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Dr. J. Henry Clarke, Business Manager
Division of Behavioral Sciences
University of Oregon Health Sciences Center
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Increasing interest among dentists in dental history.
Encouraging dental schools to develop historical collections on dentistry, and to offer adequate instruction in dental history.
Developing a broader understanding of the facts of dental history among the leaders in dentistry in order to aid them in their attempts in solving important problems in dental education and practice.
Stimulating more thorough and comprehensive research in dental history, thereby extending the boundaries of dental knowledge, giving substantial support to growing professional culture.
Creating an authoritative body to which important questions relating to dental history could be referred for factual verification.
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THE NEW PRESIDENT
of the American Academy of the
History of Dentistry
Kenneth V. Randolph, D.D.S.

Dr. Kenneth V. Randolph, D.D.S., B.S., is a native of West
Virginia where he received his elementary and secondary education. Pre-
dental courses were taken at West Virginia University prior to
matriculating in the Baltimore College of Dental Surgery, Dental School,
University of Maryland. His dental degree was earned in 1939 and a
Bachelor of Science in education in 1951. After graduation in dentistry,
Dr. Randolph joined the faculty of the Operative Department at his
alma mater. He continued full-time teaching and served as Professor and
Chairman of Operative Dentistry from 1946 to 1957. In 1957 he
accepted a position as Associate Dean at the newly formed dental school
at West Virginia University. In July of 1958, he was appointed Dean and
served in that capacity until 1968. He resigned his position at West
Virginia University to accept the deanship of Baylor University College
of Dentistry. In 1971 he was appointed President and Academic Dean of
the newly structured Baylor College of Dentistry.

Dr. Randolph is a member of Omicron Kappa Upsilon, a Fellow
of the American College of Dentists, an honorary member of the
Academy of General Dentistry, and an honorary member of Sigma Phi
Alpha (dental hygiene honorary society). He served on the Council of
the National Board of Dental Examiners from 1965 to 1971 and was
chairman for the last two years. He is a former trustee for the American
Fund for Dental Health and a former delegate to the American Dental
Association. He is past president of the Southern Conference of Dental
Deans and Examiners. Dr. Randolph has been involved in many civic
and community activities. He is a Rotarian and a member of the United
Methodist church. He has numerous publications and has participated
in many professional programs. He is presently serving on the Board of
Trustees of the Texas Area V Health Systems Agency, Inc.
A History of Porcelain in Dentistry

—ROBERT C. SPROULL
El Paso, Texas

Tracing the history of porcelain is, in effect, chronicling the history of civilization. Porcelain traces its ancestry back to the primitive potter, and archaeologists teach that finds of pottery mark the beginning of civilized living. As man discovered agriculture (10,000 B.C. to 5,000 B.C.) and the advantages it offered for a more steady food supply and better way of life, simple pots came into being. They were crude and made of clay. Those who have made mud pies as a child know basically the problems they presented. Crude, baked in the sun, susceptible to fracture, porous to water and ugly, they were far from perfect. So man experimented to improve them. The sun-dried vessels were replaced by those hardened in fire. Other materials were added; techniques were improved. Decorations made them more esthetic. On this substructure the pottery of the last 4,000 or more years was built. Like porcelain, the fragments of these pots are practically indestructible and their shards are found today by the hundreds of thousands, providing archaeologists with valuable clues to our past.

It is true that these early vessels were merely clay, baked until they became hard. If the temperature was raised, however, the clay fused, was no longer porous and was then called stoneware. The Chinese potters of the Han Dynasty were doing this by 100 B.C., and glazing the vessels in various colors. Some authorities call this the first true porcelain. Some feel it is merely a proto-porcelain that led to the development of true porcelain. The early lead of the Chinese continued, and it was in China that porcelain first came of age. Its development in Korea was perhaps contemporary, and Japan made porcelain by the 1500’s.

The stoneware of the Han Dynasty (206 B.C. to 589 A.D.) led to that of the Six Dynasties (A.D. 220-589). It was during this period that kaolin and chinastone were discovered, and which could be fired to a white body. It was not until the T’ang period (618-906 A.D.) that a translucent porcelain was produced, but this was still 800 years before Europe produced porcelain. Marco Polo’s experience in China and his return to Florence in 1295 made Europe aware of the beauty of true porcelain. The rulers of Europe paid fortunes for these wares and began to seek ways to create their own. Alchemists were imprisoned, and with their life at forfeit, told to produce porcelain. At Florence, Italy in 1575 a soft paste porcelain was finally produced for the Medicis. In the 1700’s through intrigue, outright theft, war, bribery and any other means available, the other countries of Europe founded porcelain factories, many of them still in operation. In America the first porcelain was manufactured in Philadelphia in 1770. Large numbers of skilled workers from England were brought over and the ware resembled that of the Bow factory from which they were lured.

All ceramic materials whether earthenware containers, china or delicate porcelain are composed of essentially the same materials - feldspar, quartz and kaolin. Purity of the materials, percentages of the materials used and firing procedures have created the differences. Most
have seen examples of magnificent early ceramic wares. They reinforce what we have come to realize about our use of porcelain in dentistry. It is a material that can assume an endless variety of forms. It does not break down when exposed to a wide variety of destructive elements. It can be colored in a wide gamut of rainbow hues. It is strong in compression but tends to fracture in tension. It is easily cleaned. Also, it has rigid handling characteristics that must be respected if its full potential is to be realized.

It was a long journey from simple pots to fine porcelain, and it was also a long journey from the first crude fillings to today’s dental restorations of porcelain. As civilization developed so did man’s concern for his appearance. In the beginning, simply to obliterate a space was sufficient. A close color match or functional restoration was a fortunate accident. Pebbles, wood, ivory, animal and human teeth were among the materials used. They were carved to fit or perhaps bound to place with sinew, thread or gold. The Greeks and Phoenicians bound loose teeth together with gold wire to retain them in position. The Etruscans, later conquered by the Romans, made partial dentures and bridgework of gold as early as 700 B.C. It is an interesting commentary that not until about the middle of the 19th century could their excellence be equaled! In the meantime, dental materials were basically very poor.

**INADEQUATE RESTORATIVE MATERIALS SPUR EXPERIMENTATION WITH PORCELAIN**

Because of the inadequate materials used and the atrocious fit of the complete and partial dentures, dentists began to experiment with porcelain. If consumer advocates had existed in the 1700’s, dentures would probably have been labeled “Danger. This denture is injurious to your health — and may kill you.” The organic ivory or bone from which many of the dentures were made became putrescent in the warm, moist oral environment, emitting a horrible stench and releasing toxins. Human teeth were often affixed to the denture, and these also suffered decay. George Washington soaked his dentures in port wine in order to be able to tolerate the taste and smell. It is little wonder that other materials were sought!

Pierre Fauchard, (1678-1761), the remarkable French dentist and author of *Le Chirugien Dentiste*, is given credit by some for first suggesting the use of porcelain. To improve the appearance of artificial teeth Fauchard applied jeweler’s enamel to artificial teeth of thin gold plate, but the enamel is thought to have been in the form of a paint or varnish. So, although he mentioned porcelain, it is unknown if he actually used it.

**THE FIRST BIG BREAKTHROUGH: TRUE PORCELAIN TEETH**

Nicholas Dubois de Chemant’s “incorruptible teeth of mineral paste” were hailed (especially by Chemant) as the answer to clean, stable and hygienic dentures in the 1790’s. In spite of the fact that de Chemant, a Parisian dentist, claimed sole credit for the process and was awarded a French patent in a bitterly fought suit, the credit for these dentures rightfully belongs to Alexis Duchateau. In reality they were little better than crockery, but they were a first step.

Duchateau, an apothecary of St. Germain-en-Leige, a little town near Paris, was burdened with a set of hippopotamus ivory dentures that
he had managed over the years to stain a variety of colors because of the chemicals he used and tasted. In addition the chemicals tainted everything he ate. Observing the clean surface of his porcelain mortars, his thoughts turned to a denture of the same material. He went to the Sevres china factory, got materials and started to work, learning the hard way about the difficulties of firing porcelain to size and color. Not being a dentist, he sought help from de Chemant. By adding pipe clay, coloring earths and baking at lower temperatures they conquered dimensional changes sufficiently to get a denture that Duchateau could wear. Duchateau was elated and felt he was ready for a career in dentistry, but the trauma engendered by dissatisfied patients swiftly ended this. In 1776 he presented the process to the Royal Academy of Surgeons in Paris, was thanked and retired from the field.

De Chemant persevered, however, and finally was able to make his china dentures with such a degree of success that he published a book in 1788 extolling his success. The Paris Faculty of Medicine endorsed the beauty and hygiene of his dentures; his practice flourished and he won his patent. The coming of the French Revolution convinced him that his fortune lay elsewhere and he moved to London in 1792 where he gained exclusive rights for 12 years to his porcelain paste dentures. He obtained his raw materials from the Wedgewood porcelain factory.

Although his dentures were a giant step forward they were only for the rich, fractured easily, were difficult to make and therefore never obtained wide acceptance.

The stimulus of Chemant's work, plus his patents, led others to seek solutions. Dubois Foucou, the dentist to the French king, was on the jury that awarded de Chemant his patent. His greatest contribution was in following the example of Fauchard in publishing the results of his experiments to improve the quality and color of de Chemant's incorruptible mineral paste. De Chemant gave no hint of the ingredients, the formulas, or techniques used. Foucou told all. Ultimately a bitter enmity developed between these two.

Guiseppangelo Fonzi, an Italian dentist practicing in Paris, was the first to successfully manufacture individual teeth and small blocks of teeth in porcelain which he called "Terro metallic teeth." His efforts were known popularly as "French beans" which they closely resembled. Enamed on the outside, they were round on front and flat on the back. Platinum pins or hooks protruded from the back to enable them to be attached to various bases. The porcelain was of a better grade than de Chemant's and the metal hooks encouraged the use of metallic bases of a more compatible, hygienic and endurable nature than ivory. But old ideas die hard; as late as 1875 Claudius Ash of London was supplying blocks of ivory for dentures.

Despite the availability of the "French beans," many dentists preferred the so-called "Waterloo teeth." The carnage of wars in Europe made the gathering of these teeth from the battlefields a profitable venture, and if a war weren't available, there were always the graveyards. Europe was not the only source for these teeth. The American Civil War provided another bountiful harvest and the teeth of American war dead were shipped to England by the barrel. Porcelain teeth had to await further development, along with development of better denture base materials, to end the use of human teeth. The use of de Chemant's porcelain dentures almost ceased in the first part of the 19th century, but the stimulus had been effective.
IMPROVEMENTS IN PORCELAIN TEETH

Once the barrier had been broken by de Chemant, Duchateau, Foucou and Fonzi, development of porcelain in dentistry accelerated in keeping with the acceleration of technology in the industrial revolution. A. A. Plantou provided the incentive to American dentists when he arrived in Philadelphia from Paris in 1817 bringing with him a supply of teeth that from description, must have been Fonzi’s “French beans.” By 1820 he was manufacturing his own. In 1822 Charles W. Peale, also of Philadelphia, began manufacturing porcelain teeth with platinum pins and by 1825 S. W. Stockton, of the same city, entered the field. He was the first in this country to produce porcelain teeth in quantity. Others who made porcelain teeth in this period for their own use, not commercially, were Mcllhenney (1826), Harwood and Tucker (1833) and Alcock and Allen (1835). All these teeth were apparently the type of Parian china that self glazed.

In England, when a silversmith named Claudius Ash was asked by a dentist if he would reproduce a prosthetic appliance in the early 1800’s, it started a chain of events important in the successful use of porcelain. Ash was skilled and soon found himself working for dentists to the exclusion of other patrons. He disliked handling the “Waterloo teeth,” and was determined to develop porcelain teeth more acceptable than Fonzi’s. He was eminently successful, and his dense porcelain, in more esthetic shades, became widely used. He also disliked the difficult manner of attaching the “beans”, and in 1837 developed the tube tooth. The firm bearing his name still prospers.

S. S. White, nephew of S. W. Stockton, started manufacturing porcelain teeth in 1844. His product was excellent, he expanded and the firm bearing his name became one of the largest in the world. A mold maker for White, H. D. Justi was another who launched a company making porcelain teeth. This company is still in existence.

Elias Wildman, another Philadelphia dentist, began his experimentation in 1835 that resulted in a much more life-like porcelain; before his studies the teeth were a uniform white. His experiments are credited with placing the manufacture of porcelain teeth on a scientific basis.19

It wasn’t until vulcanite came into general use in the second half of the 1800’s that adequate dentures became available at a price that could be afforded by most. This stimulated expanded manufacture of and research on porcelain teeth and indirectly profited restorative dentistry by making better porcelain available. It was fortunate that vulcanite arrived when it did. The establishment of accredited dental schools; the beginning of a variety of dental societies and journals; the discovery by Horace Wells of anesthesia which simplified extractions and resulted in multitudes of edentulous patients who clamored for dental treatment; all these factors made such a material imperative. Gold for denture bases had been used as early as 1757 by Bourdet of France, but it remained difficult to attach teeth and they were expensive. Cheoplastic dentures were introduced in 1856 by A. A. Blandy and referred to dentures made of metal made plastic by heat and poured into a mold. Expense and technical difficulties prevented them from becoming a serious challenge to vulcanite.

A history of porcelain would be incomplete if Dr. John Allen’s continuous gum dentures of 1850 were not mentioned. Until Allen’s development, all porcelain dentures were painstakingly adjusted to fit by
using a marking die on a cast, the same procedure as had been used in fitting an ivory denture. By improving the porcelain, reducing its fusing point and shrinkage, improving the color of the gum portion and baking the denture on a platinum base to which teeth were previously attached by soldering, Allen eliminated many of the previous problems. Although we think today of these dentures as ancient history, it is interesting that as late as 1928, Prothero in his text Prosthetic Dentistry had this to say: “From an esthetic, as well as hygienic standpoint porcelain or continuous gum dentures fulfill most perfectly the requirements for the lost natural teeth.” It wasn’t until 1937 and the advent of acrylic resin dentures that vulcanite was finally displaced as the most popular denture base material.

ADAPTATION OF PORCELAIN TO RESTORATIVE DENTISTRY

The use of porcelain in restorative dentistry lagged behind its use in removable prosthetics for good reasons. The crude instruments used for removing tooth structure did not lend themselves to swift, efficient and planned preparation of teeth. Means of efficiently controlling pain were not available. The porcelain ovens were large, crude and expensive. Firing porcelain to a given dimension was difficult. Effective dental cements and root canal filling materials were not available.

However, the period from 1840 to 1900 was one of rapid change and one in which the arts and sciences were taking giant steps forward. Dentistry took advantage of chemical, physical and engineering advances and by the end of the century porcelain was being used in an ever increasing volume.

The jewelers bow, which looks much like an Indian device to start fires, was first used for drilling cavities in 1773. Before that primitive hand drills were used. James Nasmyth, a Scottish engineer, introduced the coiled wire spring and flexible cable in 1829. Charles Merry of St. Louis subsequently developed a flexible dental engine cable for a hand drill in 1858 and several others followed. The first motor driven hand-piece was invented by George F. Harrington of England in 1864. The Nasmyth flexible cable was adapted to use with foot engines in 1870 and the electric dental engine was finally applied to dentistry by George F. Green.

The coke burning porcelain ovens were finally improved beginning in 1880 by Ambler Tess. The large size and tremendous weight were reduced to office size, but the fuel was still coke. Gas, oil, and finally electric power were introduced by the end of the century.

In 1855 the French chemist Sorel introduced oxychloride of zinc cement. Oxyphosphate of zinc cement was used as early as 1870 and given to the profession in 1879 by C. N. Pierce.

In 1842 gutta-percha was discovered in India and in 1883 it was dissolved in eucalyptol for use in root canals.

The stage was set for making crowns and bridges, and porcelain was used in a staggering variety of techniques. Unfortunately for the progress of porcelain, the limitations of the material were too often ignored. Wells published a history of the crown in 1901. He found the post crowns to be the earliest made and this is logical considering the early drilling devices. As porcelain teeth developed, they were substituted for the ivory and natural teeth first used. Hickory posts were gradually replaced by metal posts beginning about 1864. The gold shell crown was developed by Beers in 1873. The Richmond crown (1880),
Logan crown (1885) and Davis crown (1885) were used for decades. The first successful porcelain jacket crown is attributed to Dr. C. H. Land who patented his platinum matrix technique in 1887. Porcelain inlays evolved from substituting porcelain for the ivory, bone, amalgam or cement-like materials used originally. A variety of techniques were tried. Cavities were sometimes ground to fit inlays cut from round porcelain rods. Other times the process was reversed and the inlay was ground to fit a round cavity. It wasn’t until the medium fusing porcelain was substituted for the high fusing by Brewster in 1900 that esthetic and fitted inlays became a reality. The controversy over high, medium and low fusing porcelain continued for years and is still a matter of controversy to some. Low and medium fusing porcelain has, however, generally won acceptance with the present porcelain fused to metal techniques.

By the time Taggart patented his casting process in 1907, the overwhelming enthusiasm for porcelain that had been present at the turn of the century was on the wane because of the wide spread abuse of the material. The limitations of porcelain were not recognized; the rigid handling procedures were ignored. By 1920 its popularity was on the rise again as researchers and clinicians demonstrated that porcelain could be used successfully.

An unusual technique for porcelain was developed in the 1920’s for the casting of molten porcelain into a mold. It was used for inlays and crowns.

The advent of plastics in the 1950’s and enthusiastic commercial claims almost destroyed the use of porcelain as dentists flocked to the new, simpler material and the reservoir of skilled ceramists slowly disappeared.

The porcelain bonded to metal restoration reversed the trend and porcelain experienced its greatest revival. Fusing porcelain to metal was not new. Land had experimented with it for facings in the 1880’s, but opaque porcelains hadn’t as yet been developed and the color problem couldn’t be solved. After 1907 high fusing porcelain was fused to iridio-platinum alloy castings for almost 50 years with limited success. The metal was difficult to cast, color control was poor. Beginning about 1960 and with increasing frequency, different franchised porcelain systems began to appear on the market. John McLean of England began experimenting in the mid-sixties with a technique to reinforce porcelain and eliminate the need for metal. David Southan of Australia has also been active in seeking ways to strengthen porcelain and has published articles on its history and development. Base metals have been, and are, being introduced at an ever increasing rate raising many questions as to which porcelain/metal system is best. This part of porcelain history is familiar to most of us.

As in the past, abuses are rampant. The limitations of the material are too often ignored, the full potential too often not realized. It is necessary for us to become more familiar with this material, learn the truth about the confusing claims and counterclaims that beset us daily, so that we may be in a position to fully exploit the true potential of this beautiful material.

We have an advantage not available to those men who labored so diligently in the past. Today we have in dentistry workers whose background includes training in physics, engineering, chemistry and the biological sciences, and for whom dentistry is not a sideline but their profession. As Peyton states, “Cooperative efforts among the workers in
the field of restorative dentistry and materials appears to be stronger now than ever before."

References


DR. SPROULL, a past-president of the American Academy of the History of Dentistry was also a founder of the American College of Prosthodontists. He is currently the chairman of the Inter-Society Color Council’s Subcommittee #35 on Color and Appearance Matching of Living Tissue; also the chairman of the Library Committee of the American Academy of Esthetic Dentistry. His address is 2601 McRae Boulevard, El Paso, Texas, 79925. Requests for reprints should be made directly to Dr. Sproull.

(This paper was the opening address at the symposium “Dental Porcelain - The State of the Art: 1977” held in Los Angeles, February 24th to 26th, 1977.)
W. D. Miller and the
"Chemico-Parasitic" Theory
of Dental Caries

—JERRY J. HERSCHFELD, D.D.S.
Cornwell Heights, Pennsylvania

Most students of dental history will immediately recognize the
name of Willoughby D. Miller. Thoroughly trained in the natural
sciences, Miller was one of the first to elevate dentistry to the level of a
scientific discipline.

Miller was born in 1853 on a small farm in Ohio. After having
received his Bachelor of Arts in natural sciences from the University of
Michigan, he traveled to Edinburgh where he intended to study physics
and mathematics. There he was befriended by an American dentist,
Frank Abbott, who encouraged him to return to the United States to
study dentistry. In 1879, Miller graduated from the Philadelphia Dental
College. He subsequently returned to Berlin where he began studying
bacteriology. His enthusiasm for microbiology in addition to his clinical
activity, helped him to scientifically investigate many of dentistry's
problem areas.

Between 1881 and 1907 Miller published one hundred and sixty-
four scientific articles reflecting his intensive studies. The publication in
the Dental Cosmos for January, 1883, of his "Agency of Micro-
Organisms In Decay of Human Teeth" greatly impressed those in the
medical and biological fields as well as those in dentistry. This article,
which is reprinted here, was hailed as the true explanation of the carious
process. Miller did not however, claim full credit for originating this
"chemicoparasitic" theory of dental caries. He acknowledged the work
of others and in particular that of W.Y. Miles and Arthur S. Underwood
who, in a paper presented in London in 1881, referred to the action of
acids and germs as two constant factors in the carious process. It was
Miller, however, who determined the exact nature of this relationship
and devised a method to "isolate the microorganisms responsible for
causing decay." He announced that dental caries was a "chemico-
parasitic disorder caused by the solvent action of lactic acid generated by
the enzyme action of a certain type of microorganism upon car-
bohydrate food debris, the acid removing the mineral constituents of the
tooth structure and exposing the organic matrix to the liquefying action
of proteolytic and putrefactive bacteria."

Miller's research helped to uncover the nature of the decay process,
which, he stated, was only a part of the cause of tooth decay. Further
studies involved trying to define the problems of susceptibility and im-
munity to dental caries.
In 1890 Miller published his monumental *Micro-Organisms Of The Human Mouth*. It was the first major attempt to confront a number of dental problems in a scientific, rather than a speculative way. His impact on dentistry rested in his ability to draw far reaching conclusions from his meticulously recorded experiments. A case in point was his theory of caries prevention:

It must be apparent that there are four ways by which we may counteract or limit the ravages of this disease. We may endeavor 1) by hygienic measures to secure the best possible development of the teeth; 2) by repeated thorough, systematic cleansing of the oral cavity and the teeth, to so far reduce the amount of fermentable substances as to materially diminish the production of acid, as well as to rob the bacteria of the organic matter necessary to their rapid development; 3) by prohibiting or limiting the consumption of such foods or luxuries, which readily undergo acid fermentation, to remove the chief source of the ferment products injurious to the teeth; 4) by the proper and intelligent use of antiseptics to destroy the bacteria, or at least to limit their number and activity.

Miller’s knowledge of the role of microorganisms in the carious process precluded the hope that caries could be eradicated with mere toothbrushing and elimination of certain foods. “If a very thorough mechanical cleansing has not preceded the antiseptic, its actions upon the centers of decay will be equal to little more than zero.”

Miller’s thorough investigation of pathologic fungi of the mouth aided in expanding our knowledge of oral diseases. It helped demonstrate the possible transmission of oral pathogens via the bloodstream, resulting in inflammatory reactions in other parts of the body. He was among the first to propound the theory of oral infection as a source of systemic disease.

Although subsequent research has elaborated on Miller’s theory, it in no way detracts from the tremendous effect it has had on dentistry. His accomplishments in the study of dental caries and related areas, considering the unsophisticated laboratory facilities available to him at the time, were extraordinary. In the words of G.V. Black,

One of the noblest pieces of scientific work in pathology was Dr. W.D. Miller’s investigation of dental caries. It not only developed the questions at issue, but completed the investigation so that the rest of us, in repeating his experimental work, could only say, well and correctly done.

**AGENCY OF MICRO-ORGANISMS IN DECAY OF HUMAN TEETH**

As early as the year 1846 Facinus is said to have entertained the idea that caries of the human teeth was in some way influenced by the lower forms of life which may always be found in the oral cavity. It was not, however, till 1867 that an attempt was made by Leber and Rottenstein to determine the exact nature of this influence. These authors came to the conclusion that the action of an acid or acids, was not sufficient to explain all the phenomena associated with caries of the teeth, but that “the elements of the fungus (leptothrix) easily work their way into the dentinal tubules, which they expand, and thereby assist the penetration of acids into the deeper parts.”

F. Y. Clark believes decay of the teeth to be produced by what he calls dental bacteria, which he describes as being “of a half-U
shape, from one and a half to three micrometers long, by about one-half wide,” and as having “an almost imperceptible screw-like motion.”

A. Weil is the opinion that the leptothrix bores directly through Nasmyth’s membrane and then into the enamel; he doubts very much whether certain acids, principally lactic acid, can account for the whole process. Arthur S. Underwood and W. Y. Mills consider that caries, as well as suppuration of the pulp and alveolar abscess, depends upon the presence and proliferation of microorganisms. These organisms attack first the organic material, and feeding upon it create an acid, which removes the lime-salts.

However much opinions may differ as to the etiology of caries of the teeth, it is a theory pretty generally accepted, that the first stage of the caries consists in a decalcification of the hard tissues of the tooth by certain acids which come in contact with them in the mouth. Numerous experiments were long ago made by Frerichs, Maly, and Donath, to determine the solubility of lime-salts, especially phosphate, in solutions of glutin, salts, etc., and attention has lately been called to the fact (by Prof. Mayr) that though fresh egg albumen is alkaline, it contains lime-salts in solution; that sugar will dissolve carbonate and hydrated phosphate of lime; and that chloride of ammonium will prevent the precipitation of carbonate of lime in analyzing for alkaline earths; that is to say, certain neutral and even alkaline substances have the power of dissolving or at least of holding lime-salts in solution.

It is well to bear these facts in mind, but I think we should not place too much weight upon them. Solubility of lime-salts and solubility of tooth-substance are not exactly identical, and Magitot has determined by experiment that neither sugar as such nor chloride of ammonium has the power of extracting the lime-salts from the tooth. The same, so far as we yet know, may be the case with the albuminoids.

