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Contributions, which may deal with any aspect of dental history or bibliography, are invited. The maximum length for original articles is about 5,000 words. Manuscripts should be typewritten with double spacing and wide margins. The Editor reserves the right to make literary corrections. All references should contain name(s) and initial(s) of author(s) and full title of paper or work. Journal articles should also include name of journal, year, volume number and complete pagination, in that order. With books, the city of origin, publisher, date and full pagination should be given.

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Historical Aspects of Blacks in Dentistry

—CLIFTON O. DUMMETT, D.D.S.
Los Angeles, Calif.

There is a need to tabulate events of significance which have occurred during the years of the black American's gradual advancement in dentistry. Although the majority of these occurrences have been separate from similar ones among white dentists, nevertheless they have occurred within the framework of American dentistry, and are as typical of American initiative and enterprise as have been happenings in other spheres of activity.

Although there is a relatively meager amount of literature on the subject, the recording of proper dates has been accomplished from what information is available.

The selection of exactly what is or is not significant is always a difficult undertaking. It is further complicated by the debatable distinction between significance to an event or to a total concept. In addition, the interrelationships of dental, medical, hospital and public health practices help to complicate the picture. Pertinence, relatedness, precedence, consequence and originality have been the criteria of selection.

Three general periods may be distinguished as characteristic of the history of blacks in dentistry. They are:

Phase A. 1740-1900. The phase during which there was acceptance of dentistry only as a tolerable mechanical vocation.

Phase B. 1900-1935: A second period during which there was an espousal of hazy educational and administrative policies. There were definite indications of the need for preparation to achieve medical professional status.

Phase C. 1936 to present: A third phase during which there has been a gradual recognition and acceptance of dentistry as a vital health service with distinct social aspects.

BLACK DENTISTS IN THE EARLIEST DAYS OF THE NATION

This presentation is limited to the first two phases, and an excellent item with which to begin this brief history of blacks in dentistry is the very first reference to the Negro in medicine, and significantly enough, this is to be found in an early account of dental practice. The Pennsylvania Gazette of September 11, 1740 carried an account of a Negro named Simon who was able to "... bleed and draw teeth and pretended to be a great doctor among his people."

A few years later, around 1765, some publicity was given to a native American by the name of Peter Hawkins, "a tooth puller and preacher." He was described as a "rawboned very black Negro riding a very rawboned horse, for his practice was too extensive to be managed on foot, and he carried his instruments, 2 or 3 pelicans, in his pocket." Hawkins
has been credited as being probably "... the first colored specialist extractor on the continent, if not on any continent."

Around 1792, Caesar, a Negro slave, made such a favorable impression with his medical and dental cures with roots and herbs that the Assembly of South Carolina appropriated a sum to purchase his freedom and provide him an annuity of $100.

THE PROFESSION OF DENTISTRY COMES OF AGE

The sketchy accounts available estimate that in 1840 the number of Negroes practicing dentistry in the United States was approximately 120. These were all men who had been apprentices and laboratorians. It is significant to note that this was also the year that The Baltimore College of Dental Surgery, the first dental school in the world was founded by Horace H. Hayden and Chapin A. Harris. (The first dental journal in the United States, the American Journal of Dental Science, had already been established in the previous year.)

In 1849, James McCrummil was reputed to be one of the best dentists in Philadelphia, and Thomas Keenard of the same city did a large portion of the prosthetic laboratory work for dentists in and around Philadelphia. In the same year, John S. Rock of Salem, N. J., was apprenticed to a Dr. Harbert to study dentistry. He finished his studies and went to Philadelphia to practice. Two years later he attracted much attention when he won a silver medal for making artificial teeth. Examples of his work were placed on exhibition by the Benjamin Franklin Institute. In 1856, Dr. Rock left Philadelphia to study medicine in Boston. In that same year he delivered a lecture on "The Unity of the Human Race" before the Massachusetts Legislature. This enterprising man later studied law and in 1861 on a motion of T. K. Lothrop, Esq., Dr. John S. Rock, dentist and physician, was examined in Superior Court before Judge Russell and admitted to practice as an attorney and counsellor-at-law in all the courts of Massachusetts.

In those early years dentistry was also practiced by blacks in the South. In 1857, Dr. Zeke, who had studied in Scotland, practiced dentistry in Savannah. Because of race friction, he was driven from his home. He settled in Augusta where he practiced among both races, serving whites in the day time and Negroes at night.

In 1859, Roderick Badger was practicing dentistry in Atlanta along with a few Negro technicians and mechanics. As a result, the Atlanta Council was formed to protect white technicians from Negro competition. A petition composed by the Council read: "We feel aggrieved, as Southern citizens, that your honorable body tolerates a Negro dentist (Roderick Badger) in our midst and, in justice to ourselves and community, it ought to be abated. We, the residents of Atlanta, appeal to you for justice."

A BLACK DENTIST IN THE RECONSTRUCTION ERA

Records indicate that Dr. Thomas Bayne, a Negro dentist was active in the Republican convention. He was an eloquent and fiery orator, and was regarded as one of the shrewdest politicians of his time. He was a liberal
delegate from Norfolk City, Virginia, at the authorized Constitutional Convention in Richmond.

At the close of the Constitutional Convention of Virginia, the April 16, 1868 edition of the newspaper, Enquirer, which was politically opposed to Dr. Bayne, undertook to hold him up to ridicule by stating, "Our people will learn with profound regret that the distinguished statesman, sage, philosopher, logician, debater, elocutionist and tooth-puller, Dr. Thomas Bayne, of Norfolk, will leave Richmond tomorrow per James River steamer. For four and one-half months past, the Doctor has afforded us no little amusement, and not unfrequently furnished us with material for a paragraph. We bid the Doctor an affectionate farewell; wish him a safe and prosperous journey, and trust that he will never more be conventionist for Virginia."

BLACKS IN ORGANIZED DENTAL EDUCATION

Four years after the 1863 Emancipation Proclamation, Howard University, referred to as the capstone of Negro Education, was founded. That same year of 1867 saw the organization of Harvard University's dental school. This was the first dental school established by a regular university in the United States. Among the six students accepted to the first class was a Negro American — Robert Tanner Freeman, who had worked in the office of Dr. Noble, a white dentist, located in the 1500 block of Pennsylvania Avenue, and he was to become the first Negro American to receive the dental doctorate in the United States. It is of some interest to note that Dr. Freeman was the grandfather of Dr. Robert Weaver, the first black appointed Secretary of Housing and Urban Affairs in the administration of former President Lyndon B. Johnson.

BEGINNINGS OF HOWARD UNIVERSITY'S DENTAL SCHOOL

On October 11, 1881, Howard University's dental department was established. James B. Hodgkins, D.D.S. was appointed the first lecturer on practical dentistry to the medical class. In the following year, the first regular professor of dentistry, N.W. Whitcomb, D.D.S., was appointed to the College of Dentistry, Howard University. His appointment was made possible through the efforts of O.F. Presbrey, M.D., and C.B. Purvis, M.D., of the medical school. The first class of the dental college was listed in the 16th Annual Announcement and Catalogue of the Medical Department of Howard University. This class was composed of James B. Hallwood, New York, New York; James H.A.B. Howard, Brookville, Maryville; Collins Marshall, Washington, D.C.; Charles J. Russell, Bridport, Vermont; Augustus Stabler, Brighton, Maryland; Mary L. Wooster, Middleburg, Connecticut.

MEHARRY COMES ON THE SCENE

Although Meharry Medical College of Nashville, Tennessee, was founded in 1876 as a result of a $20,000 gift from five Meharry brothers, it wasn’t until 1886 that the dental school was organized as a unit of the medical school, with J. P. Bailey, D.D.S., from Vanderbilt University in
charge. He taught operative and mechanical dentistry, and one of the founders, W. H. Morgan, M.D., D.D.S., was demonstrator in clinical dentistry.

In 1887, R. F. Boyd, M.D., received his dental degree from Meharry Medical College while holding the post of professor of physiology and hygiene. Among his numerous papers was “What are the causes of the great mortality among the Negroes in the cities of the South, and how is that mortality to be lessened?”

PROMINENT BLACK DENTAL GRADUATES

In 1889, William A. Jackson was graduated from the Philadelphia Dental College after working as a janitor of the school before and during the entire period he studied. Dr. Jackson was an unusually successful practitioner and aided several young men in their practices. In the same year Thomas A. Curtis, St. Louis, Missouri, graduated from Meharry Medical College, winning the Morrison Gold Medal. He took the State Board Dental Examination of Alabama and was the first Negro American to qualify for the practice of dentistry in that state. Of the eighteen applicants taking the Board, Dr. Curtis ranked second.

An excerpt from the annual report of the Alabama State Board Dental Examiners October 1889 said: “Among all of the applicants was one colored man, bearing a diploma from the Meharry Medical and Dental College of Nashville, who stood a most excellent examination in all dental branches, greatly to the surprise of every member of the board. We mention the case especially as being the first among the colored race to don the professional gown in Alabama; and we hope the brotherhood will extend to him all reasonable professional courtesies and a helping hand, as a vast field is opened for his services in our Southland.”

In 1890, Ida Gray Nelson Rollins became the first Negro woman to graduate from the University of Michigan Dental School. Dr. Rollins was also the first Negro woman to practice dentistry in Chicago.

Marie Imogene Williams became the first female dental graduate of Howard University in 1896, and in the same year Dr. R. R. Royster a graduate of the Pennsylvania College of Dental Surgery became the first black American to pass the Pennsylvania State Board of Dentistry.

A few years earlier, in 1890, Dr. T. A. Curtis attended the National Dental Association (now the A.D.A.) in Atlanta, Georgia. Dr. Curtis reported that he was welcomed politely but with much curiosity at the idea of a Negro dentist And no wonder, for in 1885 it was estimated that there were only 25 licensed colored dentists in the nation out of a total of 15,000 dentists.

DR. CHARLES EDWIN BENTLEY – LUMINARY IN THE DENTAL PROFESSION AND THE STRUGGLE FOR CIVIL RIGHTS

One of the important contributors to dentistry’s cultural advancements was a distinguished, aristocratic Negro American dentist, Charles Edwin Bentley. He was born February 21, 1859 in Cincinnati, Ohio. His parents were free, literate residents of this city located just across the river from Kentucky, a state where the practice of chattel slavery was still in
existence. Charles Bentley graduated from the Chicago College of Dental Surgery in 1887 and immediately became attached to Rush Medical College as oral surgeon to its outpatient dispensary. Regarded as an exceptionally good teacher, Dr. Bentley later became professor of oral surgery at Harvey Medical College, a post he held until the school went out of existence in the late 1900's. Dr. Bentley was credited with being the first dentist in Chicago to use cocaine as a local anesthetic. In 1889, he organized the Odontographic Society of Chicago, and served as its first president. In 1892, he was first vice-president of the Chicago Dental Society, and in 1902 received national publicity as program chairman of the National Dental Association when it met in St. Louis. Dr. Bentley resigned this position on account of the expressed prejudices of Southern white dentists. Dr. Bentley was ever in demand to present professional clinics, and was a constant contributor to the scientific literature of those times.

He is reputed to have had one of the largest and most selective practices in Chicago. The majority of his patients were white, but Dr. Bentley made a conscientious effort to serve all racial groups. He was the first Negro American dentist to have offices in Chicago's famed "Loop" district.

Dr. Bentley was prominent in community affairs. A polished and forceful orator, he was frequently called upon to assume positions of leadership among his colleagues, as well as in civic projects. He was an interracialist of the first order, opposing any forms of segregation. He resisted, forthrightly, the organization of Negro medical and dental societies, not only in Chicago, but also in those northern regions where none existed. He argued that such acts of 'voluntary' separation would encourage the general spread of segregation. This position, together with an uncompromising insistence that Negro Americans must 'win their spurs' by dint of hard work, contributed to a certain unpopularity among Negroes of that period.

In 1891, Dr. Daniel H. Williams, first surgeon to operate successfully on a human heart, headed a group of prominent citizens who founded Provident Hospital in Chicago. The function of the hospital was to train Negro physicians and nurses. Because of the influence of Dr. Williams, Dr. Bentley joined this movement, threw his support behind his friend, and insisted that the institution be interracial with respect to its staff, clientele and administrative board. He became a board member, serving later as the secretary. He was also chairman of the Training School Committee and insisted that the technical and social standards at Provident should be the same as those at "Caucasian" hospitals.

Around 1900, Dr. Bentley was among a group of prominent Negro Americans who met at Niagara Falls, New York to organize the fight for civil rights. There was formed the well-known Niagara Movement out of which developed the presently influential National Association for the Advancement of Colored Peoples. Throughout his period of association with this organization, Dr. Bentley was an outspoken advocate of equal rights and responsibilities.

In 1921, Howard University awarded him an honorary Doctor of Science Degree.
THE GROWTH OF BLACK PROFESSIONAL ORGANIZATIONS

The first national organization of black health professionals was the National Medical Association. Initiated in 1895, the membership included physicians, dentists, and pharmacists. The Association was called the National Negro Medical Association of Physicians, Dentists and Pharmacists, and was organized during the same year as the Atlanta Cotton States and International Exposition. A Meharry graduate, R. F. Boyd, M.D., D.D.S. was chosen as the first president.

In 1900, the first dental organization of ethical Negro dentists in the United States was established as the Washington Society of Colored Dentists. In that year it was estimated that there were 125 licensed black dentists in the United States. Founders of the Society were: A. J. Gwathney, T. A. Campbell, C. C. Fry, Walter Over, C. S. Wormley, M. I. Williams, Gray, and Hamilton and Walker. Dr. Marie Imogene Williams was the only female member of the founding group. The Society was later renamed the Robert T. Freeman Dental Society of the District of Columbia.

In 1905, the first efforts were made by Dr. D. A. Ferguson to organize the National Association of Negro Dentists. These efforts failed.

In 1907, at the annual meeting of the National Medical Association in Baltimore, Maryland, an actual division into sections occurred. W. S. Lofton, D.D.S., Washington, D.C., was the first chairman, dental section, National Medical Association. Dr. Charles H. Roberts, New York City, was the first dentist elected to the vice-presidency of the National Medical Association. At the clinical sessions, Drs. W. S. Lofton and C. C. Frye presented the first formal papers.

The next year the Journal of the National Medical Association was founded and became the official organ of the National Medical Association and allied professions of Medicine, Surgery, Dentistry and Pharmacy. The journal was published quarterly. C. V. Roman, M.D., was the first editor, and W. S. Lofton, D.D.S., first associate editor in charge of dental news.

BLACKS IN DENTISTRY MAKE SIGNIFICANT STRIDES

In those earlier years of this century, other black dentists were making significant contributions, both to their chosen profession and to their communities.

In 1901, Dr. Alva C. Garrott, pharmaceutical and dental graduate of Howard University resigned from the Pension Bureau of Washington, D.C., and began the practice of dentistry in Los Angeles, California. He was the first Negro dentist to locate in California and became one of the most successful practitioners there.

The next year, O. H. Arnold, Wilmington, North Carolina, and W. A. Pethel, Charlotte, North Carolina, both Howard University graduates, were the first Negro dentists to be granted North Carolina licensure. It is of interest to note that North Carolina was the first state to establish a board of dental examiners in 1879.

In 1904, Dr. Hubert Washington Ross, a graduate of the Yale University College of Medicine in 1899, received the D.M.D. degree from
Harvard University and was one of the most distinguished early practitioners in New England.

In 1909, Rufus P. Beshears, St. Joseph, Missouri, became the first Negro American to be graduated from the University of Iowa College of Dentistry, ranking in the first fourth of a class of '67. Dr. Beshears was also the first of his race to become a member of the Northwest Missouri Dental Society, the Missouri Dental Association and the American Dental Association.

By the year 1910, the number of Negro dentists listed by the U.S. Census had risen to 478.

The year 1913 was very significant. First, The District of Columbia Health Department requested the Robert T. Freeman Dental Society to conduct examinations of large groups of pupils in the public schools for the benefit of the Board of Education. As a result, it was recommended that dentists be added to the public schools' medical inspection staff under the D.C. Health Department. Second, Dr. Walter Beekman, Brooklyn, New York, was honored as a guest of the Brazilian Government at the first Pan-American Dental Congress.

Next, the Old Dominion State Dental Society of Virginia was established at a February meeting at the We-Us Hotel with Normal Lassiter, Newport News, president; J. M. G. Ramsey, Richmond, vice-president; Hamilton Rance, Suffolk, corresponding secretary; J. T. Lattimore, Hampton, recording secretary; G. C. Strong, Norfolk, treasurer; R. C. Brown, Richmond, historian; and C. A. Tomlinson, Norfolk, librarian. Dr. Lassiter, an outstanding dental leader, was the first chief of the Hampton Institute dental clinic.

Finally, the first meeting of the Tri-State Dental Association (Virginia, District of Columbia, Maryland) was held at Buckroe Beach, Virginia. Members of the founding group were D. A. Ferguson, J. M. G. Ramsey, A. O. Reid, C. S. Wormley, A. J. Gwathney, G. H. Butcher, J. E. Washington, R. C. Brown, and C. M. Tomlinson. The present National Dental Association counts its beginnings from this date.

In 1916, at Tuskegee Institute, Booker T. Washington initiated a program for the improvement of Negro health. Public and private agencies brought health information via the churches, schools, civic groups and health agencies. This lasted for a period of one week in April during the birth anniversary of Booker T. Washington and became known as National Negro Health Week.

1917, John Alexander Somerville graduated from the dental college of the University of Southern California, becoming the first Negro to achieve this distinction. He practiced in Los Angeles and was a founder of the Physicians, Dentists and Pharmacists Association for Southern California. His wife, Dr. Vada Watson Somerville was the first black woman west of the Mississippi river to become qualified in dentistry, graduating in 1918 from the same dental college. She was the only Negro and the only female member of a class of 88 persons.

In 1918, D. A. Ferguson, D.D.S., Richmond, Virginia, became the first dentist to serve as president of the National Medical Association. It was in the previous year, 1917, that the first president-elect of the Association was chosen and Dr. Ferguson achieved the honor of being named the first
president-elect of the National Medical Association. In this same year, because of its growth, the Tri-State Dental Association changed its name to the Interstate Dental Association, and established an annual Bulletin of the Interstate Dental Association.

In 1919, there was established an affiliation between the Negro dentists of Alabama and the Alabama State Dental Association. This provided the former the privilege of membership in the American Dental Association. In the same year, Roscoe C. Brown, D.D.S., entered the U.S. Public Health Service and became associated with that agency as Chief, Office of Negro Health Work. This was the first time that the U.S. Public Health Service employed dentists to render dental treatment to wards of the Federal Government, that is, the discharged soldiers of World War I.

The 1920 census gave 1019 as the number of black American dentists.

In 1923, 21 states were represented at the annual Buckroe Beach, Virginia, meeting of the Interstate Dental Association.

This was also the year that the dental clinic of the Veterans Hospital, Tuskegee, Alabama, was begun with T. B. Davis, D.D.S., appointed first Chief, Dental Clinic. Dr. Davis was the first Negro doctor appointed to the staff. He had been previously employed at the Atlanta VA Regional Office.

Members of the Ku Klux Klan maintained that there were not enough competent Negro physicians and other personnel to administer the United States Veterans Hospital No. 91, Tuskegee, Alabama, and in protest over the appointment of John C. Calhoun as a personnel clerk, they marched through the town and campus of Tuskegee Institute.

In 1924, the North Harlem Dental Clinic was established with dental work being devoted to children and pregnant mothers. The clinic was conducted under the auspices of the Harlem Branch of the New York Tuberculosis and Health Association. Dental supplies were donated by the dentists themselves, chief among whom were: Drs. L. H. Fairclough, H. Delaney, A. Robinson, L. Carter and C. Norman.

In 1928, Louise C. Ball, D.D.S., wealthy philanthropist, was appointed member of the Board of Trustees of Howard University. Dr. Ball was particularly interested in dentistry, having established the New York School of Dental Hygiene in 1916. She was later instrumental in helping to establish the Howard University department of dental hygiene.

The 1930 U.S. Census listed 1773 Negro dentists in the United States. Of these 98.1% were males, 1.9% female.

Among the Negro dentists in the National Medical Association invited to the February 1931 Washington, D.C. White House Conference on Child Health and Protection called by President Herbert Hoover were U.T. Carter, Rhode Island; R. C. Brown and W. S. Lofton, District of Columbiz, and E. F. Jones, New York.

THE MODERN NATIONAL DENTAL ASSOCIATION IS BORN

In 1932, all rights to the title ‘National Dental Association’ were released by the American Dental Association, and the Interstate Dental Association was renamed the ‘National Dental Association.’ The organization was founded at Bordentown, New Jersey with D. A.
Ferguson first president, E. W. Taggart of Birmingham, the first chairman of the Executive Board, and R. H. Thompson the first secretary-treasurer. At this meeting, 122 practitioners were registered. The meeting was endorsed by the American Dental Trade Association and contracts for exhibit spaces were received from a large number of leading dental manufacturers.

In the same year, in his presidential address to the National Medical Association, Peter M. Murray, M.D., analyzed the 'compound character of the organization' as being a necessity in 1897 but a handicap in 1932. He said, "The mastery of problems of adjustment is peculiar to each profession — medicine, dentistry and pharmacy, and the problems can best be solved by the application of the best medical, dental and pharmaceutical leadership available." He recommended that the National Medical Association "welcome into the fields of professional organization, the National Dental Association as an indispensable health agency."

The next year 1934, The Journal, National Medical Association, published the address of Dr. W. D. Giles, chairman of the Dental Section of the National Medical Association, who argued that membership in the National Medical Association did not preclude membership in the newly formed National Dental Association, and creation of the latter did not signify antipathy to the former.

At the August 15, 1936 meeting of the Dental Section, National Medical Association, acting secretary of the Executive Board, Dr. M. B. Hutto, told the Executive Board that there had been national unfavorable publicity relative to the division in the ranks of the dental section. He asked the Board to go on record as desiring a conference between appointed Boards of Arbitration to heal the breach existing between the National Dental and Medical Associations. The Executive Board subsequently appointed Dr. Hutto permanent secretary of the Executive Board. Concurrently, a committee from the Dental Section with Dr. W. D. Giles as spokesman, pledged its support to the National Medical Association at its final Executive Board meeting, and asked that the Association support the dental section's resolution that a dental department be established at the Flint-Goodridge Hospital in New Orleans. The resolution was passed.

CONCLUSION

This final item illustrating a harmonious temporization following a period of intensifying discord is a logical place to conclude this brief review of some of the historical events involving black dentists in the United States.

Four general impressions emerge from a review of the list of happenings. First, from the very beginning, black dentists have evidenced a concern for the dental health care of the nation's poor and disadvantaged peoples. In view of their own difficulties in gaining a dental education and conducting a successful practice, it would seem natural for black dentists to possess some empathy with all others who experienced untold hardships in the mere pursuit of a daily existence. Many of today's young leaders and activists are likely to be surprised at finding that what
they have called the ‘new’ regard for America’s disillusioned and dispossessed is really not so new after all.

Second, there is some commonality in the beginnings of medicine, pharmacy and dentistry among the nation’s black population, and it is probably this particular factor that has been responsible for the interprofessional competition, conflict and cooperation, all of which have occurred in greater or lesser degrees during various stages of development of these health professions.

Third, it is apparent that black dentists have traditionally displayed unusual and uncommon interests in political and organizational activities. There has been an accompanying high degree of participation in social concerns, and this has often overshadowed the bioscientific performance, technical knowledge and research aspirations of black dentists. Nevertheless, in view of dentistry’s current developments in public health, community dentistry and the behavioral sciences, it is prophetic that black dentists of early America should have manifested such profound interests in community, in government and in public service activities outside the dental office. More amazing is the fact that they occurred at a time when these things were thought to be wholly unrelated to professional competence and duty.

Finally, there are seen the traditional differences in approach to the question: “Which direction should the black dentist take?” These differences revolved around what might be termed the Bentley philosophy, which consisted of an uncompromising penchant for total integration, versus the Ferguson dogma which insisted upon a strong organization of black dentists, working separately for its own advancement. Ironically, these ethical differences are still part of contemporary American dentistry.

The objectives to which organized dentistry is presently committed are identified much more closely with what black dentists actually want, namely, the earliest possible removal of all road-blocks to the reasonable goals of equality of opportunity, fair treatment, and quality care for all people.

REFERENCES


Dr. Dummett is Associate Dean, School of Dentistry, University of Southern California. He is also the Editor, National Dental Association, Los Angeles, California.
Ancient Documents Depicting the First Women Dentists and Saint Apollonia.

—DR. JOSE DE PAIVA BOLEO
Lisbon, Portugal

The appearance of women in the practice of dental surgery is much older than has commonly been believed. Ancient documents reveal that, since the 13th century, women were engaged in many of the service occupations. The notion of professionalism seems, however, to have been later in coming (at the end of the 16th century).

With the evolution of manners and customs, liberal careers were, gradually opened to women, and in time they benefited much from this liberalization. Today, in the domain of medicine and the dental art, they are too numerous to be counted. Little attention however, has heretofore been paid to tracing the history of the first women who were tempted to engage in these specialties in different parts of the world. In France, for example, it is known that since the middle of the 18th century certain “expert” women had been authorized to install themselves officially as dentists. In any case, starting at the beginning of the 20th century and especially during the last 30 years, their number hasn’t stopped growing, and there are some countries where they are more numerous in this profession than men.

EARLIEST REPRESENTATIONS OF WOMEN DENTISTS

To be convinced that this is not a recent phenomenon, however, it is only necessary to take a look at some ancient documents.

Thus, in a Latin manuscript attributed to Roland of Parma and kept at the Royal Casanatense Library in Rome, one can see two curious pictures of the 13th century. One shows a woman caring for a sick person whose face she is binding up with a handkerchief. She is tying it at the top of his head in a way that is still practiced by country folk when there is toothache or in the case of a dislocation of the lower jaw. The operator is placed above her patient, with her feet resting on his shoulders (Fig. 1). In the other picture the same woman is shown using a pair of forceps with long handles (Fig. 2). It appears that these are the oldest pictures extant on this theme.

The position of the practitioner in relation to that of the patient has evolved over the centuries. In the remotest of times, (and even today among primitive peoples) the patient was laid out on the ground in a horizontal position while the practitioner was on his knees. Later the former sat on the ground while the latter stood and held his patient’s head between his thighs. Finally, seats appeared, at first low stools and then armchairs, right up to the dental chairs of today - highly perfected and mobile.
It is interesting to note that little by little we have returned to the first position mentioned; in the modern reclining chair the patient is comfortably stretched out while the operator is seated.

