, bronze, brass, lead, and tin. Whenever the dentist used brass for dies on which to swage, he usually turned to the founder for the duplication of a plaster model in metal, as well as for the counter die which corresponded. This dependence of the dentist on the foundry man extended well into the nineteenth century in some instances.

When the dentist used the low-fusing metals, he could easily do the casting himself; and it became possible for him to learn to cast copper and others of the higher-fusing metals. When he did so, his methods were very similar to those of the founder. M. Maury counseled the young dentist who wished to make his own dies to take lessons for some time from a good foundry man.

The Goldbeater

From the time when gold foil was employed by the dentist for filling teeth, which was at least as far back as the fifteenth century, down to the present, the dentist has been depended upon this craftsman for his handiwork. The art of goldbeating was one that the dentist never acquired.

The Cutler and Instrument Maker

Next to the jeweler and his associated craftsman, the artisan on whom the dentist was most dependent was the cutler. This craft was principally concerned with the manufacture of knives of all sorts, especially dinner service; but until early in the nineteenth century, when the making of surgical instruments became a separate art, the cutler usually supplied all the needs of the surgeon and the dentist for lancets, scalpels, and other special knives, as well as for forceps of all descriptions, elevators, trephines, etc.

In the earlier days at least, surgical and dental instruments were for the most part invented and improved by surgeons. But in order to get their ideas realized in metal, they were obliged to rely on the skill and technical knowledge of artisans of the cutler’s craft.

During the early nineteenth century the cutler specializing in surgical instruments gradually became, or was superseded by, the surgical instrument maker. The latter abandoned the manufacture of service knives and other implements of daily life and devoted himself to the making of surgical instruments, sometimes specializing exclusively in certain types of instruments as, for example, extraction forceps. Some of these craftsmen possessed considerable versatility and would construct original instruments in accordance with the needs or plans of the surgeon or dentist.

In America, skilled workers such as those in England and France were unknown in the early years of the nineteenth century. According to Josiah Flagg, all forceps of any merit in this country were imported from Europe until 1820. Conditions improved shortly, however, for Chapin A. Harris and other prominent dentists in the early forties were recommending instruments produced by craftsmen such as Francis Arnold of Baltimore. Instruments such as these were sometimes offered as prizes for excellence in scholarship as, for instance, in Baltimore College of Dental Surgery where, in 1847, a set of Arnold's forceps was given as such a reward.

(G.B. Denton)
The Dental Manufacturer

In America numerous manufacturers of dental instruments and supplies came into existence. Among these were Horatio Kern, Chevalier, and Samuel Stockton. The latter, a dentist, was among the successful tooth manufacturers in Philadelphia, and between 1830 and 1845 he was one of the foremost producers. His nephew, Samuel Stockton White, was indentured to him in the year 1838 to learn the manufacturing of teeth and the art of dentistry. The latter pursuit he studied under the tutelage of J. deHaven White, a dentist. Having completed his apprenticeship with his uncle a year earlier, S.S. White, in 1844, began the business of tooth manufacture for himself on a small scale, with the help of two assistants. Shortly he was joined by two partners, and in 1851 the firm became Jones, White and McCurdy. By this time other needs of the dentist had been added to the stock for sale. (G.B. Denton)

Paradigm Shift

Most historical surveys and timelines portray the growth of the dental profession to be primarily the result of specific scientific and technical improvements in the services dentists were able to render. In addition, as Beck has commented “the majority of dental history writing consists primarily of biographical eulogies of prominent dentists. All honors for dentistry’s remarkable progress has been placed at the feet of its illustrious founders and leaders, who have been glorified until they have become symbolic of the profession’s aspirations. Facts gleaned from such accounts could hardly be assumed to be the unadulterated truth.” In reality, there developed three lines of growth in America dentistry. Two sources were common with other professions, namely, political and educational (academic). Unique to dentistry was the participation, integration and adoption of the technical innovations that were occurring as America moved from an agrarian to industrial society.

Current historical research involving uncovered archival materials and biographical data from other disciplines reveals a close association and inter-relationship between 19th-century American dentists and an organization that some consider our “earliest industrialists”. By taking a broader perspective of the effects of urban growth during the late 18th and 19th century and the ensuing economic, political and social consequences, we can begin to appreciate...
that American dentistry’s professional evolution developed along dual paths.

**Mechanics and the Manufacturers**

In a dissertation on transformations in the early American workplace, Kornblith states, “In common usage, the [mechanic] served as the broad term, encompassing any individual who pursed a trade that required a knowledge of “mystery” or mastery of a skill. As a practitioner of the “mechanical arts”, the mechanic applied both is mind and his hands in a creative process, usually employing simple tools. The manufacturer, on the other hand, generally used machinery in his production of articles and …. Like the mechanic he was most commonly a small craftsman directly involved in the process of production.”

Kornblith argues that:

[A] substantial number of artisans effectively took advantage of the opportunities presented by an expanding marketplace and successfully promoted the capitalist—and early industrial—transformation of their trades [professions]. Motivated in part, but not in whole, by the promise of material gain, they reorganized the system of handicraft production in which they had been trained, by introducing a more advanced division of labor as well as, in some instances, new labor saving machinery [instruments]. In the process they gradually left behind their artisan orientation and became businessmen; similarly they reformulated their conception of society and of their place within it. While unable to resolve completely the tensions between republican ideals and commercial realities, they increasingly embraced a liberal view of the world—a view that endorsed unregulated economic growth at the expense of social equality and the pursuit of private interest at the expense of public virtue. And at the center of their new world view was a belief in the moral superiority of a middling [middle] class composed of diligent, temperate, self-disciplined individuals—people like themselves.

Similar associations rapidly developed throughout the emerging industrial centers of the northeast. Whether primarily organized for either benevolent or political reasons, each independent association developed educational and training programs for its members. All developed libraries of considerable depth to aid in the education of members. In addition, lectures, general educational classes and “practical skill” training programs would become the hallmark of the associations.

**Amalgamators**

One of the first associations, the Providence Association of Mechanics and Manufactures, was founded on February 27, 1789, by a group of fourteen men, all skilled “artisans”, of whom one was a dentist.

This dentist was Isaac Greenwood, Jr. (fig. 17), the eldest of five sons of Isaac Greenwood, Sr., four of whom entered into the practice of dentistry. His younger brother, John, is remembered most for his association with George Washington. Isaac had moved to Providence in the early 1780’s and by 1788 was practicing dentistry exclusively (figs. 18 & 19, see Appendix).

Isaac Greenwood delivered on July 9th, 1798, the first of the annual lectures (initiated by him) before the Providence Association of Mechanics and Manufactures (PAMM). His closing remarks that evening clearly expressed the ideological underpinnings of the mechanics’ view of the requirements necessary to create the wealth, prosperity and security for America:

And above all, let us be ambitious in the prosecution of our various callings; for, were it not for emulation, man would scarcely have been distinguished from the beast of the field. The arts were sent to mitigate the toils of life, and regale the active mind. That spirit of emulation, which in a state of nature impels every man to aspire at distinction, takes a twofold direction when connected with society. He who was ambitious of pre-eminence in a state of independence, is still ambitious as an individual, and moreover becomes ambitious to promote the honor and happiness of the society with which he is connected.

Isaac Greenwood is representative of the initial group of “dentists”, who through their

---

*Isaac was with Samuel Maverick, an apprentice to his father, when Maverick was killed at the “Boston Massacre”, March 5, 1770. Isaac witnessed the “Boston Tea Party” in 1773.
identification with artisans, in political and economic concerns, would initiate the exposure of the “dental craft” to the larger circle of “mechanics”. This involvement, perceived either as a model for others, or as having a more direct influence, facilitated the migration of these artisans toward the practice of dentistry. The expanding profession was filled by those who understood the advantages and opportunities of the field. The entrepreneurial spirit of this group of craftsmen recognized the “value added” to which their skills could be adapted in providing dental services to this growing marketplace.

These relationships with the emerging Mechanics Associations would be duplicated throughout the developing urban landscape, with varying degrees of involvement. As an example, the membership roster of The Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts (1824) lists more than a dozen dentists as founding members of this Institute. Eventually, more than forty dentists would become members, prominent among this group includes: Gardette, Culp, Arthur, Stockton, Flagg and McQuillen.27

**The Die is Cast**

This initial symbiotic relationship between artisan, mechanic and dentist provides an explanation, in part, for the growth and prestige of American dentistry. This amalgamation created individuals who could provide for and satisfy the dental needs and wants of the emerging and health-conscious middle class in America. Indeed, for the next 100 years, technical and mechanical innovations by American dentists would provide comparatively more significant patient benefits than those developed by medicine (an exception being the field of general surgery, which benefited from the discovery of anesthesia; yet even this was the first of a number of inventions and innovations by American dentists which were immediately embraced by medicine).

As with all evolutionary changes, the developing product derives it strengths, and its inherent flaws, from the attributes of its ingredients. So it would be with the evolving growth of the professionalization of American dentistry. Conflicting matters of principles, and the different values placed on the aspects of the Art and Science of Dentistry by these two groups, would be an ongoing source of contention until the implementation of the Gies Report recommendations.28

As Beck concluded, “American dentistry followed similar basic patterns inherent in the evolution and development of professional occupations. The causative factors can be general, however, each profession responds to internal and extrinsic factors which in there unique interplay with cultural and society norms provides the catalyst for evolutionary change.”29 The synthesis of these two groups (dentists and mechanics) in America provided the necessary innovative intercourse (technical, social and professional) to create a new provider of dental care: the American trained dentist.

An appreciation of the convergent and divergent characteristics and beliefs between these groups is necessary in understanding the progress and the controversies in our professional evolution. Furthermore, by such study, we may begin to appreciate the path by which American dentistry endeavored to obtain, maintain and sustain the professional credentials of a health profession. Historical research provides insight into dentistry’s adaptation to the changes in scientific, technical and educational advancements and the evolving social contract as a healthcare profession – offering guidance as we deliberate present dilemmas.
The American Dentist began as an immigrant looking for opportunity. Through desire, independent spirit, and American ingenuity our profession evolved. It was the Dentist’s co-operation with the Craftsman that enabled dentistry, by 1840, to take the next step in its maturation.

Figure 20. An itinerant dentist portrayed in the style of American Folk Art.$^{30}$

End of Part I...
References


16. Waite, F.C. *History of the School of Dentistry of Western Reserve University.* Cleveland: Western Reserve University, 1940, p. 5-6.


21. Ibid. vi-vii.


25. Greenwood Family Archives, New York Historical Society, NYC.


**Bibliography**


Denton, G.B. Personal papers.


Appendix: Newspaper Advertisements

Figure 1. The New York Weekly Journal, Issue LXIII, January 20th, 1734.

Teeth drawn, and old broken Stumps taken out very safely and with much Ease by James Mills, who was instructed in that Art by the late James Reading deceased, so fam’d for drawing of Teeth, he is to be spoke with at his Shop in the House of the Deceased, near the old Slip Market.

Courtesy, American Antiquarian Society

Figure 2. The American Weekly Mercury, Issue 963, June 8th, 1738.

To be Sold, by William Whitebread, OPERATOR for the TEETH, Now living in Arch-Street, opposite the George:
The most effectual Cure for the Scurvey in the Gums; which not only Cures the Scurvey in the Gums, but makes the Teeth as white as ever, and Causes the Gums to grow up to the Teeth again, by only taking a Tea Spoonful in the Morning, and rub your Teeth well, then wash your Mouth with fair Water.
Price One Shilling the Bottle.

Courtesy, American Antiquarian Society

Figure 3. The Pennsylvania Gazette, Issue 613, September 11th, 1740.

RUN away on the 23d. past, from James Leonard, of Kingston, in Middlesex County, East-New-Jersey, a Negro Man named Simon, aged about 40 Years, is a well-set Fellow, about 5 Feet 10 Inches high, has large Eyes, and a Foot 12 Inches long; he was bred and born in this Country, talks good English, can read and write, is very slow in his Speech, can bleed and draw Teeth, pretending to be a great Doctor and very religious, and says he is a Churchman. Had on a dark grey Broadcloth Coat, with other good Apparel, and peeked toe’d Shoes. He took with him a black Horse, about 13 Hands and a half high, a Star in his Forehead, branded with 2 on the near Thigh or Shoulder, and trots; also a black hunting Saddle, about half worn.
Whoever takes up and secures the said Negro, so that his Master may have him again, shall have Three Pounds Reward and reasonable Charges, paid by James Leonard.