I confess that the possibility of a certain part in the decalcification being performed by non-acid substances is not to be excluded. At the same time, I am not aware of a single alkaline or neutral substance which has been shown to have the power even in the slightest degree of extracting the lime-salts from the tooth; there are, on the other hand, at least a score of acids possessing this power in a high degree to be met with in the oral cavity, under varying conditions. Consequently, until some one by facts establishes a better theory, we must look upon the theory of decalcification by acids as the accepted one. A question which continually suggests itself to me in practice, and which I at present will not attempt to answer is, whether a decalcification in the sense of resorption of the lime-salts may not take place under the influence of external agents through the medium of the dental pulp. Ribbert (Virchow’s Archiv. Bd. 80, S.436) records observations on a form of senile osteomalacia in which the first step is a disturbance in the nutrition of the bone; this is followed by a chemical transformation (Umsetzung) of the basis-substance, diminution of the glue-giving substance, loosening and separation of the lime-salts from the glue-giving substance, and their solution in the fluids of the body. Can a similar process be concerned in decalcification of the teeth?

There is no difficulty in accounting for the source of the acids concerned in the caries of the teeth. The saliva is impregnated with acids in various special and general disorders of the system; acid is brought into the oral cavity with the food and in the administration of medicines; but by far the greater part in the decalcification is to be attributed to those acids which are produced within the mouth by
fermentation, viz., lactic, acetic, butyric, etc. A mixture of 68.0 grams saliva + 1.0 bread + 0.5 meat + 0.5 sugar, kept for forty-eight hours at the temperature of the human body, generated more than sufficient acid to decalcify the entire crown of a molar tooth.

Pieces of sound dentine, placed in a mixture similar to the above, became in ten days decalcified to the depth of half a millimeter.

When a like mixture with the addition of 0.2 gram pulverized dentine was allowed to stand for eight hours at 38° C., and then filtered, the filtrate gave with oxalate of ammonium a heavy precipitate of oxalate of lime. Numerous experiments of this nature showed a constant and powerful generation of acid, wherever particles of food, especially bread, remained for a few hours in contact with saliva at the temperature of the human body. The conditions present in the experiments may always be found in the human mouth. Portions of food remain lodged between the teeth, or in fissures and depressions in the teeth themselves, or in cavities of decay, and lead to the production of acids sufficiently strong to at once attack the teeth.

In the last few months I have examined hundreds of cavities in which particles of food were found, and have in very few cases failed to detect an acid reaction, even though the saliva as it issued from the ducts, or as found free in the oral cavity, might be neutral or slightly alkaline.

The general impression that these acids are produced by the fermentation of meat in the oral cavity is wrong. Meat of any kind, either raw or cooked, kept in contact with saliva at the temperature of the human body never shows more than a slight acid reaction, and in the course of ten to twelve hours becomes invariably neutral or even alkaline. On the other hand, bread, potato, rice, or other starch-containing foods under the same conditions, produce a decided acid reaction, distinctly evident both to taste and smell, and maintain it for weeks. We therefore should not be surprised to find now and then even an alkaline reaction in cavities of decay. This would occur when they become filled with meat exclusively which was allowed to remain in place for some twelve or fifteen hours.

Enamel contains only three and a half per cent of organic matter, therefore the very delicate net-work, which remains after decalcification, falls to pieces of itself or is torn away by the action of mastication. Decalcification of the enamel signifies consequently total destruction of that tissue. Dentine, on the other hand, contains twenty-three per cent of organic matter, and after the lime has been extracted there remains a tough, spongy mass, consisting of the organic part of the basis-substance of the membranes surrounding the dentinal tubules and the contents of the latter.

Under certain rare conditions a reaction may now take place accompanied by a re-deposition of lime-salts, a hardening of the softened dentine, and a permanent cessation of the carious process. The ordinary course of the disease is, however, this: enormous masses of fungi, leptothrix-threads, bacilli, micrococi, etc., work their way into the deeper parts of the softened dentine, stop up the dentinal tubuli, or destroy the dental fibrils; the outer layers of dentine consequently receive no further nourishment, lose all vitality and fall a prey to putrefaction.

The presence of micro-organisms within the substance of the decalcified dentine may be easily demonstrated by any one possessing a good microscope (capable of magnifying 600 diameters). From a freshly-extracted carious tooth, remove carefully all remains of food in the cavity, as well as the outer layers of softened dentine.
Then with a clean instrument take a small piece from the underlying dentine; place this for a moment in a drop of distilled water upon an object-glass which has been purified by heating; a microscopic examination of the water will then reveal such numbers of bacteria and micrococci that not the slightest doubt can remain as to their existence in the dentine itself. Again, place a freshly-extracted carious tooth in concentrated carbolic acid, and allow it to remain there for one hour; at the end of this time wash it carefully in distilled water, remove all loose decayed matter from the cavity of decay, as well as the outer layers of dentine, and portions of dentine then taken from the cavity will be found to be quivering with living organisms. This experiment shows conclusively that the fungi had penetrated so deeply into the tissue of the tooth as not to be reached by the acid in the space of an hour.

The leptothrix-threads contain granules of starch, and give, consequently, with an acid solution of iodine, a blue to violet color. This reaction, which was first used by Leyden and Jaffe for determining the presence of these organisms in the sputum of persons suffering from gangrene of the lungs, may be applied to carious dentine in the following manner: A very dilute solution of iodine in iodide of potassium is rendered acid by adding a drop of acetic acid. In this solution are placed microtome- or razor-sections of carious dentine. Immediately a deep blue or violet color will appear on the margin of the section corresponding to the surface of the cavity, and will be seen to run along the course of the dentinal tubuli, sometimes to a depth of two or more millimeters. This coloration is due to the presence of the elements of the leptothrix buccalis in different stages of development within the dentinal tubules.

I have in my possession over one thousand sections of carious dentine, in not one of which bacteria and micrococci are missing, whether the sections were made from teeth containing live pulps, or whether the pulps were dead, or whether the caries was produced artificially out of the mouth. My specimens were prepared in the following manner: from a freshly-extracted carious tooth a concavo-convex disk of softened dentine is removed by means of a spoon-shaped excavator. This is cut at once on the freezing microtome. After the sections have then remained for an hour in absolute alcohol, they are ready for staining in magdala, fuchsin, or methylene blue. In specimens prepared in this manner and examined with Zeiss's oil immersion and Abbe's illuminating apparatus without blend, the tissue of the tooth should be almost or absolutely invisible; if this is not the case the specimens have either been overstained, or the excess of coloring matter has not been properly removed. Examined with the naked eye, or with a very low magnifying power, the preparations usually show a deep coloring on the outer border, which grows gradually less intense towards the inner border, the latter being sometimes altogether unstained, indicating a decrease in the number of bacteria as the depth below the surface increases. Under the power of 150 diameters and at a depth of from one to two mm. beneath the surface numerous oval figures or spaces are to be seen, from ten to one hundred micrometers in length and from five to fifty in breadth. These places are always found crowded with micro-organisms, and are due to one of the dental tubuli becoming expanded to many times its original diameter and pressing apart the neighboring tubuli on each side of it. In the larger spaces one or more of the central tubules, together with the intervening basis-substance will be found to be entirely destroyed, giving rise to a cavity within the substance of the dentine.
A section of carious dentine made at right angles to the direction of the dentinal tubules shows, under 300 diameters, those tubules, which are filled with micro-organisms, to have a diameter from one to four times that of the normal tubule, and often two or more converted into one by the destruction of the intervening basis-substance. This melting together of the tubules increases as we near the outer border of the specimen (i.e., the surface of the cavity), until it is no longer possible to distinguish the separate tubules. If we now continue the examination with a power of from 1000 to 1500 diameters (for this purpose the homogeneous immersion with Abbe's illuminating apparatus should be made use of), we will find the outer border of the preparation to consist of debris of the decomposing dentine filled with enormous masses of micro-cocci, bacilli, and leptothrix-threads. The latter are by no means always found along the whole margin; on the contrary, in many preparations they are wanting. They do not, as a rule, penetrate the dentinal tubules to any considerable distance, except when the latter are distended by bacilli and micrococci, or where the dentine has already become partially decomposed. The leptothrix-threads sometimes present one end curved after the manner of a spirillum. On examining a zone slightly below the outer margin, we will find the tubules filled almost exclusively with bacilli and micrococci. As we go further from the outer border the number of bacilli gradually decreases, until in most preparations they give way entirely to micrococci, which in like manner diminish in number as they near the inner margin, where, if the section comprises nearly all the softened dentine contained in the cavity, only a few tubules will be found to contain organisms.

The "dental bacterium" described by Clark, and which he believes to be the chief agent in caries of the teeth, does not exist in the dentinal tubuli. No more do vibriones, which have been looked upon as very dangerous to the teeth, have the power of penetrating the tubuli; bacilli and micrococci, on the other hand, enter their finest branches, producing the appearance of a very delicate-colored net-work connecting the adjacent tubuli and ramifying through the basis-substance. Neither the bacilli nor the micrococci have the power of penetrating or boring separately through the basis-substance, and can only escape from one tubule to a neighboring one by a complete destruction of the membranes and the basis-substance. In the separate tubuli is frequently to be seen a gradual change from leptothrix-threads to long bacilli, from long to short bacilli, and from the latter to micrococci.

Besides this there obtains in some sections a definite arrangement of these forms in zones of the above succession. We obtain, therefore, essentially the same figures which Zopf obtained for the zooglaea ramigera. The leptothrix-threads are sometimes twisted after the manner of a spirillum. Since this regular succession, the existence of which has been confirmed by examination of my preparations by many competent microscopists, cannot be accounted for by the successive invasion of completely heterogeneous fungi, we may have a case before us in which one fungus can produce entirely different forms of development, namely micrococci, long bacilli, short bacilli, leptothrix, and screw-forms. We consequently have a further confirmation of the theory of Billroth, Nageli, Cienkowski, and Zopf.

I have been able to obtain sufficiently thin sections of fresh dentine in an advanced state of decomposition, to observe and study the action of the fungus. In such preparations the tubules are seen to be filled with micro-organisms in active motion. They are entirely
limited in their movements by the walls of the tubuli, but at certain places, probably where the tissue presents less resistance, they crowd together in large masses, distend the tubules, and cause the gradual disappearance of the basis-substance. In this manner originate numerous microscopic holes and fissures in the dentine, and these increase in number and size until the tissue loses all trace of structure or disappears entirely. The process in the mouth is probably very much the same.

The masses of micrococci and bacilli which penetrate the dentine stop up the tubules, and must lead, sooner or later, to the death and destruction of the dentinal fibrils, in consequence of which the outer layers of the dentine lose their nutritive connection with the pulp and die from lack of nourishment.

From this point on the process is very similar to the putrefaction of a piece of decalcified dentine out of the mouth. In this stage, however, the leptothrix-threads themselves seem to play a more important part, in many cases penetrating the superficial layers of dentine, cleaving it in all directions and preparing it for the decomposing agents. Whether the leptothrix-threads themselves assist in the final decomposition of the tissue, is a question which cannot as yet be answered.

Experiments demonstrating the direct effect of bacteria upon decalcified teeth have not been made in the mouth, on account of the almost absolute impossibility of decalcifying the teeth on the one hand, and of making the necessary test experiments by excluding bacteria from the mouth on the other. Experiments made out of the mouth show that freshly-extracted teeth, which have been decalcified by being left for some weeks in a mixture of bread and saliva, and afterwards infected with carious dentine, go through a form of caries, and present microscopic changes very similar to those which occur in the mouth. Moreover, it is the universal testimony, gathered from hundreds of thousands of experiments in practice, that softened dentine may be left in the bottom of the cavity in a carious tooth and will not decay, provided that it is thoroughly disinfected and the cavity closed sufficiently air- and water-tight to prevent its reinfection from without. It is equally well known that if decalcified dentine is left in the bottom of a cavity without being thoroughly disinfected, or if the filling is so poorly made that moisture may find access to such dentine, then the decay will go on under the filling. Further, softened dentine may be left in a cavity with impunity when the filling-material itself possesses antiseptic properties. These facts, taken together with the anatomical changes above described, lead us directly to the conclusion that the second stage of caries of the human teeth is in part, at least, to be attributed to the action of micrococci and bacilli.

There remain still to be answered the questions: Do bacteria ever penetrate directly into perfectly-sound enamel or dentine, and do they perform any part in the decalcification?

I have already referred to the gradual diminution of the bacteria in number, as we go from the outer to the inner margin of the preparation (i.e., from the surface to the deeper parts of the dentine), till at the inner border but few or none of the tubuli are found to be infected. This fact, which leads us to the conclusion that the micro-organisms cannot penetrate beyond that point to which the tissue has been softened by the action of acids, may be readily confirmed by the examination of the softened tissue taken from different depths of a cavity of a carious tooth. The same gradual diminution in the intensity of the infection will be observed, and at the boundary between healthy and softened dentine, it is, with the
proper precaution, always possible to obtain dentine which has evidently been subjected to the action of acids, and which yet does not contain any bacteria.

The facts necessitate a negative answer to the first question. In order, however, to confirm the conclusion, a great number of sections of carious teeth were made, including both the carious and the sound portion. These were ground sufficiently thin to admit of examination with a power of from 1000 to 1500 diameters. The microscopic examination showed the decayed part to be filled with bacilli and micrococci, but in not a single case have I found them to pass beyond the softened (carious) into the sound dentine.

Teeth of poor structure always contain numerous irregular microscopic cavities (interglobular spaces) in which a deposit of lime-salts has not taken place. These cavities frequently communicate with one another, and through cracks or fissures with the surface of the tooth, in which case they may become filled with micrococci. The latter are completely confined within the limits of the cavities and do not penetrate the normal dentine. Again, microscopic sections made from pieces of sound dentine, which had remained for four months in contact with carious dentine under favorable conditions of warmth and moisture, failed to reveal an invasion of the fungi.

We now come to the second question: Have the organisms found in and upon decayed teeth the power to effect the decalcification of the same? In reference to this question the following experiments were made:

1. Pieces of perfectly sound dentine, handled with great care, so as to be kept as free as possible from all foreign matter, were placed in small vials and covered with a drop of distilled water. These were then infected with leptothrix, bacilli, and micrococci from decayed tooth-bone, and kept at a temperature of 35 to 38° C. If now the organisms were capable of decalcifying the tooth-substance we should expect: 1, a softening of the tooth-bone; 2, the infection of the softened part; 3, an increase in the number of bacteria and cloudiness of the liquid, and, 4, since the bacteria could accomplish the decalcification only through the generation of an acid, we would expect an acid reaction of the liquid.

These flasks were observed for four months. For the first few days an increase in the number of bacteria was apparent, but as soon as all matter upon the surface of the pieces and at the exposed ends of the dentinal fibrils was consumed, the numbers diminished, and at the end of the four months only now and then a micrococcus was to be seen. A cloudiness of the liquid did not occur, an acid reaction could not be detected, nor were the pieces of dentine changed either microscopically or macroscopically.

2. Similar pieces of sound dentine were kept for the same time under the same conditions with the addition of several pieces of decaying dentine, so as to insure the presence of great numbers of bacteria. The result was the same as in the first experiment. Microscopic sections failed to reveal the presence of bacteria.

3. In each of forty flasks with long necks, were put 0.2 gram of finely-pulverized tooth-substance, with 10.0 grams of distilled water. Twenty of these were at once richly infected with leptothrix-threads, bacilli, and micrococci; twenty others, after the necks had been drawn out to a fine tube, were boiled for ten minutes and hermetically sealed at the moment of removal from the fire. After three weeks the contents of the flasks were filtered by passing several times through four thicknesses of Swedish filter-paper. If the micro-organisms had the power of decalcifying tooth-
bone,—this power would be many hundred times increased by the
fine state of division to which the substance was brought,—we
would be able to detect the lime in the filtrate. Using the most
delicate chemical reagent known for lime (oxalate of ammonium), I
was not able to establish any action whatever on the part of the
micro-organisms in decalcifying tooth-bone. A very slight
cloudiness was in some cases perceptible on adding the oxalate of
ammonium. This occurred, however, as often where the organisms
had been excluded as where they were present, and cannot be at-
tributed to their action. If 0.2 gram of the same pulverized tooth-
substance is added to a mixture of saliva and bread, which has stood
for six or eight hours at 38° C., not two weeks, but twenty minutes
will be sufficient to effect the solution of enough lime to be easily
detected in the filtrate.

From this fact we may draw the conclusion that, whatever
power of decalcification the micro-organisms associated with decay
of the teeth, may possess, it is, when compared with the power of
acids generated by fermentation, so small as to merit very little con-
sideration.

Whether or not the leptothrix fungus in any of its forms has
the power of generating acids, could only be determined by pure
cultivation. I have found that flasks containing carious dentine in
water or saliva, kept at the temperature of the human body, in-
variably become alkaline, unless other fungi, the germs of which are
frequently found in the human mouth, become developed in the
solution. The pure cultivation of the leptothrix buccalis is an ex-
ceedingly difficult task, and has not, so far as I am aware, been ac-
complished by any experimenter.

Practical experience teaches us, moreover, that the fungi of
tooth-caries can have little to do with the decalcification of the teeth.
It is well known that tartar is filled with masses of leptothrix in all
its forms of development, and teeth imbedded in tartar we would ex-
pect to find bored through and through by the organisms continual-
ly acting upon them. But if we remove the tartar from a tooth which
has been enveloped for forty years, if you like, we will find the
tooth perfectly free from caries.

I have found, moreover, in the mouths of dogs and cats and
other carnivora, especially when they were suffering from pyorrhea
alveolaris, such masses of leptothrix as I have never met with in the
human mouth, without a trace of caries and without an acid reac-
tion.

I have been led to the conclusion through my experiments, that
the micro-organisms associated with caries of the dentine are not a
factor of any importance in the production of either pulpitis,
periodontitis, or alveolar abscess; but I hope to consider this point
on another occasion. The general results which I have arrived at
may be summed up in the following paragraphs, partly in accord-
ance with and partly contrary to the commonly-accepted views.

The first stage of caries of the teeth, i. e., the extraction of the
lime-salts, is for the most part caused by those acids which are
generated in the mouth by fermentation.

2. Decalcification of the enamel signifies total destruction of
that tissue; of the dentine there remains after decalcification a
tough, spongy mass, which becomes subject to the invasion of enor-
mous numbers of fungi (leptothrix-threads, bacilli, micrococci, etc.).

3. The leptothrix-threads are found, with rare exceptions, only
upon the surface, or in the superficial layers of the softened dentine,
and appear to take but a small part in the invasion. The bacilli, on
the other hand, penetrate far into the dentine, even into the finest branches of the canaliculi. Micrococci penetrate furthest.

4. In the separate tubules is frequently to be seen a gradual change from leptothrix-threads to long bacilli, from long to short bacilli, and from the latter to micrococci.

5. The fungi produce anatomical and pathological changes in the deeper layers, stop up the canaliculi, and necessarily lead sooner or later to the death of the dentinal fibrils. The outer layers of dentine, thereby deprived of nourishment, die and fall a prey to putrefactive agents.

6. The invasion of the fungi is always preceded by the extraction of the lime-salts.

7. The fungi have not the power either to penetrate or to decalcify sound dentine, so that the infection of a perfectly sound tooth by a carious one seems to be excluded.

8. We may accordingly look upon caries of the teeth as consisting of three stages: (1) decalcification; (2) infection and devitalization of the decalcified dentine; (3) putrefaction of the devitalized dentine; though it would not be easy to say just where one stage ceases and the other begins.

9. I have in a number of cases been able to establish the participation of the fungus saccharomyces mycoderma (?) in the carious process.

I do not, however, wish to be understood as saying, that acids or pathogenic bacteria, or putrefactive bacteria, or all together, are the sole and only cause of decay of the human teeth. What I am prepared to say is this, that in my opinion, there is not a single case of caries in which micro-organisms do not play some part, and that in the most cases they play a very important part.

NOTE.—I have adhered to the acid theory of decalcification in this article, not because I regard it as in any way competent to account for all the facts connected with the first stage of caries (i. e., the softening of the dentine), but because it comes nearer to accounting for them than any other theory yet proposed. I wish also to designate by the term "decalcification" not necessarily the complete solution and removal of the lime-salts, but the breaking up of the bond of union between the lime-salts and the basis-substance, followed in most cases by the partial or complete removal of the salts, either in solution or otherwise.

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DR. HERSCHFELD is a member of the Editorial Board of the Bulletin of the History of Dentistry. His address is 2169 Galloway Road, Cornwall Heights, PA 19020. Requests for reprints should be made directly to the author.
The Dental Aspects of the
Compositiones Medicamentorum of
Scribonius Largus: A Glimpse of Dental
Treatment in the 1st Century A.D.

—LYNN R. THOMAS, D.D.S.
Elkhart, Indiana

Between the years of 43 and 48 A.D. the Roman physician
Scribonius Largus compiled a treatise on medicine, the Compositiones
Medicamentorum. Written during the Silver Age of Roman Literature
by a distinguished physician who had attained a considerable knowledge
of the dental art of his time, the work holds a particular interest to those
interested in dental history. It contains some 271 chapters, mostly in the
form of prescriptions, many personally tested by the author. The
chapters are arranged in descending order of the parts of the body,
beginning with the head.

The introduction to the book takes the form of a greeting to one
Caius Iulius Callistus, a freedman and evidently also a physician. It is
seemingly due to Callistus’ urgings for more medical knowledge that
Scribonius compiled his work.¹ Scribonius himself says that he had
many sources to draw from.² Among these sources were friends, con-
temporary physicians, and many distinguished texts of medicine. The
fact that most of the latter sources were Greek, coupled with the fact that
many Greek words actually appear in the text, suggests that Scribonius
had a thorough knowledge of Greek, and that perhaps many of the
prescriptions derive from earlier Greek ones, being updated and expand-
ed by Scribonius.

There have been several editions of Scribonius’ work. The most re-
cent, and now standard text is that of George Helmreich (Leipzig, 1887).
It is curious that although selected passages of the book have been
translated from the Latin, it seems that the bulk of the work, including
much of that dealing with dentistry, has never been translated into
English.³ In this paper the author has attempted to make a literal transla-
tion of that part of Compositiones (Helmreich text) that relates to den-
tistry, and to analyze its contents in order to get a glimpse of dental
treatment in 1st Century Rome, especially as taught and practiced by
Scribonius, as well as those who were treated. A full translation of the
dental portions of Scribonius’ text appears in the appendix.

While the work is rather brief and does cover the entire field of
medicine, Scribonius does deal with the teeth and gingiva in some 10
chapters. Thus it seems to this author that a study of Scribonius’ dental
chapters as a whole may indeed lead to a greater understanding of the
early history of dentistry. It is interesting to learn through Scribonius
how much we owe to ancient times, and how far the art of dentistry has
advanced in two thousand years.
THE AUTHOR

Little is known about the personal life of Scribonius Largus. Most of what we do know comes from his work itself. He mentions that he was physician to Emperor Claudius during his expedition to Britain in 43 A.D. This fact would suggest that Scribonius must have been a highly regarded physician and very knowledgeable on the subject of medicine. It seems apparent from the work that Scribonius knew much of both the practices of the ancient Greek physicians as well as those of his own times. While he supports much of the medicine of Hippocrates, he does not hesitate to put forth his own views when they differ.

From Scribonius’ introduction to his work, one can gain an insight into his philosophy of medicine, as well as the state of the art in 1st Century Rome. Evidently, at that time, medicine was splitting into many special branches. He speaks against the many who call themselves doctors just because they can cure some diseases. According to Scribonius, the true doctor must be able to treat all diseases. His chapters dealing with dentistry definitely show that he considered treating the mouth as part of the physician’s duty, not to be relegated to a specialist. He sharply criticizes many of his contemporaries for not knowing the medicines available, or how to use them.

It seems as though Scribonius was in a large part a follower of a strong Greek tradition, the Pythagorean school, which taught that surgery and cauterization were the least acceptable forms of medical treatment, and that drugs were the most important forms. Indeed, in his opening statement he says that “medicinal plants are the hands of the gods.” Surgery was becoming more popular at this time, and one can assume that one of the new “specialties” which Scribonius fought against was that of the “dental surgeon,” who would have used surgery as his chief means of treating patients. One may conclude that dentistry must have come into its own about this time, beginning its separation from medicine.

Scribonius had much to say about the moral conduct of the physician, which is still very valid today. In asking why his colleagues do not use many drugs, he wonders if they are negligent, or even worse if they deliberately deny their use. In this case they are to be condemned because they burn with envy, which is an evil that must be despised by the physician who is himself despised by the gods if he is not full of sympathy and compassion as the will of medicine dictates. The true physician can harm no one, not even his enemies, and is bound to medicine like a soldier is bound by his military oath.

While the code of Scribonius is inspiring, it seems to be well ahead of its time, and was probably only held by a small minority. Scribonius himself related how little his beliefs were followed in his own day: “A person seldom evaluates a physician before putting himself and family under his care. . . . It is therefore not surprising that so many physicians put forth so little effort. . . . When a wise choice is not made, everyone will practice medicine as he sees fit.”

THE DENTAL TEXT

Scribonius’ chapters on dentistry are much in keeping with his medical views denying surgery in favor of drugs. He begins as follows:

For toothache, although many say that forceps are the remedy,
nevertheless, I know many things that have been useful without
this necessity. Therefore, even when the tooth is partially destroyed
from caries, I do not recommend that it must be pulled, but the bad
part must be cut out with a medical chisel, by which it can be ex-
cavated, because this can be done without any pain: for the remain-
ing solid part of the tooth, there will present a good appearance and
use of the tooth. But when the ache will become very painful, by
various methods it must be soothed, partly by rinses, partly by
masticatories, sometimes with suffusions or direct applications of
other medicaments.

Thus Scribonius will do almost anything to save a tooth, with the
forceps being the last resort.