In ancient times, forceps with long handles were used, like those seen in the picture. The Roman odontagra from Salzburg is 36 cm. long, while the rhizagra from the ruins of Pompeii, and now in the National Museum of Naples, as well as the forceps of Guillemeau (16th c.) and most of the oldest forceps are from 25 to 35 cm. in length. In those days, only those instruments used for extracting roots were less than 19 cm. in size. It appears that the extreme length of the forceps was thought necessary because it was believed, in those days, that the tooth had to be pulled with the traction exerted along the tooth’s axis; it was later understood that it was preferable to dislocate the tooth.

In Paris, in the Department of Prints of the National Library is to be found an engraving dating from the end of the 16th century, showing a woman dentist in the act of operating. While in the earlier pictures discussed the operator could possibly have been a lay person, in this engraving we have depicted what is undoubtedly a true professional. Some authorities consider this picture to be the first in which a woman dentist appears. It is noteworthy that the instruments she uses are clearly shorter, both the one she is holding as well as the ones sticking out of the pocket of her apron. The characters, expressing themselves in verse, comment on the scene. As evidence of her skill, the woman is wearing, slung across her shoulder as an ornament, a collar of teeth which she had extracted (Fig. 3).

In another picture, also of French origin and identified only as dating from the 18th century, the woman dentist is richly attired in the fashion of the time and is examining the mouth of a patient.

Besides the “tooth pullers” who accompanied jugglers and acrobats in the streets, public places and at country fairs, there were also more
respectable and recognized practitioners of whom the woman dentist depicted is one, and who visited patients in their homes. It wasn't until later that they acquired their own offices. The woman dentist in the picture referred to exclaims, after having seen the jaw of the patient: "Heavens! What an infection! You have not only a spoiled tooth but a rotten one!" (Fig. 4).

SAINT APOLLONIA, PATRON OF DENTISTRY

Even older pictures also show a woman in the act of extracting teeth. She is not a dentist at all, to be sure, because it is Saint Apollonia.

The idea of depicting saints protecting those who are suffering from certain diseases came about during the Middle Ages; several saints were chosen for the toothache, but none had as much approbation as Saint Apollonia. Her story was first told by her contemporary, Eusebius. This scrupulous historian sought information in the transcriptions of the trials of Christians arraigned by Roman magistrates, and this fact testifies to the rigorous precision of his work. This is what he writes of Saint Apollonia:

Figure 3
They also got hold of the admirable virgin, Apollonia, already an older woman, and they broke all of her teeth and cracked her jaws. Finally they lighted a pyre at the entrance to the village and threatened to burn her alive if she didn’t join with them in repeating the awful blasphemies that they uttered. Then she begged them humbly to release her for an instant, and as soon as she was free she ran and threw herself into the flames, which consumed her.

This all happened in Alexandria, in the year 249 A.D.

In the Middle Ages a new concept of work appeared: it had its dignity and its corporate organization, the guild. Each profession chose its patron saint and Saint Apollonia was chosen by the dentists, and has remained as the patron saint of Christian dentists the world over ever since. Her cult
widened, and one finds numerous chapels all over Europe which are consecrated to her. She inspired hundreds of works of art, sculptures, paintings, illuminations, engravings and sacred ornaments which were dispersed in sanctuaries, in museums and in private collections. In several studies on the subject, it has been shown how rewarding it is to study this iconography, not only from the artistic point of view, but also in order to follow the evolution of the art of dentistry.

SIGNIFICANCE IN THE STUDY OF DENTAL ARMAMENTARIUM

Museums have only very few dental instruments dating from before the Christian era, or even from before the 11th century. It is in a manuscript of the Arab surgeon Alcucasis Al Tarsif (916-1022) translated in Practica or Liber Servitores, of which there exists in the School of Medicine at Montpellier a handwritten Latin translation dating from the year 1300, that the first engravings of dental instruments are to be found. From this time no further pictures appear until the discovery of printing and the appearance of the first dissertations on this subject in 1540. This enormous void of four centuries in our knowledge of dentistry cannot be filled except through study of the iconography of Saint Apollonia, whose cult began to develop at the end of the 13th century. It is very fortunate that the artists of that time were great realists who rendered the objects that came under their scrutiny with great fidelity.
THREE TYPES OF REPRESENTATION OF SAINT APOLLONIA

The pictures of Saint Apollonia may be classified in three groups:

1.) The saint appears alone and carries the emblem of her torment - a forceps. It is almost always shown clamped on a tooth. Sometimes, other instruments of torment, such as the cold chisel and the hammer appear as well.

2.) The saint appears as one of a number of saints fitted into a scene from the Gospel or from the life of the Blessed Virgin. This type is termed a “holy conversation.”

3.) The martyrdom of the saint. In these the torturers are armed with forceps, mallets, cold chisels, crow-bars, or simple stones; some may be shown carrying wood for the funeral pyre.

In the author’s own collection of more than 800 pictures showing Saint Apollonia, there are three which don’t fit into any of these categories, the subject of which is discussed in this paper: the saint herself taking care of a wretched person who is suffering from toothache.

Figure 6
The first is very old. It dates from the end of the 14th century and is a part of the precious Wessler collection of the Royal Museum of the Stockholm Dental Institute. It is a colored woodcut by an artist called "The Master of the Dagger" because he always drew a dagger in the corner of his pictures in lieu of a signature. A patient, thin, raw-boned and lank (perhaps unable to feed himself because of his toothache) is on his knees, and so frightened that his hair is shown standing on end. He is imploring the protection of the saint, who, with a tender, compassionate air, shows him a tooth at the end of a forceps in one hand, while with the other she strokes his cheek (Fig. 5).  

The second picture is an illumination which appears in the lower right hand corner of a page of a breviary in a Dominican manuscript dating from the end of the 14th century, and which is also to be found in the Wessler Museum of the Stockholm Dental Institute. It is the only one that we know of in which the saint is actually operating. The patient, a poor one-legged beggar, and the person who accompanied him, both appear confident. Everything seems to be going smoothly, and the poor man who is extending his beggar's bowl to ask for alms, will go away relieved (Fig. 6).  

The centuries-long yearning by women for access to medical careers is today at last being satisfied. It was perhaps by fortuitous premonition that a woman was chosen centuries ago to be the patron of dentists. Undoubtedly, this corresponded with the desire to find a way, through feminine gentleness and compassion, of alleviating the awful pain against which most people were so defenseless. To those suffering from the toothache, Saint Apollonia would seem to be the most logical one to plead their cause before the Almighty.

The modern dentist can call upon all the resources of science in order to make a real contribution to the betterment of mankind. In the performance of his work, he makes an act of faith come true. If he is a believer, his work has, to him, even more value, elevated as it is by the spirit in which he performs it: it becomes a prayer. The past takes on meaning for him, and he seeks divine protection by means of intermediary heroic souls such as Saint Apollonia who preferred death to the denial of her faith.

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2. This picture is reproduced in Miarnau's book as well as in *Bildgeschichte der Zahnheilkunde (5,000 Years of the Dental Art in Pictures)* by Proskauer and Witt, Cologne.
3. This picture is part of a collection of post cards on the art of dentistry, edited by Julien Prelat, Paris, at the instigation of the late Guy Didier who, Mme. Didier tells us possessed the page showing the picture.


6. The picture from the Wessler Collection was reproduced and distributed by the Astra Pharmaceutical Company of Sweden.

7. This print was published for the first time in *Dental Art in Ancient Times*, British Medical Association, Aberdeen, Burroughs, Wellcome & Co., 1914.

(Translated from the French by Catherine Smith, Pi嫦ard, New York.)

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Medical College of Virginia's New Living Museum

-H. GORDON CHENEY, D.D.S., M.P.H.
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How do we picture the modern dental office of today? We visualize a metallic, sterile mass of equipment which blends into its surroundings, is without distinction, and resembles other dental offices. This is quite a difference from the dental operatory of the practicing dentist in Virginia in the latter part of the nineteenth century. At that time most of the equipment was wooden. You would find that it would be individually carved, not mass produced. It would have a richness to it, not just shininess. And it would have the stamp of the dentist's own personality, rather than the uniformity of today.

Virginia, "the birthplace of Presidents" is known for its richness and interest in tradition and history. Yet amidst the retention of its memorabilia, Virginia is also in the forefront of our rapidly growing and progressively modern world.

At the School of Dentistry, Medical College of Virginia-Virginia Commonwealth University, action has been taken to preserve yesteryear's individualistic dental office. This preservation of the past is being done in a unique way, which will make the past relevant and the present more meaningful for today's dental students. Through the dental school's new living museum, today's generation can see and reflect upon the past dentist's rugged individualism and pride of ownership, and contrast it with our present tendency towards conformity.

The living museum idea began with the accumulation of rare and valuable dental equipment by interested parties in Virginia. Many dentists donated these dental instruments and equipment to the Medical College of Virginia back in 1954 when the new Wood Memorial Building opened. There were many gorgeous instruments made in the nineteenth and twentieth centuries which were placed in a museum, but the priceless artifacts were not accessible to viewing by the public. Neither were they accessible to the dental faculty or the dental students. Because the museum, neglected and unappreciated was kept closed.

The decade of the sixties brought big changes to society and also to the Medical College of Virginia, School of Dentistry. A second dental building was built. There were modifications in thinking, actions, and dress. The college went through an era of massive growth and finally became part of the university system as a division of Virginia Commonwealth University. Class size increased from 60 in 1960 to an entering class of 110. Full-time faculty increased from 27 to a proposed number of 65 full-time faculty for 1973.

The faculty this year in considering the plight of the museum decided that they would like to create a living memory of the past — an exhibit that would be open and available to the public creating a "please touch"
atmosphere. This would not only allow dental faculty, dental students, and alumni, but also the public — our patients — to see the past wonders and progress of dentistry. After making this decision, two interested dental faculty members, Dr. Elmer Bear, Chairman of the Department of Oral Surgery and Dr. F. B. Wiebusch, Director of Continuing Education, implemented the plan. The decision that faced these men was to develop a master plan to properly demonstrate the instruments of the past. It was decided that the living museum focus on the dental operatory as it looked in the latter part of the nineteenth century in Virginia. The committee determined that the best place for maximum viewing would be in our large waiting room which connects the two buildings of the Medical College of Virginia-Virginia Commonwealth University. So over one weekend the plan was implemented; and when the staff appeared on a Monday morning early in 1973, our reception room had been drastically converted from a rather large, cold, and uninteresting room into an attention-getting area showing what dentistry was like 100 years ago. In two corners of the reception room were placed dental operatories as they might have been a century ago. In the first operatory was placed a handcarved wood instrument cabinet, a foot treadle drill, a velvet-covered chair with a round footstool (which was introduced by Archer using the Ask patent), and a foot pedal laboratory lathe drill. Under this equipment was placed a vibrant red rug for contrast (Fig. 1). The second operatory contains an all metal frame chair covered with leather, an exquisite octagonal instrument case, a marble-top spittoon, and a foot-treadle drill (Fig. 2). A vast array of valuable, hand instruments had been stored in the

Figure 1.
In Operatory No. 1 Jay Alperin, Senior dental student, pumps the foot treadle drill of the 1800's.
old museum, and the committee felt that they also should be exhibited. Therefore along the most prominent wall, three display cases of antiquated dental instruments have been placed. The instruments are primarily elevators, scalers, and forceps. The highlight of these cases are the handles on the instruments which are hand-carved in ivory, bone, or mother-of-pearl. Of additional interest is the fact that many of these instruments had been found on the battlefields around Virginia. The display cases were placed in front of the portraits of our former deans, these leaders of dentistry being Dr. Harry Lyons, Dean from 1951-70; Dr. Harry Bear, Dean from 1929-50; Dr. J. A. Cameron Hoggan, Dean from 1915-25; and Dr. Richard Lee Simpson, Dean from 1910-15 (Fig. 3).

This initial display in the reception room at the Medical College of Virginia-Virginia Commonwealth University is only a beginning of our future projections of what we might do to remember and retain the heritage of the dental profession in the state of Virginia. Other displays will be placed in the student study rooms and other prominent positions around the School of Dentistry buildings when further historical valuables are obtained. Also, as our School moves toward a more individualized and elective-type curriculum, we feel it most probable that interested students would elect to keep alive the past of dentistry for the benefit of the "now generation." Today's living museum is thus just a beginning.
This living museum in Virginia will be viewed by approximately 50,000 people each year. Thus, this exhibit can bring forcefully to the attention of the public, the dental students, the dental faculty and alumni, the significant role that dental history has played and can play in the progress of the profession. We, at Virginia Commonwealth University, feel it is the responsibility of all dental schools and dental educators to keep the heritage of dentistry alive.

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Oddments in Dental History:
Insect Bodies to Cure the Toothache

—MALVIN E. RING, D.D.S.

While researching changing methods in children's dentistry, the author was startled to come across a reference to a most dangerous substance being used in the mouths of the little ones. A Professor E. T. Darby of Philadelphia, in a lecture before the New York Odontological Society in 1884 entitled “The Treatment of Children's Teeth,” advocated the use of cantharides (Spanish fly) for the devitalization of a deciduous tooth with a pulp exposure. One or two treatments with the powdered cantharides, he claimed, would be sufficient to allow the pulp to be removed painlessly. (American Journal of Dental Science, Vol. 17, page 511, March 1884.) It is horrifying to think of the severe and possibly disastrous results that might have occurred, had this powerful irritant been absorbed into the blood-stream of the child. It is fortunate that the dentists of today forego such “remedies.”

Nevertheless, it is interesting to find that the crushed carapaces of insects had been used in “dentistry” many years earlier, with the following being one of the less believable accounts of their employment. It appeared in an early New York medical journal, The Medical Repository, 1805, Volume 2, page 312. The author, identified only as Dr. Fredrick Hirsch, dentist to several German courts, writes:

In the practice of my profession of a dentist, I have particularly turned my attention to the cure of the tooth-ache, and I learned from a celebrated German physician, as well as from the Journal der Erfindungen, & c (Journal of inventions, theories and contradictions in natural philosophy and physic) No. xiv, page 135, that among other insects the well-known lady-bug Coccinella septempunctata, possessed a peculiar virtue against the tooth-ache; I was induced to collect some of these insects. On repeated trials I found it to exceed my expectations, and I was so happy as to cure several persons speedily and completely with the small insect, finding myself obliged to repeat the remedy only in the cases of a few female patients.

My method of proceeding was as follows: I crushed the insect between my thumb and forefinger, and rubbed it between them until their points grew warm. With the forefinger and thumb thus prepared, I then rubbed both the affected parts of the gum and the aching tooth; upon which the pain in every instance, except in the case mentioned above, completely ceased: I found, likewise, that the medicinal virtue of this insect was so powerful and durable, that my forefinger was capable of removing the tooth-ach for some days after,
without crushing an insect on it afresh. It is not to be expected, however, that this insect, when preserved dead, should produce the like effect; as then its internal parts, in which its virtue may be presumed chiefly to reside are wholly dried up, leaving nothing but the wings and an empty shell. I could wish, therefore, that some skillful physician would impart to me, from his own experience, a method of preserving the virtue of this insect, so that its efficacy may be in full vigour throughout the year.

There is no mention in later issues of his ever having been enlightened by a "skillful physician" and so we may assume that the technic was in limbo until carried a dangerous step further three-quarters of a century later by the reckless Prof. Darby.
Mark Twain Visits the Dentist

-SHELDON BAUMRIND, D.D.S.
Berkley, California

On July 15, 1884, Mark Twain wrote a letter to his good friend, William Dean Howells:

Elmira

My Dear Howells--

I meant to write you that I told Webster to let Raymond see the play, but I have fooled around & neglected it. This fooling around has been done in the dental chair. I go down every other day & have one or two teeth gouged out & stuffed. I have been in the dental chair ten days, a couple of hours a day; & shall be there 3 days this week & I suppose as many more next week. The dentist is a bright man, & gouges & digs & saws & rasps & hammers, & keeps up a steady stream of entertaining talk, all the time, like his professional ancestor the barber; & so these have been very pleasant relaxations to me, & I shall be rather sorry to see them come to an end. They have been a vast improvement to me, too—an education; I can stand the most exquisite pain, now, without outward manifestation; & indeed without any very real discomfort. The Indian has fallen in my estimation; he is no better than you or me—he is merely a product of education. I have picked up a lot of good dental stuff, & I wish I had the time & energy to write it up.

On my off days I work at a new story (Huck Finn & Tom Sawyer among the Indians 40 or 50 years ago).

Yrs Ever

Mark

The observations of a man of Twain's perceptiveness and insight would make a valuable addition to our knowledge of the dental practices of his day, and so it is fortunate that he did indeed later record his "dental stuff," and that there exists among the Mark Twain Papers in the Library of the University of California at Berkeley an incomplete and unpublished manuscript titled "Happy Memories of the Dental Chair." The manuscript is made the more interesting since it develops that the dental experience about which Twain writes is a prior set of visits to Dr. John M. Riggs of Hartford, Connecticut, an early American periodontist, the Riggs of "Riggs' Disease."

Twain's manuscript begins with a description of the events which precipitated his visit to Doctor Riggs, which must have occurred some time during the early '70s.

"I was not able to remember," Twain begins, "that I had ever sat in a dentist's chair; I was not able to remember that I ever had a pain in any tooth. And so it was a cold awakening to me when a dentist who had caught a fleeting glimpse of my interior when I was laughing at something which spread me wider open than usual, told me ought to go to Dr. Riggs and get my teeth attended to . . . (He) said I had a certain disease of the teeth which had a scientific name but was sometimes called 'Riggs' disease' because Dr. Riggs had invented a
method of treating it which cured it in some instances and arrested its progress and rendered it harmless in all; whereas it had formerly refused to succumb to dental science."

"He said that most people had Riggs' disease, especially people whose teeth appeared to be perfectly sound and flawless; said one did not often find it with bad teeth; said it was heritable—where it existed in the parents it would usually be found in the children. He said it was in the nature of blood poisoning; a secretion decayed the bone-surface of the roots of the teeth; then the gums retreated from these surfaces, pus was engendered in the gums, the teeth began to loosen, and the man's general health was injured."'

Here we have an interesting and valuable description of periodontal pathology as perceived by a fairly sophisticated mid-nineteenth century dentist. It is noteworthy that the relationship between periodontal disease and systemic illness is perceived by the clinician. The dentist then described the proposed treatment.

"He said that Doctor Riggs' method was to dig up under the gums with his instruments and carve and scrape all the dead bone away, down to the living bone, then the gums would return to their place, attach themselves to the living bone and become healthy again."

Though Twain was an able and well-trained reporter, his is a lay and third hand account of the logic of Doctor Riggs' method. How interesting it is to compare it with the doctor's own presentation. On October 20, 1875 Doctor Riggs read before the American Academy of Dental Surgery, a paper titled, "Suppurative Inflammation of the Gums, and Absorption of the Gums and Alveola Process," describing what was then technically termed "pyorrhea alveolaris."

"This disease," he said, "is called by many the disease of old age, as formerly it was more particularly noticed in persons of advanced year, but at the present day we find the middle aged, and even the young, affected by it. Many of the textbooks of our specialty consider it hereditary, or constitutional, or bone disease, arising from a scrofulous diathesis. The result, from whatever cause, is most disastrous to the teeth, and in many cases to the health of the patient, for one by one the teeth become loose from loss of bony support and are plucked out as an intolerable annoyance . . ."

"As this disease exists in a less annoying and less dangerous form for several years previous to the above aggravated symptoms, covering from ten to twenty years before it culminates in its miserable characteristic, the loss of the teeth or life, I have thought best to tabulate its process by treating it under four heads or divisions, as follows:

"First. Where the margin of the gums shows decided inflammatory action, with some absorption of its substance, and bleeding at the slightest touch of the brush.

"Second stage. Where the inflammation extends down over the thinner alveolar border, causing absorption of the bone, as well as gum tissue, forming small pockets beneath the gum filled with pus.

"Third. Where the diseased action takes deeper hold, involving the thicker portions of the process, absorbing it most rapidly nearest the tooth, causing the tooth to sway back and forth for lack of most of its bony support.
"Fourth and last stage. Where the disease has swept away all the alveoli and much of the gum, the tooth being held in place by the conversion of the peridental membrane at the apex of the root into a tough ligamentous attachment."
He discussed etiology and prognosis.

"... The teeth in perfect polish and cleanliness, at and under the margin of the gums, whether of animals or man, produce no inflamed action in that tissue. It can be artificially produced, however, by inserting a foreign body into or beneath its substance. If then diseased action can be set up by a foreign body, artificially introduced, it can be arrested and cured by withdrawing the same. And, therefore, if the tooth becomes an extraneous body by reason of the accretions and concretions upon it, near and under the free margin of the gum, and inflammation ensues, as it certainly will, the true prophylactic and pathologic treatment surely would be to thoroughly and carefully remove said concretion, tartar or roughness—polish the tooth and let nature take care of the rest. In two hours time the inflamed and bleeding gum will assume a lighter color, its swollen tissue will begin to shrink to its normal thickness, will grow more tense and firm, and in twenty to thirty hours will grasp the neck of the tooth to the exclusion of all foreign substances.

"I have thus pointed out the treatment of the disease in the first stage.

"The treatment of the second stage is the same, only being careful to reach the extreme limits of the diseased action, breaking up the diseased tissue and removing every particle of tartar from the tooth, and necrosed bone from edge or margin of process.

"The third stage presents greater difficulties from the greater depth of the active line of disease, and demands a firm and skilled hand, a delicate and nice touch, and, I might add, the transfer of the sense of sight to the fingers ends. The sense of touch must be so trained and cultivated that all foreign bodies can be readily distinguished from tooth substance—live bone from necrosed bone—healthy from diseased tissue. This manipulation cannot be attained at once, but time and practice, with close and earnest study, will qualify and school the hand, and embolden the true and sensitive mind to achieve success in the treatment of this third stage.

"Of the treatment of the fourth and last stage, little can be said, except that the loss of the tooth or teeth is inevitable. The tooth is held in place by a cartilaginous attachment or condition of the inverted root membrane, which holds it in place as a buoy is held in the water. The only alternative is extraction, for all the alveoli is obliterated, and nature refuses to reconstruct the socket anew. The fiat has gone forth, and we must acquiesce."

Notwithstanding an occasional error, as in the reference to "necrosed bone" and the too easy imputation of gingival reattachment, it must be said that this is a remarkably modern statement of a non-surgical periodontal approach. It is the more remarkable when we consider that Riggs' classification antedates by twenty years Roentgen's discovering of the X-ray.

But in that day as in our own dentists had trouble convincing patients of the propriety of periodontal treatment. Listen again to Twain's dentist friend.
"... He went on to say that talk was generally wasted on a Riggs disease victim, there being no pain, they didn’t mind the disease and they did mind the desperate operation required to check the malady. By way of example he instanced the case of a young woman who came to him to have her teeth examined. They were beautifully white and regular and perfectly sound and he told her so; but he also told her that the whole thirty-two were in danger; because Riggs disease was at their roots. She was a teacher and had a salary of seven or eight hundred dollars; but she refused to pay ‘any such price’; she hadn’t any pain, and she didn’t choose to import any; she wouldn’t take all that proposed thirty-two batches of agony as a gift, let alone go into the market and buy it.”

Twain himself was made of sterner stuff. He accepted the dentist’s referral to Riggs and visited the specialist’s Hartford office. Twain describes Doctors Riggs:

"He was grey and venerable, and humane of aspect; but he had the calm, possessed, surgical look of a man who could endure pain in another person.”

Twain describes the doctor’s office:

"I got into the chair and looked about me, noting the cuspidor at my left elbow, the convenient glass of water; the table at my right covered with long steel bodkins laid out in rows on a white napkin; then laid my head back in the rest, feeling pale and nervous, for this thing was all new to me; new and hellish, if I may use such a word without offense. The doctor bent over me, spread my mouth and he put a mirror the size of a nickel into it, and inspected it all around. And began to talk. Not swiftly, not excitedly; but evenly, smoothly, tranquilly.”

"He said I must have smoked considerable tobacco in my time. I responded as well as the mirror would let me—’tons.’ He said it was the best of preservatives for the teeth; and went on tapping around in there with the mirror and examining, while I made a mental note of his remark for use against the anti-tobacco incendiaries. "

"Presently he laid the mirror aside, raked among his bodkins, selected one, gave it a pass or two over an ‘Arkansas stone,’ laid a rag over my chin, placed a couple of fingers where could have closed on them, and approached my mouth with the bodkin which he held in the grip of his other hand. I began to shrink into myself and curl together, in a cold nightmare of expectancy. There was a strength exhausting pause; then the doctor eased up his attitude and began to tell me some particulars concerning the Riggs disease.”

Doctor Riggs now proceeded to give a more detailed account of the systemic implications of periodontal disease.

"He said among other things that he had known it to so affect its victim’s health as to prostrate him and keep him bedridden and helpless during long intervals, the physicians doctoring his stomach, not suspecting that the chief trouble was in the teeth and so failing to afford relief. He instanced the case of a lady who had lain thus for a long time under the hands of the most noted physicians of New York until she was so wasted away that she could be gathered up and carried in one’s arms like a child. When the case came to him, at last, he stopped the medicines; went to work with his dental instruments, and she was presently sound and well.”
Doctor Riggs in his article is very eloquent about the systemic impact of periodontal pathology.

"None but the most vigorous constitutions can withstand this type of disease. The appetite begins to fail; even the odor of cooking the most savory food is offensive. A cup or two of strong coffee, and a few crackers, constitute the sole breakfast; languor and ennui are substituted for cheerfulness and vigor of mind and body; neuralgic pains sweep up through the face to both hemispheres of the brain, and are intensified by a recumbent position, thus banishing sleep. The patient paces his room at night, or reclines as well as he may, until in his agony he cries out, as MacBeth to his physician, 'Canst thou not minister to a mind diseased? Pluck from the memory a rooted sorrow? Raze out the written troubles of the brain, and, with some sweet oblivious antidote, cleanse the stuffed bosom of that perilous stuff which weighs upon the heart?" "

Twain describes his reaction to Doctor Riggs' actual clinical procedures.

"... He put his tool into my mouth, rooted it under a gum and began to carve. He seemed to fetch away chips of bone the size of my hand. In truth what he removed could hardly have been seen without a microscope, I suppose—but my imagination is a microscope. If I had been honest enough to speak my mind I would have said, 'Ow' to every dig, and shouted it; but I was ashamed to do that, and so only said 'Um,' in a low voice, and kept back the exclamation point. The doctor worked fast, and with a hand that was as sure as it was vigorous; though along at first I was all the time expecting the instrument would slip and carry away all my Riggs disease at one rake." 