Courtesy, American Antiquarian Society
Appendix: Newspaper Advertisements

Figure 4. The Pennsylvania Gazette, Issue 662, August 20th, 1741.

RUN away the tenth Inst. from Robert Christie, of Philadelphia, an Irish Servant Man named John Green, by Trade a Barber (of the late John Gilbert's, Barber, deceas'd) about 24 Years of Age, down Look, middle Stature, pale Complexion, and much pockfretten, had on when he went away, a Caster Hat, a black Wig, a red and white yellow India Handkerchief, an Olive colour'd broad Cloth Coat, and lined with the same, a check Shirt with a white one under it, a pair of Breeches of the same of the Coat, a white Linnen Jacked shagg'd routh the tail, a dark gray pair of Stockings, a new pair of brass Buckels, a pair of Pumps soaled; carried away a pair of Ozerbrigs Towsers, a pair of ticken Trowsers, a pair of shoes almost new, and Instruments to draw teeth. Whoevery takes up and secures the said Servant so that he may be had again, shall have Forty Shillings reward and reasonable Charges paid by Robert Christie, N.B. It is suppos'd he had a false Pass; he can bleed and draw Teeth.

Figure 5. The American Weekly Mercury, Issue 1184, September 2nd, 1742.

JOHN HANSON, from England, Weaver, intends in two Weeks Time to remove to the Sign of the Shuttle in Third-street, (the House where Robert Dawson now lives,) where he intends to follow Weaving of common Camblets, bold Camblets, double and single Callimancoes, Duroys, Ruffels, Prunells, Grograms, and other Worsted Stuff; also Woollen and Linen Cloaths, as usually Wove in this Country.

JOHN HANSON, from England, Weaver, intends in two Weeks Time to remove to the Sign of the Shuttle in Third-street, (the House where Robert Dawson now lives,) where he intends to follow Weaving of common Camblets, bold Camblets, double and single Callimancoes, Duroys, Ruffels, Prunells, Grograms, and other Worsted Stuff; also Woollen and Linen Cloaths, as usually Wove in this Country.

The said John Hanson Bleeds and Draws Teeth greatly to the Satisfaction of the Patients, and has been these 20 Years experienced in Curing all or most Distempers in Cows, Oxen and Calves, and in Drawing Calves from Cows that cannot Calve of themselves, and is willing to serve this Country in that Way when Occasion serves.
JOHN BAKER,
Surgeon Dentis,
Begs Leave to take this Method of informing
the Public, Th at he shall leave this Place in
Twenty Days at farthest. —Th at those who are dis-
posed to apply to him may not be disappointed.
He also begs Leave to express his Gratitude for
the Favours he has received while in Boston ; and
hopes that those who doubted of the Safety of his
Art, from its Novelty in this Country, are now con-
vincined of its Safety and Usefulness.
Until he leaves this Town he continues at Mr. Joshu-
a Brackett’s, near the Town House, after he has
left the Town. N.B. Each Pot is sealed with his
Coat of Arms, as in the Margin of the Directions,
to prevent Fraud.

Philadelphia, July 14, 1748,

This is to give Notice, that Francis le
Blanc, wigmaker, lately come from France, in-
tends to set up at the sign of the Bear and Highland-
man, in Front-street, where he proposes to make all
sorts of wigs, fitting for gentlemen and ladies, shave,
trim and dress hair, for both sexes, after the newest and
nicest fashion. Any gentleman or lady, that is pleased to
employ said Le Blanc, shall be served with all manner of
decency and expedition.

N.B. Mr. Anthony Noel, an experienced doctor, lives
with said Le Blanc, who can bleed, draw teeth, and cure
all manner of wounds incomparably well.[emphasis added]

Robert Woffendale,
SURGEON DENTIST, lately arrived from London, (who
was instructed by Thomas Berdmore, Esq: Operator for the
Teeth to his present Britanick Majesty) begs Leave to inform
the Public, that he performs all Operations upon the Teeth,
Gums, Sockets, and Palate; Likewise fixes artificial Teeth so
as to escape Discernment, and without Pain, or the least
Inconvenience.

N. B. May be spoke with at his Lodgings, at Mr. John La-
boyteaux, at the Golden Ball, betwixt the Fly Market and the
New Dutch Church, from the Hours of nine in the Morning
to six in the Evening.

BEGS Leave to take this Method of informing
the Public, that shall leave this Place in
Twenty Days at farthest.—That those who are dis-
posed to apply to him may not be disappointed.

He also begs Leave to express his Gratitude for
the Favours he has received while in Boston; and
hopes that those who doubted of the Safety of his
Art, from its Novelty in this Country, are now con-
vincined of its Safety and Usefulness.

Until he leaves this Town he continues at Mr. Joshu-
a Brackett’s in School Street; where he will
be ready to contribute to the utmost of his Power to
serve the Publick in his Profession.

His Dentifrice, with proper Directions for
preserving the Teeth and Gums, will be to be had at
Mrs. Eustis’s, near the Town House, after he has
left the Town. N.B. Each Pot is sealed with his
Coat of Arms, as in the Margin of the Directions,
to prevent Fraud.

Courtesy, American Antiquarian Society
Gentlemen and Ladies that may want Artificial Teeth may have them made and fixed in the neatest manner, without the least pain by ISAAC GREENWOOD, Ivory Turner, at his house in the Main-Street, between the Old South and Seven-Star Lane, at the South-End of BOSTON; they help the Speech as becoming as the natural ones.

Ladies, wax rots your Teeth and Gums, throw it away. Come and have your Teeth cleaned, and if done in time, saves them from rotting and parting from the Gums.

N.B. Said GREENWOOD continues to make Artificial Legs and Hands; Turns in Ivory, Bone, Silver and Wood; Makes Fifes, German-Flutes, Hautboys, &c. &c.

Ladies please to send your Umbrellas to be mended and cover’d.
Appendix: Newspaper Advertisements

Figure 10. Continental Journal, Issue 236, March 29th, 1781.

GENTLEMEN AND LADIES.

Foul Teeth and scurvy in the Gums greatly affect the Breath, and a thick substance grows on the Teeth, which, if not removed, will part them from the Gums, and you will lose them; they are so valuable both for use and ornament, that a hint to preserve them (to the Wife) is sufficient.

ISAAC GREENWOOD, Ivory-Turner, for his Profit and your Good, would be glad to wait on you at his House, at the South End of Boston, between the Old-South Meeting House and Seven Star Lane, he has a Room devoted to your Service, as private and convenient as you could wish, where you may have your Teeth made white, if not too far gone—If you have lost any, you may have others made and fixed in their stead, in so neat a Manner as not to be known from the natural ones, without drawing the Stumps, or putting you in Pain, they help the Speech and keep the Lips from falling in; and nothing is more becoming than a good set of Teeth.—Said Teeth he makes of Stuff that will keep their Colour; the price for Cleaning them is from three to six shillings; a single Artificial Tooth is eight shillings, if more than one six shillings each Hard Money, or the Exchange, and if not done to the compleat Satisfaction of the Patient he requires no Pay.—You may have neat new invented Teeth—Brushes in neat Cases—Also, common ditto, with Boxes of Teeth-Powder, that will recommend themselves.

N.B. Said GREENWOOD continues to turn in Ivory, Silver, Bone, Wood &c.—Mends, mends and covers Umbrellas—Mends Ivory and Bone-Stick Fans—Makes Ivory and Bone-Headed Sticks, Whips, Chess-Men, Back Gammon Tables, Boxes, Men and Dice, Flutes Fifes, &c. &c.

Courtesy, American Antiquarian Society
Lectures on Anatomy, &c.

DOCTOR FOULKE’s LECTURES on ANATOMY, SURGERY, DISSECTION and MIDWIFERY, will commence on the First MONDAY in NOVEMBER next.

As Anatomical Knowledge is of great Importance in a Medical Education, peculiar Pains and Care will be taken to familiarize the Pupil with the Structure, Uses and Diseases of every Part of the human Body.—The Demonstrations will not be confined to the fresh Subject only, but will be assisted by shewing a Variety of injected and prepared Parts. Five Lectures will be given on the Formation, Diseases and Operations of the Teeth, in order to enable Country Practitioners to become useful and expert Dentists.[emphasis added]

—Machines, well adapted to the Purpose, will be used in the Practical Part of the obstetrical Course.

The Price of a TICKET to the whole, will be THREE GUINEAS.

Josiah Flagg, junior,
SURGEON DENTIST,

In MILK-STREET, facing Federal-Street,
Has the honour to acquaint the Ladies and Gentlemen of this metropolis and the vicinity, that he cures ulcerated Teeth, and hardens the Gums without drawing—fastens those that are loose by the scurvy, or other accidents—alleviates the most acute pain, without the use of instruments—stops haemorrhages, arising from any cause whatever—cleans the Teeth and Gums, restoring them to perfect sanity, free of suture injury—makes artificial Teeth, with and without roots, the former equally as serviceable as the natural ones—and practices all the various branches of the Dental Art, upon a new, much improved; highly recommended, and really safe method.

Different Brushes, and Dentifrices, with directions, peculiarly adapted to the relief of every complaint.

“The poor ye have always with you,” They are cheerfully promised assistance gratis.

“TRY ME, PROVE ME,” “HOLD FAST THAT WHICH IS GOOD.” March 20.
Whereas many Persons are so unfortunate as to lose their Fore Teeth by accident, or otherways, to their great Detriment, not only in Looks, but Speaking, both in public and private: - This is to inform all such, that they may have them replaced with false Ones, that look as well as the Natural, and answer the End of Speaking, to all Intents, by PAUL REVERE, Goldsmith, near the Head of Dr. Clarke’s Wharf, Boston. - All Persons who have had false Teeth fix’d by Mr. John Baker, Surgeon Dentist, and they have got loose (as they will in Time) may have them fastened by the abovesaid Revere, who learnt the Method of fixing them from Mr. Baker.

ARTIFICIAL-TEETH

Paul Revere, Takes this Method of returning his most sincere Thanks to the Gentlement and Ladies who have employed him in the care of their Teeth, he would now inform them and all others, who are so unfortunate as to lose their Teeth by accident or otherways, that he still continues the Business of a Dentist, and flatters himself that from the Experience he has had these Two Years, (in which Time has has fixt some Hundreds of Teeth) that he can fix them as well as any Surgeon-Dentist who ever came from London, he fixes them in such a Manner that they are not only an Ornament but of real Use in Speaking and Eating : He cleanses the Teeth and will wait on any Gentleman or Lady at their Lodgings, he may be spoke with, at his Shop opposite Dr. Clark’s at the North End, where the Gold and Silversmith’s Business is carried on in all its Branches.

Figure 15. The Boston Gazette and Country Journal, Issue 701, September 5th, 1768.

Figure 16. The Boston Gazette and Country Journal, Issue 801, August 13th, 1770.
Appendix: Newspaper Advertisements


ISAAC GREENWOOD,
DENTIST
Cures all Complaints incident to the Teeth and Gums, substitutes artificial Teeth in the neatest Manner, and doubts not but nine Years Practice has afforded him Experience sufficient to execute every Part of the above Art with the greatest Ease and Exactness.—As he never wishes to rise in Esteem, unless gained by pure Merit, those Persons who incline to pay any Attention to their own or Children’s Teeth, may depend on being perfectly satisfied with his Performances.—Brushes and Powder suitable for the TEETH.
N.B. Those Gentlemen or Ladies who cannot conveniently wait on him, shall be attended to, at a little more Expence, upon sending Directions, two Doors South of Mr. Jacob Whitman’s, West Side of the Great Bridge.

From the author’s private collection.


I. GREENWOOD
DENTIST,
WHOSE Practice is universally approved of, performs every Operation on the TEETH and GUMS, tending to their Ease, Beauty and Preservation.—A late Discovery has enabled him to set Teeth that will vie in Beauty, Duraction and frequently in Use, with the most brilliant natural Ones.

Those Persons who wish to preserve their Teeth, with those who have had the Misfortune to loose any, by applying personally, or sending Directions to said GREENWOOD, on the West Side of the River, Providence, may depend on his Exertions to merit their Esteem—executing every Part of the above Art to the complete Satisfaction of his Employers.