Scribonious goes on to give a number of remedies for the relief of
toothache. The following rinses may be used:

1) the root of parietaria cooked in wine
2) pellitory and cypress berries cooked in water
3) hyoscyamus root or seed, wrapped in cloth and boiled in water
4) purslane, chewed, and its juice held in the mouth
5) the lukewarm juice of solanum mixed with lignite

It is interesting to take a brief look at these and following remedies, and
to see whether they might have been effective, and whether any of the
ingredients are still in use. Parietary, a member of the nettle family
produces a nonvolatile organic irritant, used externally against neuralgic
pains and sore throats. Pellitory produces an aromatic resin that has
been used as a sialogogue, and against toothache. Hyoscyamus produces
the alkaloid hyoscyamine, with actions similar to belladonna, and thus
would have sedative properties. Purslane is an herb no longer used. The
Solanae family has actions similar to belladonna also. Thus it seems as
though Scribonius' remedies would indeed have been helpful in treating
toothache.

In an important passage hyoscyamus is again mentioned:

However, it is necessary to fumigate the open mouth with the
seed of the hyoscyamus, burned over charcoal, and to repeatedly
rinse the mouth with hot water: for sometimes, as it were, little
worms are expelled.

This belief of worms being the cause of dental decay lasted into the 18th
Century!

Other herbs that can be chewed are the oleander, with its juice held
over the tooth for a long time; mint; cotyledon; and pellitory. Oleander
contains glycosides, with digitalis-like actions. Mint does have an
antiseptic action. The genus Cotyledonis seems to have no relation to
medicine.

Scribonius goes on to mention a number of compresses and plasters
that can be used to treat toothache. Alum wrapped in a linen cloth may
be applied to the tooth for a long time. Another plaster is composed of
the following ingredients: 3 parts of peucedanum juice, 1 part
opopanax, 2 parts incense, and 1 part dried raisins. These are mixed into
a single compound. None of these above ingredients seem to have any
medicinal value. Scribonius suggests that the foregoing remedy may be
supplemented by wrapping an earpick with soft wool, dipping it in hot
oil, and applying it to the tooth and surrounding area.

A number of remedies are also given for "loosened teeth." Teeth
may be strengthened with rinsings of a mixture of lignite, she-asses'
milk, wine, and sorrel, boiled down to one third. The above remedy
would appear to have little value. Another mixture, elaborately prepared
is as follows:

Even a mixture strengthens the teeth, with alum, which dyers
use, and Attic honey, in such a way that 2 parts are honey, 3 parts
are alum. It is necessary to mix these with a mortar, then cook them
in a clay dish, so that it thickens, and so to store it in a vase, as long
as it is not copper. This medicament at first is sour and too much
deadens the tooth; afterwards it will become mild.

Alum can be a powerful astringent, and topically applied could indeed
affect the gingiva. Another medicament for loose teeth consists of cook-
ing strong vinegar, cedar gum, and alum in a copper kettle. This mix-
ture, rubbed on the teeth three times a month was recommended in order
to keep the patient from experiencing toothache.

Scribonius also gives the prescriptions for a number of dentifrices
used at the time. One that will beautify the teeth as well as strengthen
them is made by mixing barley flour with honey and vinegar, kneading
it, and dividing it into little balls. To each ball salt is added, and the balls
are burned over charcoal, cleansed, and mixed with enough spikenard to
provide an agreeable fragrance. This was used by Octavia, the sister of
Augustus.

In another dentifrice, dried radish skins are crushed and passed
through a sieve; while a third dentifrice consists of finely ground white
glass mixed with the fragrant oil, spikenard.

The following is the prescription for an elaborately prepared den-
tifrice which was used by Augustus:

Gather pellitory which is in seed and with many roots, then
wash and dry it for one day; on the following day soak the hard
parts in fresh brine; on the third day, after the water has been press-
ed out, bring them together in a new earthenware pot; immediately
afterwards they are to be placed between layers of salt and
thoroughly cooked in the furnace of a bathouse; then partially
burned over charcoal. Afterwards, the remainder is mixed with
spikenard, which is pleasing. This then makes the teeth white, and
makes them firm.

Messalina, the wife of Emperor Claudius, used the following dentifrice:
3 ounces of stag’s horns burned in an earthenware pot and reduced to
ashes, 1 ounce of Chios mastic, and 1½ ounces of sal ammoniac.

Scribonius concludes the dental portion of his medical text with
several prescriptions for treating gums, which “are often accustomed to
a diffuse infestation, in which they become swollen.” This statement is
certainly a description of periodontal disease. One remedy consists of
crushed, dried, and sieved leaves of the mastic-tree, which are burned
and then boiled in water. The mastic-tree produces an aromatic resin,
which has antiseptic qualities. It is a minor irritant, thus stimulating
repair. When applied topically, it provides local protection and lessens
inflammation. Thus this remedy must have been somewhat effective.

A final prescription, said to be good for all ulcers, especially those
of the mouth, consists of the following: 3 parts alum, 1 part fluor spar, 2
parts saffron, 2 parts cypress berries, 1 part gall nuts, 1 part juice of
yellow roses, and 1 part sandarach incense. However, there seems to be
no real dental value in this concoction.
CONCLUSION

We can conclude that Scribonius Largus was evidently a highly motivated and skilled physician. The fact that he did devote some ten chapters to dentistry does suggest that the preservation of the teeth held great importance not only to him, but also to the Romans, at least the higher classes. These chapters also suggest that caries and other dental diseases must have been fairly common in 1st Century Rome.

While toothache seems to be Scribonius' most important concern, the number of prescriptions for "loose teeth" and "swollen gums" would suggest that periodontal disease was also a rather common problem among the Romans. Finally, the number of prescriptions for dentifrices mentioned by Scribonius further indicates that the educated and more affluent Romans were much concerned about the health and appearance of their teeth. It is to the credit of Scribonius that many of his remedies seem to have been somewhat effective in treating dental problems.

NOTES

2. Ibid., p. III, 1. 10 ff.
3. Most dental histories do translate a few passages from Scribonius, but do nothing to analyze their content or look at his work in perspective. The most extensive translation is found in The History of Dentistry, by Guerini, and I have reviewed his passages as an aid in translating some of the more difficult passages.
4. Scribonius, op. cit., chap. CLXIII.
5. Ibid., p. 1, 1.5 ff.
8. Ibid. A discussion of Pythagorean beliefs can be found on pp. 30-33.
13. Ibid., p. 4, 1. 10 ff.
14. A full discussion of Scribonius' moral philosophy, with appropriate text translations, can be found in Edelstein, op. cit., pp. 337-348.
15. The information concerning the herbs and drugs discussed in this paper comes from the following two sources: Sollmann, Torale, A Manual of Pharmacology, Philadelphia, W.B. Saunders, 1957; Trease, George, A Textbook of Pharmacognosy, Baltimore, W. Wood, 1945. In many cases it is very difficult to determine exactly what herb is being referred to. I have used the one that would appear to be the most applicable and accurate.

APPENDIX: THE TRANSLATION

LIII. For toothache, although many say that forceps are the remedy, nevertheless, I know many things that have been useful without this necessity. Therefore, even when the tooth is partially destroyed [from caries], I do not recommend that it must be pulled, but the bad part must be cut out with a medical chisel, by which it can be excavated, because this can be done without pain: for the remaining solid part of the tooth,
there will present a good appearance and use of the tooth. But when the ache will become very painful, by various methods it must be soothed, partly by rinses, partly by masticatories, sometimes with suffusions or direct applications of other medicaments. Frequently it is useful to rinse the mouth with the root of the five leaved herb cooked in wine; likewise with pellitory and cypress berries cooked in water; also the root and seed of the hyoscyamus wrapped in a heavy linen cloth and most frequently boiled in water and repeatedly put on the tooth. Likewise, chewing purslane relieves the toothache equally well, by which they will not hurt; or to keep the juice of the purslane contained for a longer time in a small area; and the lukewarm juice of solanum with lignite makes the tooth well.

LIV. Indeed, it is necessary to fumigate the open mouth with the seed of the hyoscyamus, scattered over charcoal, and to repeatedly rinse the mouth with hot water: for sometimes, as it were, little worms are expelled. And fumigations of warmed bitumen relieve the ache.

LV. Likewise, it will be useful to chew the oleander herb and to pass it, in the saliva, over the area with pains and to hold it in small amounts for a long time and so endure to let the saliva run out of the mouth; likewise to chew mint or the root of cotyledon, which herb has leaves similar to a cymbal, and is usually found in humid ruined walls. Also the root of pellitory, chewed, relieves the ache, nor less so does alum surrounded by a heavy linen cloth, and thus it is useful to hold the compress on the tooth for a long time.

LVI. Truthfully, it is well to place this medication on the tooth in the form of a plaster: juices of peucedanum p. XIII, opopanax p. XI, incense p. XII, dried grapes without seeds p. XII. You will have these things crushed together, the rest, especially the third ingredient, to be mixed into a compound. When there will be a toothache, so can an earpick, wrapped with soft wool, be moistened with a very hot oil and so it is first placed on the tooth, then on the gingiva in the surrounding area two or three times, until the ache in the area is deadened; afterwards the tooth is entirely covered with this medication. If any ache should come back or remains without diminishing, besides the plaster, an earpick with wool, dipped in hot oil, in the same way should more often be applied; this is done until the ache is removed.

LVII. But whenever the teeth have loosen from chewing, they must be strengthened by rinsing with a small amount of lignite, combined with she-asses milk and Marsician wine in which sorrel roots ought to be combined, so that everything is cooked together, and boiled down to one third. Even a mixture strengthens the teeth, with alum which dyers use, and Attic honey, combined in such a way that 2 parts are honey and three parts are alum. It is necessary to mix these with a mortar, then cook them in a clay dish, so the mixture thickens, and so to store it in a vase, as long as it is not copper. This medicament is at first sour and too much deadens the teeth; afterwards it will become mild.

LVIII. Likewise, this medicament will be useful on loose teeth: ½ sextarius of a very strong vinegar, ½ sextarius of cedar gum without pitch, ½ pound of mixed alum. The alum is rubbed with vinegar, then it is mixed with cedar and together everything is cooked in a copper kettle, and stirred with pine oil until everything is boiled down into a thickness of temperate honey. If anyone would rub the teeth with this medicament three times a month he will not experience toothaches.

LVIII. There is a dentifrice which strengthens the teeth and makes
them very beautiful: It is necessary to moisten a sextarius of barley flour with vinegar and honey mixed together, and then knead it longer and so divide the mass into six balls, each of which is mixed with a semuncia of salt, and then cooked in an oven, and then partially burned over charcoal. Then it is necessary to cleanse these balls and mix with them enough spikenard to provide an agreeable fragrance; this is used by Octavia, sister of Augustus.

LX. The skin of the radish, dried in the sun and crushed, passed through a sieve, is good for toothache and making the teeth firm; also very white glass, which is similar to crystal, carefully ground, and mixed with spikenard. Many also use a dentifrice of the following kind: They gather pellitory, which is in seed and with as many roots as possible, then it is washed and dried for one day, on the following day, the hard parts are soaked in fresh brine, on the third day, after the water has been pressed out, they are brought together in a new earthenware pot, immediately afterwards they are placed between layers of salt and thoroughly cooked in a bathhouse furnace, then partially burned in charcoal. Afterwards this is mixed with a third part of spikenard, which is pleasing. This then makes the teeth white, and makes them firm. Augustus makes use of this. For Messalina, the wife of our god Caesar, this is used: One sextarius of stag's horns burned in a new earthenware pot and reduced to ashes, an uncia of mastic of Chios, a sesuncia of sal ammoniac.

LXI. The gums are often accustomed to a diffuse infestation, in which they become greatly swollen. The crushed, and passed through a sieve, dried leaves of the mastic-tree are useful for this; make ashes from the leaves of this same mastic-tree, and boil them in water. Moreover, there has been collected this medicament, which is useful for all ulcers, especially those in the mouth; pleasing it is called from the Greek. These things are required: alum p.XIII, fluor spar p.XI, saffron p.XII, cypress, which is joined at the roots p.XII, gall nuts p.XI, the juice of yellow roses p.XI, and sandarach p.XIII.

MEDICAL WEIGHTS AND MEASURES

\[ \times = \text{denarius (a weight of about 5 grams)} \]
\[ \text{p.} \times = \text{pondus denarius (a weight equal to the weight of a denarius)} \]
\[ \text{sextarius} = \text{In liquid measure, the sixth part of a congius (about a pint) In dry measure, a sixteenth part of a modius (about a sixteenth of a peck)} \]
\[ \text{uncia} = \text{an ounce} \]
\[ \text{suscuncia} = 1\frac{1}{2} \text{ounces} \]

(I am indebted to my wife, Mary, teacher of Latin and classical scholar, who has done a large part of the translating for this paper.)

(This paper was the winner of the First Prize in the 1977 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. Dr. Thomas was at that time a senior at the Indiana University School of Dentistry. Dr. Thomas' address is 330 West Lexington Avenue, Elkhart, IN, 46514. Requests for reprints should be made directly to the author.)
Scenes at the 1977 Annual Meeting, American

(L. to r.) Dr. Cesar A. Mena, former Dean of the dental school, University of Havana, past-president Jack Carr and newly elected president Dr. Kenneth Randolph.

Attentively absorbed in one of the fine presentations at the meeting are (l. to r.) Dr. Samuel Fastlicht, Mexico City; Dr. Malvin E. Ring and Dr. L. L. Mulcahy, Jr. of Batavia, New York; Admiral Alfred W. Chandler, Chevy Chase, Md. and Dr. Henry Green of Detroit.

Old friends renew acquaintances during the coffee break: Dr. Ring, Bulletin editor (left) and Admiral Chandler.

Dr. Malvin E. Ring, Bulletin editor (left) shows his display of dental postcards to Dr. Charles Vacanti, the Academy's historian.

Dr. Herbert C. Butts, then Editor of the American Dental Association, addresses the meeting on the subject of the history of dental journalism.
Academy of the History of Dentistry, Miami Beach

Dr. Newell O. Feeley explaining a display of early instruments to Everett A. Jackson and Herman S. Harris.

President Frank Orland awarding certificates of appreciation to Dr. Berton McCauley (left) and Dr. Robert Thoburn for their participation in the meeting’s program with excellent papers.

Past-presidents of the Academy, Dr. Swanson (left) and Admiral Chandler chatting during the coffee break.

Dr. Clifton O. Dummett, Associate Dean, School of Dentistry, University of Southern California, engrossed in one of the presentations. Dr. Dummett also presented a paper on the history of Blacks in dental education.

Dr. Edward F. Leone, the luncheon speaker, kept the audience in stitches with his amusing anecdotes.
THE DENTIST
A "painless dentist" through and through.
We must give to you your due:
To tell the truth,
You yank a tooth
Without one bit of pain—to YOU

Milestones and Millstones of
The American Academy of the
History of Dentistry After
A Quarter-Century

—FRANK J. ORLAND, D.D.S., Ph.D.
Forest Park, Illinois

The most recent annual meeting of the American Academy of the History of Dentistry was held earlier this month in Florida where it was warmer than October 7, a bit over a fortnight ago. Several times in the past, as some of you remember, we have held meetings together. Unlike the Working Group on Dental History, which is somewhat younger in years, but not necessarily in wisdom, our Academy was organized in 1951 as an outgrowth of the Committee on History of the American Dental Association.

It is my intent as Academy president for the past year, to present a retrospective critical resume in the form of twenty-five milestones and millstones of our organization. The milestones are positive, progressive events in the Academy’s life, while the millstones are the negative, unfortunate occurrences. As historians, we must tell it as it was! But, I do not think we have time to analyze each of the twenty-five events in depth, in order to declare which is a milestone and which a millstone. That I’ll leave to you or some future historians to better judge.

I. In 1950, J. Ben Robinson began surveying the national interest in the United States for a proposed organization among those members of the dental profession who had demonstrated an active concern with values to be derived from the study of dental history.

II. Four other historians met with J. Ben to establish the present Academy. These were: Milton B. Asbell of Camden, New Jersey; Harold L. Faggart of Philadelphia, Pennsylvania; Gardner P.H. Foley of Baltimore, Maryland; and William N. Hodgkin of Warrenton, Virginia.

III. An organizational meeting was planned for 1951 to select a formal name, to identify the purpose, and to construct a series of governing articles.

IV. On October 16, 1951, twenty-five enthusiastic supporters convened in the Mayflower Hotel in Washington, D.C. for the charter meeting. J. Ben Robinson presided and stated these reasons for the proposed organization:

a) The need for improved interest among dentists in dental history.

b) The encouragement of dental schools in developing historical collections and in offering adequate instruction in dental history.

c) The development of a broader understanding of the facts of dental history among leaders in dentistry as an aid in their attempt to solve important problems in dental education and practice.
d) The stimulation of more thorough and more comprehensive research in dental history that would extend the boundaries of knowledge.

e) The creation of an authoritative body to which important questions relating to dental history could be referred for factual identification.

f) The substitution of an association of dental historians for the former Committee on History of the ADA which was discontinued in 1950.

The Constitution and Bylaws were adopted. The first officers were: J. Ben Robinson, President; Arthur H. Merritt, President-Elect; Harold L. Faggart, Secretary-Treasurer, and Gardner P.H. Foley, Editor.

V. The Academy was established on a permanent basis at the First Annual Meeting held at the Jefferson Hotel in St. Louis on September 6, 1952. The essayists at the first historic meeting were only three in number: L. Laszlo Schwartz, George B. Denton, and Nell Snow Talbot, the latter two from Chicago, and my mentors.

VI. The very first issue of the Bulletin of the History of Dentistry was published by the Academy in March 1953. The first Bulletin was prepared as a trial issue comprising only two pages. It was stated: ‘If [it] meets approval of the members of the Academy, it will be continued in the present form at monthly intervals.’ The first issue was edited by George B. Denton through his office in the ADA. It presented news of interesting dental collections and publications of books on dental history. In point of fact, the first ten volumes of the Bulletin were edited by George Denton; Donald A. Washburn followed him and Malvin E. Ring is the present versatile Editor.

VII. At the Second Annual Meeting in Cleveland on September 26, 1953, the following internationally known dental historians, all over 80 years of age, were elected to Honorary Membership: Vincenzo Guerini (Italy), Sir J. Frank Colyer and Lilian Lindsay (both of England), and Herman Prinz (U.S.A.).

VIII. Our affiliation with the Smithsonian Institution began in 1958 with a special committee chaired by the late C. Willard Camalier. Starting in 1960, he was instrumental in securing dental artifacts for the proposed dental museum to be established in the Hall of Dentistry of the Museum of History and Technology. Admiral Alfred Chandler has headed this important committee since 1967. The result has been a strong cooperative effort with the Institution, especially with our Academy members on its staff, Audrey Davis and Everett Jackson.

IX. In 1959 the first joint meeting was held with the Working Group on Dental History of the FDI Commission on Dental Education. From those who attended this first joint meeting came the highest praise. It was called one of the finest meetings on the history of dentistry ever held throughout the world. The program was a joint effort with speakers from both the United States and Europe. It was the Centennial meeting date of the American Dental Association, with many magnificent exhibits by our members. Various presentations were made, among which was a gavel fabricated from the wood of a walnut tree from the farm of G.V. Black. Joint meetings were also held in 1969, again in New York City and in 1975 in Chicago. They likewise proved very fruitful. It has been my privilege to attend all three.
Also in 1959 a proposal by the Academy was made to designate the birthplace of Horace Wells, discoverer of nitrous-oxide anesthesia, so that it might serve as a permanent memorial in his honor.

X. Since 1959, the annual Bremner Award has been provided for the winners in a contest open to dental students. It is supported by funds donated by M.D.K. Bremner, author of the well-known book, *The Story of Dentistry.* (The winner of the very first competition was Rolla Ray Burk, graduating with a D.D.S. in 1960 from the University of Maryland.

XI. George Bion Denton, Editor of the *Bulletin* since 1953, died 9 March 1963, only a day after completing the delayed November-December 1962 issue, thus, consummating a distinguished decade of service.

XII. Donald A. Washburn, then ADA Director of the Bureau of Library Services, now the newly-elected Vice-President of our Academy, became Editor of the *Bulletin* in 1963. Soon after, it was expanded from a four-page mimeographed leaflet to the booklet format.

XIII. At the 1963 annual meeting, preparations were made for publication of a bibliography in the *Bulletin,* listing all published writings dealing with dental history of states, cities, and other geographical areas of the United States and Canada; it was also to include histories of all dental organizations and colleges.

XIV. The first Hayden-Harris Award for distinguished contributions to dental history was presented, appropriately, to J. Ben Robinson, at the 1967 meeting in Washington.

XV. The first Academy *Newsletter* was issued in 1967 by Don Washburn. It has been continued and expanded by our current Editor and now comes out four times a year with a great variety of enlightening items of pertinent news.

XVI. In 1968 Malvin E. Ring of Batavia, New York was selected as Editor and is serving very meritoriously at present.

XVII. The *Bulletin* by 1969 with increasing publication costs was in imminent financial danger. Robert Rothstein (later the Academy Historian) provided financial support to allow continuance of publication. Moreover, it was commendably arranged in 1971 that there would be joint monetary assistance by the Henry Spenadel Fund for the Advancement of Education in Dentistry (through the efforts of Isidore Teich and Joseph J. Blinderman of the First District [N.Y.] Dental Society) and the William J. Gies Foundation for the Advancement of Dentistry (through the help of George C. Paffenbarger.) This much appreciated contribution allowed for the publication of the *Bulletin* for five years through 1976. With the energetic effort of the Editor, a one-year grant to continue publication was obtained from the Ritter Division of the Sybron Corporation as well as two German subsidiaries, Ritter A.G. and Baisch K.G.

XVIII. For a number of confluent reasons, the 1975 meeting in Chicago held on October 24 in the great Assembly Room of the ADA Headquarters building proved to be the largest and most significant of annual meetings. It was a joint meeting with the FDI Working Group on Dental History. It was a full-day continuous program in the same large room, including many paper presentations, the business meeting, a large
number at a luncheon with the presentation of the awards and the showing of a special motion picture depicting the role of dentists in early movie "flickers". There were also innumerable exhibits in the latter part of the day around the periphery of the Assembly Hall.

XIX. General membership climbed over the 300 mark.

XX. The Twenty-fifth Anniversary Meeting of the Academy took place in Las Vegas on 12 November 1976. On that occasion, Milton Asbell, one of the founders, long-time Secretary-Treasurer, now President-Elect, read his comprehensive paper on "A Compleat History of the Academy..." This gathering also coincided with the U.S. Bicentennial Commemoration, so citation was made of the role of dentistry in the Colonies and in the early days of the Republic.

XXI. The Publication Committee of our Academy was reactivated and expanded to include persons of Chairman Malvin Ring's choice with abilities to assist the Editor in improving and expanding Bulletin operations.

XXII. Also at that meeting in Nevada, Frank J. Orland, then President-elect, asked and received approval from the Academy (as had already been done by several other important dental organizations) for a request that there be issued a U.S. Postage Stamp in 1978 commemorating Greene Vardiman Black on the occasion of his receiving the D.D.S. degree 100 years before, in 1878.

XXIII. Unfortunately, to date, this has not been approved by the U.S. Post Office Department. Also, there were no Bremner Awards presented in 1976 because of the lack of papers submitted.

XXIV. Another sad note was the passing of J. Ben Robinson, primary founder of the Academy, on June 15, 1977 at the advanced age of 94.

XXV. The recent Annual Meeting of our Academy was concluded just days ago in the Doral Hotel in Miami Beach. It was well attended with excellent presentations and certificates of appreciation being awarded to all participants, including those for the three winners of the Bremner Award this year, as well as the prestigious Hayden-Harris Award bestowed upon Henry A. Swanson, the twelfth recipient in the Academy's history. The newly-elected officers for 1977-78 were installed, the new President being Kenneth V. Randolph, Dean of the Baylor College of Dentistry.

No further editorial comments should be necessary on my part. The record stands as read with both its progressive elements — the milestones — as well as its regrettable events — the millstones. This has been the Life of our Academy through its first quarter of a century.

DR. ORLAND is the immediate past-president of the American Academy of the History of Dentistry, the former editor of the Journal of Dental Research as well as a past-president of the International Association of Dental Research. He is also the author of the book The First Fifty-Year History of the IADR. His address is 519 Jackson Boulevard, Forest Park, IL, 60130. Requests for reprints should be made directly to the author.

(This paper was presented at the annual meeting of the Working Group on Dental History of the Federation Dentaire Internationale, held at Toronto, Ontario, October 25, 1977, Dr. Ivo Vinski of London, England presiding.)
French Dentists and Their Contributions to Colonial American Dentistry

—JACQUES FOURÉ, D.D.S., D.F.M.P.
Paris, France

I feel most deeply honored to have been selected this year to receive the Elmer S. Best Memorial Award. To receive this plaque, which you have so graciously presented to me, your Excellency, represents for me the culminating point in my professional life.

I am profoundly touched and wish to thank my confreres for the expression of friendship and esteem they have seen fit to show me but also I am sure to a large extent this gesture has been prompted by their desire to underline the intimate relationship that has existed between the members of our dental profession in France and America during the past two centuries.

I should also like to express my thanks to Dr. Howard Hartman for having made this occasion possible and who, together with Mrs. Hartman, have made the long trip from Ohio, the State so close to my heart for having been brought up and educated there.

My heartfelt thanks also to Dr. Murray Gavel, President of the Pierre Fauchard Academy and to the other officers and members of the Academy who are honoring me by their presence as well as to all those who have come to be with me on this momentous occasion.

It is all the more meaningful to me to receive the Elmer Best Memorial Award this year when we celebrate the 200th Anniversary of the Independence of the United States.

To evoke the 200th Anniversary of the Declaration of Independence has certainly different meaning for different people. Perhaps today, here, it would seem opportune to project our thoughts back two centuries and call to mind the first of our professional ancestors to practice dentistry in America. It might seem all the more fitting to do so as it appears that the quality of the early practice of dentistry in America was strongly influenced by French thought as well as by the experience and example of French dentists who made more or less protracted stays in America. A century later the reverse was to take place; in the late nineteenth century it was French dentistry which benefited as the result of the dynamic flow of knowledge coming from America.