Periodontal treatment was apparently no less painful in Twain's day than in our own and Doctor Riggs, who had years previously been an associate of Horace Wells, offered his patient the option of chloroform analgesia.

"The chloroform created a radical change; it made everything comfortable and pleasant. The pains were about as sharp as they had been before, but they seemed to be impersonal pains; pains that belonged to the community in general, including me but not me particularly, not me any more than the others. So, I did not care for them any longer; I do not care for a pain unless I can have it all to myself." 

Twain summarizes his experience with Doctor Riggs.

"I was in the chair a good part of two days—nine hours the first day and five the next—and came out of it with my thirty-two teeth as polished and ship-shape and raw as if they had been taken out of their sockets and filed. It was a good job, and quickly and skillfully done; but if I opened my mouth and drew in a cold breath it woke up my attention like pouring ice water down my back. I could not touch anything to my teeth for several days, they were so supernaturally sensitive. But after that they became as tough as iron, and a thorough comfort. If by some blessed accident my conscience could catch the Riggs disease, I know what I would do with it." 

We may conclude that Twain's description of the post operative sensations is not exaggerated—fourteen hours of scaling in a two day
period would do most patients in. Perhaps our modern patients lack something of Twain’s hardiness or perhaps they are not so amenable to "education."

Apparently Doctor Riggs did not have what we would consider a modern recall system for Twain was told that although he had some incipient caries his next visit could probably wait "five or six years."

"When my six-year limit was up, I went to the doctor again, and he found sure enough, that my harvest was fine and large and ripe for the sickle."

Unfortunately the manuscript breaks off and we are not privileged to know of Twain’s subsequent dental experiences. Notwithstanding, we may be grateful for the considerable light which this literary fragment casts on dental treatment in his day and perhaps our own.

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2. Mark Twain Papers, DV51, unpublished manuscript in Library of the University of California, Berkeley. Copyright 1964 by the Mark Twain Company. Not to be reprinted without specific permission of the Mark Twain Company.


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Silencing of A Voice:
The Death of A Dental Journal

–JAMES D. WINDELL
Portland, Oregon

Man's urge to write, or better still to express himself, is an innate quality. This quality is suppressed by some; but in others it becomes refined and develops into a cornerstone to thoughts that all too often could become altered over the years. Historically speaking, there would be no history to judge the past and plot the future if it were not for written words. Experience has shown us that hear-say by word of mouth, when reaching future years, is half truth divided by two and subtracted to zero. Past occurrences would be far out of proportion if someone had failed to put those first incidents down in written form. Written language is an important entity in life and when someone concerned with communication sees an expression of thought stop, it is troublesome. In the case in question not only did an individual lose something, but dentistry lost part of itself with the disappearance of Dental Items of Interest in 1953.

When the first true publication of organized dentistry, the Official Bulletin of the National Dental Association, (later to have its name changed to Journal of the National Dental Association and in 1922 to Journal of the American Dental Association) appeared in 1913, Dental Items of Interest had already been in print thirty-four years. Although not an official journal of organized dentistry, it began and remained a publication dedicated to the profession and the science involved with that profession.

FIRST EDITOR OF ITEMS

Dental Items of Interest (hereafter referred to as Items) was first published in 1879 under the direction of Dr. Thomas B. Welch and shortly after was under the supervision, financially, of the Wilmington Dental Manufacturing Company of Philadelphia. Dr. Welch remained editor until 1896 and utilized this position to full advantage in the early years of Items publication.

Dr. Welch lived and practiced "temperance," and some of his editorials reflected these opinions. However, he was forming a journal and was not ashamed to print ideas sometimes not easily accepted. He overrode the personal opinions of those who objected to his ideas in an attempt to elevate the dental profession through the pages of the publication. He upheld the ethics of dentistry and was a strong and early supporter of the belief that it was an equal partner with medicine in the field of health care professions.

He used many clinical observations to relate problems faced in practice and suggestions for improvement in this area. In 1883 he explored the problems of dental caries and its relation to bacterial and chemical phenomena. This was a theory only since proper evaluation and
bacteriological techniques were not widely available until many years later. However, he was a scientist, willing to calculate from observable data and form a theory that had substantial scientific merit.

Although many of the editorial comments by Dr. Welch were of a theological nature, based on his temperate views, he did open up the pages of *Items* to include the scientific discussions prevalent during that period. He also assured *Items* a place in the discussion arena of interested dentists. This, above all else, formulated a doctrine of which *Items* never lost sight. It existed primarily for the profession and was to continue as a publication insuring that premise. *Items’* position was never to veer from this in its seventy-five year history. Thus these early foundation years represent a progressive step in the life of *Items* and should be recognized in the annals.

**MAJOR CHANGE IN OWNERSHIP AND EDITORSHIP**

In 1896, *Items* again changed hands as well as editors. It was purchased by the Consolidated Manufacturing Company and Dr. Rodrigues Ottolengui was given the editorship. Dr. Ottolengui accepted the position under the stipulation that he would have complete charge of the scientific portion of *Items*. He averred that *Items* would be a publication strictly for dental science and would never be considered merely a trade journal, subservient to commercial interests. This is another doctrine that *Items* held to throughout its history. At no point was commercial control ever to influence the publishing of the subject matter incorporated into its issues. *Items* represented an open forum for dentistry, where any item worthy of print, and without political influence, was able to find publication.

Dr. Ottolengui changed the format after he took over, and these changes can be seen in the issues put out during his term as editor from 1896 to 1937. He encouraged the inclusion of illustrative material to accompany articles submitted to *Items*. He also followed the policy of limiting reports delivered at official meetings of dental societies, feeling they were adequately covered in official journals and, if pertinent, in national publications of that type. However, he made an exception when he instituted a section, “Orthodontia,” which he felt would be of interest to the subscribers, since it was a developing area. Following this he invited contributions from the American Society of Orthodontics, offering its members a place of publication in *Items*. Other departments developed throughout *Items’* life, such as “Prosthodontia,” “Dental Medicine,” etc., and these as well as the whole journal were open to original contributions.

Ottolengui followed the concepts of journalism set down by the *American Journal of Dental Science*, including an alertness to secure good writers and to supply the needs of the general practitioner. He published articles that, in other journals might not have made print because of their obscurity at the time, covering such topics as gold inlays, dental roentgenology, fixed and removable bridgework, porcelain fillings, oral infections, oral surgery, and others. Their publication enabled clinical application of techniques that otherwise might have remained unknown to a majority of the practicing profession.
Items under his leadership is credited with the first publication of the following:

1. Publication of the first radiographs in 1897.
2. Publication of Dr. William J. Morton's pressure anesthesia method in 1899.
4. The publication of Dr. William H. Taggart's paper, "The Cast Gold Inlay."
6. Publication in serial form of Dr. Howard R. Raper's articles on Dental Radiography in 1911, as well as Dr. G. V. Black's lengthy contribution, "The Beginning of Pyorrhea Alveolaris; Its Treatment and Prevention."

These articles gave Items a reputation of fulfilling the goals of the journal for the practicing professional, offering him the latest ideas of the period, written in a style that could be understood and which generated discussion with improvement in mind.

Besides enriching its fame with publication firsts in the field of dentistry, Items innovated a feature which, in the author's opinion, gave it the place it deserves in the history of dental journalism. This occurred in 1914, with the formation of the department, conceived by Dr. Ottolengui, titled "Around the Table."

At the time of its origin Dr. Ottolengui, found from correspondence to Items a desire for shorter articles. Something was needed to trim an all too lengthy piece down to an easily readable length. He felt, too, that a leisurely, yet scientific, approach, might be appealing to the all too busy general practitioner. He also observed from numerous society meetings that interest did not lie in the principal papers being delivered. Instead, when the assemblies were broken down into smaller groups to discuss papers already read, interest levels were high. These "Around the Table" discussions, as he called them, actually proved to be of more value than the original paper, because views could be brought out and dissected down to areas of benefit to the practitioners. Papers became improved and clarified when others became involved. This represented true Aristotelian methods, where problems were openly discussed and new implications faced if the problems engendered them.

People are sometimes hesitant to express their ideas if faced by a large assembly or an editor's desk that has no room for intellectual rebuttal. "Around the Table" offered a place for these persons. An exchange of ideas was cherished, and so popular did it prove that there was never a dearth of material. It became, in effect, a discussion group, and brought forth new ideas resulting from problems arising in techniques and new innovations. A reader-editor relationship was thus formed that perhaps will never again be equaled in dentistry.

In 1925 the Nevin family took over control, with financial support from the Novocol Chemical Manufacturing Company, but the editorial
policies remained unchanged, with Ottolengui continuing as editor until his death in 1937.

**THE THIRD AND LAST EDITOR**

In 1937 the third and final editor, Dr. Paul H. Belding, took over the reins, maintaining editorial control until his death in 1953.

Dr. Belding, too, was an individualist as were his two predecessors, but each matured during different epochs of dentistry. Dr. Welch dealt with an infant profession, helping to guide it in its ethical and technical development. Dr. Ottolengui dealt with an emerging, modern profession and the new innovations it offered. Dr. Belding was part of an adult profession on a par with medicine.

Dr. Belding was a journalist in the classic sense. He practiced his profession in its best form, fulfilling the needs of his community even though he worked long hours and reaped small financial reward. The small community where he practiced offered an atmosphere in which to formulate those ideas which were the basis of his editorial thinking and which suffused the pages of *Items*. He gave his full attention to his profession, and yet was influential in maintaining *Items* as a voice of dentistry.

Belding maintained the tradition that views not in agreement with authority could find publication. *Items* became the arena for attacks on faulty concepts in the profession, and solutions to them. *Items* was often criticized for this, a prime example being a series of three editorials, two by Dr. Belding and one by Dr. Lon W. Morrey, editor of the *Journal of the American Dental Association* in the February 1953 issue of *"Items,"* dealing with the allocation of federal funds for professional schools and the socialistic implications that Dr. Belding feared were implicit in this step.

He favored free enterprise and when socialist doctrines were advanced by political groups seeking control of the professions, *Items* became a mouthpiece against them. Dr. Belding loved his profession and at that time he felt that dentistry was being eased in through the back door of socialism. Now we are again faced with a similar problem in our national health policies. Today, however, dentistry and medicine are at the front door, insisting on being consulted in policy decisions. The professions have educated themselves, using a knowledge of past situations to arrive at these conclusions. Part of this was due to *Items* printing all sides of a problem, and especially its faults.

Through *Items* he also attacked the fact that small power groups controlled dental societies. One basic problem concerned the licensing system in a number of states. He felt that the boards of examiners in these states deviated from their original charge, and instead were excluding from practice individuals in certain areas by not fully judging them on their qualifications as the laws intended. This problem still exists today, and is evident in the movement for national licensure.

During Dr. Belding’s editorship, *Items* became the center of a national controversy over progressive education. Progressive education at that time was defined as a system in which the student would be allowed to
pursue a course to whatever degree and depth he himself determined was relevant for him. This very liberal approach to education had considerable political backing, but Dr. Belding felt this system would be detrimental to the health professions since a minimum of knowledge and skill is absolutely essential before a practitioner can be entrusted with the public's health. Educators, parents, and administrators followed his stand and professional schools were encouraged to selectively choose students they felt best qualified. Although this problem has not been completely resolved, modern educators feel that education will change. They believe that the health professions' schools represent a distinct problem since their graduates deal with such a vital sphere of life as the health of the nation.

With the death of Dr. Belding in 1953 came the death of Items. Perhaps the author has in this paper dealt more with the lives of the editors than with the life of the journal. However, it is impossible to discuss the history of a journal without considering the minds responsible for its existence. Although each of the three editors and his contributions to dentistry can be considered on his own, Items needs all three in order to tell its story. It is interesting to note that Dr. M. D. K. Bremner gives credit for the life of this journal to Dr. Mendel Nevin, who controlled the financial strings at a deficit or at best only a break-even policy since 1925. Money does run a journal and without it there is no journal. Items was in financial difficulties throughout its years since it did not accept all manner of advertisements as freely as did the other journals. So Items was indeed fortunate to have had Dr. Nevin, a concerned member of the dental profession as a backer, enabling it to continue in existence for another twenty-eight years.

Items must now remain only in the memories of those who are aware of the impact it had on the profession. Its influence can be summed up in a poem:

When I have something to say
I try to avoid saying it to wind chimes.
While the sound is beautiful,
The impact is naught.

REFERENCES

Dr. William D. Coolidge, director-emeritus of research for the General Electric Company, on November 2, 1972 was made an honorary member of the Odontological Society of Lyon, France, in recognition of his many contributions to dentistry, including invention of the original "Coolidge X-ray Tube" which made possible modern medical and industrial x-ray technology. Presentation of the certificate was made at Dr. Coolidge's home in Schenectady, by Dr. Roger Vincent, director of education and dental research at the University of Lyon. In the photo (left to right) are Dr. Louis B. Amyot, member of the American Academy of the History of Dentistry and who recently was named as a Fellow of the International College of Dentists, Dr. Vincent, Dr. Coolidge, and Dr. Robert H. Pry, manager of the Metallurgy and Ceramics Laboratory at the GE Research and Development Center.
Ho Ho For These Days:
Verses of Advancing Technology
by "I.B.B."

—JOHN W. HOWARD, A.M.
Morgantown, West Virginia

Now that the distrust of advancing technology is more and more apparent, it is pleasant and instructive to recall there was a time when one could exuberate, for all was progress and all progress was good. An instance is the verse here reprinted from the Dental Register of the West, 12:121-2, September 1859. Unrecorded in the Index to Dental Literature, the work is signed with only the initials "I.B.B." While identification is presumptive, he was likely I.B.Branch of Galena, Illinois. His are the only matching initials in the Index, where two of three items listed are in verse.

Preliminary investigation has revealed nothing of a birth or death date for Dr. Branch. His earliest indexed contribution, in the 1850-51 Dental News Letter, was signed from Galena. Vera Millhouse, the present librarian at Galena, has kindly furnished a copy of the page in the 1854 Galena City Directory on which Drs. I.B. and P.C. Branch proclaimed theirs "the oldest dental establishment in the northwest."

In 1865 or thereabouts, P.C. removed to Vinton, Iowa, for in the meeting of the Iowa State Dental Society of that year, he was introduced as a new member. A visitor was "Dr. Branch of Illinois." One likes to believe it was I.B. who made the journey to see his former associate installed.
And that, aside from his listing once as owner of a share in the Ohio College of Dental Surgery is all I know of our author. That and his joy in the changing world he saw.

Ho ho for these days,
And these modern ways,
When science so rapidly rides,
That the fastest of men,
With their keen ready ken,
Can hardly keep pace with her strides —
When steam, frost, and light
Have become her delight,
But patiently do what they can;
When o’er the sea’s bed
The nuptials are said,
That marry the nations together,
And the electrical flash
Is an order for cash,
Or a note on the state of the weather;
When if, as you pass,
You look in the glass,
The light has your features at once —
Your picture is there,
At which all may stare,
And call you a knave or a dunce;
When the lucifer match,
With a most gentle scratch,
Takes place of the flint and the steel,
And the strong Iron Horse,
With terrible force,
Treads Time with his scythe ‘neath his heel;
When children are fed,
By bumps on their head,
To bid their vile passions be still,
And steel and fine gold
In the market are sold,
Instead of the “gray goose quill.”

Ha ha for these days,
When science displays,
Her power o’er the tortures we feel;
No longer, per force,
We bear them of course
Because we’re afraid of the steel —
But instead of the pangs,
From the wrenching of fangs,
Or the cutting of nerves all diseased,
We now go to sleep —
And wake not to weep,
But to smile that the horror has ceased.
Or, if we’re afraid
Lest we may wake dead,
As indeed too oft is the case,
Then the “local” we try,
With the frost in his eye,
And soon the offender displace,
For he in a trice
Cools it all off so nice,
We laugh at the surgeon, forsooth;
And scarce will believe,
Till we feel and perceive,
We’re minus an old aching tooth.
Are we fond of new things,
Then we just hold the strings
To the engine of lightning at play,
And feel the quick claws
Hook into our jaws,
And forget while the tooth breaks away.
Ha ha for the age,
When history’s page
The wonders of science contains:
May the wonders grow
As the ages go,
Till the Light o’er the Darkness reigns.

This little gem, like the ones before it that graced previous issues, is a product of the Plectopteran Press which is located in the basement of the Howard home in Morgantown, West Virginia. Professor Howard, a frequent contributor to our pages, is Associate Professor of Dental Literature, School of Dentistry, West Virginia University in Morgantown.
On the Teaching of Dental History

—STANLEY R. KORF, D.D.S.
Chicago, Illinois

In darkness dwells the people which knows its annals not.

One of the sad and largely unheralded casualties of World War II was the quiet elimination of dental history courses from the curriculum of most dental schools. The exigencies of a great national effort seemed to make it necessary to put aside for the time being, the teaching of the fascinating history of dentistry. The concentration and focus fell on only the pragmatic and technical aspects of our profession. The crisis has long passed, but because of our natural apathy, a lack of dental historians, and the pressures of a "now" philosophy, such courses of study have not been reintroduced. Today's students are seriously short changed in their total dental education by not being taught and inspired by the intriguing story of our profession's heritage and traditions.

Ours is a history replete with noble motives, scholarly examples of elegant erudition, technical accomplishments of the most exquisite refinement, broad vision of service to humanity, realistic (and unrealistic) philosophies of altruism, marvelous instances of serendipity, fascinating personal feuds of tremendous intensity, a little chicanery thrown in here and there, and some smashing scientific insights — in short — a total picture of an ongoing saga from the crude but well meaning barberism of medieval days to the present time of a totally respected and still growing profession.

What a shame that most of today's dental students know little or nothing about their chosen profession's very special history. What a pity that the dental giants of yesterday: Black, Angle, Kells, Morton, Wells, Pare, Fauchard, Fonzi, Hunter, Taggart, Miller, Gies, and an outstanding host of others are only rusty names from the past; that their prodigious efforts and accomplishments are hardly remembered or honored except by a few.

Some may argue that in this very practical world of ours there is no longer time or a need for learning about the past. They would be quite content to let the dust of a past time settle and be swept away forever. Their thoughts are only of today and the future. May I gently suggest to these pragmatists that such preoccupation with only the now and tomorrow may be part of what is wrong with our rushing, bustling, and unhappy world of today. Perhaps it would be wise to stop for a while for some quiet contemplation of our past. Permit us even a little romanticism or sentimentality about our professional inheritance, for surely we all recognize that the past holds some of the best clues to our future. It seems to me that the negation of one's history is accompanied by an insidious and devastating feeling that one is now merely a dull cog in a dreary and
coldly repetitive system that can only produce boredom and insensibility until the inexorable release of death finally ends it all.

History, on the other hand, when properly and imaginatively taught can bring excitement, vitality, stimulation, and inspiration, for it is the very stuff of our lives, it is the essence of where we have been and what we have done, and it holds the limitless promises of where we can ultimately travel and what we can accomplish. Surely there is still a huge wellspring of sensitivity in today’s dental students that merely needs to be tapped. I think that students would truly like to know something about dentistry’s past, something of its record of accomplishments as well as its failures, and I am convinced that were this reservoir of sensitivity to be released, it would result in future generations of dentists with a firmer sense of their participation and responsibility in their own profession.

One of the hallmarks of the true profession is that subtle sense of belonging to a group whose primary purpose is to serve humanity. The history of dentistry reveals it to be such a group, solidly built on this cornerstone of service. Yet today, some dental schools may be fairly faulted for not imbuing students with this sense of a mission. It is never enough to just teach technical competence. All young people need a continuing identification with an honest and unselfish tradition of service to mankind, for without this, dental students merely become skilled technician tradesmen.

If dental history courses were again introduced into the curriculum in the imaginative, enthusiastic, and zealous way that history should be taught there well might be the start of a magical renaissance of cohesion and dedication to the fundamental principles of our art and science.

This hiatus without dental history has been too deplorably long. It may not be easy to restore, but the Deans of every dental school working with their faculties and with the cooperation of the American Association of Dental Schools should have the vision and sensitivity to reintroduce the teaching of the history of dentistry to its rightful and proper place in the schema of dental education.

DR. KORF’S ADDRESS is 1642 East 56 Street, Chicago, Illinois 60637.

(Reprinted from the January, 1973, issue of the Journal of the American College of Dentists.)
Notes & Queries

Recently I found this provocative bit of information in a book (1868) about Edinburgh: John Howell, an exceptionally versatile resident of Edinburgh in the early nineteenth century, practiced medicine, "blending such services with those of a dentist in which role he invented the Pompeian dental plate." Can any member of the Academy supply me with a description of the "Pompeian dental plate?"

—GARDNER P. H. FOLEY

(Anyone having the information sought by Professor Foley may send it to the Editor of the Bulletin and it will be transmitted to him.)

The following letter which is self-explanatory was sent by the Secretary of the American Academy of the History of Dentistry to the American Fund for Dental Education since such a great need currently exists to bring the message of the Academy to dental educators as well as the dental profession as a whole:

March 7, 1973

American Fund for Dental Education
Suite 1630
211 E. Chicago Avenue
Chicago, Illinois 60611

Dear Sir:

I was greatly intrigued by your advertisement appearing in page 448 of the February issue of the Journal of the American Dental Association.

The words "rich inheritance" and "great tradition" struck me immediately and had me wondering just how many of the some 125,000 dentists of our country know anything about the history of dentistry. It would logically follow that if there is a lack of such knowledge, then how can one expect them to be aware of this "rich heritage" and "great tradition."

Our Academy is vitally concerned with the progogation of the history of American dentistry to every dentist, dental student, paradental person and indeed the public as well.

We shall be happy to assist you in bringing this inheritance and tradition to the people you serve.

Cordially,
Milton B. Asbell, D.D.S.
Secretary-Treasurer
American Academy of the History of Dentistry
In the December 1972 issue of the *Bulletin* there appeared a charming piece by Prof. John W. Howard entitled "A Soft Sell of Dental Hardware." These were verses from a dental journal of 1889, and which were part of an advertisement of a dental supply house. Prof. Howard herewith submits his latest discovery as to who the author of the verses may have been:

You might be interested to know that I now suspect Palmer Cox may have written the verses, as well as having done the illustrations. Some time after I had printed "A Soft Sell," I was looking at some issues for the 1880's of a nice weekly paper called *Harper's Young People*. Some illustrations looked rather familiar — rather like the way one would recognize Mickey Mouse in any disguise — and I found that they and the accompanying light verses were the work of Cox. It didn’t take me long to discover that he was an eminent author-illustrator of the time, whose most famous works were the resoundingly successful "Brownie" books. They were really before my time, but I do recall having seen some of them. Whether he did these dental verses as well as the pictures, I can’t be sure. But certainly the Wilmington Manufacturing Co. must have been in good shape to be able to hire Cox to do advertisements for them.

Citation is presented to W. Harry Archer, formerly Professor of Oral Surgery, and now distinguished University Professor, University of Pittsburgh, and B. E. Phillips, Executive Director of the Veterans Administration Hospital, for the role they played in establishing the first VA Dental Residency Programs. The presentations were made by the Western Pennsylvania Society of Oral Surgeons and the Pennsylvania Association of Hospital Dentists at the 25th Anniversary of the establishment of the pioneer residency program.
To the Editor:

Just a line to congratulate you on the December issue of the Bulletin. The papers therein are most educational and interesting to the members of the dental profession and undoubtedly many others. Naturally, I am pleased with the article by Hamarneh describing the dental exhibit at the Smithsonian. This exhibit, as you probably know, is largely the result of the efforts of the Special Advisory Committee to the Smithsonian while I had the honor of serving as chairman.

It is my opinion that the United States has the greatest dental exhibit in the world, as described in the Bulletin, and I wonder if we should not make this known either through the F.D.I. or perhaps the State Department or some other governmental agency. I notice that other governments do not hesitate to announce to the world whenever anything out of the ordinary has been developed by them. Please give consideration to this suggestion and if I can be of any service in the matter, please advise, even though I am supposed to be retired and have just passed my 86th birthday.

With best wishes for your continued success
C. Willard Camalier, Sr., D.D.S.

(Dr. Camalier, who is a past-president of the American Academy of the History of Dentistry as well as past-president of the American Dental Association, is the author of a history of dentistry in the District of Columbia.)
To the Editor:

I was very happy to receive the Bulletin just before the holidays which provided more time to peruse the plump issue you produced. The article on "History of the Dental Exhibit at the Smithsonian Institution" was very revealing, especially since I saw some of the displays when I was last there. However, one photograph was not included and that is of the newly established room of Dr. Edmund Kells.

With best wishes, I remain sincerely yours,

Frank J. Orland, D.D.S.

(Dr. Orland is a past-president of the International Association for Dental Research and the former editor of the Journal of Dental Research. He is the Director of the Walter G. Zoller Memorial Dental Clinic of the University of Chicago.)

To the Editor:

Just a note to tell you what a great job you are doing as Editor of the American Academy of the History of Dentistry. I read the Bulletin with great interest and then pass it on to my brother-in-law.

Sincerely,

L. L. Mulcahy, Jr., D.D.S.

(Dr. Mulcahy is Past-president of the Eighth District Dental Society of the State of New York. His brother-in-law, Edward Atwater, M.D. is on the faculty of the School of Medicine of the University of Rochester and teaches the history of medicine.)

To the Editor:

I am an Australian dentist now undertaking graduate studies at the School of Public Health of Columbia University. For some years past I have been generally interested in dental history, but during the past few months I have encountered the Bulletin in the library here, which has stimulated my interest further.

I am at present enrolled for two historical courses — Topics in the Social History of Medicine and Health Care, and Historical Method and Documentary Analysis in Sociological Research.

The purpose of this letter is to enquire whether you have back numbers of the Bulletin, and if so what the price would be.

Yours sincerely,

John D. Jago, M.D.Sc.

(Dr. Jago, who has had many papers on pedodontics, orthodontics and public health published in journals in his native country and elsewhere, has recently become an active member of the American Academy of the History of Dentistry.)
To the Editor:

It was ever so good of you to send me a copy of your Bulletin. I appreciate your kindness and graciousness. I certainly extend to the American Academy of the History of Dentistry my best wishes in the months and years ahead. It is fortunate to have you as Editor.

I had a bout with pneumonia in December but I am feeling better now and get in to my Faculty Study at the library every day. One book is in press in Belgium, and of course I still spend an enormous amount of time on my section in the Journal of the History of Medicine.

Send my best greetings to you and every good wish for all that remains of 1973.

Sincerely yours,

Dorothy M. Schullian

(Miss Schullian, who is world renowned as a medical historian, bibliographer and editor of a section in the journal issued by the School of Medicine of Yale University, has recently retired as Curator of the History of Science Collection of the Cornell University Libraries.)
An event of outstanding importance to bibliographers and other scholars of dental history has just taken place with the issuance of this long awaited book. It represents not only years of painstaking research but tremendous insight into dental literature and all of it together truly represents a labor of love. And we are all the more proud of it because it is the work of a founder and the current Secretary of the American Academy of the History of Dentistry.