From the author’s private collection.
Dr. Arthur Davenport Black: His Contributions to Dentistry

by Jack W. Gottschalk, DDS

Presented as the Frank & Phyllis Orland Memorial Lecture,
58th Annual Meeting of the American Academy of the History of Dentistry,
June 11th, 2009, Chicago, IL

Arthur Davenport Black was the fourth child, third son of Jane and G.V. Black. He was born in Jacksonville, Illinois, on November 15th, 1870. Arthur was educated in public school and graduated from high school in 1888. The following year he entered Illinois College of Jacksonville, from which he received his Bachelor of Science degree in 1892. He was an outstanding student and took an active part in extracurricular affairs. He was a member of the football team and was a leading participant in organizing and developing a college annual, the Hercules serving as its editor-in-chief. It is said that this stimulated his interest in publicity, organization and writing, all of which were to become outstanding features of his professional career.

He was very impressed with his father’s old buggy-wheeled bicycle, which he learned to ride. He was one of the first to buy one of the new high-wheeled (50 inch) bicycles, which he not only rode locally, but also on long trips into neighboring states. He rode as far as Washington, D.C. and Denver, Colorado. He received a number of prizes for his cycling prowess, organized a bicycle club and sponsored races with other riders in close-by communities. We must remember that all of this occurred before the hard surface roads of today. He knew bicycles inside and out and became a bicycle salesman, and then manager of the Indiana Bicycle Company Store in Chicago. Unfortunately, the bicycle company folded at a most inopportune time--his wedding invitations had just gone out, and he was now out of a job.

This was probably the turning point in his career. At his father’s suggestion, he decided to take up dentistry. He had saved some money, and with his father’s additional support, he entered the Dental Department of Northwestern University in 1897, graduating in 1900 with high honors. He then enrolled in the Medical Department and received his MD degree in 1901. He was brilliant, talented and endowed with an attractive, outgoing personality. Even at this young age he had a great interest in education, obviously inherited from his father, and began teaching in the dental school immediately after his graduation. He taught in the Departments of Operative Dentistry, Oral Surgery and Oral Pathology. He served as an oral surgeon on the staff of St. Luke’s Hospital for 12 years.

Correspondence:
Dr. Jack W. Gottschalk
7195 Given Road
Cincinnati, OH 45243
jgotts@cinci.rr.com

A.D. Black (far left), preparing for his bicycle ride to Washington, D.C.
In 1913, students presented a resolution to the faculty of the Northwestern School of Dentistry to create an honor society in dentistry. Dr. G.V. Black, dean of the Dental School, was impressed with this resolution, and in 1914 appointed a committee of three people, chaired by his son, Arthur Black, to meet with the students. It was decided to send a letter to the deans of the 51 other dental schools in the US to see if this establishment of a dental honor society was of interest to them. A positive response was received, and after much discussion, the committee composed a statement that they felt best described the ideals of the dental profession: “The conservation of teeth and health.” This national honor society was to encourage scholarship, excellent performance and ethics among dental students. Dr. Black selected the initials for the words Omicron and Upsilon, the first letters of the Greek words for “teeth,” odont (ὀδοντ), and “health,” ygeia (υγεία). He thought they were not only appropriate, but pleasant to the ear. He selected Kappa, as the beginning of the Greek word for “and,” kai (και). Thus, he developed the name Omicron Kappa Upsilon: OKU. Teeth and Health. The key for this fraternity was designed with all three Greek letters, housed within the prominent letter Sigma, which is the initial letter for “conservation,” soteria (Σωτηρία).

The design and insignia were approved by the Northwestern University Faculty on April 8, 1915, and the society was officially incorporated by the State of Illinois in 1916. Admiration for the purposes and attainments of this society stimulated the formation of chapters at other dental schools in the United States and Canada, leading to the creation of Omicron Kappa Upsilon as a national honor society. Northwestern was designated as the alpha chapter. Dr. Black stayed very involved in OKU and in 1921 was elected its national chairman for two years.

The year 1920 saw the birth of the American College of Dentists. At the Iowa State Dental Association that year, plans for a dental honorary organization were discussed by four leaders in the profession: J.V. Conzett, president of the National Dental Association; Henry E. Friesell, president-elect of the National Dental Association; Otto U. King, secretary of the National Dental Association, and dean Arthur D. Black, president of the Dental Teachers Association. Dental education was going through difficult times and needed reorganization and improvement. Thoughtful dental educators and leaders felt that creating a meritorious dental organization dedicated to the pursuit of the highest ethical and educational standards would be an influence for progress throughout the dental profession. Thus, on August 20, 1920, the first formal meeting of the American College of Dentists was held. Dean Arthur Black was elected its first secretary, and a member of its Board of Directors. The American College of Dentists was to be independent of all other organizations, free from political influence, and immune to the pressure of friendship. Membership was granted only by invitation. As today, the college stressed continuing education, leadership, volunteerism, and embraced dentists who showed high ideals in their dental practices and who dedicated themselves to making advances in the dental profession and among the public it serves. Black was very active in organizing groups of select character, which were designed to recognize superior achievements and to offer rewards for unselfish service. It should come as no surprise to see his interest and involvement in founding both OKU and the American College of Dentists. He did not want to create a regal class. He felt that these organizations served to stimulate dentists and dental students to greater achievements, and to create higher esteem and recognition among others through the favorable attention the societies would attract.
Architectural Skill and Research

Dr. Black practiced dentistry in his office, usually a half day. The other half he taught at Northwestern. He maintained this schedule from shortly after his graduation until his death December 7, 1937. It should come as no surprise that he had very specific ideas on how his office should be designed. In fact, he was ahead of his time, drawing the plans and arranging his office so that all of his operatory equipment was concealed in cabinets and drawers, so that all the patient saw was the dental chair and a few major items. The objects in the cabinets and drawers were placed so they were handy for any procedure, and after their use, were immediately out of sight.

One of his great accomplishments was his ability to visualize what would work, and then draw the plans from which it could be made. In fact, he was said he built many things himself because of his knack for beautiful woodworking. All of this planning, designing and woodworking was done at night, often until way past midnight, after a very busy day working.

In 1921, a new building was constructed through a donation from Mrs. Montgomery Ward, in memory of her husband, that would be the new home of the Northwestern Dental and Medical Schools. And, of course, Dean Black designed and did all of the architectural drawings for the six floors that were to be the dental school. He also designed all of the equipment that was used for the laboratories and clinics. With unusual farsightedness, he included space for research in each department, which undoubtedly stimulated research activities at the school.

He believed that carefully-planned research was what made dentistry an independent profession, and that further research could do much to bring comfort, happiness and longevity to future generations. He looked upon research as no longer an individual pursuit, but a team effort. As dean, Black was to stimulate, direct and coordinate the work of all of the involved individuals.

Post-Graduate Courses, Study Clubs and New Dental Programs

With the adoption of the 1914 resolution of the National Dental Association establishing triparte membership as we know it today, the NDA expected the majority of the dentists to now enroll as members. Dr. Black realized that the newly-formed local dental societies could only maintain these new members if the societies could supply a project that would stimulate participation of individual members, and at the same time fill a void in their educational development. Hence, we see the start of postgraduate courses and study clubs.

Dr. Edmund Noyes wrote, “It is generally understood that it is Dr. Arthur D. Black, more than any other man, that gave us the concept and successful carrying out, of both the reorganization work and the arrangements for the post graduate courses. For 5 years he has given unselfishly of his time, speaking all of the United States and in many foreign countries, and has shown a genius for organization and perseverance possessed by very few.” At this time, almost all postgraduate courses were being held in the dental schools, and Northwestern was a leader in this area of postgraduate education. The establishment of new courses in postgraduate training was encouraged, and in the October 1921 to June 1922 school year,
there were 53 postgraduate courses of 1-2 weeks duration, one four-week general course, and three 10-week oral surgery courses. Dr. Black had an unforgettable influence toward the much-needed changes to dental education.

In 1921, Dr. Arthur Black was directly involved in the creation of a separate course of study in pediatric dentistry, a topic that had previously claimed very little serious attention by educators or practicing dentists. In 1922, Northwestern’s dental school opened a dental clinic for children. All dental students were required to earn “points” in the children’s clinic, the same as they earned in other departments of the school. At the same time, a department to train dental hygienists was started. This course was one year in length and required a high school diploma. The first class consisted of 11 young women, all of whom were appointed instructors in public schools. They gave oral prophylaxis, and taught the children how to brush and keep healthy mouths. Following soon after, courses in dental assisting and dental mechanics (now dental laboratories) were also offered at Northwestern.

Perhaps Arthur Black’s visits to the famous G.V. Black study club courses gave him the inspiration for postgraduate study clubs. Study clubs have had their active and slow periods through history. It was said that if two dentists were shipwrecked on an island, their first activity would be to start a dental study club.

Index of the Periodical Dental Literature

Dr. Black’s contributions to dental education were outstanding. However, it is thought by many that his development of the *Index of Periodical Dental Literature* will have a longer and greater educational value than any of his other achievements.

It started while he was still a dental student. At the suggestion of his father, he arranged and classified his father’s famous library, as well as the library at the dental school. The Northwestern dental school had purchased the library of Jonathan Taft of Cincinnati in 1897* and used it as a nucleus to build a large and outstanding library for educational purposes. This great library started what was called the “library movement in dentistry.” However, Dr. Black found that it was very difficult to find what he needed in the dental literature, and he felt that a properly organized index would be invaluable. It would be a great time-saver, as well as motivation to become more familiar with what had been accomplished in the field. He began by working with the sets of dental journals in the Northwestern library, and then adding journals that were not in the library. As these accumulated and the index got larger, it occurred to him that such an index should cover all dental periodical literature and be available to the entire dental profession, especially the dental schools. At this time he confined his classification index to publications in the English language.

In 1898, Dr. Black, along with Dr. Frederick Noyes, used the Dewey Decimal Classification as a basis, and expanded it to include dentistry. They then tested the system over the next 5 years (1898-1903), by indexing the articles published in two dental journals – the Dental Cosmos (1859-1902) and the Dental News Letter (1847-1859). This alone required 25,741 cards for subject and author catalogues. It was said that it took 1200 hours to accomplish this five-year task. Even though the dental profession was not immediately attracted to the index, it was shown that it was an invaluable accessory to dental teaching and writing. In December of 1908, the *Index of the Periodical Literature* plan was presented to the Institute of Dental Pedagogies, who appointed a committee to organize the dental index bureau and find funding.

However, the committee could not find funding. Dr. Black and his committee tried instead to solicit subscriptions to the *Index*, but they also found it very slow. In fact, it took over 20 years to raise enough money to finally publish the first edition of the Index in 1921. It was published only in the English language for the years 1911-1915. They had planned to index only 10 journals, but eventually included 65. I could hardly guess the number of publications there are worldwide today. Dr. Black and many educators thought that the aforementioned “library movement” did much to bring the Index to its successful position.
Starting in 1925, a committee of the Association, headed by Arthur Black until his death in 1937, assumed direction of the work. After 1933, the American Dental Association assumed major support of the index and in 1939, the title was changed to *The Index to Dental Literature*, taking out the word periodical. In 1950, the index became a quarterly publication, and the volume for 1952 contained material from more than 150 publications, appearing in 10 English-speaking countries. Today, the *Index* is maintained and published by the National Library in Washington, D.C.

The *Index* is an invaluable aid to dental teaching and writing, and is used worldwide. I can only imagine the excitement and amazement that Dr. Black would feel if he could see that today his Index is accessible to every dental institution, school, library and museum in the world – not to mention its availability to millions through the Internet.

However, the Index was not the only thing to occupy Dr. Black’s mind at this time. He was teaching at the dental school, writing papers, speaking to dental organizations, and was deeply involved in his beloved profession in many, many ways. He was always concerned with and constantly studying the problems of both the dental practitioner and the dental student. This did not go unnoticed, for he was appointed dean of Northwestern in 1917.

**The Reorganization Plan**

It is almost impossible to elaborate fully on the long, tenuous, and at times hostile environment that was the process of reorganizing the National Dental Association. This reorganization plan resulted in what is known today as the tri-partite membership plan of organized dentistry. This subject took up over 100 pages in McCluggage’s book, *The American Dental Association: 100 Years*. I will only briefly touch on the highlights of the plan.

Dr. Black’s leadership and perseverance in the reorganization of the National Dental Association into what we recognize today as the tri-partite membership plan was, along with the Index of Dental Literature, thought by many to be his most outstanding and valuable contribution to dentistry. It set in motion the structure of what is now the ADA, and its component and constituent societies.