During the early colonial days life was hard in America as the rugged country was being settled; battles with the Indians were a common occurrence. At that time dental ills in the colonies were taken care of by itinerant barber-surgeons who were more closely allied to the medical than to the dental profession. On the other hand during the 18th century, dentistry in Europe had made great progress, especially in England and France. This progress was due in a large measure to Pierre Fauchard, whose name you, who are all here today, will recognize even if those outside our profession had not heard of him before.
Pierre Fauchard whom all dental historians regard as the founder of modern dentistry was of superior intelligence and possessed an acute sense of observation and a capacity for work which gave him the possibility not only of establishing a most successful practice but of producing a book in which he set forth all that was known about dentistry at that time, as well as the results of his own vast experience. Until then dental literature was scattered in the various treatises on surgery and medicine and seldom written by dentists but more often by physicians and surgeons.

I would like to mention for example the work of one of the forbears of the Honorable Ambassador here present: Dr. Benjamin Rush. Dr. Rush was one of the outstanding figures of the American Revolutionary period. A noted surgeon and physician, friend of Benjamin Franklin and Thomas Paine he was well-regarded for his ideals and his stand for the independence of the colonies; he was also a phenomenon for his time for his stand against slavery. Among Dr. Rush's publications was one entitled "On teeth as a cause of disease". Aside from a few practitioners such as Rush, the colonial doctor in America was laboring under the handicap of being relatively isolated from the scientific world of his day.

The contacts with the European "dentists," "surgeon dentists," or "operators for the teeth" which were made when these first arrived on the American continent at about the time of the Revolution contributed vastly to increase the knowledge and technical know-how in America.

There has always been some uncertainty as to who was the first qualified dentist to practice in the United States: John Baker or Robert Woofendale - and they were both English. The main source of information we have to determine the dates of arrival as well as the location of the men with whom we shall be concerned are the advertisements they placed in the newspapers of the locality where they intended to practice. It must be remembered that announcements for professional services of all sorts including dental care were at that time an admitted and ethically recognized custom. We thus learn that Woofendale arrived from England in October 1766 as his first advertisement appeared in the New York Weekly Journal on November 13th soon after his arrival. Whereas in the Boston Evening Post of January 22, 1767, John Baker expressed his intention to leave Boston and it is certain that Baker had been in Boston some time prior to the announcement.

THE EARLIEST FRENCH DENTISTS IN THE U.S.

The first French dentist who arrived in America was Michael Poree. In the Pennsylvania Gazette of August 25, 1768 we find his first announcement as an "Operator for the Teeth" from Paris. Later that year he moved from Philadelphia to New York where he remained until the Summer of 1771. During the next 10 years we find him at different times not only in New York and Philadelphia but also in Boston and Baltimore. In an ad in the New York Gazette of December 11th, 1769 he seeks to instruct the public on the importance of the teeth and their care, advising especially "to keep them as clean as a young child, for otherwise decay of the teeth will set in."

Another "surgeon-dentist" from Paris, Joseph Labeaume used the South Carolina Gazette on December 5, 1774 to "inform the Public that he has just arrived in Charleston to settle and follow his business."

It is in the Maryland Journal in 1792 that we learn that Frederick Raymond, another Frenchman, had the honor of offering his services as
a "dentist" and "oculist" to the public of Baltimore. His advertisement is printed first in French, and then in an English translation.

In the Federal Gazette in Philadelphia of March 5, 1794 we learn of yet another Frenchman, Le Breton, who apparently had been practicing in America for some time. He stated that he had been "a pupil of M. Lassecteur, physician from Paris and M. Dubois surgeon-dentist and formerly dentist to the King and Royal family of France."

Two other French dentists who have made a particular place for themselves in early American Dentistry were Jacques Gardette and Jean Pierre Le Mayeur.

JACQUES GARDETTE

It has been said that Jacques Gardette, later anglicized to James Gardette, was the first practicing dentist in America to have had formal medical education. He was born in 1756 in Agen in the Lot et Garonne in France. After having received his academic education in the provinces he went to Paris at the age of 17 where he studied for two years at the Royal Medical School. Then, after 18 months spent in a hospital in Toulon, it was considered that he had acquired what was at the time thought to be a complete medical training. This gave him the right to present himself for an examination to receive a commission as surgeon in the French Navy. It is thus that Jacques Gardette arrived in America early in 1778 with the French navy. It is uncertain how long he remained with the navy before giving up his commission. It is probable that he was already practicing dentistry in Newport in 1780 when Rochambeau made Newport his headquarters with an army of 6000 men where he remained until the battle of Yorktown the following year.

In 1785 Gardette took the oath of allegiance to the United States and made Philadelphia his home until 1829. He was probably influenced by the fact that a considerable number of Frenchmen had located there, and Philadelphia was then the commercial and political center of the country. But like his other confreres, he also made more or less extended stays in other cities, particularly Baltimore, where we find him in the Fall of 1788 and again in the winters of 1789 and of 1790.

According to Isaac John Greenwood whose father, John Greenwood, had treated George Washington, Gardette also attended the President and he provides this interesting detail: "When in the winter of 1795-1796 sittings were given to Stuart for a second effort by that artist, Washington was wearing a set of teeth recently fabricated by Gardette, with the result that the bulging upperlip is a prominent feature in the portrait."

At the age of 73 after 45 years of practice in Philadelphia Gardette was able to satisfy a long cherished desire to return to France and end his days in his native land. He returned to his birthplace but disappointed by the changes he found there after an absence of over half a century, he finally settled in Bordeaux, where he died in August, 1831.

JEAN PIERRE LE MAYEUR

The other French dentist who was outstanding in the America of that period was Jean Pierre Le Mayeur.

Early dental historians claimed that he had come to America from France with the troops of Rochambeau. However, Weinberger in his History of Dentistry in America has proven conclusively that this could
not have been so. It is true he was a Frenchman, born and seemingly trained in dentistry in France but who had been practicing in London several years before he came to America. It is probable that he came to settle some affairs concerning the estate of a brother. In late October 1781 he arrived in New York, which was then still occupied by the British, bearing a letter of introduction to Sir Henry Clinton and General Robertson.

Le Mayeur was well received upon his arrival in New York and well considered both professionally and as a gentleman, being accepted in the highest social circles of New York. But in May 1783 Le Mayeur made a request to leave New York which was as yet not evacuated by the British. This request came to the attention of General Washington who demanded information about the Frenchman from Lt. Col. William Smith then in New York. In his report Smith gives an excellent account of Le Mayeur's character and reputation. He also mentions that Le Mayeur had arrived 3 years before and had enjoyed the favour of General Robertson and the ranking British officers until during the course of a dinner some disparaging remarks had been made about the French. Le Mayeur had reacted violently which seemingly had displeased the British.

It is uncertain whether this incident was the cause of Le Mayeur's desire to leave New York, or whether it was because he wanted to prospect other towns for possible clients. At any rate this request resulted in his coming to the attention of General Washington.

We know that throughout his lifetime, Washington's health, particularly his oral health were a great and constant concern to him. To answer his need for dental care he was attended over the years by at least eight dentists of which we know. When Le Mayeur's application to get out of New York came to Washington's attention the General availed himself of this opportunity to place himself in the hands of a dentist of repute.

Col. Smith's reply was apparently satisfactory; a month later Le Mayeur was received at Washington's headquarters in Newburg to perform the services required of him. This was the first of many visits Le Mayeur was to make to the General's headquarters and later to Mount Vernon where he was received not only as a doctor but also as a friend. Numerous letters from Washington express his appreciation and gratitude for Le Mayeur's care, as well as his high regard for the man.

In one such letter to Le Mayeur he says: "I shall always be happy to hear from you, and only wish for opportunities to make you amends for the attention you have shown me. This letter will be handed to you by the Marquis de La Fayette to whom I have mentioned you as one to whom I am under obligations."

We know therefore that Le Mayeur had the opportunity of meeting his famous countryman.

Le Mayeur was practicing again in New York at the end of 1783, after the departure of the British; but the next year he was in Philadelphia and in 1785 in Richmond, Virginia and again in New York in 1786.

During all this time Washington's diaries make mention of Le Mayeur's numerous visits to him. Late in 1787 Le Mayeur left Richmond to go to Havana, probably for his health as well as for professional reasons. His last visit to Washington, of which we have a record, was on November 20, 1788. For some reason which we do not know,
Washington, the following year employed the services of John Greenwood.

It was in October 1789 that Jean Pierre Le Mayeur became John Peter Le Mayeur when he took the oath of allegiance and became a citizen of Virginia. The following year he decided to move from Frederickburg to Mount Pleasant, situated on the boundary line between Virginia and West Virginia, where he bought several parcels of land and lived there until his death in 1806.

**PAUL REVERE**

As a dentist it is impossible to speak of the Revolutionary period without evoking one of the most colorful and best known participants. Paul Revere is of particular interest to us here for two reasons. First, he was of French descent and secondly at one time in his life, among his various activities he engaged in the replacement of teeth. However, Paul Revere’s sentiment for the French was, in his early years, anything but friendly. This was occasioned by the fact that Paul’s father, Apollos Rivoire, had fled France in 1715 as a boy from the region of Bordeaux where the persecutions against the Huguenots were most ferocious. When Paul’s father arrived in Boston he apprenticed to one of the 32 goldsmiths who were doing well in the fast growing town. After the death of his patron he settled on his own and later married Deborah Hichbourn whose family had been settled in New England for many generations. Thus Paul was born in Boston and grew up on the wharfs, in the heart of the silversmith’s district and learned their trade, thus following in the footsteps of his father.

As a young man he soon participated in the life of the community and the fast changing world about him. He joined the Militia and was engaged in the final phase of a war which for a century had opposed the French and the English.

Later when the freedom and welfare of the colonies were threatened by British domination he was to become one of the most active participants in the rebellion. When the French brought their support to the Yankees, and in 1778 the French fleet sailed into Boston harbor, it was Paul Revere who fired the cannon to salute the event.

The help that the French supplied in fortifying Boston and in the fight against the British helped overcome Paul Revere’s original prejudice against the French. During the next three years which were to lead to the final victory at Yorktown, Paul Revere was able to appreciate that the French aid was a determining factor in liberating the colonists from British rule.

The years of unsettled conditions and revolutionary strife resulted in a severe economic depression. Prior years of prosperity had brought a demand for Paul Revere’s craftsmanship, while bad times saw a drastic slackening of the silversmith’s trade. To compensate for this in 1768 Revere turned to another field which was an outgrowth of the skill he had acquired: this was dentistry.

One of the principal dentists of whom we know, John Baker, remained in Boston for over a year and it was from him that Paul Revere learned to set false teeth. It is probable that Revere never attempted to do more than clean teeth and replace them, and even then, only front teeth. However, Paul Revere was inadvertently to be one of the precursors of forensic dentistry. This came about as a result of having replaced some teeth prior to 1775 for Dr. Joseph Warren one of the leaders of the
rebellious colonists. When Warren was killed at the battle of Bunker Hill his body was hastily buried in a mass grave. When a year later Massachusetts wished to honor Warren by reburying him with appropriate ceremonial it was impossible to determine which of the remains were his. Positive identification was finally made when Paul Revere recognized the silver and ivory bridge he had placed in Warren’s mouth some time before the battle.

During his long and eventful life Paul Revere spent only a relatively few years in the practice of dentistry, and after the revolution his interest was directed once more to the art of the silversmith. When he became involved in the production of copper plate he gave up dentistry completely.

I have thus tried to give a brief account of the lives of some of the men who 200 years ago were our professional predecessors. Of these mentioned we have some trace of their passage and of their activities. But if we salute them in this rapid retrospection we must not forget the more obscure ones of whom we have no record, but who nonetheless dedicated their lives to the relief of the suffering of their contemporaries. They too pioneered the path which we now are following.

DR. FOURÉ is the Attending Dental Surgeon and the Chief, Dental Service of the American Hospital of Paris. His address is 151 Boulevard Haussmann, Paris, VIIIe, France. Requests for reprints should be made directly to the author.

(This paper was presented on the occasion of Dr. Fouré’s receiving the Elmer Best Award of the Pierre Fauchard Academy. The presentation was made on June 24, 1976 by the Honorable Kenneth Rush, United States Ambassador to France at the American Embassy in Paris.)
NOTES & QUERIES

HAYDEN-HARRIS AWARD TO DR. HENRY A. SWANSON

The Hayden-Harris Award of the American Academy of the History of Dentistry has become recognized as the sine qua non of acknowledgements of outstanding contribution to the field of dental history. Established in 1967, its first recipient was the late J. Ben Robinson, founding president of the Academy. This was followed with awards being made in succeeding years to outstanding leaders in the rich and fertile field of the history of the dental profession. The 1977 award was made at the Academy’s annual meeting, held in Miami Beach on October 7th, to Dr. Henry A. Swanson of Washington, D.C., 1970-71 president of the Academy. The presentation was made by Dr. Milton B. Asbell, President-elect of the Academy and himself the 1975 Hayden-Harris Award recipient. Dr. Asbell’s remarks follow:

It is with a great deal of emotion that I stand to make this presentation. It was just two years ago that I was honored by this Academy as the recipient of the Hayden-Harris Award; and to be asked to present this award to Dr. Henry Swanson is both a privilege and a pleasure.

Dr. Swanson has made, and continues to make, noteworthy contributions to dentistry. He is a past-president of the American Board of Dental Examiners; a past-president of the American College of Dentists and currently one of its Distinguished Lecturers. Most interesting, he made dental history as the first resident dentist in the Pribilof Islands, one of the Aleutian chain in the Bering Sea.
This was the farthest north establishment for the practice of dentistry in this hemisphere. As an active member of our Academy, chairman of its membership committee and Past-president, he was a moving force in the organization of the Advisory Committee to the Smithsonian Institution, a move which ultimately led to the establishment of that organization’s outstanding dental historical collection.

I make this presentation rather brief at his specific request. And so, it is with a great deal of pleasure and a sense of honor that I present the 1977 Hayden-Harris Award to Dr. Henry A. Swanson.

**SIR WILLIAM OSLER ON THE IMPORTANCE OF TEACHING THE HISTORY OF MEDICINE**

Past-president of our Academy, Professor Gardner P.H. Foley has contributed this item from the September 6, 1902 issue of the *Journal of the American Medical Association*. Prof. Foley notes that teachers in our dental schools would do well to follow the lead of one of the most eminent of medical educators who, almost 80 years ago, recognized the need for a student to be exposed to the historical background of his profession. Sad to say, few dental school faculty are conscious of this need and the good that can be derived from such teaching.

**A NOTE ON TEACHING THE HISTORY OF MEDICINE**

William Osler observes, in the *British Medical Journal*, that in the everyday work of the wards, and of the outpatient department, the student may be helped to get into the habit of looking at a subject from the historical standpoint. In his out-patient class this is made a special feature of the teaching. A case of exophthalmic goiter comes in — the question at once is put: Who was Graves? Who was Parry? Who was Basedow? Of course the student does not know; he is told to bring, on another day, the original article, and he is given five to ten minutes in which to read a brief historical note. Osler takes from the class-book at random the titles of some subjects which have been presented this session, very often to the edification of the teachers as much as the students.

Once a week he meets his clinical clerks in an informal conference on the events of the week. For half an hour he gives a short talk on one of the “Masters of Medicine,” in which, as far as possible, the original editions of the works are shown. In the present crowded state of the curriculum it does not seem desirable to add the “History of Medicine” as a compulsory subject. An attractive course will catch the good men and do them good, but much more valuable is it to train insensibly the mind of the student into the habit of looking at things from the historical standpoint, which can be done by individual teachers.

**ADA RESOLUTION HONORS J. BEN ROBINSON**

At the annual meeting of the House of Delegates of the American Dental Association held in Miami Beach in October, 1977, Fourth District Trustee, Dr. Joseph P. Cappuccio, who is a longtime member of the American Academy of the History of Dentistry, introduced the following resolution (122H) which was passed unanimously. It honors the memory of the founding president of the Academy, Dr. J. Ben Robinson, who had passed away that June. In addition to listing all of
Dr. Robinson’s many contributions to dentistry, the resolution reads in part:

Resolved, that we, the dentists of the nation, note with unusually profound regret the passing on 15 June, 1977, in his 95th year, of the illustrious past president of the American Dental Association, J. Ben Robinson, D.D.S., Sc.D., F.A.C.D., universally honored as educator, historian, statesman, and public servant of the dental profession, and be it further

Resolved, that the name of J. Ben Robinson and the notable accomplishments of his long and productive career, which constitute an example and a legacy to every member of this profession, be inscribed in the minutes of the Association as evidence of the high personal esteem, appreciation and gratitude of his colleagues for untiring efforts in our behalf and in behalf of the integrity, ideals, and effectiveness of dentistry as a science, an art, and an instrument of the public health. To wit:

1. The education of thousands of dentists as competent providers of an important health service, many of outstanding ability and reputation, beginning in 1914 with his appointment as instructor in operative dentistry on the faculty of the Dental Department, University of Maryland; and extending to 1958 when he retired as Dean Emeritus of the School of Dentistry, West Virginia University.

2. The incorporation in 1923 of the Baltimore College of Dental Surgery into the University of Maryland as a definite school of the university rather than a department of medicine, thus advancing the integrity of dental education and preserving the identity and tradition of the first dental college.


WANT ADS — DENTAL MEMORABILIA

Dentist would like to purchase old books on Dentistry and related fields. Please send titles and prices to Donald H. Salk, D.D.S., 317 Sixth St., Manhattan Beach, Calif. 90266.

* * * * * *

I am very interested in corresponding with anyone who has old dental equipment, instruments, books, or other historical collectibles to sell. Please write to Dr. Melvin B. Borg, 52 South Main Street, Spring Valley, N.Y. 10977.

DR. HOWARD R. RAPER DIES — PIONEER IN HISTORY OF ANESTHESIA

Dr. Howard R. Raper, a pioneer in dental radiology and author of the definitive history of anesthesia, died January 15, 1978 in Albuquerque, N.M., at the age of 91.

In 1913 Dr. Raper published “Elementary and Dental Radiography,” an early text in the field, and in 1925 he introduced the interproximal bite-wing x-ray examination which he developed in
collaboration with the Eastman Kodak Company. It is still widely used.

The son of a newspaper editor in his native city of Chillicothe, Ohio, Dr. Raper was an eloquent and prolific writer. "Man Against Pain," his outstanding history of anesthesia, was published in 1945, and his "As I See It" columns were a regular feature in "Dental Survey" from 1950 to 1963. His booklet on "How to Prevent Toothache" was based on an article that appeared in "Hygeia" in 1932 and later was reprinted for mass distribution by the Eastman firm, most recently in 1974.

Dr. Raper was a 1906 graduate of Indiana Dental College, which later became the Indiana University School of Dentistry. He then served on the faculty of the College until 1917, when he moved to the Southwest for reasons of health.

Honors bestowed upon Dr. Raper include the Distinguished Alumni Award from Indiana University, the Callahan Medal from Ohio State University, the Dentist of the Half Century Award (presented by the New Mexico State Dental Society in 1950), and the Honorary Doctor of Laws degree from the University of New Mexico. Last fall he received the Award of Merit from the Horace Wells Society, named for the man known as the "father" of modern anesthesiology, because of his discovery of the anesthetic properties of nitrous oxide.

Dr. Raper maintained close ties with Indiana University and at the time of his death was a consultant to the I.U. School of Dentistry. A booklet containing an account of his work was published by the School last year under the title "What Do We Mean When We Say Preventive Dentistry."

Dr. Richard J. Maloney presents check for $1,000 from the California Academy of Periodontology to Dean Dale F. Redig, who accepts on behalf of the A. W. Ward Dental Museum of the University of the Pacific School of Dentistry. The presentation was made January 30 at a ceremony in memory of two past presidents of the Academy, the late Drs. Clarence E. Butler and Lowell N. Peterson, who were active in establishing the museum.
UOP HONORS 2 PERIODONTISTS WHO HELPED ESTABLISH A. W. WARD MUSEUM

Two San Francisco periodontists were honored posthumously January 30 for their service in helping to establish the A. W. Ward Dental Museum at the University of the Pacific School of Dentistry.

Relatives, colleagues and employees of the late Drs. Clarence E. Butler and Lowell N. Peterson gathered in the museum for the ceremony and reception. Dr. Dale F. Redig, dean of the San Francisco school, unveiled a plaque in memory of the two men, who helped raise funds in 1970 to start the museum project, and later represented the California Academy of Periodontology on the school's Museum Committee.

Dr. Peterson served on the committee from its formation in November 1971 until his death in July 1975. Dr. Butler served on the committee from October 1975 until his death in March 1977. Both were past presidents of the California Academy of Periodontology and served terms as chairman of the Periodontics Department at the College of Physicians & Surgeons, predecessor of UOP's School of Dentistry.

After the plaque unveiling, Dr. Richard J. Maloney, current president of the California Academy of Periodontology, presented a check for $1,000 to the museum on behalf of the Academy. The Academy sponsors a display of historical periodontic items in the museum.

The museum opened in October 1974. It is named in memory of periodontics pioneer A. W. Ward, who developed a myriad of instruments and technics, examples of which may be found today in virtually every dental office. A founder of the California Academy of Periodontology, Dr. Ward died in November 1973.
Oddments in Dental History:
The Deathbed Treatment
of President Washington

—MALVIN E. RING, D.D.S., M.L.S.
Batavia, New York

For centuries the practice of medicine was a mish-mash of irrational, illogical and, in most cases, dangerous therapeutic techniques. This extended into the realm of dental treatment when that was undertaken by members of the medical fraternity. Lazare Riviere (1589-1655), a professor of medicine at Montpellier University described his treatment of a toothache:

Where the pain was occasioned by “hot humors” the treatment began by bleeding in the arm. The following day an aperient was administered. Afterward, if the pain still persisted, the sufferer was cupped in the region of the scapula or spine; blisters created behind the ears or the nape of the neck; resinous plasters were placed at the temples; all this without taking into account the remedies which were introduced into the ears, or the various operations performed on the aching part itself. This was finally capped by extracting the offending tooth.

With the entrance of Pierre Fauchard into the field, dentistry slowly but surely underwent a basic change; it became more firmly rooted on rational treatment based on logical, scientific assumptions. Much as had practitioners of its parent art, surgery, dentists began treating dental diseases in a manner that reflected a basic understanding of cause and effect. If a diseased tooth couldn’t be treated by removing the diseased part and rebuilding the tooth, then it was extracted. If an acute abscess existed, incision and drainage was resorted to. If a neoplasm existed intra-orally it was excised. And although the armamentarium of every dentist still held a lancet for the opening of a vein in order to “bleed” a patient, this was seldom resorted to by a practicing dentist. In fact, the lancet’s inclusion in the kit was generally a concession to the medical doctors who bought the kits for their practices.

Medicine, in contrast to dentistry, languished in the morass of superstition and illogicality until late in the 1800’s, because a true understanding of the nature of disease was lacking. One of the best examples of this was the way George Washington was treated during his last illness by what were the leading physicians of his day. Washington, a robust and otherwise healthy man, developed what would appear to have been a peri-tonsilar abscess. It is likely that had he been left alone, his bodily defences would have helped him to overcome the infection. But drained as he was by the physicians’ “treatment”, he was robbed of his remaining strength and succumbed. The following is a verbatim account of Washington’s final days as reported in the Alexandria, Virginia Times for December 19, 1799. The attending physicians were James Craik and Gustavus Brown, both graduates of the medical school at the University of Edinburgh and Elisha C. Dick who had been graduated from the Medical College of Philadelphia.
Sometime in the night of Friday the 13th inst., having been exposed to rain on the previous day, General Washington was attacked with an inflammatory affection of the upper part of the windpipe called in technical language, cynanche trachealis. The disease commenced with a violent ague, accompanied with some pain in the upper and fore part of the throat, a sense of stricture in the same part, a cough and a difficult rather than painful deglutition, which were soon succeeded by fever and a quick and laborious respiration. The necessity of blood-letting suggesting itself to the General, he procured a bleeder in the neighborhood, who took from the arm, in the night, twelve or fourteen ounces of blood; he would not by any means be prevailed upon by the family to send for the attending physician till the following morning, who arrived at Mount Vernon at 11 o'clock on Saturday morning. Discovering the case to be highly alarming and forseeing the fatal tendency of the disease, two consulting physicians were immediately sent for, who arrived, one at half past three and the other at 4 o'clock in the afternoon. In the interim were employed two copious bleedings; a blister was applied to the part affected, two moderate doses of calomel were given, and an injunction was given which operated on the lower intestines, but all without any perceptible advantage, the respiration becoming still more difficult and distressing. Upon the arrival of the first of the consulting physicians, it was agreed as there were yet no signs of accumulation in the bronchial vessels of the lungs, to try the result of another bleeding, when about 32 ounces were drawn, without the smallest apparent alleviation of the disease. Vapors of water and vinegar were frequently inhaled, ten more grains of calomel were given, succeeded by repeated doses of emetic tartar, amount in all to 5 or 6 grains, with no other effect than a copious discharge from the bowels. The powers of life seemed now manifestly yielding to the force of the disorder. Blisters were applied to the extremities, together with a cataplasm of bran and vinegar to the throat. Speaking which was painful from the beginning, now became almost impracticable, respiration grew more and more contracted and imperfect, till half after 11 o'clock on Saturday night, when, retaining the full possession of his intellect, he expired without a struggle.
What Is It?

—ROBERT C. SPROULL, D.D.S.

El Paso, Texas

Our intriguing item for this issue’s “search for identity” is a gem! It is a beautifully machined dental instrument and dates back to about the year 1891. It is about the size and shape of a dental handpiece. (No, it is not a dental drill, although it must have been belt-driven.) Another invention by the same dentist, an articulator, was said to have been the standard of excellence for the profession for about forty years. Anyone who wishes to take a stab at this item’s name and function is invited to write to me directly at 2601 McRae Blvd., El Paso, Texas, 79925.