This volume it the most up-to-date work on the literature of dentistry in America during this period, covering not only books and pamphlets but scientific articles appearing in medical and scientific publications. Not since the bibliography of the late Dr. B. W. Weinberger has there appeared such a resource book. It will be a valuable tool for the researcher, librarian, historian, scholar and anyone interested in the literature of dentistry.

The materials assembled so judiciously and extensively are an embodiment of historical values chronologically oriented that will be of enduring worth to the student of dental history. Besides the citation of the contributors, their works, and places of publication, the Bibliography presents many other useful data: a short title list of the entries, a key to the symbols used, a listing of all copies of the works located, brief commentaries on each item and a citation of the reviews.

Dr. Asbell has recovered from the budding period of the literature on American dentistry the writings of those forceful and imaginative men who helped to build the foundations for the profession's remarkable organizational, literary and educational structuring in the 1840's.

Dr. Milton B. Asbell is recognized as one of this country's leading authorities on the history of dentistry. He has devoted many years to
writing, researching lecturing and promoting the dissemination of information on the history of the dental profession. He is a special lecturer in dental history at Temple University, School of Dentistry, and past-historian of numerous dental, specialty, fraternal and historical associations. He holds honorary membership in foreign scientific and historical societies, and has published several works on dental societies and over one hundred articles on many areas of dental history in lay and professional journals.

Professor Gardner Foley, who is also one of the founders of the Academy, in his fine introduction to the book, places the value of the work in its proper perspective. "The Bibliography," he says, "constitutes an effective acknowledgement of the debt that contemporary dentists owe to their predecessors, for as a partial inventory of a heritage it provides a record of early fulfillment and promise in the literature of American dentistry."


In the early days of this country medical practitioners were few and settlements were isolated, and thus many of the people of the nation had no alternative but to rely on folk-lore and other types of "common-sense" therapeutics. And what few medicines did get through to the backwoods areas were brought by the itinerant peddlers who carried in their saddle-bags and buggies snake root oil along with the pots and pans.

After the Civil War printing became more widespread, mail service became more efficient and manufacturers, no longer relying so heavily on salesmen, put their pitch into print. Almanacs and catalogs became common and trading cards widespread. Newspapers and magazines which had grown by leaps and bounds all carried their messages of "health" and "healing" and there wasn't a home which didn't boast a compendious home medical advisor and remedy book, generally written by a "professor" with a string of degrees following his name. The woman of the house made the medicines after the recipes given, and they were usually so strong that a teaspoon was considered the maximum dose a tablespoonful would probably have killed the patient.

Fortunately for the country the Pure Food and Drug Act of 1906 put a stop to much of this worthless merchandising, and although the "medicine man" died hard, the day of the widespread use and exploitation of these nostrums is thankfully past.

In this lavish volume the author, who is a high-school science teacher, and who has devoted years to the collection of her material, brings together a treasure-trove of labels, advertisements, drawings, trading cards and other paraphernalia relating to the day of the patent medicine man. The text is made up almost entirely of excerpts taken from old "remedy books" or advertisements, and they capture in a unique fashion the tenor of the times.

For the dental historian the book has the additional fascination of the
many "cures" cited for toothache and other dental ills: "To fasten the teeth: Gargle often with phyllera leaves boiled with a little alum in forge water."

The Indian Doctor's Dispensatory (which is reprinted in its entirety) gives this "guaranteed" remedy:

The Tooth-ache, to cure by Sympathy: The process — The patient is enjoined not to narrate what is done to him, or the Tooth-ache will return. (But a repetition will restore the cure.)

All the finger and toe nails are to be trimmed, the pieces off of each are to be laid on a rag or paper; to which also is to be laid a lock of hair taken from the head; then the gum of the tooth is to be gouged or pierced, to add some blood to the nails and hair; then the whole is to be wrapped together in the bank of some creek or gully, at a place where no creature crosses. The operator may keep the putting away to himself, if he pleases.

Indians they say have queer notions. Hah but I have tried this for perhaps fifteen years, on myself and many others, and seldom without immediate success. The tooth, it is believed when it becomes easy, will never ache again. — If the pain remains, chew root, No. 2, or No. 16.

Sections on "Passions and Sex," "Aphrodisiacs," "Almanacs" and many others like them can provide hours of interesting reading. We who live in what we consider an enlightened age can only wonder at the superstition and foolish ideas of our forbears of only a few generations ago.

The book is not a text; there is no index and only a rather loose arrangement of subject matter, But its quarto size, innumerable illustrations and quaint reading make it a fascinating record of a bygone age.


The book will be of primary interest to those British citizens who served in or were associated with the Royal Army Dental Corps since it was established in 1921. Many others, however, with an appetite for, and an appreciation of, history will be fascinated with the view of the dramatic and oftentimes cataclysmic changes of the past fifty years as seen through the eyes of the British soldier-dentists. Winston Churchill's signature launched the Corps and the Corps became an integral part of the British fight for survival, triumph and post-war adjustments as she dismantled the Empire.

The struggle to establish a Dental Corps to serve the British troops paralleled a similar struggle in America to convince the medical profession and the government that dentistry was a vital health service. Lack of dental support in World War I for British troops caused such a serious loss and waste of manpower that the British Dental Association was finally able to convince the government that "a modern army can not operate effectively without an appropriate dental establishment organized
and equipped for its special needs. As in the United States, the Dental Corps was initially administered by the Medical Branch (Director General, Army Medical Services). Whether this situation caused the same friction and ill feelings as it did in the United States Army can not be gleaned directly from the book. One suspects that it did since references are made to the added efficiency and higher morale of those dental units operating independently.

The scope of the British Empire prior to World War II is outlined in the enumeration of the distribution of the dental units throughout the world. The precarious early years before the war when the Corps fought for survival is documented. The justification for the dental corps came in the realities of the blitzkrieg, Dunkirk and the battle for Britain. The battles around the world, the triumphs and defeats are calmly documented. The lessons learned and the sometimes desperate steps necessary to overcome wartime shortages of materials and manpower are discussed.

Many persons are named and their activities described, so the book is more than an impersonal documentation of events. The chapter which tells of the life of the dental P.O.W.’s in Axis or Japanese prison camps is fascinating reading even for those not interested in dentistry. Interesting vignettes of life in the Army as it was in bygone days are scattered throughout the pages. It is hard to realize that as late as the 1930’s field grade dental officers were required to wear not only breeches and leggings but spurs as well. The solution of the British War Office to the inability of the edentulous soldiers to masticate the Army rations in the Boer War was to ship in mincing machines to chop up the food. An early day Jack Anderson would surely have had a field day with that one The attitude of the New Zealanders toward the capture of a great number of their available dental officers and other dental personnel in the Crete and Greek campaigns can’t help but elicit a chuckle. Rather than bemoan the loss, the New Zealanders rejoiced that their P.O.W.’s would have such superior dental care Another interesting sideline to history concerns Brigadier A. F. Hely — a dental surgeon in peace time who served in combat as Divisional Commander of the 7th Indian Division.

The Royal Army Dental Corps has come a long way since its birth in 1921. Today it is a vital treatment, teaching and research organization recognized for the excellence of its many programs. To gain a better perspective of dentistry in Britain, and especially in the British Army, this book is an enjoyable source of information.

(Reviewed by Robert C. Sproull, D.D.S., who is a Colonel in the Dental Corps, United States Army.)


Here is a welcome addition to the books on single elements. Dr. Goldwater has written the complete and total book on that most interesting element MERCURY.

He traces its history back to prehistoric times. He gives us chapters on
its mining and extraction. He writes a fascinating chapter on its use in the occult arts, and explains its chemistry.

The chapters on mercury's use in medicine and dentistry are of primary interest. For years it was the only drug used for the treatment of Syphilis. It was and still is used in various compounds for everything from diuretics to antiseptics.

In dentistry, its use along with other metals as an amalgam, started a controversy known as the "amalgam war" which continued until G. V. Black published his authoritative work on amalgams. There have been many studies on mercury toxicity in dentistry both from the standpoint of the dentist and the patient, and they all conclude that there is little or no danger from its use.

The book has been thoroughly and completely researched. It is fully indexed. The bibliography at the end of each chapter is very detailed.

Mercury: A History of Quicksilver should be in every public library. Those of us who are interested in history will want to own it.

(Reviewed by Lawrence L. Mulcahy, Jr., D.D.S., F.A.C.D.)


Towards the end of the eighteenth century exciting findings were being made in the field of chemistry and principal among these were the discovery of the vital gases oxygen and nitrogen and their various compounds. The stir in the medical world created by the work of Priestley and others in discovering these hitherto unsuspected elements led to their being tried as remedies for a variety of illnesses and this gave rise to the branch of healing which was then dubbed "pneumatics." It wasn't long before "pneumatic institutions" were established for the treatment of patients and it was while he was Superintendent of the Medical Pneumatic Institution of London at the very young age of 22 that Humphrey Davy brought out his great work Researches, Chemical and Philosophical . . .

Davy discovered the anesthetic properties of nitrous oxide as a result of experimentation upon himself. In his book he details the steps of the experiment with remarkable clarity, and his writing comes down to us after almost 175 years with brilliance and interest. He wrote of the first time he inhaled it to any degree:

The first inspirations occasioned a slight degree of giddiness. This was succeeded by an uncommon sense of fulness of the head, accompanied with loss of distinct sensation and voluntary power, a feeling analogous to that produced in the first stage of intoxication; but unattended by pleasurable sensation. Dr. Kinglake, who felt my pulse, informed me that it was rendered quicker and fuller.

Descriptions of further experiments on himself and other prominent persons as well follow, many of them bizarre in their execution, but all of them leading to the same conclusion, that " . . . nitrous oxide in its
extensive operation appears capable of destroying physical pain, (and) it
may probably be used with advantage during surgical operations . . .”

Humphry Davy's book in time became exceedingly rare, and on the
bicentenary of the publication of Priestley's Observations on Different
Kinds of Air it was decided by the Royal College of Surgeons to reissue
Davy's book in facsimile. It was agreed that no attempt would be made to
embellish the book with modern annotations or footnotes. These would
be superfluous since Davy comes across to us in a manner so clear that it
would be presumptuous to intrude upon his writing.

This facsimile edition is a work of art. The binding simulates the style
of an old leather-bound volume with embossed gold lettering on cover
and spine. The typography is identical with that of the original and the
original spelling has been preserved. Any serious student of the history of
anesthesia or of dentistry would treasure this fascinating book not only
because it laid the groundwork for the greatest boon ever rendered to
mankind, anesthesia, but also because of its intrinsic and compelling
interest.


Remarkable and adept as they were in the fields of engineering,
arithmetic and metallurgy, the ancient Romans never developed an
indigenous system of medicine. For the freeborn patrician there was
thought to be only one intellectual pursuit worthy of his status — oratory.
The practice of medicine smacked of crass commercialism and thus was
below his dignity. Thus the Romans relied on Greek physicians who
either immigrated freely to Rome or were brought there as slaves, to
supply their need for medical practitioners.

The Greeks had developed a more-or-less organized system of medicine
based on the teachings of Hippocrates, augmented by the philosophy of
Aristotle, and it was this system which was transported to Rome and
which flourished there until Rome's downfall. It is therefore not
surprising that all of the outstanding physicians of Rome were of Greek
origin, not even excluding the remarkable Galen.

Thus a book which treats in great detail with the practice of Greek
medicine in Rome is a valuable addition to the literature of the history of
the medical sciences. This book does just that. It is a compilation of a
series of lectures on the history of medicine delivered at the Royal College
of Surgeons of London in 1909-1910 by Sir T. Clifford Allbutt who was
then Regius Professor of Physic in the University of Cambridge and also
Sometime Classical Scholar of Gonville and Caius College. (Dr. Allbutt's
classicism is manifest in the numerous quotations from the Greek, but
their worth will be lost on the modern reader, I fear, since none is
translated into English, and there are scarce any medical scholars around
today with a working knowledge of Greek.) Although the book was first
published in 1921, it has long been out of print until recently reissued by
this publisher.

The lectures' topics range from primitive Roman medicine, through the
introduction of Greek medicine into Rome and up past the age of Galen. Special chapters deal with the principal medical theories and practices of the time such as the doctrines of generation, hygiene and therapeutics as well as pharmacy and toxicology.

That Dr. Allbutt, whose erudition is manifest in every paragraph, was sought after as a lecturer is evident in the half dozen or so additional lectures on the history of medicine that are appended at the end of the book, lectures dealing also with such luminaries in medicine as Boerhave, Palissy and Bacon.

A compendious index, which alone runs to fifty-two pages, makes the book a scholar’s tool and a valuable source book on ancient medicine.


One of the most fantastic accomplishments in the field of bibliography of the sciences is this work, of which this is the third edition. Originally published in 1954 and reissued in 1962, it has been out of print for years until now, when it has been reissued in an expanded and updated version which can well stand as a monument to scholarly bibliography.

The authors, both professional librarians, (the former at St. Bartholomew’s Hospital Medical College of London and the latter at the University College of North Wales) have teamed up to put together a fascinating and detailed account of scientific literature from the most ancient days up to the present. The book follows a chronological pattern with such chapter headings as “Scientific Literature Before the Invention of Printing,” “Scientific Books of the 15th and 16th Centuries” and so on. All of the basic sciences, except the medical sciences, are dealt with, but the wealth of material in the adjunctive fields makes this volume of great value to a researcher in dental or medical history.

The chapter on incunabula is especially valuable, listing and describing practically all of these early scientific books from the embryo days of printing, naming bibliographic works in which they are listed, libraries and collections owning them and so on. Anatomy, chemistry, physiology and other biological sciences are dealt with in great detail in each chapter.

The exhaustive index makes it easy to use the material. For example, the index heading on “anatomy” has as subheadings “in the 15th century,” “in the 16th century,” and so on. And the entries in the text not only deal with the books themselves but give interesting facts about the authors and the publication histories of the books as well. There are in addition numerous facsimile reproductions of title pages of older works, which heightens the interest of the user of the volume.

The chapter “The Growth of Scientific Periodical Literature” is a very good treatment of this branch of the literature, but it confines itself to the literature of the western world. In a similar fashion, although the chapter dealing with scientific libraries is very good, it lists only those in the U.S. and England. Further chapters on booksellers, collectors and publishers of scientific literature make this book a true treasure house of
bibliographical information. The bibliography of those works consulted by the authors in compiling their work runs to 84 pages alone.

The book is intended as a working tool for librarians, but will well serve any serious bibliophile and collector of scientific literature.


The Wellcome Institute of the History of Medicine is one of the world’s great treasure-houses of medical lore. Its collections, not only in the field of medicine but of the allied sciences in the health field, especially of dentistry, are among the most extensive in existence.

The Institute sponsors an annual International Congress of the History of Medicine, issues numerous monographs and books, publishes the excellent periodical *Medical History* among its many services to the scientific world. In addition it maintains an outstanding library as well as an exhaustive museum. Among the many fine items in the museum’s collection are numerous portraits of physicians and other scientists through the ages, and this newly issued catalog is a complete compilation of these portraits.

The author, Dr. Renate Burgess, is a distinguished art historian who received her training at the University of Munich and has been for many years the Keeper of the Art Collections of the Wellcome Institute.

The catalog is a sumptuous work containing several hundreds of small reproductions of many of the portraits. However, these are but a very small portion of the entire collection, since the book gives details about 12,000 individual items. Dr. Burgess has carefully documented all of the details of the artists, as well as the designers and engravers of each portrait, and this information is readily accessible through the use of a good index.

The book would be of some value to libraries of the life-sciences in aiding authors in tracking down portraits of specific historical figures, as well as furnishing them with the information on who did the portraits, (some artists being as prominent as Rembrandt and Van Gogh.) Copies of any portrait listed, in the form of either a photographic print or slide can them be secured from the Institute.

The principal failing of the collection, however, is that far-ranging as it may be, not a single prominent person in the history of dentistry is included, not the great Fauchard, not W.T.G. Morton, not even Horace Wells who gave to the world its greatest medical gift of all—anaesthesia.
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The New President


Our new President, Dr. Jack Dent Carr, has proved to be a man dedicated to the dental profession, and his intense interest in the history of dentistry will enable him to add to the accomplishments of the Academy.

Born in Clayton, Indiana in 1913, Dr. Carr received his A.B. degree from Butler University in 1937, his D.D.S. from the Indiana University School of Dentistry in 1939, and his M.S. in Education from Butler University in 1954. His thesis was "The History of the Indiana Dental College." He taught Oral Surgery at the Indiana University School of Dentistry in 1939 and 1940, and then began private practice. During World War II he served in the Army Dental Corps, and resumed private practice in 1946. Dr. Carr returned to the faculty of Indiana University on a part-time basis in 1952 as an Assistant Professor of Dental Radiology, where he served as Co-chairman of the Department of Radiology for four years. He is also the lecturer in Dental History and teaches clinical photography.

Dr. Carr has served the Indiana State Dental Association in numerous capacities: Speaker of the House of Delegates, Delegate to the American Dental Association, Historian, and Official Photographer. He held the office of President of the Indianapolis District Dental Society in addition to serving on many committees for the Society. He was Chairman of the Advisory Committee for Medicare and Medicaid to the Governor of Indiana. Dr. Carr has been active in Indiana University alumni activities, and has held the offices of President of the Dental Alumni Association and National Chairman of the Alumni Fund Drive, and he is a member of the Indiana University Century Club. Community activities show his interest in Boy Scouts and American Legion organizations. He is a Past Commander of his American Legion Post.

Professional memberships include the American Dental Association, the Indiana State Dental Association, the Indianapolis District Dental Society, the American Academy of Dental Radiology, International Maxillofacial Radiology, and Federation Dentaire Internationale. Dr. Carr is a Fellow of the American College of Dentists. He was elected to membership in the Omicron Kappa Upsilon Fraternity, and is also a member of Psi Omega and Sigma Chi Fraternities.

Dr. Carr is married and has one daughter and four sons. One son is a dentist, another is a sophomore in dental school, and the youngest is a pre-dental student.
A Historical Survey of Anthropometric Instruments and Techniques Utilized In Determinations of Cranial Dimensions and Antomic Relationships In Dentistry with Special Consideration of Roentgenographic Cephalometry

—CHARLES C. THOMPSON, D.M.D., M.S.D.
Portland, Oregon

The purpose of this paper is to perform a historical survey of the instrumentation and related techniques utilized in the measurement of the skull and, in particular, the registration of facial dimensions. Three general areas have been selected in which to conduct the survey, namely the investigation of photographic, radiographic and strict metro-mechanical methods.

TYPES OF MEASUREMENTS IN USE

Anthropometry represents a system of techniques or a systematized art for measuring and taking observations on anatomical parts by the most reliable means and methods for scientific purposes. The system is divided into (1) anthropometry of the living, (2) craniometry, (3) osteometry, (4) encephalometry, (5) organometry, (6) physiopsychometry, and (7) measurement of the brain. The latitude of the subject is surprising to the uninformed literary reviewer, particularly one who, for one reason or another (perhaps philosophically), has relegated all such subject matter to a stereotyped niche in the area of academic anthropology, thinking it to be of little practical value. However, with some superficial investigation one readily finds how practical application of anthropometric procedures relates to (1) industrial production purposes, (2) regulation of art, (3) military selection, (4) medical, dental and surgical equipment design purposes, (5) detection of body defects and their correction, (6) criminal and other identification, e.g. morbid identification for forensic purposes, (7) life insurance purposes (related to #6), (8) eugenics, (9) scientific-research investigation, and (10) the manufacture of automobiles, aircraft, clothing, hand instruments, kitchen utensils, etc.

WHAT ARE THE PITFALLS IN ANTHROPOMETRY?

In the past, considerable controversy occurred in regard to the use of particular instruments and methods as well as the accuracy of the measurements and validity of data obtained; the principal areas of
contention related to the interpretation of results. Les Gros Clark in “The Fossil Evidence for Human Evolution” discussed eight fallacies relative to the problem of interpretation, these being; (1) reliance on inadequate statistical data; (2) the treatment of all metrical data as of equal taxonomic importance; (3) the treatment of characters separately and independently instead of in combination; (4) inadequate and/or inaccurate statistical treatment; (5) failure to understand the principles of morphologic equivalence; (6) comparison of skeletal elements in individuals of different age, sex and size; (7) comparison of measurements taken by different observers using different techniques; and (8) the reliance for assessment of affinities on a complex, statistical, biometrical analysis of characters which have no genetic basis.

Other arguments involved such questions as the efficacy of using a photograph or radiograph for obtaining accurate measurements; the subject distortion in the extrapolation and conversion of measurements from film print to paper; and the suitability of the instrument and/or method for any given case. The technical problems involved in such methods were numerous and detailed. Despite meticulous technique, artifacts and some error in data obtained still must be anticipated and minimized. For example, in photographic methods variables (in part) include film speed, lighting, lenses, camera, type of photographic paper, developing solution, etc. All such elements pose variables for consideration and, in the past, have been the basis for criticism and argument.

Lengthy discussion of all instruments, methods and related matters is impractical if not impossible in one paper, and is outside the historical intent of this writing. Hence, emphasis will be placed on that historical subject matter which should prove of most practical interest to the dental practitioner.

AN INVESTIGATION OF ROENTGENOGRAPHIC CEPHALOMETRY

Investigation of past literature reveals considerable subject material relating to roentgenographic-cephalometric studies, which in itself is a very adequate topic for historical review and deserves special attention in this report. In the past, cephalometric techniques have been a prime target for controversy. For the past thirty to forty years the literature has included reports of investigations pertaining to errors and values in roentgenographic techniques. Generally no one sought to discredit roentgenographic cephalometry as being of little or no value. Rather the general trend was to accept it and continue to improve it as a clinical, investigative tool.

In discussing roentgenographic cephalometry, it is probably more fitting to define the subject by attempting to place it in the total spectrum of dental science for the dentist and other allied health personnel who may not be familiar with it. In broad analysis, the subject traverses a number of areas, both basic science and clinical; anatomy, anthropology and orthodontia are the primary interrelated areas.

Anatomy and anthropology began, we know, as somewhat related descriptive disciplines with information being obtained through ex-
amination and measurement of bodies, both living and dead. Initially the body was studied with a particular interest to resemblances (early anatomical studies), followed by a shift of interest to differences related to race, sex, nationality, nutrition, geographic adaption, and morphology; structure and function were considered primarily with a latent developing interest in morphometry. With completion of the dissection, “What else,” asked Krogman and Sassouni, “was left to study but the skeleton.” Hence, interest in the subject evolved as a sequence of rational events.

STUDY OF THE SKULL
AN EARLY TECHNIQUE IN ANTHROPOLOGY

Of the skeletal parts, the skull for obvious reasons (facial differences, number and complexity of bones, sutural growth, etc.) received considerable attention. No readily apparent, alternative means of study but conventional measurement was available to obtain data in the comparative assessment of skulls. The field of osteometry was born, of which craniometry became a sub-division. This was a precedent to somatometry, of which cephalometry became, similarly, a sub-division.

Krogman and Sassouni noted a logical transition from craniometry to cephalometry to roentgenographic cephalometry. Hrdlicka proposed a more simplified scheme: anthropometry of which craniometry was a sub-division with cephalometry as a class under the subdivision. Thus, Hrdlicka noted a logical transition from craniometry to cephalometry to roentgenographic cephalometry which, in effect, became a sub-discipline of cephalometry as denoted by the term “roentgenographic.”

CRANIOMETRY VS. CEPHALOMETRY

Craniometry is defined as the scientific measurement of the dimensions of the (dried, defleshed) skull. Cephalometry is defined as the scientific measurement of the living (growing) head dimensions. Roentgenographic cephalometry, hence, became defined as the scientific measurement of head dimensions by roentgenographic means which involves precise X-ray examination of the skull and measurement of selected film points. Simple-sounding as this procedure might have been, the technique was found to be a most difficult and controversial one.

THE BEGINNINGS OF ROENTGENOGRAPHIC CEPHALOMETRY

To outline the history and tabulate some of the proposed or real errors requires the selection of a starting point, some outstanding historical date. A logical starting date is 1931, when Dr. B. Holly Broadbent presented his article, “A New X-Ray Technique and Its Application to Orthodontia,” to the profession. This material dealt with different methods of super-imposition of images, demonstrating an alternative method which could be of use depending on the area or structures to be serially elucidated. In his article the author introduced “the Broadbent-
Bolton Roentgenographic Cephalometer which has remained a popular instrument through the years. At the time of publication, Dr. Broadbent was director of the "Bolton Study" in the anatomical laboratory of Western Reserve University (Cleveland, Ohio) which, incidentally, has the largest skull collection to be found in the United States.

The Boltons referred to in the study were the Honorable Francis Payne Bolton (House of Representatives) and son, Charles B. Bolton, who were the benefactors in the establishment and administration of the "Bolton Fund" which supported the Western Reserve study. The technique described in the study initiated a new and more acceptable roentgenographic method leading to further valuable clinical research particularly pertinent to orthodontia.

GROWTH OF THE FIELD OF CEPHALOMETRY AND ITS APPLICATION

In 1949, Brodie presented a history of roentgenographic cephalometric techniques and a discussion of each as applicable to various dental specialties. The following year, 1950, he offered an appraisal of current orthodontic concepts with special reference to the utilization of growth data and information. In the same year Higley cautioned against diagnosis and treatment based on cephalometrics. In 1952, Wylie also cautioned against too-strict utilization of cephalometric studies in case analysis, prognosis and treatment. 1954 was the year Courtland presented an analytic study of what he termed "teleradiography." His paper dealt with different methods in the establishment of lines or planes of superimposition in roentgenographic cephalometry. Lundstran, in the same year, discussed clinical interpretations of roentgenographic cephalometric findings and Muller wrote a general review on the various types of roentgenographic cephalometric analyses that had appeared up to 1954. These papers represent a very small sample of a large number of articles on the subject appearing in the literature within a relatively short period of time before and after 1931.

A PIONEERING WORKSHOP IS HELD

In 1957, the first Roentgenographic Cephalometric Workshop, sponsored by the American Association of Orthodontists, was held March 24-26 at the Bolton Fund Headquarters of Western Reserve University. The workshop was dedicated to the Bolton Fund and commemorated the publication of the first paper on cephalometrics by B. Holly Broadbent. Two products of the workshop were 600 pages of Workshop Proceedings and a 366-page Syllabus and Manual of Roentgenographic Cephalometry by Krogman and Sassouni. These investigators, who studied both the syllabus and the proceedings, concluded that the combined effort constituted the most exhaustive and detailed study to that date.