In 1903, Dr. Black proposed the component society plan in his state of Illinois. He felt that if the states and the National Dental Association had one weakness, it was that their dental membership represented an extremely small percentage of the ethical practicing dentists. In fact, in Illinois, out of 3,000 dentists, only 200 were dues-paying, and that was with dues of $5.00 a year. Illinois had 44 counties which that had no dentists represented in the Association. There was also great discontent by the members over the fact that the meetings spent too much time on business and not enough on scientific endeavors. They also complained that there was too much politics, and that the same group of people assumed leadership year after year, refusing to relinquish their power. Black concluded that if dentistry expected to maintain its claim as a scientific profession, the Association must have a permanent membership of between two and three thousand, with at least one thousand in attendance at annual meetings. The members should take an active part in the Association, and contribute annual dues large enough to support its scientific work as well.

The Chicago Odontographic Society, whose members included many leaders of the state association, appointed a committee to formulate a reorganization plan, patterned after the state medical society. This plan was sent to a committee chaired by Arthur Black, who, being a physician, was very familiar with the state medical society plan.

The first thing the committee did was to make a list of all the dentists in each county, and check off those who already belonged to a local or district society. They were after only ethical dentists, as there were also many charlatans and unethical dentists who had large advertisements in newspapers, and who had procured their licenses by fraud. The committee established a list of what
was called the “in group,” to be selected for membership. Each new member had to be recommended for membership by a present member.

The state was divided into sections and organizational meetings were set up to meet personally with these prospective new members. This was a very slow process, as it was recorded in 1903 that only 603 dentists were members of the Association, out of an estimated 35,000. It was obvious that a new, more generous membership policy was necessary.

The secret to the success of the component society plan was that a dentist automatically became a member of the state association when he joined the component or local society. In 1905 there were 1,300 dues-paying members, a significant increase upon the 600 in 1903. As was mentioned earlier, this was basically the “Illinois Plan”.

Since Dr. Black was very familiar with this plan, he was asked to speak to other state dental societies. One of his talking points was that the increased membership was a major factor in strengthening the Association’s legislative influence. He told the states that there was a strong possibility of having a truly representative National Dental Association if a large number of states would adopt this plan. The Association would then number 15-20,000 members instead of a weak organization of only a few hundred.

Between 1907 and 1914, there was a bitter “seven year war” over the Illinois Plan. There were many fights, revisions, additions and deletions. Dr. McCluggage, in his History of the ADA, gives a detailed running commentary on the many skirmishes between Arthur Black and his adversaries – particularly Homer Brown of Cleveland, the recording secretary of the National Dental Association. However, many of Arthur Black’s ideas were incorporated into the final amendments, which were adopted by the National Dental Association in 1914. The Association could now realistically aspire to enrolling a great majority of the dentists in the country. Regional distribution of the trusteeships, and representation in the house of delegates based on state membership, assured a truly national organization.

In 1922, when the National Dental Association had approximately 33,000 members, the organization’s name was changed back to the American Dental Association. The altered membership clauses had opened the way to a very large increase in membership.

This reorganization, and the tri-parte membership, is still the strength of the American Dental Association. For this we will always be indebted to Arthur Black.

Epilogue

I have only briefly touched on Dr. Arthur Davenport Black – the man, his accomplishments and contributions to our dental profession and dental educational system. He will stand out, along with his father, as one of the giants of dentistry. As you might guess, Arthur adored and idolized his father and shared with everyone how much his father had influenced his life. He was dedicated to developing and carrying out the ideas and ideals which his father had set in motion.

Their two lives, 1836-1937, span more than a century. Combined, they practiced dentistry for 95 years, had 82 years of teaching and 37 years as deans.

After a long illness, Dr. Arthur Black died on December 7, 1937, at the age of 67.

Dr. Arthur Black’s finest achievement was his work in dental education. Time does not permit more than a brief mention of his varied accomplishments, and his numerous writings, especially the herculean task of rewriting G.V. Black’s books on ‘Operative Dentistry and Dental Pathology’; the stupendous work he did on the indexing of the dental literature and the marvelous results he obtained in the reorganization of the Illinois Dental Society.
The lesson to be learned from telling you of the accomplishments of Dr. Black's life work is the inspiration it provides, and the boundless opportunities it portrays. It cannot help but inspire any ambitious dentist to go on to greater and better efforts, and it must be evident to all that infinite opportunities are always present.

Bibliography

*Images courtesy of the Galter Health Sciences Library Special Collections, A.D. Black History of Dentistry Collection, Northwestern University, Chicago, IL.*


Special Thanks to Andrea Matlak, Mary Kreinbring, Clifton O. Dummett & Scott Swank.

---

**Bremner Award for Pre-Doctoral Dental Students**

A certificate, $500 cash prize and up to $500 travel and related expenses will be awarded to the winning unpublished essay on:

1. A subject relevant to the history of dentistry
2. The result of an original research effort related to dental history
3. A composition revealing an uncommon appreciation and understanding of historical items related to dentistry.

*Eligibility:* Contest open to all predoctoral students of dentistry in the US and Canada, including undergraduate students preparing for admission to dental school. Purpose is to encourage the student and research of the history of dentistry.

Entries must be original essays, not more than 5,000 words, on a subject relevant to dental history.

*Selection:* A special committee of the Academy will judge all entries received prior to March 1, 2010, for the current year's award. The winner will be announced prior to June 1, 2010, so that said winner may be in attendance at the annual meeting of the Academy.

*Application:* Send typed essays (in triplicate), following the Instructions for Authors for the *Journal of the History of Dentistry*, along with a statement of authenticity by the Dean or responsible faculty, by March 1, 2010.

The Award is presented at the annual meeting of the American Academy of the History of Dentistry.

Please submit papers prior to March 1, 2010.

Please direct correspondence to:
Dr. Arden G. Christen
7112 Sylvan Ridge Road
Indianapolis, IN 46240
The Era of Whiter Teeth:
Advertising in American Dentistry 1910-1950

Stine Grumsen, MA, PhD Student
Department of Philosophy and History of Ideas
University of Aarhus, Denmark

This paper was presented at the 58th Annual Meeting of the
American Academy of the History of Dentistry, June 11th, 2009 in Chicago, IL.
It is based on a chapter of Ms. Grumsen’s doctoral thesis on the history of
healthcare and advertising, which will be submitted Winter 2011.

It has often been argued that the public image of dentists has been tainted by
association with fear and pain into an image of evil ‘psychodontists’ and that
there is an apparent lack of ‘role models’ in popular film, television, art and
literature concerned with dentistry. This paper argues that we get a different
picture when looking at different media. Advertisements introduce into a pub-
clic domain, positive images of dentistry which crucially differ from the images
found in other popular media.

This paper traces the public image of dentistry in early 20th-century America,
as seen through dentifrice advertisements, and suggests three important rea-
sons for studying advertisements: First, advertisements provide a supplement
to studies of popular images of dentistry carried out so far. Second, advertise-
ments have played an important part in advancing oral hygiene as a public con-
cern. And third, advertisements provide the historian of dentistry with a unique
opportunity for analyzing the complex and interwoven relationship of popular
and professional discourses, since ads have acted as catalysts for professional
discussions and self-reflection among dentists.

Correspondence:
Ms. Stine Grumsen
Bygning 1467, lokale 615
Jens Chr. Skous Vej 7
DK - 8000 Århus C
Denmark
idesg@hum.au.dk
Introduction

[The Modern Ethical Association of Indiana] is ready to say that the advertising tooth paste and tooth-brush makers have done more to advance the cause of oral hygiene than all of the profession put together. It recognizes this fact as a tremendous indictment of the profession.

—A. G. Belden, secretary of the Modern Ethical Dental Association of Indiana (1916).

This quotation is from a 1916 issue of the journal FACTS, in which the issue of advertising was discussed. The quote points to an interesting source for studying the history of dentistry—advertisements. To a historian, it raises the question of what role advertising has played in forming professional and popular dentistry.

Historically, advertisements have been orientated towards professional as well as popular contexts, and throughout history, advertisements have concerned, provoked, allured and attracted dentists as well as their patients.

The Popular Understanding of Dentistry

The field of popular understanding of dentistry has mainly been studied by dentists with an interest in the historical development of their profession. The studies have focused on popular images of dentistry and representations of dentists in the media, and in particular on how dentists have been portrayed in films, television, art and comic strips. The focus on these media leads the authors to conclude that dentistry and the ideal of white teeth have been present in popular culture for centuries; that the dentist has usually been associated with fear and pain and presented as an evil “psychodontist” or an unfortunate “butterfingers”; and that there is an apparent lack of role models in popular dentistry. However, if we broaden the scope of source material for studying dentistry in popular culture, we will get another picture of the popular image of dentistry. Fruitful insights into the field of popular understanding of dentistry can be derived from studying advertisements. Whereas the studies carried out so far have shown the popular image of dentists and dentistry to be predominantly negative, a study of advertisements shows positive connotations of dentists and dentistry in popular contexts.

In the following I will present the results of an analysis of a sample of more than 150 advertisements for toothpastes, tooth powders and mouthwashes from the period between 1911 and 1954. The ads are part of the Ad*Access On-Line Project at the John W. Hartman Center for Sales, Advertising & Marketing History, Duke University Rare Book, Manuscript, and Special Collections Library. First I will outline how dentists and their clinics have been presented in dentifrice ads, and afterwards I will give examples on how the rhetoric of toothpaste advertisements has changed during this period. Finally I will suggest some reasons for studying advertisements.

Portrayal of the Dentist and Dental Clinic in Advertisements

Most popular toothpaste ads from the early twentieth century feature the product alongside women or children, but a few of them include a picture of a dentist. These depictions are interesting, since they can show how the profession of dentistry was presented to a contemporary lay audience, and provide an insight into the iconography of popular dentistry; what symbols and stereotypes did it take to signal ‘dentist’? A study of the imagery of dentists in ads may provide us with stereotypes of dentists which differ significantly from the sadistic or incompetent depictions found in television, movies and cartoons.

In several ads, a dentist is shown recommending a product, performing experiments or treating a patient. All of the dentists are portrayed as middle-aged men with receding hair, wearing white coats. In the case of color advertisements, all of the dentists are dark-haired, sometimes with hints of gray. However, if we broaden the scope of source material for studying dentistry in popular culture, we will get another picture of the popular image of dentistry. Fruitful insights into the field of popular understanding of dentistry can be derived from studying advertisements. Whereas the studies carried out so
with a mirror in front of a patient, showing a tube of toothpaste or a bottle of mouthwash to the patient, or busy looking in microscopes or lighting a Bunsen burner.9 The ads are clearly gendered. The advertising image of an American dentist in the early twentieth century was a middle-aged white man, even though female and African-American dentists had been around for more than 40 years. The first female dentist was educated in 1866 and the first African American dentist graduated in 1869.10 The historian Robert A. Nye has described how the professional cultures of medicine and science became ‘masculinized’ during the late 19th century, and how what he termed ‘masculine honor codes’ lingered on even after women had become part of these professions.11 These masculine honor codes might explain why women have been excluded as symbols of expertise in toothpaste ads. This is supported by a study of “Medical Indexing and the Gendered Professionalism of American Medicine 1880-1932” by Diana E. Long, in which she concludes that women in this period “did not look like authors of medical expertise in the laboratory, classroom, or hospital.”12 However, the toothpaste ads of the early twentieth century were also gendered and targeted in accordance with the main audience of the individual publication, in terms of presenting either masculinized or feminized ideas of oral hygiene. This was done in accordance with the readerships of the periodicals featuring the advertisements.13

Toothpaste advertisements provide an image of dentists as an advising and instructing authority who approach the patients with the best of intentions. Thus the ads do not address the question of the provider–customer relationship between dentists offering their services and patients buying dental care; rather, they present dentists as objective, disinterested authorities who recommend products on the basis of their experiences and expertise. Furthermore, the friendly dentist portrayed in the ads is in stark contrast to the negative imagery of clumsy or evil dentists found in films, television and cartoons.