* * * *

Unfortunately, not a single person was able to provide a clue as to the identification or function of the piece of equipment pictured in the October, 1977 issue. Lacking any verification, I guess we’ll just have to go on believing that “it had something to do with anesthesia” as the donor’s family reported. It would really be great if someone could come up with a real explanation of what that complicated piece of machinery was.
To the Editor:

Many thanks for sending me the reprints of my article "On the History of the Suture" which appeared in the October, 1977 issue of the Bulletin of the History of Dentistry. I was especially pleased with the way the article appeared. May you enjoy a happy yuletide.

Sincerely,
Clifford C. Snyder, M.D.
Chief, Surgical Service
Veterans Administration Hospital
Salt Lake City, Utah

To the Editor:

Thanks for forwarding the order blank and check from one of your members for a copy of the History of the American College of Dentists. I have replied to him and have forwarded the book.

I want you to know that I have here on my desk, among the things that I intend to do shortly, is acknowledge your good review of the History by Dr. Brandhorst, so I'll take this occasion to include my thanks for a very fine review of this book. We have several copies on hand and, every once in a while, we have a request for a copy.

All good wishes for the holidays.

Cordially,
Robert J. Nelsen, D.D.S.
Executive Director
American College of Dentists

To the Editor:

The 1978 Annual Meeting of the Academy of General Dentistry will be held in Atlanta, Georgia on June 25th-29th, 1978. We are just beginning to research materials to be included in our Annual Meeting
programs, and I thought that perhaps your organization might be of some help to us.

I would appreciate hearing from you as to the names of your officers in the state of Georgia. I believe it might be interesting to our membership to read about history of dentistry in Georgia in their Annual Meeting programs.

I look forward to hearing from you at your earliest possible convenience.

Sincerely,
Leslie Joan Millenson
Director of Communications
Academy of General Dentistry
Chicago, Illinois

To the Editor:

It was indeed an honor for me to be able to see the October, 1977 issue of the Bulletin of the History of Dentistry with my paper published in it.

Please accept my gratitude for your kindness in sending me the additional copies of the issue. Be assured that they will be put to good use. Particularly because of the other splendid articles in the issue, the Bulletin is just one more piece of evidence of the fine and constructive work that you have been doing so many years. We can never thank you enough.

With all good wishes to you and your dear ones, I remain
Always sincerely,
Joseph H. Kauffmann, D.D.S.

(DR. KAUFFMANN is the Historian of the Dental Society of the State of New York and the Editor of the Bulletin of the New York State Society of Dentistry for Children.)

To the Editor:

I'd like to take this opportunity to express my sincere hope that you will be able to continue the work with the Bulletin. Since the FDI periodical ceased to appear, our (that is, your) Bulletin is the only one - so far as I know - to deal with the history of dentistry.

I have enclosed a reprint of my latest published article which deals with Robert Bunon, the “Father of Orthodontics”, and which appeared in Vol. X of the International College of Dentists Journal.

All the best for 1978!

Otto C. Francke, L.D.S., F.I.C.D.

(Dr. Francke is the Editor of the Swedish Dental Journal, the Curator of the Museum and Collection of the Swedish Dental Society and the Past Honorary Secretary of the Working Group on Dental History of the FDI.)
To the Editor:

It would be sincerely appreciated if you could supply me with any information you have relative to early American dentistry. This is to be incorporated into a reference book which the Reader's Digest is preparing concerning all aspects of life in the United States.

Sincerely,
Laurel Gilbride,
Research Associate
The Reader's Digest
New York, N.Y.

To the Editor:

Dr. Michael Kurtz has suggested that I contact you concerning an article he has written outlining the history of Columbia University Dental School. We are preparing for the 50th anniversary of the Columbia-Presbyterian Medical Center and would like to utilize the results of Dr. Kurtz' research in this endeavor.

Although I realize that the article by Dr. Kurtz will not be printed until a future time, would it be possible for the school to obtain a copy for internal use?

With warmest regards,
E. V. Zegarelli, Dean
School of Dental and Oral Surgery
Columbia University in the City of New York

To the Editor:

As a student at Holley (N.Y.) Central High School, I am taking a course in Our American Heritage with my teacher, Miss Smith.

Being interested in dentistry, I took the subject of dentistry for my report with emphasis on dentistry in early America up to approximately 1860. Since the information in our library is scarce, Miss Smith recommended that I write to you for any information that you may have or any help you can give me in obtaining this information.

I appreciate your effort and thank you very much for your assistance.

Sincerely yours,
(Miss) Barbara Jo Knapp

To the Editor:

Your recent Newsletter which contained a reference to Admiral A. W. Chandler brought to mind my experiences with the Admiral as well as with a Captain Davis, DC, USN who later became Admiral Davis.

Although I am from west Texas (old, dry west Texas) I did join up with the U.S. Navy as a Dental Officer, and reported to the Naval Training Station at San Diego, California. Our commanding officer was Captain Davis, but he was soon transferred, and Captain A.W. Chandler became our dental chief. I was then transferred to 11th Naval District Headquarters, and after a few months was happy to find that
Captain Chandler was also reassigned there as 11th N.D. Dental Officer. I served directly under him, and also a few months under Admiral Davis. After the war was over, I returned home to Texas where I continue to practice. For as our mutual hero, John Paul Jones said “Surrender, aw shucks, I have not yet begun to fight!”

The above two dentists were great and it was a great privilege to serve under them, and I learned a lot about responsibility from them. I also have both their photographs in my office. I wrote to them and asked for the photos, and they sent them.

It has also been my distinct pleasure and privilege to be a member of the American Academy of the History of Dentistry for a good many years.

Sincerely,
J. Henry McGowen, D.D.S.
Abilene, Texas

In this series Dr. Leake develops a philosophical discourse, practical in nature, on the ethics, logic, and esthetics of "WHAT ARE WE LIVING FOR?" The first volume concerns itself with the answers to this question. These answers, in terms of the philosopher, are the various ethical or moral formulations which have been evolved by thinkers, philosophers and leaders throughout the history of mankind. The author introduces us to ethics with a discourse on the "BIG BOSS" concept. From this point, we are toured through the "Zoroastrian Dichotomy of Goodness and Evil" on into the ethics of compassion and understanding. (Jesus and Hillel). Ethos by ethos, we are taken up to the ethics of the nineteenth and twentieth centuries where we are introduced to "NOPSIR," standing for "A Naturally Operating Principle of Interpersonal Relations": this is more simply defined as, "the ethics of mutual satisfaction."

In his chronology of answers formulated as theories of ethics, Dr. Leake shows us how we repeat these various ethical theories in our own individual lives.

Volume II of the trilogy deals with the various logics which are chiefly concerned with analysis of the methods of reasoning which have been developed in man's effort to reach the truth, whether it be a separate issue in particular or in order to reach a general truth. There are many different methods of reasoning depending upon the reflective experiences, both conscious and subconscious, of different people; no one individual thinks or reasons in exactly the same way as another in-
dividual. By taking up the various formulations of logics in an analytical and historical manner, Dr. Leake shows us how they can help us to recognize the differences between them. In so doing, he hopes to provide us with a useful aid in our reasoning about a particular issue.

The volume opens with a discourse on the role of semantics in the development of logics, and it goes on to tell us of the historical evolution of logics. The author then proceeds to introduce us to deductive and inductive logics. He continues by providing us with a better understanding of the logics of science, mathematics, cybernetics and computers, and the innate logic of sequential reasoning. Dr. Leake has avoided the jargon of the professional philosopher in these discussions and, in doing so, makes the exploration of logics lucid, useful and practical for the reader who is not familiar with the "language of philosophy."

In volume III, Dr. Leake explains that "the function of esthetics is effectively to select and apply the facts pertinent to a situation to the accomplishment of the purpose involved." He points out that esthetics are, in essence, the attempts made by mankind over the ages to apply the available knowledge to the accomplishment of our various goals and purposes. It is his hope that the third volume will bring us closer to some of these goals. He discusses the significance of conditioning in esthetics and then continues to provide us with information concerning the origin and development of esthetics. With this as a foundation, discussions are presented which take up the role of esthetics in morality and taste, as well as in innovation, investigation and creativity.

"WHAT ARE WE LIVING FOR?" is a question of great importance to all of us and it will become increasingly important as the lines of communication continue to shrink our world. Being a rare combination of scientist, humanist and philosopher, Dr. Leake is extremely well versed in life and the humanities. Certainly his attempt to carry us a little closer to an answer is worthy of recognition. These books provide excellent mental activity of the type that every professional person should welcome.

—Reviewed by Miss Rita Pessotti, Executive Secretary and Scientific Information Officer, Food and Drug Administration, Washington, D.C.


This book is very well written and quite easy to read. Specific literature dealing with the history of the development of medical education is, surprisingly, quite rare. With few exceptions, only a handful of articles exist that trace the development of medical education in historical perspective. While not an exact history of medical education, nor of medical schools, this book presents a history of the major trends and developments that affected those schools. One will soon understand how the changes in medical education were related to the social and cultural milieu, to scientific developments and to the many problems within the profession itself.

Unfortunately, no photographs, illustrations or drawings of any kind are presented. Their addition would make the subject matter more enjoyable and yet not detract from the excellent body of the text.
Scattered throughout are sayings and anecdotes that provide the reader with thoughts that accurately describe what the patients thought of their doctors, especially during the very early and "heroic" period of medical education.

The historical adventure starts at Jamestown in 1618 and proceeds into the 20th century, with all the joys and satisfactions of accomplishment as well as the heartbreaks and agonies of defeat and reform. Every page is enjoyable reading, and if one is a student of medical history, especially of the United States, one should have this book in his library.

—Reviewed by Lloyd E. Church, DDS, PhD.


This book is a perspicacious exploration of social thought, social policy, and science data by an adept historian. A series of case studies is presented as examples of their relationship.

The book is divided into two sections with several sub-chapters. The first covers the scientific ideological function of conveying social realities. The second pinpoints the development of the American scientific community. The emotional relevance of science, which by definition is religious, in the first part shifts easily from religious to scientific demands in part two. In all this we have the role in society of the scientist's values and attitudes. The author then blazes a new trail in the thematic consideration of the imperatives of existing social attitudes upon the scientist's work and thought. The applicability of the scientist's ideas and authority is molded by class, ethnicity, religious interests and education. The demands are there; the scientist must choose his response, his work, his usefulness.

One is impressed with the author's facile discussion of evangelical influence upon individual scientists as well as its effect upon social institutions. He also demonstrates a thorough familiarity with historical 19th century German post-graduate appeal to American students and that effect upon American education. The dynamic of the religious impulse became encapsulated in the German progressive learning. The guidelines were set forth which would determine the trend of American scientific research, institutions and thought. This would ensure the day when Americans would receive advanced training at home and Europeans would grasp the opportunity to study here.

Thus this book traces the course of hereditary ideas of the 19th century - like begets like; acquired characteristics are inheritable - through the revival of Mendelianism, behind cytology into the behavior of chromosomes. This type of research - what is behind what - has also expanded in various disciplines. It has given us the "explosive" knowledge of the atom. "The biologist assumed that heredity would eventually have to be reduced to microscopic material mechanisms."

The Agricultural Experimental Station and School which had a rough start in our country of vast farming areas (where its potentialities were most needed and opportunities greatest) is seen to be the developing factor for centrally important disciplines of genetics, biochemistry, and bacteriology. The Adams act of 1906 thus played a significant role in the development of sciences in America.

Great scholars and scientists pass in review. Charles Davenport
"who never doubted that racial traits were as immutable as the genes which produced them." George M. Beard and the relation of social stress to neurasthenia. Robert Hartley and John H. Griscom and the origins of the Public Health Movement. And a generous supply of others who have left their mark upon religion, science, the individual and society.

The book is good reading, good thinking, good tonic. Dr. Rosenberg writes with the perspicacity of a Corinthian rhetorician. Full credit must be given to Carroll Smith-Rosenberg for generous assistance. And fifty pages of elucidating notes are an extra-dividend.


Every so often a book is presented to the dental profession that reflects on dentistry at its highest level. Such is the text on Telescopic Prosthetic Therapy. The precision work and biological background necessary to provide the most intensive care unit of dentistry and to preserve those dentitions weakened by advanced periodontal disease are presented in magnificent detail.

This book discusses the various necessary steps of telescopic prosthetic therapy from the very beginning to completion. It is profusely illustrated. The various procedures are ideally presented in detail, so that a beginner in the field of therapy would be as much at home as would the long-established professional. The variety of cases have been selected with extreme care. This text is a tribute to the great pioneering efforts in this field of Yalisove and Dietz at the University of Pennsylvania School of Dental Medicine. Those individuals that aspire to enter this field of therapy should have this book in their possession and be familiar with it in every detail.

—Reviewed by Lloyd E. Church, D.D.S., PhD.


The history of the Johns Hopkins Medical Institution was first begun by Alan M. Chesney in his three volumes of the Johns Hopkins Hospital and The Johns Hopkins University School of Medicine; A Chronicle, from 1867-1914. This present volume is a thoughtful consideration of that institution from 1914 through 1947, an era overseen by Dr. Thomas B. Turner himself.

This amply illustrated text allows for identification of individuals involved in the era, as well as giving insight into the physical plant itself. After reading such chronicles the reader might be left with only a mental picture of the described materials if illustrations were omitted. Thus the numerous illustrations serve well for those that might have some interest in the "look" of Johns Hopkins then and now. In turn the use of eleven appendixes offers pertinent information on fiscal matters and individuals through 1950, with more emphasis on the period of 1914 -
1947. However, in one instance (Table 4, appendix A) a relationship between expenditure and tuition was compared through 1970. This appears significant in light of today’s growing concern for the financial problems in private as well as state universities.

The organization reflected in the table of contents is to be commended. Each significant period is well defined so that the four parts are readily identified. Part I concerns itself with the World War I period; Part II with the twenties; Part III with the depression years; and Part IV with World War II and the immediate past war years.

So that the author might identify with the observations of his predecessor, there is a very brief review of Chesney’s writings. By so doing, the author took into consideration those who might not have had the benefit of the prior volumes for relevant background information.

Although curricula change constantly for a variety of reasons, it is interesting to note how the crisis of World War I gave birth to a “Johns Hopkins Hospital Unit” which included some students who were granted permission to leave school early, as was the case during, and after, World War II. Shortening of the “core” programs was questioned. However, at that time, Johns Hopkins collected tuition, and degrees were issued a year after enlistment based on the recommendation of qualified members of the unit recognized for their teaching. Therefore our new innovative three year programs are not quite as new or as innovative as we once thought.

Each part of the chronicle of events is associated with financial overtones along with the great advancements made through the efforts of dedicated and motivated individuals. It is noteworthy that the culmination of funding in 1916 allowed for the final development of a graduate program in Hygiene and Public Health. This was the first such graduate program in the United States. It demonstrated an adventure into the world of finance with the beginning of advanced education programs now so prominent and accepted in our specialized medical society.

The “roaring twenties” saw rapid growth, development and progress in the Johns Hopkins brand of medicine with an even more distinguished faculty being developed than in the past. But it also resulted in the faculty becoming more specialized.

Hopkins has offered much to the world of medical science with great contributions in the field of communicable diseases as well as most other phases of medicine. In spite of the depression that followed the prosperous twenties Johns Hopkins continued to progress and survive. Perhaps this was in part because of the community attitude of the faculty, along with their close personal associations. But above all, the financial management had been exceptional, with endowments covering costs to an unbelievable extent as compared with the average private school of today.

The author spends but little time in discussing the dental clinic; it should be noted that one page is devoted to it. This is perhaps understandable if viewed in a particular perspective. However, it should be noted that in 1965 a dentist did obtain the rank of assistant professor on the medical school faculty.

The organizational aspects of the school are freely discussed throughout the text with reference to the development of the graduate and undergraduate programs. Problems, as well as the good points, are discussed in relation to the faculty, the departments, the administrators
and the students. Research, the development of a full-time teaching staff in a medical institution, administrative necessities for survival, efforts of individuals dedicated to education and community service, and the intense devotion of the leadership is emphasized throughout. Political intrigues so prevalent in other institutions of higher learning are not emphasized in this chronicle.

The text is very well written and covers the material so completely that while reading, it was difficult to stop to write the review. This book is highly commended, especially to those individuals who were associated with the institutions of higher education during this period.

—Reviewed by Paul D. Arnold, D.M.D., M.D.S.
Adjunct Associate Professor
School of Dental Medicine, Southern Illinois University,
Edwardsville, Illinois.


This is a lively, well written book about the evolution and eventual decline of the medicine shows. There are many people in their middle years and beyond that have watched saucer eyed as the medicine man, his huge Indian and other helpers relieved our parents and grandparents of some of their money for a bottle of Kickapoo Indian Sagwa, some Sequar's oil or Prairie Flower Mixture. This list is endless. You will relive many not-too-old memories of real Americana when you Step Right Up, folks and read how the early days of patent medicine really took hold in America. Included as part of this bit of history are appendices A through D - a Medicine Show Bit in Three Acts, and Appendix E a glossary of Pitchman Terms. Complete notes and bibliography make this book worth having for any person interested in our "everyday" history. You may think dentistry isn't included. Well, Step right up, folks and read all about "Painless Parker" and his activities.

—Reviewed by Lloyd E. Church, D.D.S., Ph.D.

*Microbiology and the Spontaneous Generation Debate during the 1870's.* By Glenn Vandervliet. 127 pages. Lawrence, Kansas. Coronado Press. 1971. (Also included is a translation of Giambattista della Porza on Spontaneous Generation (1589) being Book II: "Of the Generation of Animals (chapter I-IV) and Book III "Of the Production of New Plants" (chapter I), Giambattista della Porta, Magicue Naturalis Libri XX (Naples, 1589) Anonymous English translation, Natural Magick (London, 1658) with 4 engravings.)

Those students of medical history, especially in the field of microbiology will find this a very fascinating account of a specific period, the 1870's, leading to the full flowering of microbiology. They will relive the events that led to the discovery of bacterial endospore formation, to the recognition of many factors which influence microbiological thermal resistance, and to the development of effective means of heat sterilization. During this period technical problems greatly impeded the progress of microbiology. Microscopes were totally inadequate. Light sources were poor; resolution was not present, high
power and the high magnification necessary to study endospores did not exist. The eyepieces provided but meager help.

Inadequate stains further retarded microbiological research. Vegetable dyes were replaced by aniline dyes during this period. The lack of pure culture techniques formed a third technical impediment. These were not available until 1882 through the efforts of Robert Koch, Incubators and flask plugs were so poor as to be completely ineffective. The extent of man's ignorance of the nature of microbial germs was made evident during this period as the enormous gaps in available knowledge of the biology of micro-organisms were made known.

This book confines itself to the three significant episodes and the principal investigators who played leading parts in the turnip-cheese-infusion, hay infusion and urine episodes. The leading figures were: Henry Charlton Bastian, John Scott Burdon-Sanderson, Ferdinand Julius Cohn, Robert Koch, Edwin R. Lankester, Louis Pasteur, William Roberts and Joyn Tyndall. Four of these were trained physicians: Bastian, Burdon-Sanderson, Koch and Roberts. Pasteur was a chemist turned microbiologist. Tyndall was a physicist. Lankester attained scientific eminence as a zoologist and comparative anatomist.

Events are described in some detail, but no explanation is given as to why these specific infusions were selected. Illustrations would make this a more enjoyable book to read, but for those who are interested in the history of medical specialities and the early agonies and frustrations of research this book should be required reading.

—Reviewed by Lloyd E. Church, D.D.S., Ph.D.


If anyone, young or old, is interested in exploring his past to establish his own roots, this is the book. It is a very informative guide to exploring not only the family past, but one's own city or town. Clues are everywhere - the attic, drawers, basement, graveyard, even the local glass factory. Some of the most interesting places for clues are old newspaper accounts of the happenings about ourselves in the not too distant past. This book provides an awareness of what still exists, and an opportunity to reach back to a less complicated time in American past. It might just bring life a little closer to what it used to be. It did for Alex Haley, and his fascinating story is told in this book. Margaret Mead found this book perfectly delightful, and she further reminds us that if we are to face the future, we must be firmly grounded in the past. Rest assured that you will enjoy every word of this fascinating and enjoyable book.

—Reviewed by Lloyd E. Church, D.D.S., Ph.D.


This brochure is a compilation of a series of essays that originally

The history of pharmacy is the history of our country in microcosm. Whether involving exploration and settlement, the Revolution, Jacksonian democracy, slavery, industrialization, the Progressive Movement, or depressions great and small, pharmacy was a part of the whole drama. It was in intimate relationship with American history and American social development.

The search for drugs and opiates played a decisive role in the discovery of the New World; special effort was directed principally toward discovering useful medicinal plants. In 1602 one of Sir Walter Raleigh's ships traded with the Indians near Cape Fear and returned home with a cargo of timber, sassafras, china root, benjamin root, sarsaparilla, cassia lignea and an unknown "strong bark." Sassafras was the most important, and possessed many virtues for the many maladies of the day including the "French pox" and the "Plague." The reader is absolutely amazed at how the early settlers of America dealt with snakeroot, pink root, jalop, and ginseng, even exporting the latter to China.

This brochure is extremely interesting and very easy to read. If American history appeals to anyone, he will thoroughly enjoy this journey through the trials and tribulations of the history of pharmacy.

—Reviewed by Lloyd E. Church, D.D.S., Ph.D.
This Publication is Available in MICROFORM

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BULLETIN OF THE
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Academy of the History of Dentistry

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NOTICE TO CONTRIBUTORS
Contributions, which may deal with any aspect of dental history or bibliography, are invited. The maximum length for original articles is about 5000 words. Manuscripts should be typewritten with double spacing and wide margins. Only one copy need be submitted. Please consult former issues as to both literary style preferred as well as method of listing references. All references should be as complete as possible and contain the name(s) and initial(s) of the author(s) and the full title of the paper or book. Citations of periodical articles should include name of journal, year, volume number and complete pagination, in that order. For books cited, the city of publication, publisher, date and full pagination are to be given. All photographs which are intended to accompany articles must be black-and-white glossy prints no smaller than 3x5 inches. Photographs will be returned only if so requested.

Manuscripts, as well as all correspondence relating to the publication of papers, news-items and so forth should be addressed to the Editor, Bulletin of the History of Dentistry, 216 East Main Street, Batavia, New York 14020.

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Increasing interest among dentists in dental history.
Encouraging dental schools to develop historical collections on dentistry, and to offer adequate instruction in dental history.
Developing a broader understanding of the facts of dental history among the leaders in dentistry in order to aid them in their attempts in solving important problems in dental education and practice.
Stimulating more thorough and comprehensive research in dental history, thereby extending the boundaries of dental knowledge, giving substantial support to growing professional culture.
Creating an authoritative body to which important questions relating to dental history could be referred for factual verification.
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The American Academy of the History of Dentistry wishes to express its sincere appreciation to the following for their generous contributions in honor of the Silver Anniversary of the Bulletin of the History of Dentistry:

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CONGRATULATORY MESSAGES

Congratulations on passing this significant milestone, your Silver Anniversary. It indeed represents much fine work and dedication. The Academy deserves commendation for this unique Bulletin.

Sincerely,
Dr. Robert A. Smithson, Editor,
Alaska Dental Society

May I take this opportunity to extend my sincere congratulations to the Academy of the History of Dentistry for its efforts to preserve and promote the history, tradition and culture of dentistry. More than ever before, there is a need to cultivate and strengthen these qualities in members of our profession.

My congratulations, too, on the Silver Anniversary of the Academy's publication, the Bulletin of the History of Dentistry.

My best wishes. Sincerely,
Ralph L. Ireland, D.D.S.
Editor
Journal of the Nebraska Dental Association

The dental and dental hygiene professions have a proud and interesting background, and are indebted to the founders and members of The American Academy of the History of Dentistry for recording this heritage and for encouraging others to enjoy it through its Bulletin. The dedicated people who have worked so diligently to keep dental history alive and growing are to be complimented on their foresight and perseverance.

DENTAL HYGIENE, the Journal of the American Dental Hygienists' Association, sends sincere congratulations to The Bulletin of the History of Dentistry on the occasion of its Silver Anniversary, and best wishes for its next twenty-five years of publication.

Sincerely,
(Mrs.) Wilma E. Motley, RDH, Editor
Dental Hygiene

It is with a great deal of delight that I offer my congratulations to the Bulletin as it celebrates its twenty-fifth anniversary of continuous publication.

As a member and as a fellow editor I have found the Bulletin to be
of singular importance in reconstructing, for me, as a practitioner, the history upon which my professional life has been built.

I feel indebted to you and to the Academy for continuing to publish the Bulletin and for bringing timely, important and well analyzed problems to the attention of our membership and those interested in the history of dentistry as it projects the future of our profession.

Warmest best wishes for you as you continue your editorship.

Sincerely,
Raymond F. Zambito, D.D.S., Ed.D.
Editor
Journal of Hospital Dental Practice

Please add our congratulations to the many you no doubt have received on the Silver Anniversary of the Bulletin. Your effectiveness in maintaining high standards through the years merits the highest of honors and widespread recognition.

Sincerely your,
Alec L. Kamen, D.D.S.
Editor, The Mirror
Third District (N.Y.) Dental Society

I do want to congratulate The American Academy of the History of Dentistry on the Silver Anniversary of its Bulletin. I do feel that the Bulletin of the History of Dentistry is an outstanding publication and speaks well of dentistry's distinguished heritage.

I wish to congratulate you, Dr. Ring, the editor of this fine publication. It offers a world of information regarding the history of our profession. I am pleased that your publication does stress the cultural aspects of the dental profession. Let me again congratulate you and The American Academy of the History of Dentistry.