At the time of the workshop, the problems confronting the investigators necessitated an agenda which had as its purpose: (1) To define cephalometric points and planes; (2) to standardize techniques;
(3) to clarify interpretation; and (4) to evaluate clinical application. Relative to the recognition and utilization of the lateral view head plate (roentgenogram) as the principal vehicle of study, questions which arose in regard to this point alone included: (1) What are the best planes and points of superimposition? (2) What are the essential end points to be picked up? (3) What are the basic dimensions? (4) What are the basic angles? (5) Should there be a combination of angles, dimensions and ratios? (6) Should overall analysis be concentrated upon an average, a type, a range, a group, sample derivation, the individual, or an ideal canon of proportion? (7) What types of analysis should be devoted to research methods and to clinical use? (8) Should development of analysis be devoted mainly to clinical appraisal, treatment planning and progress evaluation? (9) Are annual records adequate?

The workshop also aimed to determine which of the analytic methods available at that time deserved appraisal, ascertaining general and specific contributions of each. In the evaluation of each method, the following was performed: (1) determination of all major anatomical points used, all dimensions, angles, ratios and other landmark data; (2) the planes employed; (3) the method of interpretation; (4) the purpose and use of the analysis in research and in clinical practice. During the workshop a single serial malocclusion case history in which each of the analyses was employed, was presented in order that the basic content or rationale of each analysis could be demonstrated to workshop participants. (All tracings, pertinent measurements, and calculations were considered as part of each case history.) Much preliminary study and committee work involving the case history and preparation of a syllabus was required prior to the workshop in order to formulate the basic agenda. The case history and syllabus were prepared at the Institute for Child Study in Philadelphia, all this to serve as a starting point for discussion. Committee members evaluated and circulated ideas, reactions, etc. for inclusion on the agenda well in advance of the meeting. The ultimate goal of the workshop was to formulate a report for the American Association of Orthodontists containing recommendations for a uniform standardized technique of roentgenographic cephalometric analysis and its clinical application.

Workshop participants and advisers included orthodontists, anatomists, physical anthropologists, a radiologist, and an X-ray technician. Predictably the orthodontists advised on requirements of both the researcher and clinician. The physical anthropologists and anatomists advised on landmarks, dimensions, angles and planes which are structurally integrated into the growing cephalofacial-dental complex. The radiologist and X-ray technician advised on technical details, read films and compiled tracings.

Consistent with the purpose of the workshop, common areas of agreement were sought with regard to: (1) sites of craniofacial growth; (2) landmarks; (3) points of reference; (4) methods of locating the points; (5) points, planes and angles; and (6) minimum requirements. Accomplishments of the workshop included the development of large areas of agreement, despite some heated discussions, which were important to the practice of orthodontics (regardless of any considera-
tion of the employment of roentgenographic cephalometric technique). Minimum requirements for clinical use of the technique were defined basically as they are presently understood. The importance of PA films as well as the lateral view (profile) films was ascertained. The relationship of body build to roentgenographic cephalometry was discussed.

Further, it was established in this workshop effort that roentgenographic cephalometry was playing an unequivocal leading role in research on craniofacial growth and in interpretation of the dento-facial pattern in clinical practice. Adaptation of the various angles, landmarks, etc. to clinical studies was performed.

Reversal in presentation of historical material and the problems associated with roentgenographic cephalometry has been intentional to facilitate a fuller appreciation and understanding of the Broadbent technique. In other words, following the description of the workshop, we will now go further back in time in order to have a closer look at Broadbent's contributions, keeping the immense amount of material organized in the workshop in mind.

THE SIGNIFICANCE OF THE ORIGINAL BROADBENT STUDY

The Broadbent study of 1931, was prompted by observations that in preceding years many attempts were made by physical anthropologists to acquaint orthodontists with precise anthropometric techniques in the measurement of biological problems. Prior to this time the majority of orthodontists measured dental and facial deformities largely by the interrelationships of the teeth and jaws prior to and after treatment. Dr. Broadbent presented the results of his study in a paper which he offered as "a decided advance" in the application of cephalometric methods to measure and record jaw changes in relation to the rest of the head. Analytic studies by Todd, Keith, Hellman, Krogman, Lewis, Simon, Dewey, Stanton and others led to an accumulated understanding which made the Broadbent method possible. Previous methods using landmarks in the skull of a living child required a "through skin and soft tissue" approach for location of points. Since this was an obviously uncertain technique, Broadbent was motivated to search for craniometric means of recording hard tissue landmarks on the living child as accurately as done with a craniostat, a device for positioning and holding a dried skull in a desired plane (e.g. Frankfort plane) during X-ray film exposure. His goals were first to design and build a (living) head holder and second to find a means of precisely recording the craniometric as well as the cephalometric landmarks of the cranial base and face of the living head.

BROADBENT'S TECHNIQUE

The special Western Reserve Craniostat was used as a model for achieving the first goal. The greater problem of registering internal landmarks of the face and cranial base was solved by perfection of
roentgenographic techniques used in accurately recording points on X-ray film. These films, like orthoradiographic tracings, permitted accurate measurements with drafting instruments. It should be remembered that these experimental trials were made over a period of many years which were required to perfect accuracy and make the method useful.

Initial trials were made with dried skulls placed on the craniostat. The skulls were prepared by drilling minute holes at internal and external landmarks into which were inserted lead markers. Pointers were also used to reach the interior after removal of the calvarium. Other markers were placed on dental and facial points. The skulls were clamped to the Frankfort Horizontal position and radiographed in both frontal and lateral planes. Readings from the interior of the skull were plotted on millimeter-cross-sectional paper in the frontal and saggital planes prior to X-ray exposure. The lateral and frontal films were then superimposed to give a measure of technical precision, indicating a reliable method of recording internal as well as external cranio-metric points.

Broadbent found that two relationships were necessary to produce two or more identical radiographs of the skull: (1) the relation of the skull to the instrument and (2) the relation of the X-ray source to the instrument. In order to properly orient the source of X-rays at the anode target, advantage was taken of the fact that light generated from the cathode filament was reflected from an anode target along the path of the central ray. By utilizing a gunsight principle and a projection lens, a constant relationship of the central ray to the Frankfort plane level was achieved in each case. After dismantling of the equipment and reassembling it, identical results were achieved.

The relationship of other predetermined points to the projected shadow of the ear posts were found to be dependent upon two factors: (1) the target distance at which the films were taken and (2) the distance of the film from the median sagittal plane of the craniostat or head holder. Since X-rays are not parallel as they approach the skull or the head, rather diverging in cone-shaped array from a common point, it was found that the size of the image was slightly larger than the object projected. Alterations in target distance of the distance of the film from the median sagittal plane (MSP) produced changes in image size. Broadbent determined the target distance at 5 feet and called for measurement of film distance from the MSP which permitted any investigator to easily compute the actual dimensions of the face and head. The radiographic plates obtained by Broadbent were measured with the aid of a Universal Drafting Machine fitted with millimeter scales and a transilluminated drafting table.

Broadbent’s original cephalometric equipment consisted of a head holder supported on a fixed base above a child’s size dental chair with the head rest removed. The chair did not contact the head holder and was raised or lowered to permit comfortable adjustment of the child’s head to the instrument. Like the relationship of the dried skull to the craniostat, the head rested on the uppermost side of the ear post rods which were placed into the ear orifices. These rods were calibrated and allowed the head to be centered between the ear supports. The left ear
support was constructed to allow a cassette (film holder) to be inserted and held close to the left side of the head. The distance of the film from the middle of the instrument was read on a millimeter scale at the back of the cassette support. Once the head was centered, the chair was lowered or the child was instructed to settle down so that the under surfaces of the superior border of the ear orifices rested on the upper sides of the ear rods. The head was then rotated on this Porion axis by lifting or lowering the face until the lowest point on the inferior border of the left bony orbit was at the level of the top of the ear supports as indicated by an orbital pointer. A support to the front held a rest for the base of the nose, a frontal plane film cassette, and an impression tray for securing desired models. Imbedded in the side of this support toward the face was a small piece of lead just large enough to register clearly on the films. The exact relation of this lead point to the ear posts was recorded from a millimeter scale on the instrument at the same time the X-ray film was exposed. These readings aided in adjusting the head to the instrument when subsequent pictures and models were made. The lead point was used, too, when models of the mouth were made in a known relation to the roentgenograms. In the original study two X-ray tubes were used, one for the lateral view and another for the frontal view since the head doesn't rotate 90° on a vertical axis. The central rays of the two tubes were maintained in the Frankfort Horizontal plane and the resulting pictures registered precisely the desired craniometric landmarks of the cranial base and face in three planes of space. The resulting pictures contained much soft tissue detail, especially the facial profile, which largely eliminated the need for photographing the lateral view of the face by conventional methods.

THE RESULTS OF BROADBENT'S STUDIES

Broadbent found, at the end of the first year of study, sequential pictures of children taken at three and six month intervals clearly revealed numerous and significant observations, no traces of which were to be found in data previously obtained from dried skulls. For example, one significant observation had immediate application to the interpretation of the facial developmental growth of youngsters with orthodontic problems; sequential pictures at various ages revealed areas of non-growth in the cranial base!

In the conclusion of his historic article, Broadbent stressed that the application of precise methods of measurement used by physical anthropologists to orthodontic practice was a decided advance toward a more scientific solution of orthodontic problems with utilization of a head holder and standardized roentgenographic technique. Accurate determinations of changes in the living head due to developmental growth or orthodontic treatment were found possible. The technique permitted successive changes in the same individual to be measured and studied, eliminating the uncertainty of measuring such changes by a comparison of dimension of different individuals of successive ages. His roentgenographic technique registered the craniometric landmarks of the face and cranial base of the living head which, heretofore, had only
been measured on dead skulls with a craniostat. Broadbent considered
the then current standards data (1931) compiled from measurements of
children's skulls as largely a measure of defective material since "a dead
child is usually a defective one." Cephalometric methods of measuring
facial changes, while a decided advance, did not permit the recording of
landmarks beyond the face in the cranial base. His craniometric
technique had the decided advantage of not necessitating a determina-
tion of the site of hard tissue landmarks of the face through the
overlying soft tissue cover which naturally varies in thickness.
Broadbent's sequential roentgenograms revealed areas in the cranial base
which show no change between certain ages; these areas provided a
more stable base for relating tracings and afforded a very accurate
method of measuring changes in the teeth, jaws and face. Broadbent
continued to make contributions in his chosen area of endeavor. In 1937
he presented valuable statistical data on three planes: the B-N (Bolton-
Nasion), P-N (Porion-Nasion) and S-N (Sella Turcica-Nasion).

OTHERS BUILD ON BROADBENT'S BASIC WORK

Other early craniometric students included Oppenheimer, Hellman
and Todd. These investigators were not concerned with questions of
stability, of relative and absolute point-positioning, of the comparability
of lines, planes and angles. What problems did arise in their studies
became somewhat smothered by the statistical assumption that numbers
could give reliability and stability. On the other hand it was assumed
that a few representative types could replace the adequacy of the sample.
Hence a basically static and hybridized armamentarium was inherited.
When craniometry was adapted to growth studies, it carried with it the
seeds of error and the fruits of possible misinterpretation (Krogman).
For example, in adult skulls, porion and orbitale were not subject to time
(growth) shift with reference to each other. Any plane based upon these
points (e.g. Frankfort horizontal) was intrinsically stable. Methods were
purely cross-sectional or traversant in the sense that the drawing of one
skull or one skull type was superimposed upon another. There was no
idea of growth progress or serial growth analysis.

According to Krogman and Sassouni, the search for absolute reliabili-
ty in roentgenographic cephalometry was frustrated from its very
outset. The relationship between points, lines and planes which were so
useful, so constant in adult skulls (because they were growth static)
could not be extrapolated without change, to head and neck radiography
because of intrinsic variations. It was recognized that the ultimate
validity in human growth studies utilizing serial X-ray examinations
rested upon the demonstrations of experimental research.

In orthodontics, carefully defined, precisely drawn, anthropometric
landmarks, dimensions and planes in the face and skull were traditional
tasks before any attention was given to the use of an X-ray film. The
literature reveals that most investigators realized differences in methods,
demanding different conceptual thinking and approach: from constancy
to change, from stability to inherent variability. Investigators could not
demand more of their findings than the data permit. Krogman and
Sassouni in their 1957 syllabus titled *Roentgenographic Cephalometry* asked fellow investigators not to demand of roentgenographic cephalometry a precision and accuracy that is "biologically impossible" and "historically improbable." In addition, the formation of an "International Clearing House for Orthodontic Research" was proposed by Krogman, especially with regard to roentgenographic cephalometry. Such an organization, it was proposed, would assist in removing from the field much of the isolated analytic gadgetry and in promoting more rigorous scientific methodology.

**CRITICAL ATTITUDES TOWARD CEPHALOMETRY**

Krogman subsequently stated (*Am. J. Ortho.*, Dec. 1958) that in all objectivity and sincerity, roentgenographic cephalometry had been more of a pragmatic art than a proven science up until that time. He was critical of the fact that despite possessing enough precise roentgenographic apparatus, etc., methods had not been adequately tested for significance. The methods, he claimed, had been operationally employed because they told to a greater or lesser degree what the clinician wanted to know in terms of an overall treatment plan for which verification was sought. It was also charged that too often the X-ray film tracing had been applicable because it could be bent to the will of the clinician and his "philosophy" of treatment. Krogman viewed the tracing of an X-ray film as an imperative means, not merely an affirmative end. He proposed refinements and modifications in methods which contributed to making roentgenographic cephalometry the scientific discipline it is considered today. He called for additional consideration of normal standards in child growth studies such as investigation of the probability of geographic differences such as weather variations, water supply, nutritional factors, etc. affecting the data. He cautioned against the undertaking of roentgenographic cephalometric techniques after relatively little training or experience, pointing out that it is a highly complicated and involved skill which is not learned casually or used lightly. He considered the technique as "here to stay" because of its tremendous value as a functional research tool and also as a practical clinical tool.

**PHOTOGRAPHY AS AN ANTHROPOMETRIC TOOL**

Photography as an anthropometrical tool experienced problems similar to those of roentgenographic techniques, except on a more external basis. Though photography has been used in anthropological studies since its development, it was in 1949 that J. M. Tanner and J. S. Weiner stated in an article that "photography should stand largely or entirely by itself as a method of accurate anthropometry." Advantages over more conventional mechanico-metric techniques were listed as: (1) the outlines of a photograph do not move as they are measured and to the photographic calipers all tissues become as incompressible as bone; (2) standardized photographs require but a few minutes to obtain, yet provide as many measurements as the unhurried observer can reliably
devise; (3) measurements can be deceptively irrelevant and a permanent
record of the subject’s actual appearance becomes available rather than,
or in addition to, a collection of figures and checkings; (4) leisurely
scrutinization suggests additional questions and additional questions
lead to further measurements.

ARE THERE BUILT-IN WEAKNESSES
TO THESE METHODS?

If validity means anything in anthropometry, it must be taken
necessarily to represent the directness of relationship between the
measurements taken and the subject’s genetic makeup; or, in special
instances, between the measurements and environmental stresses such
as starvation. Some of the more conventional means of measurement did
not have any readily apparent advantage in this respect. Tanner (1947)
felt that probably the somato-type or factorial analysis factors of
physique had the closest relationship to an individual’s genetic constitu-
tion. Comparison of the effectiveness of estimation of the various
factors from the living and from photographic measurements remained
to be carried out.

A prime criterion for the comparison of two sets of measurements is,
of course, the relative reliability or repeatability from one occasion to
another. Somehow, perhaps because of the multitude and variety of
classical measurements on living subjects, few reports of reliability of
methods existed at the time. This may well have been one of the primary
reasons for the long continued difficulty in securing agreement as to
which measurements were desirable to record. Hence Tanner and
Weiner devised a study which would prevent a repetition of this
occurrence in photogrammetry; they also wanted to observe whether,
generally, photographic measurements were as reliable as those made on
living subjects. The pair noted the numerous possibilities in
photographic setups for patients and stated their analysis of both
measurement error and of a 35 mm camera photographic technique, this
camera being most used in general practice.

A STUDY TO DETERMINE VALIDITY OF PHOTOGRAMMETRY

To verify the reliability of the photographic method of
anthropometry, Tanner and Weiner selected 40 subjects who were
repeatedly measured by several investigators in such a manner as to
avoid duplication. Each subject was photographed in standard AP,
lateral and PA positions. Detailed description of the developing and
enlarging techniques, temperatures and times of the solutions,
photographic papers and other materials were included in packets to the
investigators. Special photogrammetric calipers were used to make
measurements of body diameters after Sheldon’s method with particular
care being taken not to leave pin scratches which would serve as guides
in subsequent measurements.

Four principal sources of error were determined in the Tanner-Weiner
study relating to: (1) measurement of the photograph, (2) posing of the
subject, (3) differences among individual observers, and (4) photographic technique. With respect to #4, lighting and film parallax error (variation in distance of body points relative to contour) and photographic paper shrinkage were found to be among problems to be considered.

At the conclusion of their study, the authors summarized that photogrammetric measurements are in general as reliable as measurements taken directly on living subjects by classical mechanico-metric means. In their photographs, posing differences accounted for approximately 2/3 of the errors in measurement from one occasion to another, actual measuring error about 1/5 of errors, and observer differences accounted for the rest. Tanner and Weiner concluded it is the dimension measured and not the means of measuring it that determined reliability.

PHOTOGRAPHY NOT THE FULL ANSWER

Gavin, Washburn and Lewis, in an article in the American Journal of Physical Anthropology, September 1952, went a step further in stating that a large part of the error inherent in classical systems of body measurement and observation could be eliminated with photography. (Distortion, of course, remained a problem relating to accuracy, particularly with certain head measurements.) Head breadth, bigonial diameter and minimal frontal diameter were seen to be measurements which could not be taken on photographs which only show the surface; thus structures did not affect contours as much as was thought. Photographs were permanent but not complete. Regardless of how standard and excellent any photograph is, inherent problems remained which photography could not solve. But photographic methods were cited as of use in standardizing measurements and observations, in detecting bias and in increasing the amount of information available to the student of the human constitution.

MECHANICO-METRIC OR CLASSICAL METHODS

Classical mechanico-metric anthropometrical methods are included here briefly for the sake of completeness and for contrast with roentgenographic cephalometric techniques. An adequate description of this important topic is outside the scope and dimensions of this paper. Attention will be focused primarily on the mechanical instruments with but little description of technique in the space remaining.

A name which should be remembered in anthropometry (the science dealing with measurement of size, weight and proportions) is Ales Hrdlicka. In 1939 he was the curator of the Division of Physical Anthropology, U.S. National Museum, Smithsonian Institution. 1939 was the year Hrdlicka’s classic book, *Practical Anthropometry* was published by the Wistor Institute of Anatomy and Biology located in Philadelphia. This book included principles, definitions, related anthropometric and organic laws, divisions, head and skull indices, techniques and illustrations of instruments for measurement of all
anatomical parts. A full description of the method and problems in obtaining facial casts was included.

In the measurement of skull capacity, a measurement was sought corresponding closely to that of the volume of the brain. Techniques involving the filling of the skull with bird shot, liquids, sand, etc., were developed. Broca favored using a thin rubber bag and water. Welcker's method, an outgrowth of Broca’s method, involved a funnel-like instrument with stopper large enough to receive all the contents of the skull (any rounded seed such as dry mustard seed was used to fill the skull) which were then transferred with the funnel apparatus to a graduated vessel. A standard skull was used as control for each new series of measurements.

Hrdlicka considered the spreading calipers ("spreading compass," "head compass," "head calipers of Broca") as one of the most useful and indispensable instruments in anthropometry. A number of variations were manufactured including one of Hrdlicka’s own. The sliding compass was and still is used for measurements of nose, mouth and ears. This instrument closely resembles the Boley gauge familiar to so many dentists. The Boley gauge can be considered as an anthropometric instrument also.

Drs. Charles E. Snow and Karl O. Lange of the Physics Department, University of Kentucky, produced the dial spreading caliper. In comparison to the spreading calipers used for centuries, the Kentucky caliper was designed to use a metered dial rather than a bar to record spread. For this reason and because the instrument was constructed of light weight material, this caliper was generally easier to use and read than conventional calipers.

Another instrument introduced by Dr. Snow was the Kentucky Skull Rig. Among the earliest craniometric instruments were devices to hold and orient anthropoid skulls. It can be considered that there are two types of skull holders, the first being those that are integral parts of measuring instrument, e.g. the Broadbent cephalostat, and the second being those designed to support the skull for display, photographing and observation. The Kentucky Skull Rig was designed to support any primate skull in the ear-eye plane.

OTHER DEVICES USED IN MECHANO-METRICS

All drafting instruments and positioning instruments used in roentgenographic cephalometry might be considered in the mechanico-metric instrument classification, as could many instruments used in dental prosthetics such as the face bow and Gothic arch tracing devices. The Willis device for facial measurements was an instrument which could be placed to measure the distance from the pupil of the eye to the rima oris and the vertical dimension determined from base of nose to lower border of the mandible, the distances mentioned equaling each other. Acrylic and plaster masks were also used, and still are, in prosthetic studies. The Bimeter was investigated by Boos as an instrument for determining vertical dimension by registering the biting force at varying degrees of jaw separation. Theoretically the patient was to
register the maximum biting force when the teeth first contacted in centric occlusion. This theory was based on the premise that muscles of mastication exert the greatest degree of force when their origin and insertion are this exact distance apart.

Techniques, instruments, salient features of each and criticisms have been numerous in this field. Of many of the classical instruments and methods, some very acceptable ones have been seen to arise. On the other hand, there have been a great number of gadgets, gimmicks, and "Smoky Stover" inventions introduced into the field of anthropometry.

NEWER METHODS FOR STUDYING SKULL FORM

In closing, mention of some of the newer methods employed in studying the biomechanical significance of bone form, especially the skull and facial skeleton, as related to anthropology, should be made. This area would represent a miscellaneous category of skull study methods for discussion. Anthropologists, anatomists, surgeons and dentists have all been interested in the biomechanics of bone form. Three groups of stress-strain study methods have been recognized: (1) mathematical analysis of stress and mechanical behavior of sections of bone; (2) study of stresses and strains in models of bones; and (3) study of stress and strain produced in intact bone. The first two groups utilize engineering techniques only recently developed for stress-strain analysis.

Photo-elastic studies have consisted of the construction of plastic models followed by loading of the model during exposure to polarized light to show stress patterns. Objections which have arisen to this technique have been that: (1) bone is not a homogenous crystalline material; (2) the physical properties of a given bone are, in part, the result of a variety of different types of forces acting in different combinations under various conditions; (3) only a two-dimensional situation exists in actual bone; (4) the plastic model is a solid structure whereas bone is not (F. Gaynor Evans, AM. J. PHYS. ANTRHO., Sept. 1953).

Stress and strain in intact bone has also been studied with a stress coat technique of spraying a thin lacquer coat on the bone. The lacquer cracks in response to tensile deformation in the underlying material; the site where cracks first appear is taken as the area of highest tensile strain where failure would occur first. Tests have shown that stress coat patterns are essentially similar to those in fresh tissue with the exception that the extent of the pattern in fresh tissue (dog skulls) is greater.

Still another method of analysis uses electric strain gauges of the SR4 type. These are connected to a cathode ray oscilloscope which visually relates the deformation of loading and a permanent record is made by photographing the screen.

The Benninghof split line technique has been employed in functional analysis of the facial skeleton, the studies demonstrating the minute architecture of compact bone by staining methods. Decalcification of compact bone with 10% hydrochloric acid is required to a sufficient
degree to allow penetration by a sharp needle. India ink is introduced and it follows the fissures and minute fractures corresponding to the direction and orientation of the majority of Haversian systems. The meaning of Haversian system organization is not well understood; the response of any split line systems to mechanical stresses is considered highly probable.

CONCLUSION

In conclusion, it is hoped that the reader has gained from this historical survey an increased awareness and appreciation of the pioneer researchers and the vastness, complexity, usefulness and residual potential in the field of anthropometry. It becomes readily evident that neither instrument nor method can be perfected without the stimulation of constructive thought and criticism. As dentists, we are either directly or indirectly concerned with the field of anthropometry depending on the nature of our practice or research interests. Occasionally one wonders what historical background exists behind particular instruments and methods which are so familiar to us in our daily routine that their presence and use are accepted without second thought. To pause and reflect often motivates one to investigate and report. This is the essence of progress.

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Dental focal infection might be defined as a process through which germ factors act on peripheral tissues and organs.

In Niniveh, the capital of ancient Assyria on the eastern bank of the river Tigris, there was found a cuneiform table whose text deals with a king who lived 700 years before Christ and says: “The pains in his head, arms and feet are caused by his teeth and they must be removed”. I think that this is a clearly worded definition of dental focal infection. Hippocrates, who died 400 years before Christ, talked about a rheumatic patient who recovered after a tooth had been pulled. Benjamin Rush, who was one of the most distinguished doctors in America, one of the signers of the Declaration of Independence, reported the following course of a disease, in which a woman who was suffering from rheumatism of long-standing had an aching tooth extracted and, as Rush said, “... she recovered in a few days”. These reports from separate epochs all containing a causal connection between ill-health and subsequent recovery give evidence of the relation between teeth and
peripheral illness. It seems paradoxical, however, that neither in medicine nor in odontology did one pay any general attention to these matters until the end of the nineteenth century.

W. D. MILLER LAYS THE GROUNDWORK

The first one to deal in greater detail with dentogenic infectious influence was W. D. Miller, who in 1891 described the human mouth as a focus of infection. His supposition that the mouth, containing as it does pathogenic germs, might play an important part in the formation of different organic diseases, seems today to have been prophetic. Miller stressed that wherever such germ organisms are present, there is a risk that they could produce "a metastatic abscess wherever a point of diminished resistance exists." Not only teeth could be suspected as a focus, he said, but other organs as well, such as tonsils and uterus.

In 1909 the German Gürich confirmed a focal connection between tonsilitis and rheumatoid arthritis. Experimentally he produced metastatic rheumatic conditions, stemming, he claimed, from infected foci, and he also suggested tonsilectomy as a possible therapy. During an internists' meeting in Wiesbaden in 1909, his compatriot Pässler drew attention to a causal relation between a series of septic states of ill-health and infected teeth and tonsils. If at that time the scientific community had paid attention to what Pässler had said, the focal infection doctrine might have had European provenience, and thus may have not become so emotionally loaded.

HUNTER SOUNDS THE ALARM!