As mentioned, the dentists in the advertisements wear white coats. According to Malvin E. Ring, this sanitary look was not adopted by dentists until 1920, when Dr. C. Edmund Kells campaigned in order to get dentists to wear the white coat and furnish their offices with equipment in a white, sanitary look.14 The earliest ad that I have found which shows a dentist in a white coat is from 1918 (fig. 1).15 This shows that the white coat was part of popular print culture, from the very beginning already signalling “dentist!” in 1918. Few dentists were pictured in advertisements of the 1920s, but those who were are wearing white coats. It is striking that the ad from 1918 had adopted the white coat as the official image of the dentist, whereas the dental office still looked more like a living room than a sanitary clinic. This suggests that the white coat was adopted more quickly in popular depictions of dentistry than the sanitary look of the clinic. Indeed, though ads from the 1920s to 40s signaled hygiene in dental offices16, later ads showed colorful offices with a cheerful atmosphere.17 This suggests that ads needed to encompass a cozy homely atmosphere as well as the clinical professional image in order to depict

Figure 1. S.S. White advertisement, 1918.
a product as being both well-known and safe. The ads show a balance between raising the product to an expert context separated from daily life, and at the same time avoiding alienation of the product, by presenting the surroundings as friendly, welcoming and cosy.

In advertisements the authority of the dentist is communicated primarily in his appearance: his expression and his clothes, not his surroundings. In the 1920s and 30s, “dentistry” was portrayed as the dentists themselves in their white coats, not as the dental clinics. Though the sanitary look of the dental clinic appeared simultaneously with the adoption of white coats, the white coat preceded the sanitary clinic in the popular context of advertisements. Whereas the dentist was always dressed in a white coat in ads, the colors and equipment of the dentist’s office varied. In this way, a study of ads provides both a nuanced and ambiguous picture of the popular portrayal of dentistry. Dr. Kells’ campaign did not immediately result in a shift toward emphasizing hygiene in ads. The clinical sanitary look of the dental clinic did not appear overnight in popular print culture. On the other hand, the sanitary white coat was immediately adopted by dental manufacturers portraying dentists in ads, and instantly came to signal expertise. This was possible because the white coat had been a publicly well-known phenomenon in other areas of science and medicine since the late nineteenth century. Hence the positive connotations of the white coat, such as expertise and sanitation, followed the white coat into the popular imagery of dentistry in ads, and helped sell dental products as trustworthy, safe and endorsed by authorities.

**Toothpaste Advertisements in the Early Twentieth Century**

Around the turn of the 20th century, Willoughby D. Miller’s theory on caries became the point of departure for a new set of thematic discussions among professional dentists; oral hygiene was discussed in professional journals and educational programs were launched in order to get the message across to schoolchildren, housewives and the man on the street. Oral health was in vogue and the business industry quickly picked up on this theme. Companies producing and selling toothpaste, tooth powders and mouthwashes bloomed, and the manufacturers added various ingredients in order to handle the different stages of the caries problem which Miller had identified. In the 1890s the invention of the metal tube enabled the manufacturing of toothpaste as opposed to the tooth powder common at the time. Whereas tooth powders were chiefly produced by individual dentists and sold in bottles, porcelain pots or paper boxes, the new toothpastes in metal tubes were simpler to mass-produce in factories and hence large brands of toothpaste could be sold across the nation, making mass advertising lucrative. Extensive ad campaigns were launched, increasing the income of the manufacturers by informing the public of the importance of oral health and hygiene and the merits of certain preparations.

The focus on oral hygiene and preventive dentistry was furthermore part of a broader shift in social medicine. In the late nineteenth century, hygiene and prevention were discussed and promoted in all branches of medicine, and public health programs for sanitation and personal hygiene were launched. Soap and cleanliness were advertised widely by soap manufacturers as well as by private practitioners and politicians.

During the early twentieth century, advertisements for oral hygiene products increased rapidly. In 1916, the dental journal FACTS quoted Leslies’ Weekly for reporting that “never before was so much money spent for advertising as is being spent today and never before were such returns realized on the investments made.” In 1926 it was reported that two manufacturers alone had spent more than $3 million on advertising. In 1924 a dentist noted that:

One can not pick up a periodical of any kind today whether it be a daily paper or a monthly magazine and scan the list of advertisements without finding one or more relative to the use and efficiency of tooth powders and pastes. Ten or fifteen years ago the number was very limited.
Toothpaste ads were ubiquitous and a general readership would encounter slogans selling not just particular products but also very specific messages of oral hygiene in virtually every kind of periodical imaginable.

In the period from 1910 to the 1930s, American dentistry experienced rapid growth. From 1910 to 1920 the number of dentists increased by 40%, while the population only grew by 15%. Oral hygiene became part of public culture as Americans of the early twentieth century became increasingly aware of the necessity of cleaning their teeth. By 1924, 20% of the American population used a toothbrush. Most families could not afford more than one toothbrush and shared brushes were common practice until the nylon brush was invented in the 1930s. By the 1940s toothbrushes were affordable for everyone. If we want to understand the emergence of oral hygiene and preventive dentistry in public contexts, 1910-1950 is a key period. In this period oral hygiene was not yet a matter of course to the average American, so preventive dentistry became central in the discussions of a growing profession of dentists. Issues of oral hygiene were advocated and discussed by dentists, toothpaste manufacturers and hygienists alike.

**Battlefields, Bathrooms, and Ballrooms**

In the first decades of the twentieth century, two main types of toothpaste ads can be identified: ads selling beauty to women and ads selling honor and glory to Americans. The latter appeared during the Great War when the newly established U.S. Army Dental Corps (1911) and U.S. Navy Dental Corps (1912), were stationed abroad. The corps of dentists were clear-cut heroes of the toothpaste ads of the time. The oral hygiene of the army was presented as the chief means to victory in battle, and the beautiful smiles of the American soldiers as a national pride equalling the American accent and the American uniform. In ads such as “American Teeth Impress Our British Allies” (fig. 1), and “The Government is spending Millions to save the teeth of our men”, S.S. White toothpaste was presented as a national symbol. In these ads, political propaganda was mixed with praise of the products. In the ad “American Teeth Impress Our British Allies”, the impressive teeth of the American soldiers are presented as a result of cooperation between S.S. White and the American government. The argument of the ad is summed up in the illustration that is titled “Final Inspection Before Embarking for Europe” and shows two rows of soldiers standing at attention. The senior officers inspect them by grabbing their jaws, opening their mouths and examining their teeth, much like prize horses are examined on an animal show or a market. The message is clear: just like horses,
soldiers are judged by their teeth. Strong teeth mean good health and a strong soldier. Thus the title “American Teeth Impress Our British Allies” gains a wider significance; it is not only the enemy that falls back when confronted with the American army – even the allies must bow to the Americans. The teeth are something to be proud of; they are “a distinctive mark of the American – as distinctive as his uniform or his slang.” Thus white teeth were established as a national symbol on a par with the American language and the American Uniform.

While some toothpaste ads build on war propaganda, others were aimed at housewives far from the front. In the advertisement “Exquisitely Dainty” from 1912, a beautiful woman is shown in a long robe, preparing to brush her teeth with Sanitol toothpaste. Though the ad was in black and white, the reader was assured that this was a colorful woman: “Bright eyes, rosy cheeks, coral lips – and now for the final touch to unspoiled beauty – glistening white teeth.” The setting was a luxurious bathroom – a popular backdrop of the Sanitol toothpaste ads of this decade. In these kinds of ads, the information about the product was scarce; it was the smiling ladies and the promise of youth and beauty that was supposed to sell the product.

In the 1920s the setting of the toothpaste ads changed from bathroom to ballroom, and the textual information of the ads increased. The ads featured illustrations or photographs of men in tuxedos and women in fur coats and pearls at lavish dinner parties, in dance halls or at card tables. Beauty stemming from glistening white teeth was now presented as the path to acceptance into high society. White teeth equalled class and style. Slogans such as “Pearls in the Mouth” and “For Dainty people – For Beauty Lovers” underlined the exclusive and fashionable touch of toothpaste, whereas sentences such as “Wherever dainty people gather, you see glistening teeth today” pointed to the social aspect of oral hygiene.

The ad “The Era of Whiter Teeth” from 1924 is a perfect example of the “high society atmosphere” of the ads of the 1920s:

Have you noted in your circles how glistening teeth have multiplied in late years? It is so now in nearly every circle, in nearly every country. And it means a new dental era. A new method of teeth cleaning has come into vogue […] According to the manufacturer Pepsodent, oral hygiene had “come into vogue”; one’s choice of toothpaste brand was now about fashion and style. The audience of these ads was elegant women from the upper class. In the 1920s toothbrushes were still not affordable for everyone.

By the 1920s the mentioning of “science” had become a regular feature in toothpaste ads. Pepsodent frequently used sentences such as “A scientific tooth paste based on modern research. Leading dentists the world over now advise it.” Pepsodent advertised four scientific advantages of Pepsodent compared to other toothpastes: Two new methods for combating film on teeth; control of starch deposits on teeth; an increase of the salivary flow protecting the teeth; and neutralization of acids by rendering the saliva alkaline. In most of Pepsodent’s ads, film was declared to be “the great tooth enemy”, since “It holds food substance which ferments and forms acid. It holds the acid in contact with the teeth to cause decay. Germs breed by millions in it. They, with tartar, are the chief cause of pyorrhea.” Similar arguments can be found in Sanitol’s advertisements from the same period. Sentences like these were clearly inspired by the theory of caries developed by Miller, but it is too simple to assume that Pepsodent and Sanitol presented Miller’s theory of caries with scientific impartiality. In fact, the toothpaste manufacturers added details and omitted others in order to convince the consumers that their product was superior to others on the market.

The Depression and Scientific Proof

A brisk discussion on the merits of ads took place among dentists during the 1920s. Among other things, companies advertising dentifrice were criticized for “humbugging a credulous public.” Following these discussions, the dental manufacturer The Western Company launched a new campaign selling their toothpaste
Dr. West’s. According to this campaign, humbug and “guesswork” were eliminated, as Dr. West’s, for the first time in the history of toothpaste, presented the consumer with scientific proof of its cleansing power:

For the first time in history, to the best of our knowledge, a toothpaste gives you in advance, exact proof of its cleansing power and safety. Not claims and opinions. You’ve seen lots of those. But, in the case of Dr. West’s, scientific proof – from actual laboratory tests on normal human teeth.51

The scientific proof consisted of photographs of teeth taken before and after the use of Dr. West’s toothpaste (see fig. 2 as an example), and a report included in the toothpaste package, in which it was claimed the reader would find results of university laboratory tests conducted by “a leading research scientist”.52 According to The Western Company, the tests proved that Dr. West’s did not scratch the enamel. Dr. West’s dissociated itself from other toothpastes, which, according to The Western Company represented nothing but guesswork and pretty girl pictures. In the ad “FACTS or Pretty Girl Pictures: Which do you want, as an aid to wise choice of a dentifrice to clean teeth safely?” The Western Company stated that: “We agree with you that the smiling face of a pretty girl is nicer to look at than laboratory photographs of human teeth. But the sweet young lady cannot tell you what a Tooth Paste will do for your teeth” 53

Thus the discussions on fraudulent advertising entered the advertisements themselves. Dr. West’s benefited from the criticism professional dentists had aimed at the advertising toothpaste industry during the 1920s, by claiming to replace pretty girl pictures, humbugging and guesswork with scientific facts.

The campaign was launched during the Great Depression of the early 1930s and the issues of finance and unemployment were included in the campaign. Not choosing Dr. West’s toothpaste was compared to gambling54, and the readers were warned that “One bad impression on someone may be costlier than you can possibly estimate,”55 alluding to the problems of getting a job. The Western Company stressed the importance of not cutting in the toothpaste budget when trying so save money.

Selling Toothpaste in the 1940s and 50s

The importance of toothpaste for getting a job was kept in focus during the 1940s, when white teeth were presented as the way to fame and fortune in career. However, this was done in a way more romantic way than in the 1930s. The advertisements of the 1940s did not allude to the fear of losing a job or not getting a job in the first place, as was the case with the advertisements of the early 1930s. In the 40’s it was a question of getting the right job, ensuring fame and fortune or love. Whereas the advertisements of the early 30s often featured men worried about their job prospects56, the advertisements of the 40s primarily featured stories of women with successful careers.57 And whereas the advertisements of the Great War
had presented tooth paste as a source of national pride, advertisements during the Second World War presented toothpaste as a necessity and gave advises on how to ration it. On the other hand, humor entered the scene in the advertisements of the 40s and 50s. Bob Hope made fun of the army in advertisements for Pepsodent toothpaste on his popular radio show. Thus, in the 40s and 50s, movie and radio stars competed to attract attention to certain brands of toothpaste. During the 40s and 50s, ads featuring manufacturer-sponsored contests with prizes gained ground, and from the late 30s and into the 40s and 50s, cartoons told stories about young people who fell unhappily in love, but had their fortunes improve when their dentists presented them with Pepsodent or Dr. West’s Double Quick toothpaste.