Best regards,
H. L. Diversi, Jr., D.M.D., M.S.D.
Editor, The Dental Mirror
Official publication of the Northern District Dental Society of Georgia

Congratulations to the Bulletin of the History of Dentistry on the Silver Anniversary.

Very best regards,
Harold M. Fullmer, Editor
Journal of Oral Pathology

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As an inveterate admirer of the activities of the American Academy of the History of Dentistry and as a devoted reader of your publications I cannot allow the Silver Anniversary of your admirable publication to pass without extending my personal felicitations as well as those of the *New York State Dental Journal*.

Preoccupied as we are with the inexorable pressures tending to drastically modify the nature of dental practice, it is important that such an organization as yours causes us to pause now and again in the interest of mankind, that underscores all our professional efforts.

It is my hope that your organization will continue to grow and sustain its scholarly activities in behalf of our profession.

Sincerely,

Bernard P. Tillis, D.D.S.
Editor, *New York State Dental Journal*

Congratulations on the Silver Anniversary of the *Bulletin of the History of Dentistry*. In that quarter-century you yourselves have created a bright chapter in dental history, creating as you have the only publication in English that is exclusively and authoritatively devoted to the cultural aspects of dentistry.

All who are involved in dentistry, in whatever capacity, have an obligation to “pay our dues” to the profession, and I know of no better or more productive way to do so than to support the Academy through our membership.

It is not only an obligation but a privilege and a pleasure for which I am grateful to you.

Sincerely yours,

Joseph Strack, Editor
“Tic”

The Federation of Orthodontic Associations conveys its heartiest congratulations to you on the Silver Anniversary of the *Bulletin of the History of Dentistry*.

We all look forward to celebrating your Golden and Diamond Anniversary together.

Best wishes always.

Dr. Harvey Miller, Editor
*International Journal of Orthodontics*

Congratulations and continued success on the occasion of the Silver Anniversary of the *Bulletin of the History of Dentistry*.

The *Bulletin* holds a unique niche in the cultural affairs of dentistry chronicling the important events of our profession as they occur.

Best wishes for your future recording of the past.

Sincerely,

Grant A. MacLean, D.D.S., Editor
*CDS Review*
Published by the Chicago Dental Society
Congratulations to the American Academy of the History of Dentistry and to the many people who have contributed to the growth of the *Bulletin of the History of Dentistry*, now twenty-five years old. It took courage and determination to begin the *Bulletin*, knowing that to fill its pages would require research and patient waiting for the material which was stored away on dusty library shelves and in the minds and memories of people who had made history in the dental profession.

Any segment of our society which is to make an important impact on society must develop a history. The great professions have a sound historical base upon which their future growth depends. Even though progressive professions, like progressive people, recognize the importance of intelligent change, they also know that change, to be effective, must be founded in the traditions of the profession.

The *Bulletin* is recording the historical base for the dental profession, and for that we should be grateful.

Sincerely,
George W. Teuscher, D.D.S., Ph.D.
Editor
*The Journal of Dentistry for Children*

May I add my congratulations to you and the Academy on the occasion of your 25th anniversary and the Silver Jubilee edition of your *Bulletin*.

The importance of the historical record of dentistry was sharply brought into my own personal awareness in 1948 with the publication of Weinberger's 2 volume history of dentistry. Today, I consider these volumes among the most important in my personal library.

You indeed have come a long way since your earliest beginnings and I am looking forward to your anniversary issue.

Again, congratulations to you and your past editors who have aimed so high and achieved such elusive goals.

Sincerely,
Sidney Rafal, D.D.S., Editor
*The Journal of the American Society for Geriatric Dentistry*

I would like to take this opportunity to congratulate you and the American Academy of the History of Dentistry on your Silver Jubilee issue. Twenty-five years of a publication's life represents a lot of work and effort by the editor and all others assisting with the publication.

I feel that the *Bulletin of the History of Dentistry* is making a very worthwhile contribution to our dental profession.

With best regards,
Robert E. Silha, B.S., D.D.S., M.S.
Editor, *Dental Radiography and Photography*
Congratulations on the Silver Anniversary of the *Bulletin of the History of Dentistry* in which we in Maryland hold a unique position. Our Baltimore College of Dental Surgery pioneered institutional dental education and her many graduates have exerted significant historical influence in dental organization and literature. Your 1978 president is one of the notable graduates of the Maryland school.

The Maryland State Dental Association is proud of the *Bulletin's* past accomplishments and wishes you success in future ones.

Bernard Gordon, D.D.S.
Editor
*Journal of the Maryland State Dental Association*

REFLECTIONS DENTAL.

How pure, how beautiful, how fine
Do teeth on television shine.
No flutist flutes, no dancer twirls
But comes equipped with matching pearls.
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With sets like rows of hybrid corn.
Clowns, critics, clergy, commentators,
Ventriloquists or roller-skaters,
MC's who beat their palms together,
The girl who diagrams the weather,
The crooner crooning for his supper—
All flash white treasures, lower and upper.
With miles of smiles the air-waves teem,
And each an orthodontist's dream.
'Twould please my eye as gold a miser’s—
One charmer with uncapped incisors.

—Phyllis McGinley.

Reprinted from *Junior Dental* (Turin, Italy.)
DENTISTRY IN FOLK ART, V: The Dentist

Engraving by M. Darly, London, in 1778, showing a dentist of an earlier period about to extract a tooth using some sort of lever. It is reproduced from a print in the Boston Medical Library in the Francis A. Countway Library of Medicine.

The caption reads:

_I cure all the disorders of the mouth. I draw teeth in a minute, without pain. I make natural or artificial teeth & have invented a substance that preserves the purpose of the jaws._
The First Twenty-five Years of the 
Bulletin of the History of Dentistry

Batavia, New York

Twenty-five years may be a short span in the life of a person, but for a magazine it is indeed a ripe old age! Of the thousands upon thousands of periodicals which have been launched through the years, only a very small number still are publishing after a quarter of a century. This is especially so among dental periodicals, and of all the many which were issued since Horace Hayden and Chapin Harris introduced the first dental periodical in the world in 1839, only a mere handful continued in publication for more than twenty-five years.

Our Academy is very proud of our Bulletin of the History of Dentistry and rightly so, for not only has it grown from two mimeographed pages to the handsome format it enjoys today, but it has become recognized among scholars all over the world as the foremost authoritative journal in its field, and the only one of its kind in English in the entire world.

The American Academy of the History of Dentistry was but two years old when it was felt that a publication was needed to keep the membership informed of developments both within the organization as well as in the field of dental history. Dr. George B. Denton was chosen for the task of issuing such a publication.

Dr. Denton, who was not a dentist was nevertheless an avid dental historian. He had received his B.A., M.A. and Ph.D. degrees at the University of Michigan and taught history and rhetoric at that school from 1907 to 1909 when he left to become an instructor in English at the University of Illinois. In 1912 he became an English instructor at Northwestern University and in 1917 joined the staff of Northwestern Dental School as an instructor in technical writing.
Under Dr. Denton's supervision, seminar courses in dentistry were introduced in 1919 at Northwestern, and from 1934 to 1949 he taught dental history and literature at the school. From 1949 to his death in 1963 he served as research consultant to the Bureau of Library and Indexing Services of the American Dental Association. One of his great contributions to dental scholarship was his book *The Vocabulary of Dentistry and Oral Sciences*, published in 1958. He had completed a number of chapters of a comprehensively history of dentistry when death stayed his hand.

**THE FIRST BULLETIN**

Volume I, Number 1 of the *Bulletin* appeared in March, 1953, in its modest format of two pages, and the prospectus was equally as modest:

The present number of the BULLETIN is a trial issue. If it meets with approval of the members of the Academy, it will be continued in the present form at monthly intervals. Members of the Academy are requested to submit items of news interesting to dental historians. Address G.B. Denton, American Dental Association, 222 E. Superior Street, Chicago, Ill.

The material contained in that first issue was varied: a description of the purchase of a collection of ancient dental prostheses assembled by the great Italian dental historian, Vincenzo Guerini, by the Baltimore College of Dental Surgery; the completion of the Rare Book Room at Northwestern University's dental library, housing one of the world's greatest collections of rare dental volumes; a description of early French documents, then in Northwestern's possession, which detailed the status of dental practitioners in the France of the early 1700's; and an announcement of the 75th anniversary issue of the now defunct *Items of Interest*, the oldest dental journal then being published in the United States. Then followed a short bibliography of recent books of interest to dental historians and an announcement of the death of one of the Academy's members.

The *Bulletin* continued publication in this manner for six more months; then, at the second annual meeting of the Academy held in Cleveland, Ohio, on September 26, 1953, it was voted to make the *Bulletin* the official publication of the organization.

The 2-page mimeographed format of the *Bulletin* continued for about eleven years, and it resembled today's Academy *Newsletter*. It sparkled with George Denton's easy writing style and wit. He searched for bits and pieces of history which would otherwise have gone unrecorded and brought them to the attention of his colleagues. Sometimes he included items which served to delectate as well as educate the readers. In February, 1954, he noted that Northwestern's library owned one of the rarest books in the field of dentistry, *A Treatise on the Teeth, wherein is demonstrated their Formation, Growth, Extension, Preservation, Disorders and Cure* by the notorious quack known only as M. Patence. This copy of the book, which was published in London in 1774, is possibly the only copy in existence in the world. Dr. Denton published this wonderful passage from the book, in order to give an idea of the character of the work. Here the quack describes the movements of the mandible:
The present number of the BULLETIN is a trial issue. If it meets with approval of the members of the Academy, it will be continued in the present form at monthly intervals. Members of the Academy are requested to submit items of news interesting to dental historians. Address G. B. Denton, American Dental Association, 222 E. Superior Street, Chicago, Illinois.

GUERRINI COLLECTION AT BALTIMORE

The collection of ancient prosthesis assembled by the Italian historian of dentistry, Vincenzo Guerrini, was purchased in 1952 by Baltimore College of Dental Surgery. It consists of several specimens undoubtedly of the greatest antiquity, in some instances probably extending back to the fifth century B.C. or earlier, as well as a number of undated specimens which may also belong to the ancient period, and a number of pieces of more recent origin, from the eighteenth and nineteenth centuries.

The specimens from antiquity in their construction reveal Etruscan, Greek, or Phoenician origin. The Etruscan appliances, of which there are at least three, are characterized by the use of soldered gold bands for retention. The Phoenician pieces, supposedly following the manner of Egyptian craftsmanship, employ gold wires. Among the Etruscan specimens are also two examples of the votive pottery images of teeth placed by sufferers from toothache in the shrines of the gods whose good offices they wished to secure.

The collection is displayed in an ornate carved cabinet which bears the inscription "Cav. V. Guerrini, Napoli" above and "Odontotecnica Archeologica" below.

EASTERN FRANCIS DOCUMENTS

The well-known edicts of the French kings in 1699 and 1768 prescribing the fundamental statutes of the surgeons of Paris and providing regulation of the practitioners of dentistry, have been extensively quoted in various histories of dentistry. But in no instance have these documents been carefully studied with regard to the relations of "experts for the teeth" to the community of surgeons with whom they were associated. A casual comparison of the provisions for dental practitioners in 1699 with those of 1768 indicates that the usually asserted change in their status under the two edicts is not borne out by the provisions of the documents. A microfilm copy of the edict of 1699 as published, and of the edict of 1768 both in manuscript and as published in the possession of Northwestern University Dental School, Chicago, Illinois. This is probably the only form in which the entire documents are available in this country.

DIAMOND JUBILEE OF ITEMS OF INTEREST

The present, 1953, volume of Items of Interest celebrates the 75th anniversary of the journal's existence. Items of Interest, which has been a proprietary publication throughout its life, is the oldest dental journal now being published in the United States, and its publishers claim that it is the oldest dental journal in the world. This volume, according to the publisher's announcement, "will contain numerous articles by eminent authorities, dealing with the development of the various branches of dentistry in the past seventy-five years."

BIBLIOGRAPHY

For the background of ancient dental history, Chauncey D. Leake's little book of 108 pages, The Old Egyptian Papyri University of Kansas Press, Lawrence, Kansas, 1922 will be found helpful.

The Rhode Island State Dental Society, which commemorates its fiftieth anniversary of its founding this year, has issued a booklet of 34 pages, The History of Rhode Island State Dental Society. Dr. Charles F. McKivergan is the historian of the Society and largely responsible for the history.

Sir Frank Colyer's Old Instruments Used for Extracting Teeth is an exhaustive treatise in 245 pages (Staples, 1952). It is reviewed in the March J.A.D.A.

Libellus de Dentibus of Bartholomew Eustachi, the first book exclusively devoted to dental anatomy, has been published in facsimile and in German translation by Fritz Drick of Vienna (Urban & Schwarzenberg, Vienna, 1951).

MAX E. SIEFFER, member of the A.A.H.D. and editor of the Connecticut State Dental Association, died January 7 at Hartford.
If we consider the six-fold action of the jaw, it excels all mechanical motions whatever: all the parts move from the centrical points, except the compound rivet, which few understand; the rest terminate in angles from the centre, but this, when it opens, moves quite different: its actions are horizontal, vertical, forward, backward, extend behind, or shuts before: for when the grinders meet, the upper fore-teeth project over the lower, and when the fore-teeth are employed in eating, there is an open space betwixt the grinders; so that rest is given alternatively throughout the whole, the method of which no mechanic can comprehend, there being no screw, or constructed lever, to alter the wonderful operation of such an amazing construction; which alone is sufficient to prove the infinite power of our Maker.

Every issue contained some choice information which Dr. Denton had come across in his researches and wished to share: some new information on the origin of the modern toothbrush; the tragic loss of an unpublished work by Fonzi; a description of a dentist’s laboratory in 1830; a lengthy discussion of the earliest porcelain teeth in America; the status of the dentist in eighteenth century France.

Dr. Denton was gathering material for a much needed book on the history of dentistry which he then began to write. He had completed several chapters when he was taken ill on March 8, 1963. He was rushed to the hospital and operated on for an aneurysm but died early the following morning, just short of his eightieth birthday. The eulogy at his funeral was delivered by Dr. Harold Hillenbrand, then Executive Secretary of the American Dental Association, who said:

As the years pass by, the perspective of history will permit us to identify more clearly the full worth of this man and his work. I am sure those of us who knew him are willing to risk intercepting the decision of history and to say: this was a great and good man who, as the long reaches of time now begin for him, has already found a place in the history of the dental profession to which he dedicated his science, his art, his life.

THE SECOND EDITOR

Stepping in to fill the breach left by the untimely death of Dr. Denton was Dr. Donald A. Washburn, since 1949 the Director of the Bureau of Library and Indexing Services of the American Dental Association.

Dr. Washburn received his B.A. from Albion College in Albion, Michigan and his D.D.S. from Northwestern University. He practiced dentistry for a time but realized that his interests lay elsewhere. Having an inquisitive mind and wide scholarly interests, he enrolled in the University of Chicago Graduate Library Science School from which he was graduated. He served as bibliographer with the U.S. Army and as assistant research librarian at the John Crerar Library in Chicago before moving on to his position with the A.D.A. where he served with great distinction for twenty-eight years until his retirement in 1977. One of his greatest contributions was his work which resulted in broadening and expanding the Index to Dental Literature to the point where it is today the single most valuable tool to dental researchers. One of only three dentists in America to possess a formal library science degree, his contributions to librarianship were recognized when he was elected to the presidency of the Medical Library Association in 1970.
THE BULLETIN CHANGES FORMAT

In the summer of 1964, under Dr. Washburn's guidance, the Bulletin was issued for the first time in a regular magazine format. He had successfully negotiated with the American Dental Association to use that organization's facilities to publish this important journal at no cost to the Academy. Thus, in September, 1964, there appeared a single issue of 53 pages, comprising Volume 12, Numbers 1-3, covering the period January-April-July 1954. It was produced by the reduction photo-offset process from typescript, and although simple in comparison with the present Bulletin it represented a major leap forward in appearance, content and readability.

For the first time, it was now possible to reprint, in full, papers delivered at the annual meetings of the Academy, as well as the president's address and other significant communications. There were committee reports and progress notes regarding the Academy's activities, which served to keep the membership, which by 1964 had grown to about 200, informed of the organization's doings. Another innovation was an expanded bibliography of recent publications in the field of dental history.

It was planned for the Bulletin to be issued quarterly, but because of circumstances beyond the editor's control, there were times when two or even three issues were combined into one. Nevertheless, the journal was published uninterruptedly under Dr. Washburn's editorship until October, 1968. At that time two factors came together which changed the fortunes of the Bulletin.

The first was the resignation, for personal reasons, of Dr. Washburn as editor after approximately five and a half years which had seen a major expansion in the content and format of the periodical. And just before he left the editorship, Dr. Washburn made an invaluable contribution: an index to the first sixteen volumes of the Bulletin was issued.

The second major change came about because of a change in policy on the part of the A.D.A. which thenceforth forbid the use of its publishing facilities by any but official A.D.A. groups.
THE THIRD EDITOR.

To fill the position of editor, the Academy's executive committee at its 1968 meeting in Miami Beach, appointed Dr. Malvin E. Ring of Batavia, New York.

Dr. Ring received his B.A. from Brooklyn College, New York in 1939 and his D.D.S. from St. Louis University in 1946 and entered private practice in Brooklyn. He relocated to Western New York in 1952 after completing a hitch with the Dental Corps, United States Army during the Korean War. In 1968 he matriculated at the School of Library and Information Science, State University of New York College at Geneseo, receiving his M.L.S. degree in 1970, becoming the third dentist in the U.S. to hold this degree. In 1965 he joined the faculty of the School of Dentistry, State University of New York at Buffalo in the Department of Oral Diagnosis, but in 1968 took over the teaching of dental history, and is today an associate professor of dental history and literature at the school.

When Dr. Ring assumed the editorship there were some major financial hurdles to be overcome. Up to that time the Bulletin had been distributed free to all who requested it, since the only cost to the Academy was postage. Now a modest subscription fee of $5 per year had to be instituted. The format was changed to a regular printed edition of 5x7 size, and through the valuable suggestion of Dr. H. Martin Deranian, then Academy president, lilac was chosen for the color of the cover, this being the official emblematic color for dentistry. It was decided that because the Academy's finances were so limited, the Bulletin would be issued only twice a year.

The first issue of the new Bulletin under Dr. Ring's editorship came out in June, 1969. It had forty pages and carried seven major articles, four of which had been presented at the previous year's annual meeting; two were reprints, one from the lay press and one from another dental journal, and it carried the first of the very popular series "Oddments in Dental History" which was a pet project of the editor. For the first time photographs appeared in the journal.
A PERIOD OF SEVERE FINANCIAL STRESS.

By the time the second issue in 1969 was ready for the press the Academy faced a severe financial crisis. The late Mr. Robert J. Rothsstein, a non-dentist but long-time member of our Academy, was approached and the situation explained to him. In his typically generous fashion he presented our Academy with a cash gift sufficient to insure the publication of that issue of the Bulletin.

But the financial crisis continued, and the next issue saw publication only because it was wholly devoted to a history of Tufts University School of Dental Medicine, and the printing costs were paid for by Tufts on the occasion of that school’s centennial. It was a handsome issue, with thirty-five photographs. It was entirely written by Dr. H. Martin Deranian and Dr. Gerald Shklar, both of whom were at that time on the Tufts faculty.

The December, 1970, issue carried the first book reviews, a feature which has become greatly expanded and today it is one of the most valuable parts of the publication.

Luckily, in this time of great need, some very welcome help for our Bulletin came from an unexpected source. Dr. George C. Paffenbarger, the president of the William J. Gies Foundation for the Advancement of Dentistry, learned of our financial difficulties. Because of his efforts, that organization agreed to support the publication for the next five years with a grant of $750 per year. At the same time through the efforts of Dr. Isidore Teich, then Executive Secretary of the First District (N.Y.) Dental Society, a matching grant was secured from the Henry Spenadel Fund for the Advancement of Education in Dentistry. Thus from 1970 to 1975 the issuance of the Bulletin was underwritten by these two groups.

THE BULLETIN CONTINUES TO GROW.

As our Academy’s membership increased, so too did the Bulletin grow. More and more original contributions were being received, many of them written by scholars in such fields other than dentistry as anthropology, history and medicine. With publication costs assured for at least five years, more photographs could be used to heighten interest in the journal. New features were introduced in 1972, most notably the "Notes and Queries" section which was the valuable suggestion of Professor Gardner P.H. Foley. This has become the repository of important news items, personal communications concerning controversies in historical matters, as well as a clearing house for collectors looking to buy and sell dental memorabilia.

The December 1974 issue carried the first instalment of another new feature, "Classics in Dental History." Launched with the reprinting of Taggart’s monumentally important paper on the precision casting process, this feature has carried some of the most important original writings which have contributed so much to the growth of dental science. Since October, 1977, this feature has been ably handled by Dr. Jerry J. Herschfeld. It is hoped that at some time in the future these "Classics" will be reprinted in the form of a hard-bound volume.

April, 1977, saw the advent of a fascinating feature, "What Is It?", under the aegis of Dr. Robert C. Sproull. Each issue carries a photo and description of a quaint, unusual or forgotten dental instrument,
selected from Dr. Sproull's extensive collection, and readers are invited to submit an identification of the item.

MORE FINANCIAL WOES.

With publication costs rising and the two financial grants coming to an end, it was necessary in 1974 to raise the subscription price of the Bulletin to $10. A strong drive to obtain new subscribers was undertaken by the editor, and many were secured, with a surprising number coming from foreign countries; Japanese subscribers alone accounted for several dozen.

However, income still didn't approach costs, and with the specter of financial disaster looming, Dr. Ring, after lengthy negotiations was able, in 1976, to secure a grant of $4,000 from the Ritter Company division of the Sybron Corporation. Efforts to receive assistance from the American Fund for Dental Health were unavailing; our appeal was turned down by that group with the short-sighted reply that it wasn't an "educational venture." A similar appeal to the American Dental Association was equally fruitless. Nevertheless, efforts are continually being made to secure long-term funding for this important and unique publication.

Today the Bulletin enjoys a reputation as the world's foremost vehicle for writings on the bibliography and history of dentistry. It is the only magazine of its kind in English in the entire world, and one of only two journals in the world devoted to dental history. It has a circulation of about 550 and is received by every dental school library in the United States and Canada, as well as by those in many foreign countries including Ireland, England, Israel, Bulgaria, Yugoslavia, Sweden, France, Australia and numerous others. The Bulletin is now recognized as the authoritative source for information on dental history and the editor receives frequent requests from lay publications for assistance in researching articles, two such having come from the National Enquirer and the Readers Digest.

As the Bulletin became larger and distribution more complex, what had been a one-man job became overwhelming, and Dr. Ring sought help. Thus, in 1977, an Editorial Board was appointed by then president Dr. Robert C. Sproull. This was made up of Dr. Jerry J. Herschfeld, the "Classics" editor; Dr. Lloyd E. Church who has so competently served as Book Review Editor; Dr. J. Henry Clarke who, as Circulation Manager has so efficiently handled all non-member subscriptions; Dr. Hyman J.V. Goldberg and Mr. Everett Jackson.

As a result of the joint effort of the editor and Dr. Hyman J.V. Goldberg, a new project will be launched in 1979. After a half year of conferences and negotiations a grant of $2500 was secured from the Proctor and Gamble Company. This money will be used to underwrite the sending of the Bulletin to the entire Junior classes in two dental schools in different geographic areas of the country. This will acquaint these students with our organization and its publication and will hopefully recruit new members into the Academy after they have been exposed to the Bulletin.

With this Silver Anniversary we can say that our Bulletin has truly come of age. It has taken its place among the significant contributions to dental journalism. But more than that it has played a unique role in bringing a knowledge of the fine heritage of dentistry
before the dental profession. And it stands today as the only dental journal in this country devoted to the cultural, rather than the clinical, aspects of this great profession.

DR. RING is the editor of the Bulletin of the History of Dentistry. His address is 216 East Main Street, Batavia, New York 14020. Requests for reprints should be made directly to the author.

NEWSPAPER ATTITUDES TOWARD DENTISTRY
A CENTURY AGO.

The Danbury (Conn.) News says: A young lady in a neighboring town has taken up dentistry for a living. All the gentlemen patronize her. When she puts her arm around the neck of a patient and caresses his jaw for the offending member, the sensation is about as nice as they make 'em. One young man has become hopelessly infatuated with her. Consequently, he hasn't a tooth in his head. She pulled every blessed one of them, and has made him two new sets and pulled them. She is now at work on his father's saw. He holds the saw.

—Batavia, New York, Republican Advocate, March 21, 1872.

A few weeks ago a dentist arrived in Warrenton, Virginia and advertised that he would remove all of a person's teeth for two dollars and insert a new set for ten dollars, besides giving six months credit. He was busy for two weeks pulling teeth, and at the end of that time half the people of the town had empty gums. But while the people were waiting for the dentist to fit them with new sets he eloped with the hotel keeper's wife. And now there are two or three thousand people in Warrenton who cannot eat anything tougher than soup and farina.

—Batavia, New York, Republican Advocate, March 16, 1872.
DENTISTRY IN FOLK ART, VI: "The Exploits of a Dentist"

The operator says: "It isn't the right one yet, but that doesn't matter. It won't cost you any more."

(Early 19th century European print from the collection of historical pictures owned by the Northwestern University Dental School.)
American Dentistry
in the Founding Years of the Republic

—H. BERTON McCAULEY, D.D.S.
Baltimore, Maryland

Modern dentistry, conceived in the American spirit of independence and brought into being by enlightened and dedicated men in an era of unprecedented incentive and opportunity, enters the third century of the nation of its flowering with promise of ever increasing public usefulness as an autonomous health profession. There follows a glimpse of the way it was when our country was very young.