Instead it was the English physician and pathologist William Hunter, who sounded the alarm. In October 1910 he gave a lecture to the faculty of McGill University in Montreal, Canada. The title of his lecture was "The Role of Sepsis and Antisepsis in Medicine", and he formally addressed himself to his fellow physicians. This is furthermore underlined by the fact that the lecture was printed word-for-word in the most reputable medical journal in Great Britain, The Lancet, in October 1911.

Hunter's lecture, however, contained in addition, a biting attack on American odontology. His proposal for replacing the expression "conservative dentistry" by "septic dentistry" hit the well-established and widely respected American dental profession hard as well as unexpectedly.

Hunter considered himself to have created the expression "oral sepsis", and this is formally correct; he had used it since 1898. On the other hand one might question the validity of the word "sepsis", which in clinical language represents an acute general infection. (It is also to be kept in mind that W. D. Miller, by talking about the human mouth as a focus of infection, had given an early warning and thus to a certain extent had the right of priority.)

Hunter in a group of his well-to-do patients in London had seen extensive fixed and removable dental constructions, which these
wealthy patients had had constructed in the United States, and to which Hunter referred as "American Dentistry". The patients had found it difficult to clean their precious crowns, bridges and dentures. In those cases where Hunter succeeded in persuading them to have their restorations and the retaining teeth taken away, he found not only their mouth hygiene improved but their general condition as well. Some patients even recovered from severe septic diseases.

As far as is known Hunter had never studied dentistry abroad and in any case he had never visited a dental school. His whole opinion that "American dentistry" was responsible for putting his patients in states of sometimes fatal illness was based solely upon clinical observations of his own.

He accused American dentists of allowing chronic states of infection in the oral cavity to remain unattended, and attacked American crown and bridge techniques. To Hunter the gold crown was "a mausoleum of gold over a mass of sepsis". He had observed the formation of paradontitis and formed the opinion that the septic gastric ulcer was caused by swallowing the pus from the gingival pockets. In his Canadian lecture Hunter said nothing about the possibility that the infection might derive from the apex of the tooth - the area which was to become predominant in the discussion to come.

THE AMERICAN DENTAL PROFESSION REACTS

A look through the articles in the American dental journals during the years after 1910 indicates, with the exception of some emotional and chauvinistic protests, that the message of Hunter was welcomed, and that the leading members of the profession declared themselves ready to reconsider the techniques they had been using in treating infected roots. Dr. Edward Cameron Kirk, Professor of Clinical Dentistry at the University of Pennsylvania and for many years the respected Editor of Dental Cosmos said in 1911 that he appreciated Hunter's comment on the relation between bad conditions in the mouth and some septic diseases. Hunter, however, had used the term "American dentistry" and not even Kirk, a man retiring and modest, could allow this slur to go unanswered.

It seems that Hunter had cited a case of his in which a patient had been advised by his dentist not to remove his upper denture and during two and a half years had acted on the dentist's advice. Hunter's description of the mouth is expressive: "There was found the most intense septic inflammation and ulceration of the gums around a number of necrosed roots underneath the plate". Kirk though declared that the dentist concerned must have been a cheap "advertising quack" and "... a so called American dentist, who had never seen America and of whose cult London is full." American dentistry through Greene Vardiman Black and others had become exemplary, and some unscrupulous European dentists, in order to increase their reputations added D.D.S. to their names. Kirk was of the opinion that Hunter had obviously seen pieces of work done by dentists who claimed to have been trained in America. Kirk took the opportunity to quote the great
Canadian physician Sir William Osler, who characterized the insufficient British interest in dental hygiene as "a national disgrace".

The discovery by Roentgen of the X-ray in 1895 created a revolution in odontology. About six decades after the foundation of the Baltimore College of Dental Surgery, American dentists finally got the opportunity to truly diagnose a marginal periodontitis, a granuloma and so forth. It is open to doubt, however, whether X-ray equipment was widely used in American dental offices in 1910 when Hunter launched his attack. Dr. Charles Edmund Kells who was the pioneer dental radiologist in this country had to bring his own X-ray equipment to Asheville, North Carolina for a presentation before the meeting of the Southern Dental Association in 1906, because there was not a single X-ray machine in the entire state. It is to be presumed therefore, that at the time of Hunter's assault, American dentists were incapable of detecting hidden disease. One might even venture to guess that Hunter's attack acted as a stimulus to the sale of X-ray equipment.

A LEADING PRACTITIONER DEMONSTRATES THE ANSWER

Late in 1912 Dr. Meyer L. Rhein, who was a physician as well as a dentist, claimed that the medical profession had to assume some of the blame for these conditions of "oral sepsis", not the dental profession alone. Rhein openly admitted that it was deficient root canal treatment that was the culprit, but blamed it on the fact that dentists were paid insufficient fees for this difficult operation, and thus sought easier and quicker, although more harmful ways, such as the use of arsenic paste for "mummification" of the pulpal tissue. Rhein excoriated this technique, declaring that there was no place for it in scientific dentistry, in spite of the fact that the patient's relief from toothache in many cases was sudden and dramatic.

Rhein tried to get the dental profession to adopt proper root canal techniques, and taught and lectured on his methods whenever he could. That he was an authority is attested to by the fact that he was a member of the faculty of the dental school of the University of Pennsylvania in their Department of Pathology. Rhein strongly emphasized the need for an aseptic technique using the rubber-dam. He stressed the importance of securing adequate access to the canals, through the sacrifice of additional dentine if need be. When the pulp cavity had been opened, he extirpated the pulpal tissue with the use of Donaldson's barbed cleansers, similar to the ones we use today. Then he filled the canal with Schreier's paste, a compound of sodium and potassium, which acted to dissolve some of the organic constituents of the canal, thus facilitating passage of the reamers and files to the apex, and he insisted that all fillings must reach to the apex.

He had other techniques as well, and in many cases did not hesitate to keep the patient in the chair for what we would consider to be remarkable lengths of time — two hours or longer! If a canal was difficult to drain Rhein rinsed it with a solution of corrosive sublimate followed by hydrogen peroxide. For gangrene of the pulp he devised an original procedure involving electrolysis. A zinc wire which would serve
as the anode was placed in the canal and a wet sponge was placed on the cheek under the rubber-dam to serve as the cathode. Rhein seems not to have employed any special liquid in this procedure, merely using the moistened tissue itself to carry the current, and relying on the current to achieve sterility. The filling of the root was essentially the same as today: the canal was filled with a thin solution of chloropercha and then a solid point was forced to the apex by means of pluggers. The treatment was completed with the hermetic sealing of the tooth with an oxychloride of zinc cement.

THE PROFESSION TAKES A BACKWARD STEP

Yet in spite of Rhein’s excellent teachings, the immediate answer by the American dental profession to Hunter’s attack was to avoid the conservative treatment in favor of wholesale extractions. A veritable wave of pulling teeth rolled over the continent and innumerable teeth were sacrificed, even though the preserving of them had been vindicated from a clinical point of view.

It is of interest to listen to the words of a dentist who lived through this era. His name was Woods, and he was graduated from dental school in 1917. In later years he became the Editor of the Arkansas Dental Journal and he reminisced about those days of the Hunter controversy:

> We used to kill the nerves in teeth and fill the canals. That went on a long time before we found out that we were probably doing more harm than good. Finally the Mayo Clinic did a lot of research with X-ray and so forth and came up with the theory of “focal infection”. They said those dark areas at the root ends of those dead teeth were areas of infection and they were causing a lot of diseases such as rheumatism and heart trouble and lots of other things.

> So we turned right around and started pulling all those dead teeth. Many dentists just pulled out the ones with the dark spots at the root ends, but there were others - they were called one hundred percenters - who pulled any tooth that had a root filling in it, regardless of whether they could find a dark spot. During those years when we were busy pulling all those teeth, the practice of root canal filling died out. Finally, endodontia became respectable again.

The leading spokesman for this radicalism was the physiologist Martin H. Fisher, of Cincinnati. He regarded a tooth with a root filling as a dead organ - notwithstanding the fact that nutrition through the periodontal tissues still functioned. To Fisher, extraction was the only possible way out of what he called “the dentist’s dilemma”.

In 1918, Kirk, the editor of Dental Cosmos made an exception from his rule to publish only original articles. The reason was that it had been found that the ordinary American dentist had never been given a chance to read what Hunter really said in 1910. In an editorial Kirk wrote: “Though the truth frequently is not pleasant, it is never unwholesome, and if the stimulus of Dr. Hunter’s pointed criticism shall arouse the organized dental profession to renewed activity in the effort to eradicate the ignorant and incompetent practice of dentistry, he will have conferred a boon upon humanity.”
It seems quite natural that the American physicians displayed a keen interest in the signals of Hunter. They started to encourage their patients suffering from cryptic organic diseases to persuade their dentists to remove suspected foci. The dentists then were thrust into an intermediate position and had to balance between their duty to protect the patient’s health and the preservation of a satisfactory chewing function. In 1926 Edward Miloslavich depicted the situation as follows: “The patient fears his own teeth, the physician points to the teeth and condemns them and the dentist extracts the teeth on the least indication, all visualizing an imaginary enemy”.

A SCIENTIFIC SOLUTION IS FOUND

The men who took the initiative in discovering and defining this invisible enemy were Frank Billings and his pupil and collaborator, Charles Edward Rosenow. Billings in 1911 replaced the term “oral sepsis” with “focal infection” and Rosenow defined “focus” as a clearly circumscribed tissue containing pathogenic germs. They claimed two kinds of foci to exist: primary ones in connection with skin and mucous membranes and secondary ones which arose through the invasion of germs from primary foci. The fundamental clinical research was performed by Billings at the Rush Medical College in Philadelphia and the Presbyterian Hospital in Chicago. Bacteria from suspected foci were cultured and injected into animal material. Rosenow, having become associated with the Mayo clinic in Rochester in 1913, expanded the ideas of Billings and created his two major theories: one about the transmutation of germs and the other about elective affinity of germs to tissue. Both Billings and Rosenow looked upon the creation of primary foci as a manifestation not only of the reduced virulence of the germs but also a reduction of their quantity. This state of equilibrium could be disturbed and germs could pass from an apical granuloma and reach organs in the periphery of the body through the process of elective affinity. Owing to the reduced virulence, the disease would become insidious.

To Rosenow deficient root canal treatment appeared as the main reason for oral foci and he summed up the following advice for dentists: “The prevention of oral sepsis in the future, with a view to lessening the incidence of systemic diseases, should henceforth take precedence in dental practice over preservation of the teeth almost wholly for mechanical or cosmetic purposes, as has been so largely the case in the past”.

The high frequency of extractions had of course an injurious effect on the total chewing function. There was a need for an objective determination whether a suspected tooth should be kept or not. Thomas B. Hartzell removed 162 teeth from bedridden patients under the suspicion of focal infection, and he had found that 150 were completely free from bacteria. The extractions thus performed resulted in no significant recovery. Hartzell considered it to be the recommended procedure to extract so called “dead teeth” only if they showed clinical symptoms and if the radiograph indicated pathological changes.

Concerning conservative treatment and the chances of getting aseptic
conditions in the operative field, the American dentists at the end of the First World War had split into two parties. At the Mayo clinic one supported the idea that "... a tooth may become infected and, once infected, the infection can never be eradicated. The tooth must be extracted." Edmund Kells, the pioneer radiologist mentioned earlier, and others asserted from personal experience that conservative treatment might be justifiable but that the danger of focal infection always had to be kept in mind. If root canal treatment were to fail, the tooth must be extracted.

In the middle of the nineteen-twenties the attitude of American dentistry towards dental focal infection might be summed up as follows: The imminent danger for the patient was always to be recognized. The patient's need for maintained chewing function must also be considered. And rigorous asepsis during root canal treatment and the use of radiographs as a matter of routine had become taken for granted. To this date this is still the case.

It is fitting to conclude this paper by saying that one has to credit American dentistry for having been able to sublimate the Hunterian critique into fertilizing self-criticism which advanced dental techniques world-wide.

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Dr. Joseph L. Henry, a longtime member of the American Academy of the History of Dentistry, was recently honored with the coveted triennial award for "Distinguished Service to Organized Dentistry" by the National Dental Association, at its Annual Convention in Detroit, Michigan. Dr. Henry also received the newly established Founders Award from the National Optometric Association for "Dedicated Unselfish Service to Optometric Education" from the National Optometric Association, at its Annual Convention in San Francisco. Dr. Henry is Dean of the College of Dentistry, Howard University, Washington, D.C.
Profile of A Developing Dental School: State University of New York at Buffalo

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INTRODUCTION

The objective of this study is to cull the research related to the founding and early development of the dental school and, more specifically, the dental curriculum at the State University of New York at Buffalo. Attempting to describe the historical events that provided impetus for the dental school's inception in 1892 as well as describing the curriculum that shaped the early program will be a major concern of this paper. Research sources for this project have been primarily limited to past dental catalogs, alumni publications, society publications, selected texts and any pertinent information found in the University Archives.

THE SCHOOL'S EARLY HISTORY

Before discussing the founding and development of the dental school, an early history of the State University of New York at Buffalo is needed to serve as an overview. The University of Buffalo (not called the State University of New York at Buffalo until it merged with the State University system in 1962) was granted a university charter by the state legislature on May 11, 1846. Although titled a university, it had only a medical school during its first forty years. The original controlling body, or Council, of the university consisted primarily of physicians and men of prominence among whom was Millard Fillmore, the first chancellor of the new institution, and who later served as the 13th president of the United States.

The University of Buffalo was rather an anomaly among educational institutions during the period from 1846 until shortly after the turn of the century primarily because it was only concerned with professional, rather than academic, training. Even though it bore the name of a university, it did not fulfill its role until 1913 with the establishment of the school of arts and sciences. In 1886 the pharmacy department was added, in 1891 the law department, and in 1892 the dental department was created.

WHAT LED TO THE ESTABLISHMENT OF A DENTAL SCHOOL?

The 1850 to 1900 period in American dentistry was markedly transitional for the profession. Dentistry began to attain importance around 1840 when dentists established the first dental school in
Baltimore, published the first dental journal, the *American Journal of Dental Science*, and established the American Society of Dental Surgeons, the first national association of dentists. For nearly three decades thereafter, practically no legal restrictions were placed on dental practitioners and on dental schools. As a result, many of the dentists of this period were notoriously incompetent and irresponsible, and their superficiality and commercialism evoked earnest protest from their self-respecting colleagues. The first concrete attempts to control the practice of dentistry on a state wide basis, albeit limited, were enacted by Kentucky, New York and Ohio in 1868. These state statutes created the authority to issue licenses and gave power of enforcement to state boards of dental examiners.

The years from 1868 to the turn of the century gradually brought about the increase of formalized dental instruction, some within universities, and the gradual decrease of the preceptorial system of training dentists. Although there was an increase in the number of schools established during this period, some were worthless educational ventures. Many of these schools, although quite as profitable financially as their owners had expected them to be, were very poor educationally and many were disgraceful professionally. However, with increasing requirements in equipment, teaching and research, dental schools ceased to be a profitable business and consequently proprietary schools slowly faded from the educational market.
THE FIRST DENTAL SCHOOLS ASSOCIATION IS FORMED

In 1884, about twenty-two active dental schools existed and among these, ten of the schools desired an organization that would promote cooperation between dental schools and that would define a uniform standard for graduation. In August, 1884, representatives from the Baltimore College of Dental Surgery, Boston Dental College, Chicago College of Dental Surgery, State University of Iowa, University of Michigan, New York College of Dentistry, Ohio College of Dental Surgery, Pennsylvania College of Dental Surgery, University of Pennsylvania, and Philadelphia Dental College established the National Association of Dental Faculties. For nearly thirty-years after its organization, the Association was the most influential agency for the general promotion of dental education in the country.

THE FORMATION OF REGIONAL DENTAL SOCIETIES

New York, like other states, shared the growing pains of a developing profession. The elevation of standards in dentistry was recognized in New York State and, as a result, the New York State Legislature approved the organization of both state and district dental societies. The Dental Society of the State of New York was founded in April, 1868, and was granted the privilege of issuing a diploma or certificate of license to dental practitioners who could demonstrate competence by passing an examination before its board of examiners. Dentistry during this period was far from being a well defined profession with a circumscribed body of knowledge and skills. The practice of dentistry consisted primarily of extracting and the mechanical restoring of teeth with only a limited amount of training in medical and dental skills needed as a requisite to practice. However, some Buffalo dentists felt that there should be some formalized and systematic instruction offered in the art and mechanics of dentistry. Dr. George E. Hayes, as early as 1860, attempted to meet this need by constructing a lecture room for the teaching of dentistry in a building occupied for his residence and dental practice. The extent to which this lecture room was used for dental education is not known, but Dr. Hayes was instrumental in establishing the Buffalo Dental Association in 1868 and served as its first chairman. The Buffalo Dental Association consisted of legally recognized practitioners of dentistry and residents of the City of Buffalo. The Association listed the following as its objectives:

1. The promotion and dissemination of the Science and Art of Dentistry;
2. The encouragement of a high order of professional character and excellence and a higher public appreciation of the profession;
3. The cultivation and development of closer professional relations among its members by social intercourse, mutual fellowship and good will each to the other;
4. The protection of the public from the evils of empiricism.

During June of the same year the Eighth District Dental Society (comprising the western New York area) of The Dental Society of the
State of New York was founded. It was this Eighth District Society that played a dominant role in the founding of a dental school. Doctors W. C. Barrett, C. W. Harvey, G. E. Hayes, R. G. Snow and B. T. Whitney were members of the dental society and became original committee members in 1868 responsible for the task of planning and executing the founding of a dental school in Buffalo.

The first official act of the Eighth District was a motion to establish a dental college in Buffalo because the city was a great distance from the nearest dental school and Buffalo was considered a central site for the training of dentists of Western New York. The University of Buffalo Medical School had been in operation since 1846 and it was thought advisable to create a dental school in conjunction with the medical school.1

THE INSISTENCE UPON HIGH STANDARDS

There was a lag of some twenty-four years from the founding of the Eighth District Dental Society in 1868 to the admitting of dental students in the Fall of 1892, and this is explained by examining the status of dental and medical education during this period in history. The historical degradation of dental education through unworthy commercialism and, in general, the lack of professional regulation in dentistry and medicine were contributing factors in prompting the early founders to insist upon only the highest teaching standards for the new school.

Medicine suffered from similar problems, but apparently to a greater degree than dentistry. Dr. Edward Storck, president of the Medical Society of the County of Erie in 1878, former chairman of the Buffalo Board of Health, chairman of the Board of Censors of the Medical Society of the County of Erie, and a physician instrumental in creating a state medical examining and licensing board expressed the following concerning the conditions of medical practice in Erie County and in the State of New York:

In 1881 I was made chairman of the board of censors. At this time quackery in medicine was rampant in this county and throughout the state. Bogus medical colleges sprang up in New York and other cities, that operated under a charter obtained by the provision of an old law that gave colleges and institutions of learning or scientific and benevolent schools authority to issue diplomas. Such diplomas were sold for the same price as the Buchanan college in Philadelphia sold them, $25 apiece. County medical societies granted licenses to practice medicine to old practitioners who had never seen the inside of a medical college and who could not tell the location of the perineum. Some of the regular schools did a flourishing business as so-called doctor mills. Their aim was not so much to impart a large amount of knowledge to the students as to do a big business in turning out large graduating classes. Ignorant, illiterate persons were let loose upon the community as Doctors in Medicine and most of them settled down in this state.2

OPENING OF THE BUFFALO DENTAL SCHOOL

On September 26, 1892, the first dental class was admitted under the deanship of William C. Barrett, M.D., D.D.S., the only surviving
member of the original committee appointed by the dental society in 1868. An excellent clinician and devoted professional, Dr. Barrett was also past president of the American Dental Association. It was recognized from the beginning that a large part of the credit for the wise planning and efficient organization was due to Dr. Barrett, who later died in 1903."

The first class consisted of forty-six students, and instruction took place in the west wing of the new medical building on High Street in Buffalo. It was the intention of the Council of the University of Buffalo to organize the physical facilities for the dental department in close association with the medical school. For this arrangement credit is given to Dr. Charles Cary and Dr. Roswell Park, both members of the medical faculty and the University Council.

THE EARLY CURRICULUM

The first dental curriculum covered three years, with students attending for only seven months of each calendar year. An annual summer term of five months devoted to practical work in the infirmary and laboratories was optional, but students attending the summer term would receive credit toward the winter term. After the 1904-1905
session, the length of the winter term was increased to eight months. Lectures during the first, and part of the second, year were similar to those of the medical school. Instruction included courses in chemistry, physiology, obstetrics, biology, osteology, physics, anatomy, surgical and medical clinics, therapeutics and dental courses in mechanical technics and prosthetics. The second year emphasized dental laboratory skills, and the third year centered around the demonstration and mastery of clinical techniques in the school infirmary.

The early faculty consisted of about thirty members. The objective of the early founders of the school was to provide the finest dental instruction available by securing a faculty of the highest professional status. Dr. Barrett’s background and reputation enabled him to procure an excellent staff, many of whom were solicited from areas outside Western New York. The dental school started out with superior teachers, not only from the medical faculty, but from the ranks of the dental profession in Buffalo, Rochester, Elmira, New York City, Ithaca and Detroit.7

The 1893-1894 dental catalog listed a total number of thirty faculty divided into university lecturing staff, dental lecturing staff, clinical staff, and adjunct staff. Of the faculty listed in the catalog, fifteen had the D.D.S. degree, eight had the M.D. degree, the dean had both degrees, one had an L.L.B. degree, and one had a Ph.D. degree. Various titles of faculty during its early history included the following: lecturer on dental materia medica and therapeutics; lecturer on extracting; instructor in continuous gum work; instructor in porcelain work, etc.

EXPANSION OF THE SCHOOL BECOMES NECESSARY

With subsequent increases in class size and broadening of the curriculum, a new building became a necessity and in 1896 the University of Buffalo erected its first dental building. This three story building was to be used exclusively for the dental department and was located on Goodrich Street. Because of continued growth and success of the program, the building was enlarged by adding a fourth story in 1902. A few years later, the rapid development of dentistry made further room essential, so that additional laboratory space was rented in the Sidway building, a few blocks below the College.5

The classes grew very rapidly in size from year to year, which demonstrated the necessity of a first class dental school in this section of the country. In fact, the growth was regarded as phenomenal; beginning with a class of 46 in the session of 1892-93, four years later saw a registration of 222 and ten years later the registration reached 261.

The Thirteenth Annual Announcement for the session 1904-1905 states the following concerning the success of the program and the fine facilities available:

The history of this school has been one of continuous success. In establishing it, the Council of the University had but one ambition, and that was to organize a school that should afford the very best facilities for the study of their profession on the part of the students. This has also been the aim of its Faculty. Accordingly, not
a year has passed without witnessing some decided advancement in its course of instruction.

The college building has lately been materially enlarged by adding another story and rearranging the interior, thus adding to its capacity about one-third. Spacious lockers have been provided, so that every student in each class is assigned for the safe-keeping of his personal belongings. New lecture and recitation rooms have been opened, with new chemical, bacteriological, histological, biological, and pathological laboratories, where instruction in all these departments is given. Very complete courses in practical bacteriology and histology are conducted by experienced and competent teachers, aided by every scientific appliance required for thorough study. So complete is the equipment and the instruction, that many practitioners of both medicine and dentistry have taken the college course as post-graduate work.

Other advantages also enumerated by the catalog include a thoroughly graded course of instruction with frequent examinations, ample opportunities through lectures and clinical demonstrations to obtain a complete knowledge of syphilitic lesions, co-educational instruction, complete courses in operative and mechanical technics, etc.

The program was still three years in duration and did not change to a four year curriculum until 1917. Some curriculum changes did take place in the preceding fourteen years but those were minor. The freshman year centered around the study of anatomy, chemistry,
histology, materia medica, comparative dental anatomy, and prosthetic and mechanical dentistry. The morning or "forenoons" were devoted to didactic lectures, and the afternoons to practical instruction. The catalog states the following concerning the freshman year:

The taking of impressions and the manipulation of various laboratory metals, the use of the mouth blowpipe and soldering, together with vulcanite work, are thoroughly taught, and thus a broad foundation is laid. Clinics and demonstrations in mechanical technics are given daily, and quizzes are frequent.

The study of anatomy begins with a general consideration of the osteology, myology and syndesmology of the whole body, with special stress upon the viscera and functional anatomy. At the same time, the study of dental anatomy begins by lectures and demonstrations in comparative dental anatomy, illustrated by the many specimens of animal dentition in the museum.

The aim is to advance by steady progression from the study of the system as a whole, during the first year, to that of organs the second year. The same general plan is pursued in the study of chemistry and physiology, materia medica and therapeutics. Dissections must be commenced during the Freshman year. 10

The second or junior year continued with anatomy, physiology, chemistry and materia medica while classes in operative dentistry, orthodontia, embryology, bacteriology, pathology and metallurgy commenced.

An interesting sidelight of the student's education was the fact that his course "... in mechanical technique will include the forging and shaping of excavators, pluggers, scrapers, finishers, etc., with their proper tempering and pointing. Students will be thoroughly instructed in the drawing of wire and tubing, the cutting of screws and nuts, and the making, tempering and cutting of burs." 11

The senior year was very practical and clinical in nature with the student spending a great deal of time in the infirmary engaged in practical work. A definite number of dentures had to be inserted for patients and a specified number of pathological cases treated. There was a requirement as to the number of porcelain inlays and other types of fillings that had to be placed.

HOW WELL WERE STANDARDS MAINTAINED?

Until the National Association of Dental Faculties and individual state agencies were created, no uniform standard of admission and graduation as well as no regulation of the dental curriculum existed. In 1891 the National Association of Dental Faculties recommended lengthening of the dental curriculum to three years. Buffalo was right up to date and with the admitting of its first class, the dental department adopted the curriculum model outlined by the Association in 1891. Although changes did take place in the curriculum, it served as a model until 1916, with subsequent control by the Board of Regents.
OTHER INFLUENCES THAT SHAPED THE SCHOOL

Another agency influencing the early dental program was the Board of Curators (or Examiners) of the Dental Society of the State of New York. This was an impartial board consisting of sixteen dental practitioners representing the eight dental districts of the state. The objective of the board was to license, after examination, applicants for the degree of Doctor of Dental Surgery. The board and its members were outside the control of the dental faculty. The Board of Curators served for four years when in 1896, dental examination for licensure was placed under the jurisdiction of the Board of Regents of the University of the State of New York.