Discussion and Conclusion:
Sex, Success, Protection & Toothpaste

When Americans of the early twentieth century encountered oral hygiene in advertisements in popular periodicals, it was not health or prevention that were the main arguments. Rather, the toothpaste manufacturers elaborated on shifting versions of the American dream: that anyone, by using the right toothpaste and being aware of the importance of oral hygiene, could obtain anything they ever dreamed of—beauty, jobs, love, fame and fortune or glory in the army in times of war. From the 1910s to the 1950s, oral hygiene evolved from a privilege of the upper class, to a part of the everyday life of all Americans. The rhetoric of toothpaste advertisements changed accordingly, as toothpaste went from being a fashionable and luxurious cosmetic ensuring admittance to high society, to being an everyday necessity that had to be rationed during war time.

There are many things we may learn by including ads in historical studies of popular dentistry. First of all, the image of dentistry found in advertisements differs significantly from the images found in other media. Thus, a study of advertisements provides valuable insights into the popular understanding of dentistry. Secondly, advertisements have been a crucial part in advancing new topics in dentistry such as oral hygiene, as a public concern. Thirdly, a study of ads, and dentists’ discussions of ads in professional journals can provide valuable insights into the dynamic interrelationship between popular images of a profession and professional reflections on orchestration of popular imagery.

So far, no one has attempted to answer the question of how dentists have reacted towards representations of their profession in popular media, and how the profession of dentistry has been affected directly and indirectly by popular representations and accounts. Advertisements provide opportunities for such a study. Throughout time dentists have acted and reacted to ads. Thus ads have advanced discussions on specific topics, such as the public promotion of preventive dentistry. Ads have ignited self-reflection among dentists, influencing how they have presented themselves, their profession, and their task, altering their practices, and all this ultimately affects how they have behaved towards patients.

Acknowledgements

With thanks to PHIS, the Danish research training program of Philosophy, History of Ideas and History of Science, whose travel grant allowed me to visit the ADA library and attend the 59th annual meeting of the American Academy of the History of Dentistry.

References


7. Ibid., Ads #BH2376 and BH2384.

8. Ibid., Ads #BH2182 and BH2384.

9. Ibid., Ads #BH2188, BH2376, and BH2383.


13. In 1936 the magazine *Our Navy* featured toothpaste ads in which beautiful women in swimsuits were flanked by jaunty language and sailor slang. In women’s magazines the emphasis would be on women having success in their career, love or family life. See for example Ad*Access On-Line Project - Ad #BH2174, BH2176, BH2215, and BH 2358, John W. Hartman Center for Sales, Advertising & Marketing History, Duke University Rare Book, Manuscript, and Special Collections Library. [http://library.duke.edu/digitalcollections/adaccess/](http://library.duke.edu/digitalcollections/adaccess/)


16. Ibid., Ads #BH2188 and BH2347.

17. Ibid., Ads #BH2376 and BH2377.


29. J. S. Ashbrook in the discussion following a paper, published and quoted in McGehee “The Present Status of the Dentifrice Problem”, *JADA,*
1926, 1599-1612.


33. Ad* Access On-Line Project - Ad #BH2407, John W. Hartman Center for Sales, Advertising & Marketing History, Duke University Rare Book, Manuscript, and Special Collections Library http://library.duke.edu/digitalcollections/adaccess/

34. Ibid., Ad #BH2406.

35. Ibid., Ad #BH2407.

36. Ibid., Ad #BH2266.

37. Ibid., Ads #BH2201, BH2337 and BH2342.

38. Ibid., Ad #BH2339.

39. Ibid., Ad #BH2187.

40. Ibid., Ad #BH2201.

41. Ibid., Ad #BH2342

42. Ibid.

43. Ibid.

44. Ibid., Ad #BH2339.

45. Ibid., Ads #BH2381, BH2382

46. For some of the critiques of ads around the 1920s see for example Brody, H. “The Rôle of Dentifrices in the Field of Preventive Dentistry”, *Den Cosmos*, 1925, 67:42-47.


51. Ad*Access On-Line Project - Ad #BH2327, John W. Hartman Center for Sales, Advertising & Marketing History, Duke University Rare Book, Manuscript, and Special Collections Library http://library.duke.edu/digitalcollections/adaccess/

52. Ibid., Ad #BH2329.

53. Ibid., Ad #BH2321.

54. Ibid., Ad #BH2324.

55. Ibid., Ad #BH2326.

56. Ibid., Ads #BH2324 and BH2325.

57. Ibid., Ads #BH2215 and BH2370.

58. Ibid., Ad #BH2348.

59. Ibid., Ad #BH2357.

60. Ibid., Ad #BH2353.

61. Ibid., Ads #BH2336 and BH2376.

Biography

The life of Eustachius (fig. 1) is filled with many contributions to anatomy as a whole. He was born Bartolomie Eustachi (alternately Bartholomeo, and Latinized as Bartholomæus Eustachius) in San Severino Marche in the modern province of Macerata, Italy, some time between 1500 and 1510.4 Eustachius’ father was also a physician, and ostensibly provided him a humanistic background as evidenced by the many books published in Greek, Latin and Arabic which were contained in Eustachius’ library. It is alleged that Eustachius was able to translate his own copy of Avicenna.5 It appears that Eustachius studied medicine at the Sapienza in Rome. Eustachius first shows up in the historical record in 1539 in his home town as a “Fisico.”5 In 1547 he was called to the court of Count Guidobaldo II della Rovere in Urbino. Here he was able to study the other sciences as well as mathematics from the many scientists in the court. After serving as physician to the count, he then became physician to

When one considers the names of those whose affect on dentistry reached far beyond their lifetimes, one may think of Fauchard, Wells, Morton and Black. One name that deserves to be called among the pantheon of the greats is Bartholomæus Eustachius. Eustachius was not the first to study the anatomy of the teeth and jaws, having been preceded by Da Vinci; however, he was the first to publish a treatise devoted entirely to this subject, Libellus de Dentibus, in 1563. As Sir William Osler, the father of modern medicine, stated: “In Science, the credit goes to the man who convinces the world, not to whom the idea first occurs.” The purpose of this paper is to show that Eustachius deserves to be named the father of dental anatomy.

Gregory W. Bennett
Oregon Health and Science University
School of Dentistry, Class of 2010

Mr. Bennett was recipient of the 2009 Bremner Award for this paper.

Correspondence:
Mr. Gregory Bennett
2581 Northeast First Drive
Hillsboro, OR 97124
bennettg@ohsu.edu
his brother, the Cardinal Giulio Della Rovere in Rome, where he lectured on anatomy at the Studio della Sapienza (fig. 2). During this period in his life he conducted anatomical studies on adults, children, stillborn and aborted fetuses, as well as comparative studies on various animals. It was through this meticulous study that Eustachius was able to make his many discoveries, some which still carry his name. While at the Sapienza, Eustachius lectured on “practical medicine”: today, we would likely call it clinical medicine. During his tenure there, he was the first to instigate autopsies on patients that died at the hospital in order to decipher the organic changes caused by disease, making him one of the first pathological anatomists. In 1561 Eustachius left his professorship at the Sapienza likely due to criticism of his work and failing health. His death was recorded as the 27 of August 1574 by Girolamo Rossi saying that “He died while journeying to Urbino at an extreme age and suffering from arthritis. Yet he had wished to go to Urbino to treat Cardinal Della Rovere.”

Published Works

During his lifetime Eustachius published one major work, The Opuscula Anatomica, which was composed of smaller works notably, A Little Treatise on the Teeth (Libellus de dentibus). The greatest of his works, the Tabulae Anatomicae was not published until 1714, many of the copper engravings having been misplaced until then.

His name is often heard only in association with the auditory tube, yet in his Opuscula Anatomica, Eustachius was also the first anatomist to accurately describe the adrenal glands. So punctilious was his study, that he was able to discern that they have no connection to the urinary system, and they have their own vascular supply. Aside from the many contributions to general anatomy made by Eustachius, he has had a powerful and lasting impact on dental anatomy.

The Tabula Anatomicae contains two plates out of the 46 that are of concern to dental anatomists. Table 46 (fig. 3) shows the comparison of an ape and human cranium, and table 47 (fig. 4) shows many bones, most notably the maxilla, mandible, along with the permanent dentition.

Dental Anatomy

His work, A Little Treatise On The Teeth, contains 30 chapters that create an exhaustive compendium of dental anatomy. The fastidiousness and completeness of his work is evidenced in the thorough way in which it describes dental anatomy. It begins with a chapter of general information of the teeth, their names, sizes and classifications. Over the following 29 chapters he explains the substance and make-up of the teeth, the attachment of the teeth, the variation in the number of roots, an explanation of the pulp, a chapter on the nerves and vessels to the teeth, a review of the theories of the ancients, a chapter on natal and deciduous teeth and even chapters on anomalies and affictions of the teeth. This overview of dental anatomy is remarkable in its completeness.

In his first chapter he makes the initial discovery that the tooth is composed of two materials, “one like the bark that protects the tree.” This was the first description of the layers of enamel and dentin. In these first chapters he also comments on the discrepancy in the number of teeth attributed to men versus women going all the
Hippocrates seemed to attribute more teeth to men than women and more teeth to longer lived individuals. Eustachius on the other hand thought that there are 32 teeth and “my opinion is that the origin of this disagreement is due solely to the inconsistency in the number of the maxillary (molar) teeth.” One can see how hard it would be to assign a set number of teeth to humans when so many have un-erupted third molars. In addition, he describes the arrangement of the teeth in man as compared to the various arrangements in the animal kingdom. He points out that humans and apes have virtually identical premolars and then describes the variation in occlusal “tables” and the many cusps and fissures to be found. The articulation of the teeth and jaw is then covered wherein Eustachius adds his support to classification of the joint as a gomphosis since the teeth are held in place by the periodontal ligament and not by the gingiva. In addition to the first clear description of the periodontal membrane, Eustachius was the first to clearly describe the dental pulp saying that he did not think that the concavity within teeth to be unnatural as Galen had written.

Eustachius discusses in several chapters his defense of the idea that teeth themselves have sensation, and whence the sensation arises. Eustachius wrote, “I do not have any clear proof but I am never the less inclined to think that the nerve, which penetrates into the concavity, branches off into tiny filaments that become intermingled with the inner substance of the teeth.” Here he shows his incredible skill for deductive reasoning. He also presented the common theories of the day: Galen thought it was the nerve connected to the root, and Aretaeus believed that the teeth had an innate heat allowing for life and sensation, but that only the gods could know the correct answer, and man could do no more than make educated guesses.

Another instance of Eustachius’ astute deduction was in his statement that the tooth buds of the permanent molars, though not visible upon dissection of a fetus, must be present as the other tooth buds were in some imperceptible form. Here he attempts to dispel the myth that “milk” teeth are nourished by and arise from the mother’s milk, and also that permanent teeth arise from the roots of deciduous teeth. In his final chapters, Eustachius also attempted to dispel the pervasive myth that a woman would lose a tooth for every pregnancy since he failed to find a biological reason for it.
Conclusion

The science of dental anatomy owes a great deal of gratitude to Eustachius for his enormous impact. His work on the teeth gave us our first thorough look at dental anatomy and even offered some insight on treatment of disease. We can only speculate the impact his treatise may have had on the development of dentistry and dental science. His work was published over 200 years prior to John Hunter’s Natural History of Human Teeth. The lack of any translation from the Latin into French, German or English prevented this work from reaching a larger audience. In addition, the lack of detailed drawings, as had been employed in his other works, is unfortunate. His treatment ideas were ahead of his time, for periodontal disease he recommended the removal of calculus as well as curettage of granulation tissue. Due to his innumerable contributions to the study of dental anatomy, Bartholomaeus Eustachius should be named the “Father of Dental Anatomy”.

References


Dental Postcards XLII

Collected and analyzed by:
Arden G. Christen, DDS, MSD, MA
Joan A. Christen, BGS, MS
Indiana University School of Dentistry

“Cheer Up, I’m ‘Pulling’ For You Here!”

(front of card)

“Linen” postcard circa 1945, 5 1/2 x 3 5/8 inches

Correspondence:
Dr. Arden G. Christen
Professor Emeritus, Dept. of Oral Biology
7112 Sylvan Ridge Road
Indianapolis, IN 46240-3541
Phone: (317) 849-1152
Fax: (317) 284-1168
achriste@iupui.edu
The 1930s and 1940s ushered in an exclusive American postcard production process called “linens,” which created a textured paper surface that resembled quality linen fabric. The effect was achieved by adding a high content of rag into the cardboard paper itself. This brightly-colored lithographic “linen” postcard was produced by the E.C. Kropp Company of Milwaukee, Wisconsin.