Bearing a masticatory mechanism and being of substance less than divine, it is reasonable to assume that mankind appeared on earth with an inescapable need for dental treatment, and that dental service as a category of health care services originated as soon as man began to experience pain in his teeth. In the papyrus of Ebers, discovered in 1875 at Thebes, there are listed eleven dental prescriptions with origins between 3700 B.C. and 1550 B.C. That dentistry in Egypt was one of a number of medical specialties was noted by Herodotus ca. 500 B.C. "Egypt is full of doctors," he wrote, "those for the eyes, those for the head, some for the teeth . . ." Millenia earlier, one of them, Hesi-Re, King Zoser’s "chief of the toothers and physicians", ca. 3000 B.C., was probably the first dentist. Ostensibly beginning with this honored denizen of the royal Egyptian household, dental practice has been provided with the advantages of an accumulated body of recorded knowledge and experience; hence the science and the art of dentistry.

To the extent that it pertains to the healing arts, dentistry has been practiced as a medical specialty throughout human history. Consequently dental practice has always been a function of professionals, albeit also as circumstances favored or the occasion demanded, of artisans, barbers, blood letters, craftsmen, metalsmiths, wig makers and entrepreneurs of wide description and ability, ranging from the competent to the unmitigated charlatan. As a matter of observation, it is the long association of dentistry with practitioners of questionable qualification and repute that even today plagues those who would raise it to its rightful position as a fully recognized learned profession. The underlying problem is one of supply and demand. Though almost everybody has dental problems, in the past only a relative few were competent to solve them. The resultant gap provided a potentially lucrative opportunity for almost anybody who ventured to fill it; that is, until dental schools were founded to provide an appropriate community of competent practitioners and the law moved in to eliminate the incompetent.

Today’s system of dental education, backbone of the modern profession, was established with the success of the Baltimore College of Dental Surgery, founded in 1840. Attempts to license dental prac-
titioners in this country began with an Alabama law in 1841. But only in the last hundred years have these influences had universal application throughout the profession. Little wonder that the image of the dentist may be somewhat inferior to that to which the dentist may justly aspire, even if the discrepancy exists largely in his own mind!

THE AMERICAN CONTRIBUTION

The evolution of dentistry as an autonomous profession took place in America for various reasons, cultural, geographic, economic and social. Britain's North American colonies were a long way from the motherland in terms of transportation and communication available at the time. They were peopled for the most part by uncommonly hardy and adventurous souls more than happy to leave behind them restrictive British attitudes, laws, customs and practices that hampered individual aspirations and initiative. Their leaders were generally people of reasonable substance and influence who, encouraged by English monarchs in pursuit of empire, saw in the new land considerable opportunity for even greater power and affluence. The combination of people and circumstances spawned quite naturally an attitude among the colonists to which historians refer as the American spirit of independence, to a great extent the product of necessity and British "bull dog" determination. All but stranded on a wild and alien shore, the new American was forced by circumstances to support and defend himself . . . or perish.

THE TOOTH-DRAWER

Early American dental practitioners from the old country were barber surgeons and "tooth-drawers". Koch credits William Dinely, who landed in Massachusetts colony in 1636, as being the first. However, convincing evidence of an American dentist is lacking until 1734. In the New York Weekly Journal, January 6, that year, James Mills announced he was continuing the practice of James Reading "At his shop, in the House of the Deceased." Apparently one of the first to offer dental services additional to the removal of teeth was Sieur Roquet, a Parisian, who announced in the Boston Independent Advertiser, July 3, 1749, his availability for "putting in their stead, an entire Sett of right African Ivory Teeth, set in a Rose-colour'd Enamel, so nicely fitted to the Jaws, that the People of the first Fashion, may eat, drink, swear, talk Scandal, quarrel and show their Teeth, without the least Indecency, Inconvenience, or Hesitation whatever." Roquet's "Rose-colour'd Enamel" reflects Fauchard's practice of employing professional enamelers in denture processing.

THE SURGEON DENTIST

There is recorded evidence of upward of 75 practitioners of dentistry located in the Colonies in the latter half of the 18th century, for the most part in the larger centers of population, Philadelphia, New York, Boston and Baltimore. Of extraordinary prominence, and credited by the eminent historian Guerini as being the first American dentist, likely the first to devote full time to the profession, was Robert Wooffendale, "Surgeon Dentist" from London. In the New York Mercury, November 17, 1766, Wooffendale claimed the incomparable dis-
tinction of being instructed in the procedures of his profession by none other than Thomas Berdmore, Esq., “Operator for the Teeth of His Britannic Majesty”, the first appointed dentist to the British royal family and author of an excellent treatise on dentistry first published in 1768, translated into several languages, and republished in several editions, the last of which appeared in Baltimore in 1844.

Another distinguished surgeon dentist of the period, for a time (ca. 1773-1774) dentist to George Washington, was John Baker, preceptor to Paul Revere. In the New York Gazette and Weekly Mercury, May 9, 1768, Baker pretentiously announced he had served “The principal Nobility, Gentry, and others of Great Britain, France, Ireland, and other principal Places in Europe; also upward of two thousand persons in the Town of Boston.” A man of unusual talent and social status, Baker traveled far and wide. He is the first of record to practice dentistry in Maryland, evident in the Maryland Gazette of Annapolis, September 14, 1773. Here he encountered Thomas Hamilton, surgeon dentist who came to America from London in 1769, and Benjamin Fendall, apparently America’s first native-born dentist of professional distinction, born in Port Tobacco, Charles County, Maryland, 1753. This trio of practitioners of the dental art were prestigious exponents of the profession, notable devotees of the sport of kings and frequent participants of the good life as practiced in their time in Annapolis and Williamsburg. The first announcements to mention gold fillings in America were Baker’s.

Hamilton had a considerable practice in Baltimore. Demand for his services were such that in the Federal Gazette and Baltimore Daily Advertiser, August 20, 1800, he stated that “From the various and frequent applications he has received, many of which not being able to attend to, he has employed as an assistant Mr. Hayden, whose experience as a dentist, in the northern states, particularly in the capital cities and towns of the state of New York, ensured him great success.” Thus came to Baltimore Horace Hayden, architect and principal founder of the present American system of dental education. Hayden was 31 years old when he arrived to help Hamilton in his office. His distinguished colleague, Chapin A. Harris, co-founder of the Baltimore College of Dental Surgery, would not see light of day until six years later.

EARLY PREVENTION

As the nation was born, other able and dedicated dentists contributed significantly to the profession. Michael Poree, “Operator of the Teeth” from Paris, published the earliest known American article on dentistry for the information of the laymen. In the New York Gazette and Weekly Mercury, December 11, 1769, Poree warned against “erroneous operators for the teeth” and reminded his readers “it is absolutely necessary for us to have the number of teeth which was given to us . . .” John Greenwood, best known as George Washington’s dentist, was first to employ spring clasps for the retention of partial dentures, in 1792. Even more significant, he was an early advocate of regular dental check-ups for children. Addressing parents in the Daily Advertiser, New York, July 20, 1790, Greenwood wrote of “the attention that is necessary to be paid to children’s teeth at the time of shedding and after, being of so great importance to their regularity,
John Templeton, a surgeon dentist from Europe, also addressed himself to the dental care of children. Templeton was certified for proficiency in his profession by the Boston Medical Society and appears to have been America's first orthodontist, undertaking the "Charge of Children's Teeth as soon as they begin to shed" and the correction of "Irregular Teeth" in a practice that occupied the 1780's. To James Gardette, French naval surgeon who entered the country in 1781, goes the credit for the mortise plate to which teeth were secured by gold pins, and for a simple lever for the removal of teeth. He too wrote an article for public education, the second of its kind in this country, in the *Maryland Journal and Baltimore Advertiser*, September 19, 1788.

RECOGNITION

Efforts to attain professional excellence in the practice of dentistry did not go unnoticed, a fact which served to encourage the dedicated dentist of the time. None other than Benjamin Rush*, famed Philadelphia physician of the Revolutionary era, acknowledged Andrew Spence, trained by his uncle Thomas Spence, "Dentist to His Britannic Majesty", as the first of several "regular bred" dentists that settled in that city, and noted "Since the cure and the extraction of the teeth have become a distinct branch of the profession of medicine, several diseases which have arisen from them, when decayed, have been detected and cured"... clear evidence of the recognition of dentistry as a useful and necessary part of health care in the early years of the republic. Indeed, as early as 1792, the medical profession in this country had acknowledged the value of a dental service in a health care institution when the New York Dispensary, founded in 1791, conferred upon Richard Cortland Skinner, surgeon dentist from London, an official position in its organization. The result was the first dental clinic in America and the first institutional provision of free dental care for the indigent.†

LITERATURE

To R. C. Skinner also goes the credit for the first dental book published in this country, *A Treatise on the Human Teeth*, 26 pages long, printed in New York and copyrighted in 1801. Purportedly, earlier editions were distributed gratis to the author's patients in Baltimore as early as 1794. However, the published work delineates (from its title page) "the most beneficial and effective method of treating all disorders incidental to the teeth and gums; with directions for their judicious extraction, and proper mode of preservation: interspersed with observations interesting to, and worthy of, the attention of every individual". Skinner's preceptor was Bartolomeo Ruspini, celebrated Italian dentist of London, who had published his own *Treatise on the Teeth* with pronounced success between 1768 and 1797. Skinner was thus endowed with outstanding knowledge of the profession of his time and brought it with him to America, beginning practice in Philadelphia in 1789. Historians agree he is the founder of American dental literature.*†,⁹,¹¹

While Skinner was discharging his duties as the first dentist in the country to receive an institutional appointment, a flamboyant surgeon-
dentist from Boston, Josiah Flagg, was pioneering root canal therapy. In the Federal Orrery, Boston, November 30, 1795, Flagg announced "that the sensation, or nerves of the teeth in the head, can be extracted, by a simple, safe, and easy process, with instruments, and the teeth still preserved and prevented from further decay." By 1802 a second dental book appeared in Baltimore: A Treatise on Dentistry Explaining the Diseases of the Teeth and Gums, 80 pages, by B. T. Longbothom, surgeon dentist. This work served as an excellent oral hygiene primer and constitutes a thoughtful insight to the scope of dental practice of the time. Therein is first mentioned atmospheric pressure as a factor in denture retention, and transplantation of teeth is considered a risky procedure at best.

ELEMENTS OF A PROFESSION ESTABLISHED

All available information clearly indicates that modern dentistry is rooted in a long accumulated body of recorded knowledge and experience, put into practice in early America by professionally competent men who brought here the best of the art that Europe, particularly England and France, had to offer; in the unique circumstances of a new world, they expanded it into an autonomous profession. While the United States were asserting their independence, the essential elements of a profession were being assembled. America had the best in dentists and in dental technology. Motivated by the liberated spirit of the time, dissatisfaction in the service of others, and promise of personal reward, dedicated men rapidly expanded the scientific base of dentistry. An unprecedented political and social climate favored personal and professional advancement. A new land, unlimited frontiers, and an inspired system of government inevitably engendered new inquiries, experimentation, improved operating procedures, and fresh goals, personal, social, economic and political.

Consequently by 1800, the principles and philosophy that guide dentistry today were already established. Among professional practitioners, the patient’s well being, honest performance, dental health education of the public, and prevention of dental disease were matters of high priority. Pretenders were subject to attack as hazards to the public and the profession. Many instrumental refinements and procedural advancements recognizable today were in use. Three of the four essential elements of an autonomous profession were in evidence as the 19th century dawned: competent and dedicated practitioners; a store of highly specialized knowledge; and a germinative system of education, dependent though it was on the preceptor-to-student relationship. The fourth, organization for effective communication and unity of action, was conspicuous by its absence.

By 1840, however, there was an American Society of Dental Surgeons, thanks to the persistent efforts of Horace H. Hayden. Isolation of American communities — and of professional practitioners — was succumbing to inspired leadership and vastly improved transportation provided by the coming of the railroad in 1827 began physically to tie the United States together. Establishment in 1840 of the Baltimore College of Dental Surgery and the present American system of dental education supplied the last important link in the chain of factors that transformed dentistry from an entrepreneur’s opportunity to a health profession.
It is readily apparent that the modern American dentist is a direct heir of his counterpart of the 18th century. The last two hundred years have seen the profession vastly advanced in technology, literature, education and organization, even to the extent of being overorganized. And though the practitioner is no longer dependent on a preceptor for training, that means of transmitting technical know-how continues to find place in professional education.

Since America attained independence, the aim of dental practice has shifted from amelioration to prevention, at least to the extent possible in a situation where only half of the U.S. population seeks maintenance care. The early American dentist was primarily concerned with removing teeth, that of the 20th century with saving them. At the dawning of the republic, it comprised only 2.5 million people with a per capita income in the order of $400 per annum. Now it is a nation of 215 million with an income in excess of $6,000 per capita. In 1800, all but 5 per cent of the population lived in rural areas; now 75 per cent are urbanized. Accordingly, early dentists were obliged to conduct practice in a number of locations as a matter of economic stability.

Those who aspired to professional status adhered to ethical standards and practiced dentistry to the best of their ability. They were not itinerants living out of a suitcase or a carpet bag. When they went from one community to another, their travel was planned and their coming announced in the public press. If their announcements appear ostentatious, it should be realized they were couched in an era of grandiloquent language and description. In any event, they always provided an address wherein patients would be received or from which house calls would be made on request.

Until recent years health care was considered a privilege by most Americans, a commodity to be paid for out of pocket like any other. Today it has become, through political persuasion, a right, a personal service considered by increasing numbers to be a responsibility of either government or some nebulous entity known as “the establishment”. In the current environment of social responsibility and instant communication, demand for dental care is escalating, and with it the cost as inflation erodes the value of the dollar. The result is a “health care crisis”.

In a democratic society only politicians and government would presume to rescue the public from such a catastrophe. In the entire history of man there is no instance of government with any degree of honest success supplying an esoteric human need over an indefinite period of time. Yet there is no dearth of schemes of dubious foundation and effectiveness, social and economic, to provide health care for everybody, with somebody else paying the bill. Little by little, to reach the goal, government and other third parties are increasingly intervening between practitioner and patient, ostensibly to control the cost of services rendered. Such intervention is creating problems of unprecedented magnitude to public and profession. Their proper solution will demand the best that dentistry can deliver, professionally and politically.

The health professions are and will continue to be sorely pressed to maintain freedom of practice and autonomy against the onslaughts
of those who, in the name of the public weal, strive to deny the practitioner his traditional right to professional and economic independence. Nonetheless the fact remains: adequate dental care is an exclusive product of a free and autonomous dental profession. Never has the profession faced a greater challenge or a clearer promise of increasing usefulness to society. The outcome will depend on whether dentists accept their professional responsibilities in a manner of the lofty status to which they aspire.

REFERENCES
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DR. McCAULEY is a dentist with the Adult Health Services Division of the Health Department of the City of Baltimore, Maryland. His address is 111 North Calvert Street, Baltimore, MD 21202. Requests for reprints should be made directly to the author.

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DENTISTRY IN FOLK ART, VII: Self help.

This caricature, originally published in 1924, is a typical W. Heath Robinson (1872-1944) "contraption." Like the American, Rube Goldberg, Robinson presented simple procedures by a series of cock-eyed details. Over a long period Robinson's inventive humor fascinated the English public and gained for him a historic place in his art field. To the familiar operation of tooth extraction he gave a number of steps involving weirdly elaborate and dubiously practicable gadgets. The underlying purpose of Robinson's tooth extraction scheme may very well be the satirization of one of everyman's foibles — self-treatment of a health problem. For centuries man in all social circumstances and in all environments has been driven to or chosen to perform the difficult and painful act of extracting his own tooth. Another factor that lends support to this interpretation of satirical purpose is Robinson's poking fun at a traditional home remedy for the toothache — the use of a handkerchief for both thermal protection and the containment of externally applied medicaments.

—Gardner P. H. Foley

Columbia University and Those Who Made it the Mecca of Dental Education

—MICHAEL D. KURTZ, D.D.S.
Canoga Park, California

The present Columbia University School of Dental and Oral Surgery is a result of a unique series of mergers of predecessor institutions. The ancestor of the school was founded in 1851 and chartered the following year by Dr. Amos Westcott. This was the New York College of Dental Surgery, the third dental college in the world, and it was located at 6 South Salina Street in Syracuse, New York.

Westcott (Fig. 1) was born near Newport, New York in April, 1815. He graduated from Rensselaer in 1834 as a Bachelor of Natural Sciences and again in 1835 with the degree of Civil Engineer. He attended Geneva Medical College in 1838 but graduated from Albany Medical College in 1840. Westcott's practice of medicine was brief and just where and from whom he learned dentistry is not entirely known. In 1839 he accepted Edwin James Dunning (1821-1901) as a dental apprentice. This relationship lasted for five years. Edwin was the grandfather of brothers Henry Sage and William Bailey Dunning who are key figures later in this account.

Edwin Dunning assisted Westcott with the American Journal of Dental Science of which Westcott and the world renowned Chapin Harris were co-editors. Westcott received an honorary DDS from the Baltimore College of Dental Surgery in 1843, only four years after its establishment as the first dental school in the world. In 1846 Westcott introduced the finger ring/drill socket to aid in propelling the hand drill. He helped organize and was elected first president of the New York State Dental Association in 1859. Westcott, active in politics and an acquaintance of Abraham Lincoln, served as Mayor of Syracuse in 1860. He single-handedly drafted New York State's first dental law which was subsequently enacted by the legislature on April 7, 1868. At Albany a month later he presided over a meeting which resulted in the birth of the Dental Society of the State of New York, and he served as its first president. Dr. Westcott's career ended sorrowfully in suicide on July 6, 1873.

Lectures at the New York College of Dental Surgery began on the first Monday in December, 1851. The first class to receive the degree of DDS consisted of Walter Webb Allport, L.G. Bartlett, William
Dalrymple, I.D. Kilbourne, B.C. Lefler, and B.F. Wright. Allport gained notoriety as the "Father of the World's Columbian Dental Congress." However, the most distinguished graduate was Edward Augustus Bogue in 1855. Dr. Bogue associated with Dr. William H. Kennicott and later Dr. Norman W. Kingsley. Bogue joined the Harvard Faculty in 1870. He was a charter member of the American Dental Club of Paris and its first president in 1900. He was president of the First District Dental Society of New York, the New York Odontological Society, and the New York Institute of Stomatology. He was the first foreigner elected to full membership in the Odontological Society of Great Britain. Bogue was also a charter member of the American Dental Association and held the office of secretary.

The New York College of Dental Surgery was short-lived; it was destroyed by fire on January 5, 1856 though its charter was kept alive.

WESTCOTT'S SCHOOL MOVES TO NEW YORK CITY.

In 1879 the charter was amended "on paper" to allow the college to hold property up to $100,000.00. The name was thus changed to the New York State College of Dental Surgery and its location from Syracuse to New York City. Thomas Brockway Fitch, Elias W. Leavenworth, and Charles B. Sedgwick of Syracuse were the only remaining original Trustees. It is possible that this action represented some sort of business venture.

On June 8, 1892 Dr. John Howard Reed secured a charter to establish the New York Dental School. He himself had graduated from the New York College of Dentistry in 1881 (founded 1865; now the New York University College of Dentistry). Reed's New York Dental School first opened its doors on Monday, October 2, 1893 in the Kennedy Building at 289 Fourth Avenue, New York City. By 1899 all departments were moved to 216 West 42nd Street.

Reed was forced to withdraw from active participation in the New York Dental School in 1895 due to family pressure. He always remained its silent partner however and clandestinely hoped his creation would someday be taken over as the dental school of Columbia University. Just prior to his death on March 12, 1940 at the age of 81 Reed wrote to Dr. Manuel M. Maslansky:

I was impelled about this time (1890) . . . to go forward with an urge for better things, to a definite fixed purpose of organizing a better dental school that should have a four year course, . . . that should receive women on an equality with men, and that should receive students to matriculate according to the highest standards of Harvard and Ann Arbor Universities, . . . a school that should be more directly under the supervision of the Regents of New York State, and ultimately to be taken over by Columbia University as its Dental School.

In a letter written in 1892 a parallel desire is expressed by others. This document was furnished to Dr. L. Laszlo Schwartz by Dr. Charles Francis Bodecker whose father was a signatory.

We the undersigned dental practitioners are desirous of having a dental department established in connection with the College of Physicians and Surgeons of Columbia University . . . It is our wish and intent that the students of the dental department shall
study anatomy, physiology, and chemistry with the medical
students of the College of Physicians and Surgeons.

It is the aim of the undersigned to create a dental department,
the standard of which shall be very high.

Very respectfully submitted,
Carl F.W. Bodecker
Benjamin Lord
Charles E. Francis
William Carr

William Carr, the last signatory, did in fact pick up where John Howard Reed left off. In 1904, Dr. Carr, armed with Westcott's revived charter, effectively assumed leadership of the New York Dental School under its new composite name of the New York College of Dental and Oral Surgery. In 1905, because of protests that the new corporate name too closely resembled that of the New York College of Dentistry, the name was again changed to the College of Dental and Oral Surgery of New York. The College thrived and by 1913 was moved to new quarters on 35th Street.

COLUMBIA FINALLY MOVES FOR A DENTAL SCHOOL.

The Bodecker proposal of 1892 was apparently turned down by Columbia University President Seth Low because of the financial risk involved. This decision was overturned momentously in 1916 when then President Nicholas Murray Butler was persuaded to support another proposal brought by five prominent New York City dentists: Henry Sage Dunning as chairman; his brother William Bailey Dunning; Arthur Hastings Merritt; Harold Stearns Vaughn; and Leuman Maurice Waugh. Subsequently, an enlarged Committee for a Columbia University Dental School was created.

Dr. Henry Sage Dunning was the driving force behind the establishment of the dental school. He himself was graduated from the New York College of Dentistry in 1904 and in 1906 successfully began the first oral surgery clinic in New York City at that institution. He received an MD from Columbia's P&S in 1911 and after having served an internship was placed in charge of the dental department at the old Vanderbilt Clinic. Dunning was responsible for a pamphlet issued by Columbia University in May, 1916 entitled A Dental School on University Lines. Dr. William Jarvie who was a member of the Committee for a Columbia University Dental School brought the pamphlet to his brother's attention. As a result, James N. Jarvie pledged $100,000. Later this was followed by an additional $25,000.00 from Dr. Jarvie's brother-in-law. On September 27, 1916, two students, Joseph Schroff and Sidney Kramer, embarked upon what later turned out to be a six year combined MD/DDS program. The Dental School of Columbia University, as it was called, was located in the old P&S complex at 437 West 59th Street. It was the first university affiliated dental school in New York and its entrance requirements of two years of college were the highest in the nation.

DUNNING AND MERRITT, THE LEADING FIGURES.

William B. Dunning and Arthur H. Merritt were classmates. In fact, Merritt was valedictorian at their graduation from the New York
College of Dentistry in 1895. Both were founders and presidents of the New York Academy of Dentistry which had been organized by Dr. Bissell Barbour Palmer, Jr. at the Columbia University Club on February 24th, 1921.

Arthur Merritt wrote extensively. He was the author of the textbook *Periodontal Diseases: Diagnosis and Treatment*. He cooperated actively in the establishment and development of the *Journal of the Allied Dental Societies*, *Journal of Dental Research*, *Journal of Periodontology*, *The New York Journal of Dentistry*, and the *Annals of Dentistry*. Dr. Merritt even wrote an autobiography as late as 1958 when he was 88 years old. In 1936 he founded the William J. Gies Endowment Fund to support the publication of the *Journal of Dental Research*. Merritt was President of the American Academy of Periodontology, American College of Dentists, American Dental Association, American Dental Foundation and American Board of Periodontology. 1940 was by far the most memorable and busiest year in his life as he was fortunate enough to be president of the ADA at the time of the Dental Centenary Celebration. Arthur Merritt cultivated a love for history and antiquity. He was president of the American Academy of the History of Dentistry, a Trustee of the New York Historical Society and had amassed the second largest collection of Anglo-American historical Staffordshire (old blue china) in the world.

Dr. William B. Dunning first entered practice with Dr. Samuel E. Davis, a former dental associate of his grandfather, Dr. Edwin James Dunning, Sr. Dunning served in the New York Naval Militia during the Spanish-American War aboard the *U.S.S. Yankee*. From 1912 until 1918 he was editor of the *Journal of the Allied Dental Societies*. With Dr. Sebert Ellsworth Davenport, Jr., Dunning wrote a *Dictionary of Dental Science and Art* in 1936. He was to become the first Professor Emeritus of the Columbia University School of Dental and Oral Surgery in 1945.

**DENTAL HYGIENE INCORPORATED INTO COLUMBIA'S CURRICULUM.**

In March, 1917 Columbia University fell heir to the New York School of Dental Hygiene. This school was opened a year earlier by Dr. Louise C. Ball of the Hunter College Faculty and had become part of the old Vanderbilt Clinic. Dr. Ball had been assisted by Dr. Alfred C. Fones of Bridgeport, Connecticut and a $2,500.00 grant from the Rockefeller Foundation. This became the first university-affiliated school of dental hygiene in the world (Fig. 2). Years later Columbia was to lead the way again with the creation, in 1953, of the first M.S. degree program in dental hygiene. In addition, with a $129,550.00 grant from the W.K. Kellogg Foundation the country’s first undergraduate training program for teachers of dental hygiene was established in 1964.

**THE LEADING WORKERS FOR THE SCHOOL.**

Dr. Henry S. Dunning remained an effective fund raiser throughout his career. In April, 1917, the dental school absorbed the
one year old New York Post-graduate School of Dentistry. This was made possible through financial support enlisted by Dr. Dunning. It included a gift of about $15,000 from noted lawyer Edward S. Harkness. Columbia gained facilities at 35 West 39th Street and top notch personnel who would prove crucial to its development. Among them were Dr. Frank T. Van Woert and Dr. Henry Webster Gillett who had been Dean. Dunning sailed for Europe in May of 1917 with the Columbia-Presbyterian Base Hospital Unit. The dental school was placed under the control of an Administrative Board led by Dr. James C. Egbert, Ph.D., Director of the Division of University Extension. While in Europe Dunning worked with the renowned English plastic surgeon, Sir Harold Gillies. After the war Dr. Dunning returned to the United States and to the Dental School of Columbia University (Fig. 3). He aided in the establishment of the American Association of Oral
and Plastic Surgeons; he was also a founder of the New York Academy of Dentistry.