That the Board of Regents had adequate police power is attested to by the fact that "... they register only the schools which, in their judgement, exact the stated requirements in pre-professional preparation, meet the specifications for the professional curriculum, and give..."
The Board of Regents established pre-dental requirements for graduation. The reason for this was that before 1916 only high school level courses were required for entrance to dental school and those students with entering deficiencies, could, by taking make-up Regents examinations, meet the requirements for graduation while pursuing a dental degree. By January 1, 1916, conditional matriculation was no longer permitted by the Board and those students entering dental school needed to satisfy the pre-dental requirements before admittance. Below is a chronological list of pre-dental requirements and changes as dictated by the Board of Regents:

Before January 1, 1896, no preliminary requirement.
Between January 1, 1896 and January 1, 1897, a certificate of the successful completion of two years of work in a registered secondary school.
Between January 1, 1897 and January 1, 1903, a certificate of the successful completion of three years of work in an approved secondary school.
Between January 1, 1903 and January 1, 1905, two years of work in an approved secondary school. (The requirement of 1903 to 1905, while apparently a lowering of the standard, in reality was not, because the enforcement of the earlier requirement had been lax, but this requirement was strictly enforced.)
January 1, 1905 — The preliminary requirement was definitely established at four years of high school study or the equivalent in Regents examinations.
February 1, 1911 — The equivalent in Regents examinations became 45 counts in designated subjects and 15 counts in electives. Among the specific subjects were two of three sciences: physics, chemistry, and biology.
January 1, 1916 — Conditional matriculation in a registered dental school was no longer permitted.
January 1, 1917 — Instead of only two, all three of the sciences - physics, chemistry and biology - were required, whether the certificate was based upon high school study or Regents examinations.
January 1, 1921 — A requirement of one year of college study, with no equivalent, became effective. It called for the completion of a full-year course in physics in high school and the completion of a full year of study in an approved college of liberal arts and sciences, which year must include six semester hours each in English, chemistry, and biology, together with twelve semester hours of electives from the following group: a modern foreign language, mathematics, history, technical drawing, and shop practice.
January 1, 1926 — The requirement became two years of college study including six semester hours each in English, physics, chemistry, and biology, and electives sufficient to make up a full complement of work.

For the thirty year period between 1896 and 1926, the Board of Regents has been one of the most important factors in the betterment of
Amphitheatre for lectures and demonstrations.

dental practice and the elevation of educational standards in dentistry. New York State during this period had higher pre-dental requirements than any other state.

FURTHER ATTEMPTS TO IMPROVE CURRICULA

It appears that the founding and early development of the dental school was marked by a high degree of professional leadership, pride and high scholastic standards. A somewhat objective mechanism for the evaluation of dental schools in America began with the establishment of the Dental Education Council of America in 1909. This Council was concerned with the improvement of the dental curriculum and the promotion of high scholastic and administrative standards. It established a periodical classification system that placed dental schools into classes A, B, and C; the grade of C signified a lack of educational and professional reputation. Unfortunately, however, the Council was unable to function effectively until about 1918. In 1925, of the forty-three dental schools in the United States, twenty-four were rated class A; fourteen class B; two class C, and three had postponed rating since 1923. The University of Buffalo was rated class A in 1920, 1923, and in 1925. In contrast, the New York College of Dentistry and Columbia University dental schools were among the three dental schools that postponed rating and were both classified as class B in 1918 and in 1926.
The explanation for these ratings were given by the council as follows:

The Council's grouping of dental schools in grades A, B, and C are based on distinctions which, in the Council's belief, signify material differences in degrees of teaching efficiency, and imply, for example, that the graduates of class A schools are more competent than the graduates of class B schools to pass a given state board examination.

The Council nevertheless went on to point out that "...so long as the wide differences prevail in the scope, standards, conditions and quality of the examinations... the data for a school are not reliable criteria of its reputability, educational efficiency, or general worth."

BUFFALO'S SCHOOL PROVES ITS MERIT

The philosophy of dental education at the University of Buffalo during its early years was certainly consistent with the philosophy first set forth by its founders in the nineteenth century, and it is the author's opinion that this school offered an educational experience that exceeded that of many dental schools during this period in dental history. The following statement in an alumni publication lends merit to the above statement:

Hereafter any former student of the Dental Department will be admitted without charge to any of the lectures, demonstrations and laboratories during the regular winter sessions. This means that any former student of this institution who is interested in keeping up with the advances made in any branch of dental practice, or who is interested in any special line of work, will be made welcome to the lectures pertaining to such branches, and will be given the free use of laboratories and clinic.

Great changes have been introduced in Materia Medica, Anesthesia, Casting, Cavity Preparation, Orthodontia, Oral Prophylaxis, etc., in the last ten years. The doors of your Alma Mater are open to you so that you may put yourself abreast of the times in your profession.

REFERENCES

2. Ibid, pg. 47.

(This paper was the winner of the First Prize in the 1973 Bremner Essay Award Competition conducted annually by the American Academy of the History of Dentistry among students of dental schools in the United States and Canada. Mr. Kacherski, who is a student at the School of Dentistry, State University of New York at Buffalo, presented his paper at the annual meeting of the Academy in Houston, Texas, October 26, 1973. Mr. Kacherski's address is 276 Glenhaven Road, North Tonawanda, New York, 14120.)
Oddments in Dental History: Dentistry and Marital Bliss

—MALVIN E. RING, D.D.S., M.L.S.
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One rarely thinks of occurrences which take place in dental offices as having a direct bearing on marital situations, but consider these two cases which although having taken place about a century ago, make us wonder what the enlightened reactions to them might be in our times.

In the first case it was reported by the Dental Advertiser (Vol. 5, No. 2, April 1874) that a dentist in Green Bay, Wisconsin became “emotionally insane” while repairing a front tooth for a pretty woman and kissed her. This apparently infuriated her, and she went straightaway home and told her husband. That stalwart, too, became properly enraged and went round the next morning to see the dentist and seek his revenge - which he did by borrowing $300 from him on long term!

The second case, sadly, didn’t have such a fortunate ending. The same journal, the Dental Advertiser for January, 1880, reported that a Miss Roberts of Steuben County, New York was engaged to be married to a gentleman of Wayland, N.Y., a nearby community. She had recently had a set of dentures made, and needing an adjustment sought out her dentist for the needed corrections. When she handed him the dentures he put them in his pocket saying, “You can have these teeth back when you pay me for them.” Well, Miss Roberts was unable to pay for them just then, and the dentist carried them away.

As fate would have it, the young man who had promised to make Miss Roberts his wife called upon her that night, but she stayed in her room and sent down word that she couldn’t see him that evening. He, however, would not be put off without an explanation, and Miss Roberts’ friend explained the situation. The suitor left, but next day wrote to her and told her that he didn’t know she wore artificial teeth, and that he could never marry a woman who wore them. The Advertiser ends this sad tale with the following summation: “Miss Roberts fancies that she can recover $5,000 from the dentist for the loss of a husband and for annoyance growing out of his taking the teeth from her, and moreover, that she can recover damages from her late suitor in a breach-of-promise suit.”
Self-Instruction as a Means For Teaching The History of Dentistry

—SIDNEY L. MILLER, B.S., D.D.S., M.P.H.
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The story of the evolution of the education process in dentistry is recorded in the dental literature. Although it is not the intent of this paper to present this story, a brief review of the history of dental education is indicated by way of introduction.

Dental educators look back with pride upon each milestone attained in dental education as it brought dentistry closer to the present level of professional excellence.

One such milestone was reached when dental education advanced from preceptorship training during colonial days to a more formalized system in 1840 when the first school of dentistry was established. It must be recognized, however, that preceptorship training in dentistry still persisted. Nonetheless, requirements for the dental degree at the Baltimore Dental College in its earliest years were that a student attend only two courses of lectures over a period of four months, write a thesis, and pass a practical examination. Another milestone was achieved in 1926 with the publication of a report by William J. Gies on dental education following a study sponsored by the Carnegie Foundation. Hard upon the heels of the Gies Report, the American Dental Association adopted standards for dental education and instituted its program of accreditation of schools of dentistry. These two innovations in dental education - standards and accreditation - in addition to licensure of dentists by the States in 1930, marked the doom of the many substandard dental schools that had sprung up between 1840 and 1926.

By 1930 four years of formal education and training were required for the D.D.S. degree; although actually the four year curriculum may be traced back to 1917.

Predental requirements, also, were increased with the years until, in 1939, it was required that a candidate for admission to dental school must have completed a minimum of two years of predental study at an accredited undergraduate institution. By 1970, most dental schools required at least three years of undergraduate preparation before a candidate for admission would be considered.

Predental preparation for admission to dental school, although stated in terms of minimal requirements, has tended in recent years to establish its own level of what is optimal. Increasing numbers of applicants for the 5,000 first year places that exist in the nation's dental schools served to develop a pool from which the schools could select a significant majority of students who already held a bachelor's degree.
STATUS OF DENTISTRY
ELEVATED BY THESE IMPROVEMENTS

Such progressive improvements in the preparation of those who entered dental practice contributed greatly to elevating the prestige and improving the image of the profession in the eyes of the public. Today, of course, dentistry ranks high in public regard and esteem among the learned professions in the United States.

There can be no question but that the modern dentist who represents the profession in the eyes of the public is a reflection of the excellence and thoroughness of the educational process which produced him. Other criteria for judging the quality of the educational process in dentistry are its content and its sophistication. Still another criterion may be its length.

Although there are some in the profession who would satirize the educational system in dentistry, it is difficult to argue with success. The overwhelming fact remains that dentistry in the United States sets an example of excellence which many other countries strive to emulate. Undoubtedly, some of the credit for this achievement must be given the educational system that has evolved.

THE THREE YEAR DENTAL CURRICULUM
A STEP BACK

If it is safe to assume that a positive correlation exists between the length of the dental curriculum and the quality of the educational system, the stature of dentistry suffered a set-back during the years of World War II when the demands of the times dictated a condensation of the curriculum into a three year program. However, those were extraordinary times, and the reversal was justified on the basis of a necessary expediency in accelerating the production of sorely needed dental manpower to serve on two fronts - at home and in the military.

That the three year curriculum was a step backward in dental education became eminently clear when, with termination of that conflict, schools quickly returned to the traditional pattern of a four year curriculum. Furthermore, with this return to normalcy, it has been rumored that dental educators of that era breathed a sigh of relief.

The posture of dental education, however, has always been beset by change, hopefully in a direction of improvement. Since the waning months of the 60's, pressures have been brought to bear upon the system to shorten the length of the curriculum and, thereby, the time required for the training of a dental student.

Such pressures are deemed justified on the basis of a felt need to increase the nation's dental workforce. Apparently, increased demands for dental care by more people have placed an insurmountable burden upon the profession which already is said to be taxed to the limits of its capabilities. The events, factors, and pressures leading up to this latest proposal for change in dental education are a matter of record. Although important, their inclusion here would contribute nothing to this paper.
CAN THE FOUR YEAR CURRICULUM BE IMPROVED?

What is proposed is that the curriculum be redesigned to permit the gifted student to complete his educational program in fewer than four years. This, of course, means a departure from the traditional lock-step pattern of dental education. It means individualizing the curriculum in accordance with the capability of each student, streamlining its content through the elimination of excessive "fat" and the adoption of modular or correlative teaching, and broader use of programmed self-instructional technics. And herein lies the basis for this report on Self-Instruction as a Means for Teaching the History of Dentistry.

That valuable curriculum time should be set aside at all for a course in dental history is now being seriously questioned especially in those schools that are bent upon training dental students in fewer than four years. The number of clock hours devoted to the teaching of dental history in the nation’s schools varies from less than 10 to more than 36. However, this statement is somewhat misleading because in 16 schools of dentistry there is no actual block of time set aside for a distinct course in dental history. Rather, the time reported is for that portion of other courses, such as Ethics, Jurisprudence, Practice Management, and others dealing with social aspects of dentistry, which touch in part upon the history of our profession, and consequently, cannot be construed as anything beyond a reasonable estimate.

Apparently, the teaching of dental history is not a critical consideration by the Council on Dental Education in establishing a school’s accreditation rating. The decision as to whether or not History should be taught at all within the new perspective of a dental education rests entirely with each individual school.

IS THE TEACHING OF DENTAL HISTORY IMPORTANT?

There are those who would defend the continued teaching of dental history as being important in preserving the traditions, lore, and heritage of our profession in its evolution. These may be regarded by those who question its place in the dental curriculum as romanticists, already mired down within the sterile environment of personalities long since dead.

On the other hand, those who would dispense with the teaching of History would consider themselves more realistic and more practical in their drive toward a streamlined curriculum. The elimination of purposeless insignificance from the mushrooming body of dental knowledge that must be conveyed to the student is the *sine qua non* for any shortening of a curriculum to be effected. Apparently, in the competition among disciplines for appropriate place in the abbreviated curriculum already being mandated in some schools, the teaching of dental history is in danger of being relegated to the category of purposeless insignificance.

It is not the purpose of this report to select or defend either of the two alternatives herein stated that are open to dental education. Enough has already been written to explain the "why" of dental history in the curriculum. The literature abounds equally in the written word extolling the merits and rationale of cutting the "fat" from the curriculum.
A SELF-INSTRUCTION COURSE PROVIDES AN ANSWER

This paper presents a direction in dental education that would satisfy both camps - those who would retain the teaching of dental history as a required course, and those who would dispense with it in the interest of shortening the curriculum. A self-instructional course in dental history which provides for student participation on an individual basis and at the student's own pace need not require any formal curriculum time. Yet it would permit attainment of the benefits claimed for the teaching of dental history. Such a course has in fact been developed at The University of Texas Dental School at San Antonio.

The concept of self-instruction is not new to dentistry. The method has already been used by the author in the teaching of Dental Jurisprudence and is known to be effective. In fact, a dentist must live much of his professional life with self-instruction. It would be to his advantage for him, therefore, to learn by this method early in his career. In the words of Dr. H.B.G. Robinson, "We should not forget that the printed page was an early teaching aid." Furthermore, self-instruction offers other distinct advantages.

The traditional method of teaching dental history, namely by conventional lecture to a passive audience, leaves much to be desired. A student is not able to participate actively in the learning experience; he is not able to apply the facts that he is expected to learn; and usually he does not know his own progress because he receives no feed-back until the final examination is over. A programmed self-instructional course appears to offer correction to these deficiencies as well as a means of freeing curriculum time.

This course, therefore, was constructed as a teaching instrument that could stand on its own and produce effective learning even though teacher contact is reduced to a minimum.

HOW IS THE COURSE CONSTRUCTED?

The core material for the course consisted originally of a slide-tape series of three 50-minute lectures that were developed in 1968 by the author and Dr. David Bloom at the University of Alabama. The course material was prepared in the form of a narrative chronology. A syllabus was developed to accompany the course, requiring entries to be made by the student as the narrative unfolded. The course was presented in this format on a group basis for three years and student reaction to the format was obtained and utilized in modifying the presentation over the ensuing years.

The concentrated nature of the material demanded uninterrupted attention and the application of two of the senses, seeing and hearing. Such application was further complicated by the need to record factual information in the syllabus as the story of dentistry unfolded. The demand upon the student to listen, to observe, and, almost simultaneously, to record notes placed a burden upon him that, in many cases, was beyond his capacity to keep up. A number of the students reported difficulty.

The course, therefore, was modified in 1971 by further division of the
material into six units of instruction, each 50 minutes in duration. Each unit had a number of “breaks” built-in, which permitted the students to watch and listen without distraction and then to make the necessary entries in the syllabus during the “break” periods. Thus, the material was presented in smaller units and time was provided to record information in the syllabus. Before resumption of the narrative following each stop, feed-back was provided by the instructor in the form of a summarization of the material called for in that unit. However, the time factor remained constant in the presentation, and it was presented to the entire group in unison.

From this methodology, it was a simple manipulation to develop a self-instructional package that could be used by each student individually and at his own pace and convenience. The modification called for the preparation of a course manual for student distribution outlining the objectives and the procedure to be followed. Further orientation to the course is provided in the form of an introductory lecture to the entire class, following which no further class sessions are scheduled. From that point on, the students are on their own to complete the course. The packaged course has been placed in the student carrel in a supersynched configuration. A final examination is given for purposes of grading. However, there is no set time for this examination. When a student has completed the course and feels he is ready, he may request the examination.

To obviate the possibility that examination questions will be passed on from student to student, a variation was introduced. A series of 68 objective-type questions based upon the course material was compiled. These questions are of the multiple choice and cross-matching type. Each question in the list was numbered. Then, by a process of random selection, eight different series of 30 questions each were drawn, thus yielding eight different examination instruments. Thus, each examination has a different set of questions, and even in those cases where a question is repeated on several examinations, its order in the list varies greatly.

The examinations will be administered to the students in numerical succession and in the order in which they report for the examination. The first student to request an examination will take examination number one; the second will take examination number two, and so on through the eighth student and examination number eight. Then the ninth student will take examination number one; the tenth will take examination number two, and so on.

The course in dental history at The University of Texas Dental School at San Antonio is scheduled for the freshman year, to follow a 16 hour course in Orientation to Dentistry. By that time it is expected that the students will have acquired sufficient basic information to provide them with a foundation sufficient for understanding the terminology and materials projected in the History of Dentistry.

This report does not end with these final words, nor with the completion of the course at the University. The story will terminate, instead, after the course has been completed and thoroughly evaluated. We need to know whether it is effective and how well it is accepted by
the dental student. Serious consideration must yet be given to the
development of a process for evaluating this self-instructional course in
the History of Dentistry. Such development is currently in progress.

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1. Committee on Teaching Dental History, American Academy of the History

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(Presented at the 21st Annual Meeting of the American Academy of the History
of Dentistry, San Francisco, California, November 7, 1972.)

Doctor W. Harry Archer, formerly professor and chairman of the Department
of Oral Surgery, University of Pittsburgh, School of Dental Medicine and now
University Professor, was presented with the Horace Wells Medal, diploma and
pin by the Brazilian Dental Association for his original research on the life of
Horace Wells which lead to the publication of the most interesting and factual
book, The Life and Letters of Horace Wells, Discoverer of Anesthesia. The
presentation took place during the recent annual meeting of the American
Dental Association, where Professor Amedo Bobbio, on behalf of the Brazilian
Dental Association, pinned the medal on Doctor Archer. Doctor Bobbio is the
professor of the History of Dentistry at the University of Sao Paulo, a noted
author in this field and the editor of The Review of the Sao Paulo Dental
Association. He is also a member of the American Academy of the History of
Dentistry.
References to Prosthetic Dentistry
In The Talmud

HENRY P. COHEN, B.S., D.D.S.
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Much of our knowledge of ancient dentistry comes from sources outside the strictly dental field. The ancient Hebrews, in their exegetical texts concerning religious matters dealt with dental situations, not because they were striving to further the frontiers of dentistry, but because they were attempting to elucidate the solutions to some particularly difficult religious matters. Thus the dental situation was occasionally a convenient "handle" on which to base a point of law.

A great deal has already been written about these ancient Hebrew writings but recent researches have turned up even more references which the authors present herewith, in the hope that they might in some way shed even more light on dental care in those dim years two millenia ago.

WHAT IS THE TALMUD?

The Mishnah, developed in the land of Israel and transmitted in Hebrew, is a collection of laws and doctrine developing the laws of the Old Testament. It was finally arranged and revised in the beginning of the 3rd century C.E. by Rabbi Judah Ha-Nasi. The Mishnah in turn became the subject for discussion and explanation of these laws and doctrines. The Babylonian Talmud is essentially the interpretation and elaboration of the Mishnah as it was carried on in Aramaic in the academies of Babylonia. Its period ranges approximately from the first half of the 3rd century C.E. to 500 C.E. The Jerusalem Talmud on the other hand, contains a record of discussions of essentially the same Mishnah, also conducted in Aramaic, but by scholars in the academies of Israel. It was completed in approximately the middle of the 4th century C.E. The term Gemara refers to the Aramaic discussions of the Mishnah and the combination of the two, Mishnah and Gemara, is the Talmud.14

A DISCUSSION OF DENTISTRY IN THE BABYLONIAN TALMUD

The text which follows is taken from the Babylonian Talmud; treatise, Moed, tractate, Sabbath. The content is a discussion of what items a woman may "go out" with on the Sabbath without violating a general ban against carrying on that day (since carrying was considered a form of work, and work was forbidden on the Sabbath.)
"A woman may go out with . . . . . . a peppercorn, with a globule of salt and anything that is placed in her mouth, providing that she does not put it in her mouth in the first place on the Sabbath, and if it falls out she may not put it back. As for an artificial tooth, (or) a gold tooth, - Rabbi permits, but sages forbid it."

This terse reference in the Mishnah apparently proved confusing to later scholars and so an attempt was made by later rabbis and teachers to elaborate on this and thus explain it. The following discussion of the above takes place in the Gemara:

"WITH A PEPPERCORN AND A GLOBULE OF SALT: A peppercorn is for (counteracting) the (evil) breath of the mouth; a globule of salt is for the gums. And with anything that she places in her mouth . . . ginger, or cinnamon.

AN ARTIFICIAL TOOTH, (or) A GOLD TOOTH, - RABBI PERMITS BUT THE SAGES FORBID IT. R. Zera said: they taught this only of a gold (tooth), but as for a silver one, all agree that it is permitted. Abaye said: Rabbi R. Eliezer, and R. Simeon B. Elazar all hold that whatever detracts from a person’s appearance, one will not come to display it.”

The Gemara completes the discussion of what may be carried and what may be displayed on the Sabbath by briefly giving the legal principles upon which the various rabbis based their opinions.

THE TEXT IN THE JERUSALEM TALMUD

The Mishnah in the Jerusalem Talmud is essentially the same, except that the letter Vav is added in the Hebrew, changing the meaning to “an artificial tooth and a gold tooth”. This implies that the two items are not synonymous. The discussion in the Gemara of the Jerusalem Talmud follows:

R. Mena said: “I have heard an explanation from R. Samuel in the name of R. Zera but I do not remember what it was. What is the reason? R. Yosse said: “It is clear that in the case of a gold tooth, which is valuable she should not go out, for if it should fall, she would (probably) put it back. An artificial tooth (shen totevet) however, what is the reason (for forbidding it)? It is because she is ashamed to say to the artisan (nagra), ‘make me another’. It falls out and she replaces it.

Rabbi Yassa and Rabbi Ami: “One of them suffered from his teeth and his companion advised him (to go out with an artificial tooth). One of them suffered from a malady of the ear and his companion advised him (to go out with a wadding in his ear). And we do not know which one of the two rabbis said this and which one said that. However (from what) R. Yassa asked of the physician of R. Jacob B. Aha, “How are the teeth of our friend, R. Jacob B. Aha?” Because of what R. Yassa failed to say (e.g. May you not suffer from such an affliction) he did not cease to suffer from toothache from that day on.”

It is interesting to note that in spite of the fact that there were artisans in those days who created apparently satisfactory dental prostheses, albeit of a minimum type, more reliance was placed upon incantation to
cure afflictions, and Rabbi Yassa's failure to use the proper invocation is claimed to be the cause of Rabbi Aha's continuing toothache.

**WHAT IS THE SIGNIFICANCE OF THESE TEXTS IN THE HISTORY OF DENTAL PROSTHETICS?**

Although the differential between the words "gold tooth" and "artificial tooth" is not raised in the Gemara, succeeding generations of scholars, both lay and religious, have pondered upon their meanings.

One of the greatest Talmudic commentators, Rashi (1040-1105), thought "artificial tooth" and "gold tooth" were one and the same. The majority of commentators, however, differentiate between them. The word totevet, translated "artificial" may be derived from the root meaning "foreign," suggesting for example, wood or ivory. Or, it may come from the root meaning "cover" indicating a crown.

A third possibility is presented by Rabbi Ovadiah from Bartenura, a 15th Century Italian commentator. He associates the Aramaic word "totevet" with the Hebrew word "toshevet" meaning "to sit." "It rests upon the cheeks in place of the tooth which fell out."

Commentators have assumed that it refers to a wooden tooth, since it was possibly made by a nagra, a carpenter. The word nagra however may also refer to an artisan in general and is translated in our context by Jastrow, a modern philologist, as "turner" (as of ivory).

The meaning of gold tooth is likewise unclear. It may have been a crown attached by bands, a single crown or a gold pontic. Since the gold tooth in our Mishnah appears to be removable, a crown similar to those created by the ancient Phoenicians or Etruscans suggests itself.

We may conclude that the "artificial tooth" was made of an inexpensive material, constructed by a "carpenter" or similar artisan whose fees were not beyond the reach of the ordinary citizen. Possession of a gold tooth appears also not to have been terribly unusual, though considered a luxury worth showing off. Silver was probably also used as a prosthetic material in the construction of some of these prosthetic devices, but it is impossible to be sure exactly how it may have been employed.

**SUMMARY**

Talmudic texts containing material of dental historical interest have been presented. Though the exact meaning of the texts is unclear, the material looms large considering the tantalizing small amount of information concerning ancient prosthetic dentistry. It is suggested that the commentaries on these texts present valuable sources for further study, and perhaps in time new discoveries in the archives of Israel will throw further light on what the status and nature of dentistry was in those far-off days.
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NEW FACTS UNCOVERED ABOUT
MARK TWAIN'S VISIT TO THE DENTIST:

The last issue (June 1973) of the Bulletin of the History of Dentistry carried an article entitled "Mark Twain Visits the Dentist." In it Twain was quoted as saying that "... it was a cold awakening to me when a dentist who had caught a fleeting glimpse of my interior when I was laughing at something which spread me wider open than usual, told me I ought to go to Dr. Riggs and get my teeth attended to." And then Twain went on to explain that he was desirous of saving his teeth from further harm since the dentist pointed out that he seemed to be showing some evidence of what was called in those days "Riggs' disease" and which we characterize as periodontal disease. So off Twain went to see Dr. Riggs, and after two sessions of Riggs' ministrations he wrote the humorous piece which Dr. Baumrind dug up in the Twain Archives of the University of California at Berkeley.