The scenes on its mustard-yellow background illustrate the progressive phases which result in the making of a dentist. In the initial picture, the little terror engages in his favorite sport, pulling his cat’s tail; in the next illustration, the elementary school trickster maliciously twists and pulls the long hair of his startled female classmate in the desk in front of him; then, the “wheeler-dealer” teen slickly pulls his obstreperous father’s leg, conning him into handing over a few bucks; subsequently, the thickly bespectacled dental school nerd sports a molar logo emblazoned on both his sweater and his school flag, as he “pulls” for his alma mater. Finally, the full-fledged clinical dentist, still wearing the oversized glasses of his varsity days, gleefully pulls his patient into toothlessness (Can he actually see what he is doing?).

In the first, second and fifth vignettes, the recipients of the aggressor’s mean spirited actions all protest in agony: the terrorized, hackled, spitting, clawing cat hisses a wild “YEOW – OW” as the gleeful toddler laughs with excitement; the owl-eyed girl sees stars, as the perpetrator mischievously winks; and the elderly, traumatized dental patient, with his right hand defensively clasping his now toothless mouth, exclaims, “LIAR – O – OW!” As he absorbs the excruciating pain, the newly edentulous fellow spits huge drops of projectile blood and fiercely envisions spurting, crimson stars.

In total contrast, the manic, self-absorbed dentist is entirely oblivious to his patient’s distress and boastfully declares, “Didn’t hurt a bit.” Flaunting his success, he raises his extraction forceps and displays a large molar with its three bloody roots still shedding themselves of their tear-shaped droplets.

From beginning to end, these tongue-in-cheek progressions of the subject’s deeply etched character flaws deliver a comical sequence of a dentist in the making. “One Pull After Another”—from pulling tails and pulling hair, to pulling teeth.
Tweed’s Liniment

S.E. Tweed of Lowell, Massachusetts produced Tweed’s Liniment, and chose stock cards depicting African-American farmers to promote the product. It would be difficult to find another trade card so small which offered such a variety of quack claims. Tweed’s Liniment purportedly cures diseases of man, cattle, horses and even “Mange in dogs.”

“Cures on Man” included claims to heal rheumatism, neuralgia, stiff or swollen joints, headache, toothache, cuts, bruises, scalds, sprains, swellings, stiff neck, lame back, chapped hands or face, contracted cords, soft or hard corns, bunions, lumbago, eruptions, chafings, hives, catarrh, nettle rash, frost bites, sore throat and piles.

Cures for cattle and horses included everything from spavin and thrush to sore backs, necks, or shoulders, or even ringbone! Mr. T.H. Gardner offered, “Its power is so great that you fall in love with it at once.” One wonders what Tweed’s Liniment could not cure! What ingredients did such a marvelous product contain?

Analysis by the American Medical Association showed Tweed’s Liniment to be essentially a water-alcohol solution of chloroform, ammonia, turpentine, sassafras oil, and fixed oils. Tweed’s Liniment was reported in Nostrums and Quackery by the American Medical Association to have had a judgment brought against the proprietors on April 10th, 1918, for false and fraudulent advertising, by prosecution under the Federal Food and Drugs Act of 1906. They were fined $10. Despite the penalty, this particular quack medicine was still considered a necessity by the US Army in 1921. In the Cavalry Journal, a 300 mile endurance race was reportedly won by Major Stanley Koch. He described the equipment that he and the other participants held in their saddle bags:

The equipment we carried was practically the same. The saddle was a Saumur type field officer’s saddle, with pommel and cantle pockets. In the pommel pockets we carried a supply of white rock, already soaked up and wrapped in canvas to protect the other articles in the pockets. In one side I carried a bottle of Tweed’s liniment and four bandages, to be used as wet bandages. In the other pocket I carried a bottle of iodine and a supply of white lotion tablets, two empty bottles to mix up the white lotion, and Tweed’s liniment and four fitted horseshoes[...]

Dr. Croll is in private practice in pediatric dentistry in Doylestown, PA. Dr. Swanson is a dental historian.
(front of card)

(Reverse of card)
From the Archives: Vol. 2, Nos. 5 & 6

Volume II, No. 5

May 1954

BULLETIN OF THE HISTORY OF DENTISTRY

official monthly publication of
American Academy of the History of Dentistry

ANNUAL MEETING OF A.A.H.D.

The third annual meeting of the American Academy of the History of Dentistry is scheduled for Friday, November 5. A business meeting will be held at 10 a.m. The scientific session convenes at 2 p.m. and there will be a dinner meeting at 6:30 p.m. The guest speaker and program of the scientific session will be announced later. The Friday date was chosen in place of the usual Saturday to avoid conflict with other meetings.

VINCENZO GUERINI, DEAN OF DENTAL HISTORIANS

Dr. Faggart, secretary of the A.A.H.D., has received from Vincenzo Guerini a letter accepting election to honorary membership in the Academy. The text of the letter follows:

It is with a deep sense of gratefulness that I wish to express my sincere thanks to the illustrious American Academy of the History of Dentistry and to you personally for having informed me of my election as an honorary member of the said Academy.

The courteous acknowledgement of my merits constitutes for me a great and longed for recompense to the enduring efforts I made in the study of the history of Dentistry.

Will you please, dear Secretary, accept with the President and fellow-members of the Academy my cordial expressions of my profound appreciation.

Dr. Luigi Casotti is preparing a biographical sketch of Dr. Guerini, to be read at the Miami meeting of the A.A.H.D., Dr. Asbell reports, and a file of papers concerning the distinguished historian. Some of this material is promised for the Bulletin.

A HISTORY OF INDIANA DENTAL COLLEGE

Dr. Jack D. Carr, of the faculty of Indiana University School of Dentistry, is preparing a "History of the Indiana Dental College from 1879 to 1900."


The somewhat devious administrative history of the school in the early years will be traced in detail.
LINDBERGH GIFTS TO MUSEUM

General Charles A. Lindbergh has contributed to the Museum of Columbia University School of Dental and Oral Surgery a sum of five hundred dollars, representing the Pulitzer Prize which he received for his autobiography. Dr. Proskauer, the curator of the Museum, also reports that Gen. Lindbergh, two years ago, presented the Museum with an upper denture constructed by Dr. Charles Land, of Detroit, Gen. Lindbergh’s grandfather, and with other instruments and belongings of this well known dentist. Dr. Land is remembered as the originator of the porcelain jacket crown.

FURTHER INFORMATION REGARDING THE TOOTHBRUSH

From Dr. Curt Proskauer come additions and corrections to the short article on the origin of the modern toothbrush in the April number of the Bulletin. In a letter to the editor, Dr. Proskauer writes as follows:

I would like to tell you that I have found much earlier pictures and photos of toothbrushes than those mentioned in the Bulletin.

I had published in an article on “Oral Hygiene in the Medieval Occident” in Ciba Symposia in November 1946 the—as I suppose—first picture of the first toothbrush, invented in China on the 25th of June, 1498. This woodcut is contained in the Lei Shu Ts’ Ai T’u Hui, the Chinese encyclopedia of 1609. I took the picture from Franz M. Feldhaus: Die Technik der Antike und des Mittelalters, Wildpark-Potsdam, 1931, p. 65. This toothbrush, similar to ours, has bristles standing at right angles to the handle. In case you do not know my article I would suggest to write to Ciba Pharmaceutical Products, Summit, New Jersey, asking for a copy of vol. 8, Nov. 1946, no. 8. I, myself have now only one copy so that I am sorry not to be able to send you one.

Another picture of a double ended toothbrush with bristles standing at right angles is to be found in a popular booklet of the year 1790: Girault, J., Die gute Mutter, oder Abhandlung von den...Mitteln, seinen Kindern...ihre Zähne ihr ganzes Leben hindurch zu erhalten. Braunschweig, 1790.

The third one older than the ones mentioned in the Bulletin are two toothbrushes contained in a travelling-box of the “Herr I. F. von Hoensbroech, Domherr zu Münster und Hildesheim” made in 1803. It is to be found in the Germanisches National-Museum, Nurnberg. A similar one was published by T. G. H. Drake in the Journal of the History of Medicine and Allied Sciences, 2:48-50, 1947: Tooth brush set, silver, London, 1799.

May I add that the copper plate of the girl with a toothbrush is not to be found in the 1812 edition of Joseph Lemaire’s Le dentiste des dames, this picture is only in the second (1818) edition of this very nice work.
BULLETIN OF THE HISTORY OF DENTISTRY

official monthly publication of
American Academy of the History of Dentistry

DR. REHWINKEL AND OTHER OHIO DENTISTS

"Reminiscences of Early Chillicothe Dentists" is the title of an article by E. C. Mills in the Journal of the Ohio State Dental Association (28:84-93) for May 1954. The article is particularly concerned with the career of Dr. F. H. Rehwinkel, who was nationally prominent in the profession during the seventies and eighties. Dr. Rehwinkel was largely influential in the adoption of the term pyorrhea alveolaris by the profession about 1885, having taken it over from the German literature.

PRIMITIVE DENTISTRY


DENTISTRY FOR CHILDREN

Luigi Casotti has contributed an article entitled "Stomatologia infantile del passato" (children's dentistry of the past) to Minerva Stomatologica 3:43-44 Jan.-Feb. 1954. It is mostly concerned with the history of difficult dentition.

MORE ABOUT THE TOOTHBRUSH

"The New York Academy of Medicine has a copy of an advertisement in form of a handbill by Josiah Flagg, Jr., printed in 1795 which shows at the right upper corner two toothbrushes with bristles at right angle to the handle. One year later, in 1796, Flagg used the same toothbrushes (in reverse direction) for another advertisement.

"Consequently," writes Dr. Curt Proskauer, "we have also proof for the existence of this kind of toothbrushes in America already in the middle of the last decade of the 18th century."

HISTORIAN OF FLORIDA STATE SOCIETY BECOMES ITS PRESIDENT

Robert Thoburn, a member of the A.A.H.D. and historian of the Florida State Dental Society, has been elected president of the society. A biographical note appeared in Journal of the Florida State Dental Society (25:4-5 May 1954) with portrait.

WHO WAS VERGANI?

An inquiry has come to the editor requesting information concerning Angelo Maria de Vergani, surgeon-dentist to His Majesty the King of Holland. The latter was probably Louis, brother of Napoleon Bonaparte, who reigned from 1806 to 1810.
A NEW HISTORY OF DENTISTRY IN BRAZIL

P/ AO (Atualidades Odontologicas) No. 7, Jan. 1954, has announced the plan of a new history of dentistry in Brazil, to be entitled "Historia e Evolucao da Odontologia no Brasil." The work, when finished, will consist of twelve sections as follows:
1. preface; 2. history of Brazilian dentistry from the earliest times to the present; 3. biographies of dentists of the past; 4. dental associations; 5. dental schools; 6. dental bibliography; 7. dental congresses and meetings; 8. public dental services; 9. dental legislation; 10. biographies of contemporary dentists; 11. dental commerce and industry; 12. dental laboratories.

HISTORY OF TREATMENT OF FRACTURES

P/ An article, "Recherches historiques sur les traitements de contention des fractures du maxillaire inferieur avant Claude Martin" (Historical researches on methods of stabilizing fractures of the mandible before Claude Martin) appears in the May-June 1954 issue of Annales Odonto-Stomatologiques (11:123-152). The author is Francois de Mourgues.

THE DENTIST'S LABORATORY ABOUT 1830

P/ The dentist's laboratory in the early nineteenth century was a veritable factory workshop. A typical example is that of the distinguished Parisian dentist, Maury, pictured by Magis about 1830. The laboratory shown in the lithograph is a spacious room well lighted by two large windows facing the observer with a forge prominent on the right hand wall. By the windows are a jeweler's worktable, a lathe and a smaller table presumably for plaster and other such work. The floor is of tile--the part under the worktables with cup-shaped tiles to catch filings which might contain precious metals. Prominent in the foreground are the anvil, standing before the forge, the wire draw, the rolling mill for metals and the grindstone. Along the left hand and back walls are racks of tools and on the right wall behind the forge are shelves with containers for plaster, porcelain and other materials. Three technicians besides the dentist himself are shown in the picture.