It now appears that Twain's description of how he happened to undergo the dental treatment didn't come about that way at all; in fact, he set out deliberately to get a "story" from Dr. Riggs, one which he thought would be good for a laugh and worth publishing. The Dental Advertiser (Vol. 9, July 1878, page 110) prints the true story which it had obtained from the Hartford, Connecticut Hartford Courant, and it is worth reprinting in full for it shows not only Twain's inventiveness in securing a story, but also his true attitude toward dentistry when it came time to pay Dr. Riggs' his fee:

Dr. John M. Riggs, a dentist of this city, is the man who first administered laughing gas when the discovery of that anesthetic was made by the late Dr. Horace Wells. A public exhibition was given at which Dr. Wells was present, and the gas was taken first by Sam Cooley who had a tooth pulled by Riggs. Several weeks ago, the Rev. Joseph H. Twitchell, pastor of the Asylum Hill Congregational Church in this city, sat for a good part of two days in Dr. Riggs' dental chair having his teeth repaired. Riggs is chatty, and while at work gave Mr. Twitchell a detailed and interesting account of Dr. Wells' discovery and of the Cooley exhibition. There were so many rare and funny things in the narrative that Mr. Twitchell repeated them from memory to Mark Twain, who thought it would be well to see Riggs himself and get the yarn first-handed, as he might work it up with some embellishments for publication. A few days afterward, the distinguished humorist appeared in Riggs' office saying that, as he was going abroad, he would like to have his teeth overhauled somewhat, though he really had no idea that very much tinkering would be necessary. What he wanted was the story. After being well seated in the operating chair
he succeeded in getting the doctor started, and between the story and the work performed, two days were occupied. Mark rejoiced over his good luck, and took the earliest opportunity to inform his clerical friend that he had succeeded in getting just what he wanted.

The day before he sailed for Europe, however, he was astonished to get a bill for services from Dr. Riggs amounting to $200. He did not know but it might be a joke, a greater charge being made on account of anesthesia than for actual professional work. He soon satisfied himself, however, that the doctor intended the bill to cover mechanical services only, and then he was mad, particularly as all he wanted from the doctor was the story. He passed the bill over to Mr. Charles E. Perkins, attorney, who still has it. Mark, meanwhile, will not probably prepare his version of the discovery of laughing gas until he knows precisely what he has got to pay for the materials.

We will probably never know whether or not Twain ever paid Riggs' bill. Perhaps he didn't, and perhaps that's the reason that his story of his treatment by Dr. Riggs has gone forever unpublished until now.

(Editor's note: In the February, 1973, issue of the *Smithsonian Magazine*, (Vol. 3, No. 11) there appeared an article entitled "America's Most Famous Teeth" by Reidar F. Sognnaes, D.D.S. The article dealt with a history of the dentures that had been constructed for George Washington. Dr. J. Ben Robinson, the first President of the American Academy of the History of Dentistry and one of the most respected men in all the field of dentistry, not only in dental history, takes issue with Dr. Sognnaes over what he considers are several serious inaccuracies in Dr. Sognnaes' article. This open letter of comment is published in the hope that some of these incorrect statements might be set straight.)

Dr. Reider F. Sognnaes
Los Angeles, California

Dear Dr. Sognnaes:

I have no information about a front tooth which allegedly was separated from Washington's "set of teeth." The box with label which is pictured on the chart you sent me is not in the museum at the baltimore College of Dental Surgery.

The half lower ivory denture which was made for Washington by John Greenwood and given to Chapin Harris by Isaac John Greenwood about 1840, was placed in the College museum. It remained there until about 1861, when it was removed and returned to the Harris family. About 1870 Helen Pendleton Harris, daughter of Chapin Harris, gave the piece to Mr. Walter Coffin of London who passed it on to Mr. George Northcroft who, apparently, placed it in the London Hospital Medical College.

I am astonished that you should have given credence to the spurious
claim that Charles Wilson Peale constructed for Washington the crude lead-based dentures described by Weinberger. I discovered the existence of these dentures and told Weinberger about them. I promptly questioned their authenticity and branded them as a hoax. On their face it is clear to me that no human being could wear them and that no artist would construct them. In spite of the obvious, Weinberger attempted to exploit them as a discovery, and without evidence or reasonable justification speculated that Peale may have made them. You accepted a suggestion as a fact and without hesitation reported the dentures as authentic, of all places, to the Smithsonian Institution: "This elaborate lead-based denture was made for Washington by artist Charles Wilson Peale."

I regret that I cannot be more helpful to you in your researches.

Cordially yours,
J. Ben Robinson, D.D.S.

Your Editor, along with four other members of our Academy was recently connected with a project entitled "A Medallic History of Dentistry" which involved the issuance by the Medical Heritage Society of Chicago of a series of 50 large silver medals commemorating outstanding individuals and events in the history of dentistry. Such projects have been undertaken in other countries, frequently on a less ambitious scale, and sometimes commemorating a particular event. Now one of our Honorary Members, Dr. Ake B. Löfgren of Goteborg, Sweden, has undertaken a project concerned with these medals, and his recent letter to your Editor is here printed in the hope that there may be among our readers some who may have material which might be of assistance to Dr. Löfgren:

During the spring I have collected a lot of material on dental medals, award-medals, medals in remembrance of certain dentists, certain odontological events, and so on. I think that this special field has until now not been investigated and undoubtedly it is an important part of dental history. But, believe me, there are so many things to be searched for: pictures of all the medals, the material; their size; the artists and dates of issue; the names of the recipients, etc. Each of these details is necessary if the descriptions will be of any value. Therefore, I will tell you now that you will receive many questions from me in the not too distant future. Without your help, I am convinced that the medallic history of American dentistry could not be written. Perhaps, also, the history of the medals could be published in a series in the Bulletin, each time presenting one medal. What do you think about that?

Sincerely,
Dr. Ake B. Löfgren

The American Dental Association publishes periodically a register entitled National Dental Organizations of the United States. In a sudden and arbitrary move, the Board of Trustees of the A.D.A. moved to
change the criteria for inclusion in the register so that only those organizations would be included which made A.D.A. membership a prerequisite for belonging to their own organization.

The American Academy of the History of Dentistry vehemently protested this move, citing the fact that many of our most prominent dental historians who are members of our Academy are not dentists, but yet have rendered great and lasting service to the dental profession. The Academy officially filed its protest with the Board of Trustees, pointing out that were this prohibition to stand, this Academy would not be eligible for listing; what a travesty that would be, since this Academy is the only organization in America devoted to furthering interest and study in the heritage of our profession.

We were very gratified, therefore, to receive from Howard I. Wells, Jr., the Director of the Bureau of Dental Society Services of the A.D.A. a letter notifying us that at the Annual Meeting of the A.D.A. in Houston, the Board of Trustees had reconsidered its criteria for inclusion in the register of organizations, and that the requirement of A.D.A. membership had been withdrawn. “Accordingly,” he advised, “your organization will be listed in the January, 1974, revision.”
Letters To The Editor

To the Editor:

You may consider this a "fan letter," for I have long admired your workmanship in editing the Bulletin of the History of Dentistry, and have secretly envied your scholarship in the field of dental history. The June issue was replete with rich material. I was, however, completely and pleasantly surprised to see that you had thought my editorial was worthy of reprinting. I wish to thank you for your kind gesture, and I hope we meet personally in the near future.

Finally, as a sometime book reviewer myself, may I commend you on the excellence and perception of your book reviews. They are beautiful.

Most cordially,
Stanley R. Korf, D.D.S.

(DR. KORF, whose editorial was reprinted in the last issue of the Bulletin from the Journal of the American College of Dentists is the Editor of the Journal of the American Academy of Pedontics.)

To the Editor:

I have, today, received my copy of the August issue of the Newsletter. I do feel that it would be most ungracious and unappreciative on my part were I to fail to reply and thank you, very sincerely, for the superlative manner in which you have reacted to the honor which the Canadian Dental Association recently conferred upon me.

May I say that anything that I have done to promote interest in dental history I regard as a privilege. Further, let me add that throughout my years of research and collecting, I always regarded myself as merely a custodian of everything that I discovered or acquired. Consequently, I gifted my library of early books, MSS., etc. to the Royal College of Surgeons of England, and my museum of early instruments, paintings, prints, etc., to the Royal College of Surgeons of Edinburgh; because the former was rich in instruments and poor in books and the latter vice versa. At both centres everything will be permanently protected against loss, and will be available for reference to present and future dental historians, as well as to interested members of our profession, far better than being in private possession.

In addition, for the same reason and because of my belief in, and knowledge of, the value of dental history, I have never accepted fees or honoraria for articles or lectures. I was very fortunate in being able to regard dental history purely as a hobby, particularly as ill-health prevented me from indulging in other expensive pursuits such as
smoking, golf or travelling abroad, thus leaving me without any alternative but to lead a quiet life. However, my interest in dental history is as keen as ever, and will be at the end of the chapter. With renewed thanks, cordial greetings and kind regards,

J. Menzies Campbell

(DR. MENZIES-CAMPBELL, who was cited by the Canadian Dental Association for his contributions to the field of dentistry through his work in dental history, is considered by many to be the world’s greatest living authority on the history of dentistry.)

To the Editor:

The June Issue of the Bulletin of the History of Dentistry which arrived this past week surpasses all the previous issues of the Bulletin. All of them have been excellent in format and content but this Issue is a historical gem. My congratulations on a wonderful editorial job.

You are building this publication to the point that it must have continuous life and I hope that the present sponsors will continue their support beyond their present agreement.

You may recall that the Academy has a liaison committee with the Dental Group of the Medical Library Association which has a program for the development of dental historical exhibits in the libraries of dental schools. The article on page 19 of the June Issue of the Bulletin titled "Medical College of Virginia’s New Living Museum" is in line with the program of the Library Association and it carries a nucleus of a thought that there may be other dental schools doing something similar which you might investigate for publication in later Issues. This is a wonderful source for the teaching of dental history. This is somewhat of a rambling paragraph and I hope my thought is understandable.

With all good wishes and personal regards,

Henry A. Swanson, D.D.S.

(DR. SWANSON is a Past-President of the American Academy of the History of Dentistry and was on the Committee for the establishment of a dental exhibition at the Smithsonian Institution.)
The year 1973 marks the 50th anniversary of the founding of the King's College Hospital Dental School, and the small book here issued to honor this occasion is a gem. The author, a Professor and member of the Dental Council of the College confesses in the preface that when he was asked to undertake the preparation of this history he was "... naturally very flattered and also very apprehensive. Having never before attempted such a task I had no idea what it might entail and the only thing I knew for certain was that I had no particular aptitude for such a work. It would have been better for all if an accomplished historian had been asked to undertake this task."

That Dr. Hall is no accomplished dental historian is made very clear in the first chapter, where in twenty-one short pages he attempts to trace the history of dentistry from the dawn of time to the modern day. Although it is necessary to point out some of the shortcomings of this chapter, this is meant in no way to detract from the general excellence of the book insofar as the history of British dentistry is concerned, or as far as the story of the struggle to get a dental school established at King's College.

For example, Dr. Hall places the great Arabian physician Rhazes in the 1st Century A.D. instead of the 10th. He deals extensively with the writings of John of Gaddesen, ignoring completely Thomas Berdmore. And in the beginning of his discussion of the growth of dental education he makes no mention whatever of its birthplace in the United States, almost two decades before it appeared in England. In a similar way he mentions the first dental society and professional journal as being ones begun in England in the 1880's, again not mentioning that the genesis of these important branches of dental education was the United States. He does pay tribute only to the mechanical aptitude of American dentists, and in conceding that in this respect American dentistry leads the world, acknowledges that it is only in this century that British dentistry is beginning to catch up to it in this field.

However, the first chapter aside, the rest of the book is excellent reading for a fascinating study of the road travelled by our fellow practitioners in a land where great resistance existed to the development of separate schools for dentistry.

Because of the strong influence of the medical profession, and in particular the surgeons, dental education in England was for long limited to those who had pursued a course of study in medicine and then went on to specialize in dentistry. That there were, however, far-seeing men
in the profession who recognized the need for separate dental education is brought out admirably in this book. It is therefore at its best in dealing with the history of British dental education, beginning with the fascinating story of the three generations of Cartwrights, through the career of the great Sir John Tomes, and discussing all of the others who contributed so greatly.

The author has a good ready wit which enlivens the book; he discusses the use to which the school’s “mechanics laboratory” was put by students of an earlier era when they made it their private workshop where “... even wedding rings have been made; if they were for permanent or temporary use is not clear, for in those days the decencies had to be observed even for the illicit weekend.”

A new dental school building was erected by the University in the 1950's and the author discusses in detail how the planning for space was carried out, and what the results actually were in terms of efficiency. What a difference, he says, a mere five feet more in width would have made! Dental educators in our country planning new facilities would be wise to look this book over and possibly gain somewhat from the mistakes of their British colleagues.


Man uses the accomplishments of man so frequently that he often loses sight of man in the use of his accomplishments. Meyer’s work serves to inform and/or remind us that the electric, magnetic, and electromagnetic phenomena, so much a part of our current life style, tend to escape us with respect to origin. Probably few of us consider the observations made in the pre-Christian era concerning the magnetic properties of lodestone, or the recorded observations of Thales of Miletus on the electrical properties of amber, while we are busy being impressed with the output of high speed computers, the marvels of communication or the efficiency of our specialized power tools and electronic instruments. Yet a connection exists with time and people and their discoveries bridging the gap. The state of the application of the principles of electricity and magnetism has and continues to depend not only upon the discovery of fundamental laws but also upon the initiative and inventive capabilities of those who could recognize potentials and amplify them.

This book gives recognition to the technology as well as the advances in pure science and gives consideration to some of the human characteristics of some of the personalities involved in a special history that has affected our entire history and future. This is not just a terminal study in the area of man’s interest. Meyer has also included the roles of some of the small businesses, various companies and corporations that have had substantial effects upon the continuous development of one area of human endeavor that we have come to rely on so heavily but
usually take little time to become acquainted with even if we do not seek high degrees of understanding.

Electricity and magnetism were initially viewed as elusive entities and were observed whenever and wherever they could be found as a natural occurrence. Since then they have been brought into the laboratory (and sent out of the laboratory) to be probed, pondered, analyzed and applied so that they have followed a course that goes from frogs' legs to nuclear fusion. Meyer helps to familiarize us with the contributions of some of the more obscure persons involved in the study as well as those whose names have become landmarks in the history of electricity and magnetism.

Those in the past who have chosen to explore these related physical properties of the universe could have expressed some interesting views in the pursuit of their work. Benjamin Franklin may have found it striking, Alexander Graham Bell might have enjoyed talking about it, Thomas Alva Edison may have found it enlightening, Guglielmo Marconi might have found it to be of signal importance, Andre Marie Ampere may have gotten a charge out of it, Stephen Gray might have preferred to just conduct his experiments. But those who had come to really understand it rarely found it shocking. If one has a quantitative technical or semi-technical knowledge of electricity and magnetism Meyer can help to put it all together in an interesting perspective. If one would like to begin qualitative study of electricity and magnetism, this book is a good place to start.

(Reviewed by JOHN S. FAUBL, B.A., M.A., Rensselaer Polytechnic Institute. He is currently a member of the Physics Department of the Haddonfield, New Jersey, High School.)


When we think of a plague which wiped out large masses of people we immediately call to mind the Black Death of 1340. And there have been other scourges of which we’ve heard and which devastated Europe such as the “pox”, syphilis, in the Renaissance.

However, few of us are aware that a terrible epidemic struck the New England colonies between the years 1735 and 1740, one which so decimated the population that it was generations before the effects were somewhat erased. Whole families were destroyed, with child following child to the grave in a matter of only days. The people in their frantic search for succor turned to prayer, and immense prayer meetings were held, which unfortunately only further spread the disease.

What was the disease? It was a new one to the colonists, one which struck with a raging fever, great debility and a membranous covering over the trachea which blocked breathing. They called it the “throat
distemper" and we know it by the name diphtheria, and its dread effect as a killer can only really be understood after reading this fascinating book.

In 1939 the Yale Journal of Biology and Medicine published for the Beaumont Medical Club a monograph by a physician, Ernest Caulfield, entitled A True History of the Terrible Epidemic, Vulgarly Called the Throat Distemper, Which Occurred in His Majesty's New England Colonies Between the Years 1735 and 1740. The first part of this new book is a reprint of that earlier work, and a most welcome addition to the ranks of reprints of historically important works.

Dr. Caulfield had researched his material so thoroughly that the book creates a gripping, fascinating and frightening picture of this enormous calamity which befell these earlier settlers, a calamity of which not only they but the medical profession of the time had no understanding. And of course, the greater sadness is that the disease hit the young with the greatest severity, and in mysterious fashion. The author frequently compares contemporary accounts of the disease such as this one - "Children while sitting up at play would fall and expire with their playthings in their hands" with an account from a modern textbook on pediatrics which advises that "... sudden heart failure may be seen in late diphtheria. It may occur with few or no premonitory symptoms; as when a child falls dead after walking across a room, or suddenly sitting up in bed..."

The author traces the spread of the disease from colony to colony and city to city, and his copious use of reproductions of contemporary newspaper or journal pages enhances the reader's interest markedly. The remaining three parts of the book contain accurate facsimile reproductions of contemporary writings by physicians and others of the time, describing the epidemic and their attempts to understand and explain it. These sections are fascinating to peruse, for in them we are looking backward in time through the minds of those who lived in an age when this horrible disease, which thankfully has been conquered in our lifetime, was such a catastrophe.


Iris Noble admits that writing and traveling fascinate her. "In what other profession," says she, "could I carry my office with me?" Typewritter in hand she has travelled to many far corners of the world, all the time garnering useful knowledge which she turned into a series of books about many, many major personalities both of our day and earlier, ranging from Clarence Darrow and Sarah Bernhardt to Shakespeare and Cleopatra. For the last thirty years she has been writing exclusively for young people, and this excellent biography of the great father of modern surgery is intended for the pre-teen or teen-ager. However, readers of any age will find it a fascinating study of a fascinating man; this reviewer surely did.
John Hunter’s life lent itself to great drama. An uncouth, unlettered bumpkin, he left his native Scotland when he was twenty to seek out his brother in London who had become the most fashionable obstetrician of his day as well as the outstanding teacher of anatomy. Shocked as he was by his brother John’s rude country ways, he tried as best he could to make a “gentleman” of John, but John was far more interested in learning, and absorbed all his brother could teach him about the anatomy of the body, and even more. Through his brother’s intercession John became a student of the great surgeon William Cheselden, and Miss Noble’s description of the primitive surgery practiced two centuries ago, as well as her exceptionally fine portrayal of the shocking, filthy conditions in the London hospitals of those days is remarkable.

John’s progress as a surgeon was rapid, but his insatiable curiosity led him to seek out other fields, and one which attracted him was dentistry, or rather that branch of it which we would refer to today as “oral surgery”. He became a special consultant to the Spences, father and son, who operated a tooth-pulling shop in Soho, and worked with them on their most difficult cases, always diligently taking copious notes. One night John was visited at his lodgings by his older brother, the eminent William Hunter, who was livid with fury when John greeted him and went on to lash out at him:

I had hoped to change the coarseness and vulgarity in you. I taught you; I lavished money on you; I got you into the finest hospitals; I invited you to my home where you could meet distinguished men . . . I even-God help me! - tried to make a gentleman of you . . . And while I have worked hard to climb the ladder of success and honor our name, you have worked equally as hard to climb down into the gutter and pull me down with you. Dr. William Hunter, in attendance upon the Queen of England, has a brother who is associated with a low charlatan of a tooth-puller.

And turning to go, William flung over his shoulder his last remark: “I have no brother named John Hunter - remember that! In the future, if I am asked of you, I will not own to you.” Keep his promise he did, for the two brothers never spoke to one another again. However, John, whose career was launched with his first great publication The Natural History of the Human Teeth, which grew out of his years of working with the “tooth-pullers” went on to the greatest of fame and honor, while his brother William has secured for himself only a secondary place in history, notably for his work on the gravid uterus.

John Hunter was intimately connected with dentistry for many years in many ways, among them the pioneering experiments in the transplantation of extracted human teeth into the combs of roosters.

Miss Noble’s book is so well written and evokes so well the style, manners and ambience of Hunter’s period that it is highly recommended as a perfect gift for any young person, who will surely enjoy as well as benefit from the story.
Chaucer's Canterbury Tales has been called the greatest collection of narrative poems in world literature. The frame of the story is a journey undertaken by twenty-nine pilgrims of various strata of fourteenth century England to the tomb of the notable Saint, Thomas a Becket, at Canterbury. They begin their journey from an inn, and it is the innkeeper who suggests that, in order to pass the time on the journey, each tell one or more tales, with the winner of the tale chosen to be the best the recipient of a free dinner by "mine host" on their return.

Chaucer has gathered together a group representative of English society of the 1380's, comprising as it does all segments of the population ranging from a Parson and a Knight to a Prioress and a Pardonner. These are all charmingly described in the Prologue to the Tales, and one of the most interesting characters is the Physician whom Chaucer describes in part thus in the Prologue:

With us there was a Doctour of Phisik;
In al this world ne was ther noon hym lyk,
To speke of phisik and of sur_gerye,
For he was grounded in astronomye.
He kepte his pacient a ful greet deel
In houres by his magyk natureel.

*********
He knew the cause of everich maladye,
Were it of hoot, or coold, or moyste, or drye,
And where they engendred, and of what humour.
He was a verray, parfit praktisour.

*********
Wel knew he the olde Esclapius,
And Deyscorides, and eek Rufus,
Olde Ypocras, Haly and Gaylen,
Serapion, Razis, and Avycen...

*********
In sangwyn and in pers he clad was al,
Lyned with taffata and with sendal;
And yet he was but esy of dispence;
He kept that he wan in pestilence.
For gold in phisick is a cordial,
Therefore he lovede gold in special.

In 1925 Walter Clyde Curry presented a study Chaucer and the Medical Sciences, but the author of the current book feels that it is time for a new look at Chaucer's physician, since in these intervening decades many more medieval records have become available, and new generations of scholars have labored to come up with more accurate answers to such questions as:

1. What was the state of the medical profession in Chaucer's time?
2. What physicians were contemporary with Chaucer and who might
have served as his model or to have influenced his characterization?

The work here presented as a partial answer to these questions is a first-rate bit of scholarly sleuthing. The author presents the condition of medical training (or lack of it) in the England of 600 years ago and shows that the university trained "Doctours of Phisick" were primarily clerics and only secondarily medical men. But he makes clear that functioning side-by-side with these university trained personnel in the practice of some phase of medicine were such other practitioners as trained surgeons, barber-surgeons, unlicensed physicians with some training, barbers who were not barber-surgeons, apothecaries, leches (who were somewhat akin to the modern mid-European feldscher) bone-setters, tooth-drawers, midwives, treaclers, bloodletters, herbalists, as well as a wide variety of out-and-out quacks!

Through access to numerous registers of physicians of Chaucer's day, the author comes up with about forty who were contemporary with him and one by one eliminates them until he is left with three possible candidates, any one of whom may have served as Chaucer's model, and shows by records of the court of John of Gaunt (son of Edward II) that one at least was in the royal service at the same time as was Chaucer.

The book is not an easy one to pursue since it is in the form of an extremely scholarly doctoral dissertation written primarily for scholars of Chaucerian literature. Yet for historians of medicine and dentistry it has an undeniable fascination for the picture it gives of the training of medical practitioners in those late medieval days as well as of the economic status of the various members of the crafts engaged in healing. It is copiously documented and footnoted with an extensive index to all of the characters, medical and otherwise, who were Chaucer's contemporaries.


Histories of medicine abound, and this author, a German medical historian has chosen to add his mite. The result is an interestingly written survey of medicine from the days of the primitive "medicine man" practicing trepanning in the dark and dankness of a Dordognian cave to the operating theater in South Africa where Christian Barnard performed the first human heart transplant.

The book is written for the layman and the author brings to the work a good grasp of the sweep of the centuries so that at the end one has a good overview of what scientific man has accomplished in these past 5000 years. However, the author is no Sigerist or Garrison or Castiglioni and thus the book is too superficial a treatment for any serious student of the history of the healing arts.

In addition the author ignores completely the many great contributions of dentistry in advancing human welfare. He fails totally to
show how the many great figures of the Renaissance and after did much of their greatest work in the field of dentistry and other branches of oral science. For example, how can an illustration of instruments taken from Ambroise Pare's great masterwork, and which are obviously dental instruments, not be identified as such? Or how can a discussion of John Hunter dwell almost totally on his large animal collection neglecting his monumental work on the anatomy of the human teeth which first won him his fame? Further, in the retelling of the story of anesthesia, how can the author fail to identify Morton, the demonstrator of ether anesthesia, as a dentist (although he does devote one line to Horace Wells extracting teeth under nitrous oxide.) The author makes the additional error of ascribing the discovery of nitrous oxide to Humphrey Davy instead of to Priestley.

The illustrations which are grouped in two sections in the book are all quite familiar and unexciting to anyone who has perused books on medical history.

On the whole, the book is a good example that histories of medicine have a fascination for publishers, whether they fulfill a need or not. It is unfortunate that these same publishers cannot be made to see that a well written history of dentistry can be an equally intriguing work, and one which can be sold to an interested and enlightened public.


Recently, the National Observer newspaper openly printed an apology to a woman subscriber who complained that every week when the postman delivered the Observer, instead of the one copy she was supposed to get, there were left on her doorstep huge mail sacks stuffed with copies of the newspaper. The Observer's publisher, by way of explanation went on to say that the newspaper's subscription department had switched over to computerization, and that whoever punched out this lady's card punched out 991 copies instead of 1! How often do we get as a lame excuse for an incorrect charge account billing or a tax mistake that it was "computer error". Well, I don't buy that at all! There is no such thing as computer error. It is human error, because it takes the human to set the computer in motion.

The National Library of Medicine previously issued a 5 year cumulative Bibliography of the History of Medicine, and which was reviewed in the December, 1972, issue of this Bulletin. That Bibliography covered the years 1964 through 1969 and it is a gem, a marvelous tool for the seeker of knowledge in the field of medical history.

The history of dentistry is an admittedly important part of the whole field of the history of medicine, and in this latest compilation there is again a section devoted to dentistry. But this time the National Library
of Medicine should be thoroughly ashamed of itself for the horrible way it treated dentistry in this volume. And since this book is computer produced, I'm sure that those responsible at N.L.M. will cry "computer error." But as I said earlier, I don't buy that!

The principal flaw is that there is not a single citation from the Bulletin of the History of Dentistry, the only English-language periodical in the entire world devoted to dental history. (Pardon me; there is one citation: an old one from 1968 which somehow must have been found to have been left out from the earlier volume which should have contained it.) So many valuable historical articles appeared in this Bulletin alone since N.L.M.'s previous Bibliography appeared and which have been omitted in this volume that to list them all would be impossible. In addition, numerous other articles dealing with dental history have been published in many other periodicals, many excellent local and state journals and which have been omitted from this N.L.M. volume, that the value of this Bibliography as a research tool is seriously impaired. It is suggested that the people at N.L.M. responsible for the preparation of this Bibliography take a look at the excellent quarterly issued by the Wellcome Institute of the History of Medicine in London entitled Current Work in the History of Medicine: An International Bibliography. Maybe that'll give them an idea what a comprehensive bibliography should be like.

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Olson, J.V.

On the Teaching of Dental History - Korf

Operative dentistry, history

Oral sepsis, William Hunter's theory

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