None of this laboratory apparatus was constructed especially for the dentist. Among the smaller tools which cannot be clearly distinguished, were doubtless many from various crafts such as those of the goldsmith, jeweler, mounter, locksmith, turner, wire drawer, founder, watchmaker, cutler, carver, potter, enameler, goldbeater and stationer. Among those tools may be mentioned pliers, callipers, shears, mallets for swedging, hacksaws, hammers, drills, scribers, vises, enameler's lamp, the grinding mill and furnaces for enameling or making porcelain teeth.

The picture of Maury's laboratory, which was published by G. Dagen in his Histoire de l'Art Dentaire, p. 218, was from the collection of prints owned by G. Viau. The editor of the Bulletin would like to know where there is an available copy of this lithograph, from which a photograph can be made.
In earlier times, it was necessary to build a small mount of sand or dirt to raise and stabilize a golf ball for a proper drive. Since this procedure had a few inconveniences (including the dirt involved), many golfers, both in Europe and the US, developed different gadgets to replace the mound. Some of these inventions were patented and manufactured. The materials used included rubber, metal, cardboard and wood. One of the earliest inventions was patented in the U.S. by David Daiziel of Glasgow, Scotland. Several other inventors followed soon after with their own designs and materials.

One of the most successful and best known was U.S. Patent 1493687 (patented May 13th, 1925), belonging to a New Jersey dentist, William Lowell, Sr. This tee, made of wool, was originally dyed green; later, the color was changed to red, and Lowell called it the “Reddy Tee.” Dr. Lowell signed a deal with the A.G. Spalding Co. in 1922 for the manufacturing of 288 tees. By 1925, $100,000 worth of tees, now made from celluloid, were being sold. The tees were widely accepted and easy to manufacture, but unfortunately also easy for others to copy. Competitors’ versions soon flooded the market, and Dr. Lowell and his son were forced to spend a great deal of time fighting these patent infringements. A set of stamps were printed in Ireland on the theme of golf, showing the tee in use. (Scott #839 and #840)
Book Shop

**A History of Dentistry in the US Army to World War II**

By John M. Hyson, Jr., Joseph W.A. Whitehorne & John T. Greenwood
890 pages hardcover

Dental health has been a core requirement for soldiers since the earliest military history. When the muzzle-loading rifle made strong teeth critical to the operation of weapons, dentistry as a profession did not yet exist to assure this element of soldier fitness. This book documents the reciprocal influence of the maturation of the dental profession, and establishment of Army dental care programs. The theme of symbiosis of civilian and Army dentistry defines this period of dentistry's history, in this well-illustrated volume, written by three accomplished historians. The project took over ten years and was initiated and supported by the Office of the Chief of the U.S. Army Dental Corps, and sustained during the tenures of five of the men who occupied that position.

Copies are available ($79) from the US Government Printing Office (http://bookstore.gpo.gov). Use the search function where the subject, title, first author (Hyson), Stock Number (008-023-00137-5) or ISBN (9780160821592) can be entered to locate the book. PDF file version will be available for download by May 2009 at the publisher's website (The Borden Institute).

**Limericks With A Smile:**

*Dental, Oral and Facial Limericks of Yesterday and Today*

by Joan A. Christen, BGS, MA & Arden G. Christen, DDS, MSD, MA

The authors have compiled 188 previously-published limericks related to dental, oral and facial themes; plus they offer an additional 384 personally-composed limericks. The humorous verses in this collection are at once bawdy, whimsical, ludicrous and cynical, and though simple in format, they communicate in few words their strong, sometimes paradoxical message. 159 pages with complete index.

Price: $20, postage paid. Available from: Dr. Arden G. Christen, 7112 Sylvan Ridge Road, Indianapolis, IN 46240-3541 (US check only)

**Intriguing and Eccentric Characters & Stories from the World of Dentistry**

By Arden G. Christen, DDS, MSD, MA & Joan A. Christen, BGS, MS

In this 230-page book, the authors have glimpsed into the lives of 32 dental characters: professionals who range from the noble to the bizarre. Introducing this work is a chapter on one of the most memorable and controversial characters of all time, Dr. Painless Parker (1872-1952). All of these fascinating individuals have left indelible marks on their chosen profession. The stories from this collection may be inspiring or infuriating, ingenious or absurd, credible or questionable—but seldom are they dull.

Price: $20, postage paid. Available from: Dr. Arden G. Christen, 7112 Sylvan Ridge Road, Indianapolis, IN 46240-3541 (US check only)

**A Little Treatise on the Teeth:**

*The First Authoritative Book on Dentistry (1563)*

by Bartholomaeus Eustachius
Edited by David A. Chernin, DMD, MLS & Gerald Shklar, DDS, MS

One of the greatest anatomists of all time, Eustachius' major studies remained unknown until their eventual Dutch translation and publication in 1714. Eustachius contributed substantially to the development of dental science. His conceptual advances concerning tooth development and function, based on anatomical dissections, were further buttressed by detailed plates of the musculature of the face, floor of the mouth, the neck, the tongue, and the roots and crowns of the teeth. In addition to giving us the first clear description of the dental pulp and root canal, Eustachius also conceived of the periodontal membrane as a gomphosis.

This volume presents the first direct English translation from the original Latin *Libellus De Dentibus*, and maintains the Latin and English texts on facing pages. Eustachius' observations are an illuminating precursor to 21st-century medical science, and still represent a timely and relevant reference for any practicing dentist.

Membership Application

Name
Street Address
City
State/Province
ZIP/Postal Code
Tel#
Fax#
E-Mail
Dental School of Graduation
Specialty
Academic Appointments

☐ Check here if you want your name and contact information made available online for other AAHD members.
☐ Check here if you DO NOT want your name and contact information made available online for other AAHD members.

Please indicate any special interest in dental history:
☐ Rare Books
☐ Antiques/Instruments
☐ Teaching
☐ Literature
☐ Arts (fine arts)
☐ Technical Innovation
☐ Other: ______________

☐ North America
☐ South America
☐ England
☐ France
☐ Germany
☐ Other: ______________

☐ Pre-1500
☐ 16th & 17th Century
☐ 18th Century
☐ 19th Century
☐ 20th Century

Renewal Dues
Lifetime Membership $1000 one-time payment
Regular Membership $65 per year
Foreign Membership $75 outside USA
Student Membership $40 per year

Contributions to the AAHD 21st Century Fund: $ __________

All contributions are tax-deductible within the US

Total: $ __________

Visa & Mastercard Accepted
Card Number: ____________________________
Expiration Date: ________________
Security Code (3 digits): __________

Signature: X ________________________________

Please complete this application form and mail or fax it with payment to:
Dr. Marc B. Ehrlich
1371 Beacon Street
Brookline, MA 02446 USA
Fax: (617) 278-6593

Checks (mailed applications only) should be made payable to the AAHD. All registration forms must be accompanied by payment, which may be made by credit card, US Money Order, US Bank Draft or check drawn on US Bank. Registration forms not accompanied by appropriate payments as outlined will not be considered as confirmed until full payment is received.
Instructions to Authors

Correspondence

The Journal of the History of Dentistry (JHD) is the official publication of the American Academy of the History of Dentistry (AAHD). Address all manuscripts and related correspondence to: David A. Chernin, DMD, MLS, Editor, Journal of the History of Dentistry, 284 Harvard St., Brookline, MA 02446 USA. Email: editor@histden.org. Note that email is the preferred means of correspondence concerning the JHD.

General Policy

Manuscripts to be written in English (American spelling preferred) and should be original material that has not been submitted for publication elsewhere. Manuscripts previously published in any part or form in another publication are considered at the discretion of the Editor. The Editor will acknowledge receipt of the submitted manuscript; and at the conclusion of the review procedure, the author(s) will be notified of 1) acceptance, 2) need for revision, or 3) rejection. Upon acceptance, all rights to the manuscript must be transferred to the AAHD. Each listed author must agree that the AAHD holds proprietary rights in the accepted manuscript including all copyrights. Author(s) must sign a letter of transmittal to the JHD. No material published in the JHD may be reproduced elsewhere without the express written permission of the Editor prior to reproduction. The paper becomes the exclusive property of the AAHD when accepted for publication.

Submission Format

The following instructions are necessary to minimize JHD formatting expenses to the AAHD and to ensure a uniform, professional editorial style throughout each issue and continuity from issue to issue. The preferred medium for manuscript submission is as a Microsoft (MS) Word document (with .doc extension) along with high-resolution electronic images of related figures (if any) attached to an email message addressed to editor@histden.org. In addition, one paper copy of the manuscript, double-spaced, is to be mailed to the editor at the above address. Alternatively, the paper can be submitted as a MS Word document on a CD or USB flash drive along with electronic images, and one paper copy. Manuscripts should be submitted in Times New Roman typeface. Authors should retain copies of all materials submitted. All pages, including the Title Page and Table and Figure legends, are to be numbered consecutively in the bottom right-hand corner. Whenever possible, the text should begin with an Introduction and end with separate Discussion and Conclusions sections. For clarity of presentation, logical subheadings should be used wherever possible. The last elements of the text should appear in the following sequence: Acknowledgements, References, Bibliographic Works Cited, and Bibliography. Papers with running footnotes on individual pages will be returned to the author(s) for revision prior to receiving further consideration.

Title and Author

The first page should list the title of the manuscript with the first letters of the main words capitalized. The title should not have more than ten words. This is followed by the name(s) of author(s), including first name(s), academic degree(s), the institutional affiliation of each author, and a short title of not more than 45 characters. In instances of multiple-authorship, indicate the author and address designated to receive correspondence. The first page should also include reference to any grant support information that requires acknowledgement, and whether the paper is based on a thesis submitted as a requirement for an advanced degree program.

Abstracts

The second page should contain an abstract of no more than 200 words. This abstract should be factual and summarize reason(s) for the study, the main findings, and the principal conclusions. Include four to eight keywords for indexing purposes.

References

References should be listed at the end of the paper, typed, double-spaced, and numbered sequentially. When citing a reference in the text, follow these examples: Smith and Jones (1980) found... Use et al. when the work cited is by three or more authors. When the cited work is by two authors, use both surnames separated by “and” or “&.” List all authors if there are three or fewer; when four or more, list the first three, followed by et al. In general, abstracts, internal reports, or other incomplete or inaccessible materials are not acceptable references. References to private communications should be used sparingly.

Sample References


Abbreviations

If other than English abbreviations are used, they must be defined with first use: i.e., American College of Dentists (ACD).

Tables

Tables should be typed one-to-a-page and numbered consecutively. Each table must have a title. Explanatory captions are to be used whenever possible to eliminate a separate “Remarks” section. References in table captions are cited in the same manner as in the text. Tables must be self-explanatory so that the reader will not have to consult the text to understand the captions. Additionally, all tables should be provided as figures in electronic format as discussed below.

Illustrations

Within the text, all tables, graphs, drawings, maps, photographs, scans, etc. are to be referred to as figures (abbreviated as Fig). An original and two photocopies (or an original and a scanned image) of each figure must be submitted without sequence number or letter on the area to be reproduced. All figures must be provided as separate electronic files (on disk or as email attachments) in JPEG, TIFF, or BMP format, of at least 300dpi (dots per inch) resolution. If the author does not have images in electronic format, most copy centers will scan images for a nominal fee. When preparing figures, it is important to consider the page size of the JHD, and allow for necessary reduction. All lettering must meet professional standards and must be no smaller than 9 point type after reduction. It is important to consider the page size of the JHD, and allow for necessary reduction. All lettering must meet professional standards and must be no smaller than 9 point type after reduction. It is important to consider the page size of the JHD, and allow for necessary reduction. All lettering must meet professional standards and must be no smaller than 9 point type after reduction. It is important to consider the page size of the JHD, and allow for necessary reduction. All lettering must meet professional standards and must be no smaller than 9 point type after reduction. It is important to consider the page size of the JHD, and allow for necessary reduction. All lettering must meet professional standards and must be no smaller than 9 point type after reduction. It is important to consider the page size of the JHD, and allow for necessary reduction. All lettering must meet professional standards and must be no smaller than 9 point type after reduction.

Permissions

It is the responsibility of the author(s) to provide copies of letters granting permission for the reproduction of all figures.

Legends

Where legends (not to be confused with captions) are required for tables, graphs, and certain other figures, they must be included within each figure and the corresponding electronic file. Any abbreviations used in the legends must be defined in the corresponding caption for each figure.
“Cheer Up, I'm Pulling For You Here!”