By 1920 Frank T. Van Woert, M.D.S. had replaced Dr. James C. Egbert as Chairman of the Administrative Board and Van Woert became and remained Director until stricken by ill health shortly before his death on September 1, 1927. Dr. Van Woert was a pioneer in the adaptation of x-rays and electric current (pulp tester) to the diagnosis of dental disease. He was largely responsible for obtaining photographic equipment superior to that of any other school. This was for the production of lantern slides used in research and teaching.

Dr. Henry W. Gillett, who had been Dean of the New York Postgraduate School of Dentistry, was graduated from the Harvard Dental School in 1885. He had entered private practice with the famous Charles A. Brackett who was then Professor of Dental Pathology at Harvard. Gillett developed the application of cataphoresis for desensitizing dentin and played a role in the evolution of the cast gold inlay by the indirect method. In 1932 he wrote a book with Dr. Albert J. Irving, *Gold Inlays by the Indirect System*. He practiced sit-down dentistry on a tilted four-legged stool with everything in reach. Gillett was president of the First District Dental Society of New York in 1913-1914, and a founder and first president of the New York Academy of Dentistry in 1921. In 1928 he gave the Columbia University School of Dental and Oral Surgery a gift of over $30,000.

Both Joseph Schroff and Sidney Kramer who began their studies in 1916 received their MD’s in 1920. Although Kramer did not continue in dentistry, Dr. Schroff served as first president of the William Jarvie Society for Dental Research of Columbia University in 1921. In 1922 he became the first person to receive a DDS from Columbia. He was also an organizer and first president (1926-1930) of the Association of Dental Alumni of Columbia University. Schroff is most noted as an oral surgeon and he was Chairman of the Department from 1951 until 1956. He was also the author of a book *Fundamentals of Pathology*.

THE TWO SCHOOLS MERGE.

On July 1, 1923, at long last, the dreams of Dr. John Howard Reed and Dr. William Carr were fulfilled. The College of Dental and Oral Surgery of New York merged with the Dental School of Columbia University. The merger was recommended as the best means to solve certain academic deficiencies of the former school. This was at the insistence of the Dental Educational Council. Thus the Columbia University School of Dental and Oral Surgery was established. Sorely needed clinical facilities on 35th Street were added since existing clinical facilities had already become overcrowded by post-graduate courses.

THE INFLUENCE OF WILLIAM J. GIES.

*Dental Education in the United States and Canada*, prepared for the Carnegie Foundation for the Advancement of Teaching, was published in 1926. It represented the culmination of five years of hard
work by Columbia’s School of Dental and Oral Surgery’s eminent Professor William J. Gies (Fig. 4). Gies was a Ph.D. (Yale, 1897) in biochemistry whose major interests were dental research and education. This interest in dentistry began as early as 1909 when a small group of dentists, among them Dr. Arthur Merritt, sought his assistance in a dental research project. His work with the Carnegie Foundation was prompted by the casual disregard for excellence in the teaching of the basic biological sciences on the part of proprietary dental schools. Many of the proprietary dental schools that had sprung up in the late 19th century were emphasizing only technical skills in their curricula; some had degenerated into mere diploma mills. The situation reached its nadir in 1910 when an English physician, William Hunter, castigated American dentistry. In a paper read before the Faculty of Medicine of McGill University Hunter angrily charged:

No one has probably had more reason than have had to admire the sheer ingenuity and mechanical skill displayed by the dental surgeon. And no one has had more reason to appreciate the ghastly tragedies of oral sepsis which this misplaced ingenuity so often carries in its train. Gold fillings, gold caps, gold crowns, gold bridges, and fixed dentures, built in, on, and around diseased teeth and periapical pathosis, form a veritable mausoleum of gold over a mass of sepsis to which there is no parallel in the whole realm of medicine and surgery.\(^5\)

Of course, dangerous academic abuses also existed in medical schools of the period as evidenced in the Flexner Report.

The important conclusion of the Gies Report was that dental education should be a somewhat separate though equal partner of general medicine yet closely affiliated with general medical education. Further, that university management was necessary in order to achieve this. This report tolled the death-knell for proprietary dental education.

William J. Gies was a man of many accomplishments. He established the *Journal of Dental Research* in 1918-1919 and served as its first editor. The International Association of Dental Research was also Gies’ brainchild. Its initial assembly took place at the Columbia University Club on December 10, 1920. Over one third in attendance were affiliated with Columbia. These were Adolph Berger, Edward Augustus Bogue, Henry S. Dunning, William B. Dunning, William J. Gies, Henry W. Gillett, Milo Hellman, Arthur Merritt, Leuman M. Waugh, and Frank T. Van Woert. Four Columbians were to serve as presidents: Leuman M. Waugh, William J. Gies, Charles F. Bodecker, and Barnet Mortimer Levy. Gies helped initiate and organize the American Association of Dental Schools in 1923. He donated his excellent library to Columbia in 1928. He was president of the New York Academy of Dentistry in 1940. Dr. Gies’ groundwork in biochemical

Fig. 4. Dr. William J. Gies
dental research was continued in the 1930's and 40's by his student, Maxwell Karshan. Karshan started at Columbia in 1917 and received his Ph.D. in 1925.

THE DEANSHIP OF ALFRED OWRE.

Dr. Alfred Owre became Dean of the Columbia University School of Dental and Oral Surgery on July 1, 1927 (Fig. 5). He was born in Hammerfest, Norway on December 16, 1870. Dr. Owre was graduated from the University of Minnesota School of Dentistry in 1894 and from the College of Physicians and Surgeons of Hamline University in 1895. In 1905 Owre became Dean of his dental alma mater, retaining that post until coming to Columbia. His reign at Minnesota was so successful and Owre so well liked that Dr. Charles Mayo believed it was "the greatest dental school in the world." This was extremely fortunate for Columbia as Dean Owre invited the very best men from Minnesota to Columbia. Among them were: William Hopkins Crawford, Houghton Holliday, Ewing Cleveland McBeath, Carl Reuben Oman, Arthur Taylor Rowe, Gilbert Percival Smith, and Daniel Eleazar Owre was also president of the Dental Faculties Association in 1908. At Columbia he was instrumental in effecting the move to the Medical Center at 630 West 168th Street in 1928. A gift of $50,000 in 1926 by Mrs. James P. Donahue for this purpose made the task easier. Owre was a concerned educator and disciplinarian and he demanded academic excellence.

Apparently, some of the Minnesotans found it difficult to adjust to their new environment, Dean Owre included. Dr. Owre came into conflict with the New York dental societies over the existence of a teaching clinic where post-graduates would treat middle income patients, as well as the ultimate incorporation of the Faculty of Dentistry into the Faculty of Medicine. On March 1, 1933 Dean Owre took a leave of absence, subsequently became ill and died on January 2, 1935.

During Dr. Owre's reign Columbia stepped up its efforts in dental research. In 1930 it was Owre who convinced the Commonwealth Fund to donate $105,000 to study the cause and prevention of dental caries. This money was placed under the management of Dr. Charles Francis Bodecker.

DR. CHARLES F. BODECKER AND DR. LEUMAN WAUGH.

Charles F. Bodecker was born in New York City on September 2,
1880. He and Leuman M. Waugh received their dental degrees from the University of Buffalo in 1900. Bodecker's father, the renowned Dr. Carl F.W. Bodecker, and his brother, Henry, had returned to Germany in 1898 because of his father's failing health. Charles joined them after graduation. There he began the practice of dentistry and managed simultaneously to attend the University of Berlin. He seized this golden opportunity to study under Oscar Hertwig, Robert Koch, Willoughby Dayton Miller, Rudolf Virchow, and Wilhelm Waldeyer. In 1923 he returned to New York City and began to teach at Columbia. By 1926 Bodecker was a full Professor and Chairman of the Research Committee (Fig. 6). In 1928 he donated his father's rare book and periodical collection to the School of Dental and Oral Surgery. Bodecker along with Dr. Edmund Applebaum demonstrated the concept of the tooth as a living organ by proving the existence of the organic matrix of enamel. (Applebaum, incidentally, founded the field of microradiography and used it to morphologically illustrate decreasing the incidence of dental caries.) Dr. Bodecker retired in 1948 and became editor of the New York State Dental Journal until he died in 1965.

Dr. Leuman M. Waugh, Bodecker's classmate, shared similar interests. He taught at their alma mater in the basic sciences and set up its first microscopic laboratory. Dr. Waugh moved to New York City in 1914 where he limited his practice to orthodontics. Waugh was one of the original five men that persuaded Columbia's president, Nicholas Murray Butler, to establish the Dental School in 1916. Dr. Waugh became Acting Director when Dr. Van Woert took ill in 1926 and was Associate Dean under Dr. Owre from 1927 until March, 1933 (Fig. 7). Waugh is noted for his work with the Eskimos of Labrador and the Kuskokwim Basin in Alaska. It was he who made the astute observation that Eskimos living in the most civilized areas had the highest caries experience. His commitment to their study was deep and in 1928 he gave the School of Dental and Oral Surgery over $100,000 to finance a research expedition to the Arctic. He became president of the New York Academy of Dentistry in 1931 and two years later launched its participation in the Sir Wilfred Grenfell Mission along the coast of Labrador. Dr. Waugh served as president of The Dental Society of New York; Northeastern Society of Orthodontists; American Association of Orthodontists; and the American Board of Orthodontics.

DR. MILO HELLMAN AND THE DENTAL MUSEUM.

By the 1930's a sophisticated dental collection had been amassed.
Exhibits included old dentures and dental instruments; a patents-applied-for collection from 1840 to 1895; the diploma of William H. Elliot signed by Horace Hayden of the Baltimore College of Dental Surgery in 1840; and even a dentists bill of King Charles the First of England. The collection of the New York Odontological Society which had originally belonged to Dr. William Cary Barrett, who played an important part in founding the Dental Department of the University of Buffalo, was donated in 1925. It contained about 200 specimen skulls from early ganoid fishes through reptiles and carnivores to man. It served as the inspiration for the work of Dr. Milo Hellman.

Milo Hellman was born in Rumania and emigrated to the United States in 1888. While a flutist in the original Pittsburgh Symphony Orchestra under the direction of Victor Herbert, Hellman decided to study dentistry. He received his DDS from the University of Pennsylvania in 1905 and three years later a certificate of proficiency from the Angle School of Orthodontia when it was located in New York City. Before joining Columbia in 1932 he served on the faculties of Harvard, Pennsylvania, and New York Universities. Hellman had a long time association with William K. Gregory, curator of the Department of Comparative Anatomy at the American Museum of Natural History. Together, they wrote The Dentition of Dryopithicus (a forest ape) in 1926 and journeyed to Africa in 1938 to study the fossil remains of gorilla-like animals from the Pleistocene Epoch. Dr. Hellman’s most important work concerned the evolution and growth of the human dentition and face as evaluated by anthropometric and craniometric techniques.

Dr. Moses Diamond, Hellman’s countryman, had interests of a similar nature. He was graduated from the New York College of Dentistry in 1914 and was chairman of Dental Anatomy at Columbia for half his lifetime, beginning in 1922. Diamond was a consultant to the American Museum of Natural History and did extensive research on
the growth of the human skull and also the formation of tooth enamel. He was the author of Dental Anatomy and co-author of The Enamel of Human Teeth.

DR. RAPPLEYE'S TENURE.

In 1933 Dr. Willard Cole Rappleye became Acting Dean (Fig. 8).

He appointed Dr. Arthur Taylor Rowe (Fig. 9) to the post of Associate Dean. Rappleye had been the Dean of the College of Physicians and Surgeons since 1931. By 1934 he had so secured the confidence of the Trustees that he was employed in a dual capacity as Dean of the medical and dental schools until 1958. From 1915 to 1917 while a student at the Harvard medical School he served as a laboratory instructor at the Harvard Dental School, and was graduated magna cum laude in 1918. Rappleye was a shrewd and highly regarded diplomat. He was president of the Josiah Macy, Jr. Foundation; New York City's Commissioner of Hospitals from 1940 to 1942; and Chairman of the Board of the Health Insurance Plan of Greater New York from 1944 until 1948. He lived to the ripe age of 84.

On December 12, 1935 six shots from Victor S. Koussow's automatic pistol spelled tragedy. Koussow had gone berserk and murdered Associate Dean Rowe, Associate Professor Paul Benjamin Wiberg and wounded Dr. William H. Crawford before taking his own life. Rowe, Wiberg, and Crawford had come to Columbia during the Owre administration from Minnesota. Koussow suffered from family problems and was unhappy in his work as handyman. He had seen better days in Russia where he was a lawyer but was forced to flee after serving as a captain in the White Army during the Revolution.

The memory of this tragedy always remained with Dr. Crawford, who survived. Crawford's main interests were in prosthodontics and the physical properties of dental materials. In just six short years at Columbia he was promoted to head the Prosthodontics Department and he approached the challenge with vigor. In 1938 it was through Crawford's efforts that Columbia took first place for its scientific exhibits at both the mid-winter meeting of the Chicago Dental Society and the St. Louis meeting of the ADA. He resigned in 1940 to become Dean of the Indiana University School of Dentistry. In 1945 he joined
his father-in-law in Minnesota, who was then president of that University, as Dean of its School of Dentistry, a post he held until his death in 1964. Dr. Crawford also had the good fortune to serve as the president of the American Association of Dental Schools.

OTHER LEADING PERSONALITIES.

By the late 1930's Dr. Lester Richard Cahn had contributed considerably to the science of oral pathology. Cahn earned his DDS from NYU in 1918. At that time he was already author of approximately one hundred articles on the subject, as well as two books: The Modern Practice of Tooth Extraction and Basic Principles of General and Oral Pathology. In 1932 with Dr. Henry Arthur Bartels, a Columbia man, he wrote a Laboratory Manual of Oral Pathology; in 1941 his Pathology of the Oral Cavity appeared. To date, Cahn's faculty affiliation at the School of Dental and Oral Surgery is probably the longest of anyone's. He was president of the American Board of Oral Pathology, American Academy of Oral Pathology, New York Institute of Clinical Oral Pathology, and Chancellor of the International Academy of Oral Pathology.

1939 was a good year for periodontics at Columbia. Dr. Harold Judson Leonard played a key role in the formation of the American Board of Periodontology and the Advisory Board for Dental Specialties. He was the Board's first secretary-treasurer (with Dr. Arthur Merritt serving as its first president). Isador Hirschfeld's classic book The Toothbrush: Its Use and Abuse was published that year. Hirshfeld, who was graduated from the New York College of Dentistry in 1902, was one of the first dentists to limit his practice to periodontics. He was founder and chief of the first periodontics clinic in a United States hospital at the New York Nose, Throat, and Lung Hospital from 1915 to 1925. He started, and was head, of the Department of Periodontics at Columbia in 1928. He also served as president of the American Academy of Periodontology and was a founder of the New York Institute of Clinical Oral Pathology.

It was during the 1930's and 40's that Theodor Rosebury helped characterize the microbiological flora associated with dental caries and periodontal disease. He'd arrived at Columbia fresh from the University of Pennsylvania School of Dental Medicine in 1928. Dr. Rosebury was fortunate to belong to the same department as the world renowned microbiologist, Hans Zinsser, author of Rats, Lice, and History. Rosebury remained at the School of Dental and Oral Surgery until 1951 when he was appointed Chairman of the Bacteriology Department at Washington University in St. Louis. After retiring in 1966 Rosebury devoted himself, as did Zinsser, to popularizing microbiological literature. His best works were Microbes and Morals: the Strange Story of Venereal Disease and Life On Man. The latter earned him a special commendation in the 1971 National Book Awards.

Ewing Cleveland McBeath graduated from the College of Dentistry of the University of Minnesota in 1910. For five years thereafter he practiced dentistry devoting special attention to dentistry for children. In 1921 he obtained an MD from his alma mater and in 1923 began the practice of pedodontics. He came to Columbia in 1929 to organize what was one of the first pedodontic teaching activities with
full departmental status. In research McBeath stressed the importance of pre- and post-natal dietary regulation. With Theodor F. Zucker he was able to show the effect of diet on the development of dental caries. He stimulated the creative efforts of Dr. Solomon Nathan Rosenstein who in 1951 began at Columbia, the first university level training program in the world directed toward patients afflicted by cerebral palsy.

THE SCHOOL DURING WORLD WAR II.

From the time of Rowe's murder until the end of World War II, the dental school was the responsibility of Dr. Houghton Holliday, the Associate Dean (Fig. 10) Columbia was not immune to the stresses of world war during the 40's, and in 1942 adopted an accelerated three year program to meet the nation's needs. The Kellogg Foundation provided a special scholarship and loan fund of over $10,000 for students who had previously been dependent on summer income to pay tuition. The following Columbia dental school graduates lost their lives in the conflict: Julius Epstein, '34; Abram Bernard Granetz, '39; Morton Coleman Weinrib, '40; Paul Kamen, '41; Newton H. Mason, '43; and Lester Katz, '46.

Dr. Houghton Holliday

Since many of the school's graduates and faculty served in the armed forces during this period, the instruction of students and the administration of the dental school was hampered. Dialogue between Associate Dean Holliday and departmental heads broke down and Dean Rappleye devoted most of his attention to the medical school. According to Rappleye, the dental school was operating at a $200,000 yearly deficit. The cost of educating a dental student at Columbia was higher than anywhere else in the nation. After much argument and against the strong protests of the majority of the dental faculty, the Trustees decided to integrate the School of Dental and Oral Surgery into the Faculty of Medicine effective February 5, 1945. Consequently, the Council on Dental Education of the American Dental Association withdrew its accreditation of Columbia until 1951. Eventually the Faculty of Dental and Oral Surgery was reconstituted on July 1, 1959. However, the net result was that the dental school was neatly stripped by the medical school of many major financial supporters. This was to lead to a crisis in the 1960's resulting from antiquated clinical facilities, and it caused the resignation of some dental faculty.

THE POST-WAR YEARS.

Dr. Bion R. East became Associate Dean in 1945. He received his DDS in 1908 from the College of Dental Surgery of the University of Michigan. Dr. East had been an Assistant Professor at the DeLamar Institute of Public Health of Columbia University since 1940. His views that dental education should be integrated with medical education were similar to the views of the Trustees, and Dr. East was in-
instrumental in getting the Trustees to grant funds for two-year fellowships in the basic sciences to develop superior dental teachers and researchers. In addition, he expanded a program of post-graduate studies under the direction of Dr. Daniel E. Ziskin. Dr. East’s stay at the School of Dental and Oral Surgery was relatively short-lived and he resigned October 1, 1948 to become the Assistant Medical Director in Dentistry in the Veterans Administration.

Dr. Daniel E. Ziskin came to Columbia from Minnesota in 1931. Ziskin did prolific research into the effects of metabolic and hormonal disturbances on dental development and periodontal integrity. He was able to show that there is no greater incidence of caries among pregnant women in a given region and he dispelled the notion of “a tooth for every child.” Dr. Ziskin followed Charles F. Bodecker as supervisor of the research work carried on by the school. Dr. Edward Zegarelli described the results of his early groundwork:

As a result of Dr. Ziskin’s efforts, the status of oral diagnosis as a dental school discipline took on a drastic transformation — from that of a simple exercise in tooth charting procedures to that of a broadened, scientific course charged with the responsibility of bridging the gap between medicine and dentistry. Utilization of the benefits derived from a greater knowledge of oral-systemic disease relationships for the improvement of public health became a prime objective. Oral diagnosis now took on an increased meaning and with it the obligations of dentistry widened. No longer could dentistry remain self-satisfied with its impressive technical advances. If dentistry were to adequately fulfill its obligations to the public it must assume responsibility for total mouth health. It became obvious that greater emphasis on the sciences and medicine were essential.

These meaningful words echo the observations of William Hunter and William J. Gies. It is this enduring vigilance of purpose which has helped Columbia University be a leader among dental schools and brings home its motto Primus Inter Pares (First Among Equals), and which characterizes the administration of the current Dean, Dr. Edward V. Zegarelli. (Fig. 11)

1945 was the year that Dr. Carl R. Oman replaced Dr. Leroy Leo Hartman as head of Operative Dentistry. Both engaged in research to reduce the pain associated with operative dentistry and thus lessen the need for local anesthesia. The former attempted to do this by exchanging conventional rotary cutting methods for those of ultrasonics; the latter via “Hartman’s Solution” which was applied directly to the area of cavity preparation. Unfortunately neither means proved effective.

From 1948 to 1949 Dr. Maurice J. Hickey served as Acting Associate Dean and from 1949 to 1956 as Associate Dean. He was graduated from the Harvard School of Dental Medicine in 1932 and
from the College of Physicians and Surgeons of Columbia University in 1937. He joined the Oral Surgery department at Columbia a year later. During World War II Dr. Hickey was Director of the Dental Service of the 2nd General Hospital of the U.S. Army. He was a Professor of Oral Surgery at Columbia from 1945 to 1948, with his major interest maxillofacial surgery. In 1949 Dr. Hickey became president of the American Society of Maxillo-Facial Surgeons. In 1956 he left Columbia to become Dean of the University of Washington School of Dentistry. During Dr. Hickey's tenure, President Eisenhower visited Columbia to celebrate the 1949 Dean's Day Ceremony. (Fig. 12)

Fig. 12. President Eisenhower addressing the faculty at the 1949 Dean's Day ceremony. Dean Hickey is at his right.

COLUMBIA LED IN RESEARCH IN DENTAL HISTORY.

In 1948 Dr. L. Laszlo Schwartz successfully set up the Section of Clinical Oral Physiology, and its TMJ Clinic gained worldwide recognition. In the 50's and early 60's Columbia was propelled to the forefront of dental historical research through the efforts of Dr. Schwartz and Dr. Curt Proskauer. Dr. Schwartz fostered a deep admiration for the history of his profession and wrote extensively on the subject. He succeeded Dr. Arthur H. Merritt as President of the American Academy of the History of Dentistry in 1953.

From 1951 to 1965 Dr. Curt Proskauer (Fig. 13) was Curator of the school's Charles Henry Land Museum. Dr. Land, noted for his exquisite porcelain work, was the grandfather of Charles A. Lindbergh. The museum had been named in honor of Dr. Land when Lindbergh gave his grandfather's valuable memorabilia to the School of Dental and Oral Surgery. In 1954, Lindbergh donated to the museum the
Pulitzer Prize money he had won for his autobiography, *The Spirit of St. Louis*. Proskauer was a super sleuth when it came to solving dental or medical historical enigmas. His best piece of detective work was his interpretation, in 1956, of a newly discovered fourth century fresco in a Roman catacomb as the first pictorial representation of human dissection. He received the Commander’s Cross of the Order of Merit from the Federal Republic of Germany in 1968. Sadly, the illness of Dr. Proskauer saw the museum being neglected, and it was finally disbanded in 1963 with its extensive collections being donated to the Smithsonian Institution. However, Dr. Proskauer’s superlative work in dental history survivies in his classic works: *Pictorial History of Dentistry* and *Iconographia Odontologica*.

The leadership that Columbia University has shown in the past and continues to show can best be exemplified by one of its outstanding graduates, Dr. Percy Toumaine Phillips who received his degree in 1919. He served in 1937 as president of the First District Dental Society of New York, Speaker of the House of Delegates of the American Dental Association in 1948, and President of the ADA in 1959. His achievements were recognized when he received the ADA’s highest award, the Distinguished Service Medal, in 1976.

**APPENDIX I**

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<thead>
<tr>
<th>Date</th>
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<tr>
<td>1879</td>
<td>New York Dental School</td>
<td>Dr. John Howard Reed, Founder</td>
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<td>New York College of Dental &amp; Oral Surgery</td>
<td>Dr. William Carr, Founder &amp; Dean</td>
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<td>College of Dental &amp; Oral Surgery of New York</td>
<td>Dr. William Carr, Founder &amp; Dean</td>
</tr>
<tr>
<td>1913</td>
<td>Moved to 35 Street</td>
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<td>Sept. 27, 1916</td>
<td>Dental School of Columbia University</td>
<td>Dr. Henry S. Dunning, Chairman of Founding Committee</td>
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<tr>
<td>April, 1917</td>
<td>New York Post-Graduate School of Dentistry</td>
<td>Dr. Henry W. Gillett, Dean</td>
</tr>
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<td>July 1, 1923</td>
<td>Columbia University School of Dental &amp; Oral Surgery</td>
<td>Dr. Frank T. Van Woert, Director</td>
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<td>1928</td>
<td>Columbia University School of Dental &amp; Oral Surgery</td>
<td>Columbia-Presbyterian Medical Center</td>
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APPENDIX II

The Administrations of the Columbia University School of Dental and Oral Surgery
1923 to Present

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<thead>
<tr>
<th>Year</th>
<th>Position</th>
<th>Name</th>
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<tr>
<td>1923-1926</td>
<td>Director</td>
<td>Frank Thorn Van Woert</td>
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<td>1926-1927</td>
<td>Acting Director</td>
<td>Leuman Maurice Waugh</td>
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<tr>
<td>1927-1933</td>
<td>Dean</td>
<td>Alfred Owre</td>
</tr>
<tr>
<td>1933-1934</td>
<td>Associate Dean</td>
<td>Leuman Maurice Waugh</td>
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<tr>
<td>1934-1935</td>
<td>Acting Dean</td>
<td>Willard Cole Rappleye</td>
</tr>
<tr>
<td>1935-1936</td>
<td>Associate Dean</td>
<td>Arthur Taylor Rowe</td>
</tr>
<tr>
<td>1936-1945</td>
<td>Dean</td>
<td>Willard Cole Rappleye</td>
</tr>
<tr>
<td>1945-1948</td>
<td>Associate Dean</td>
<td>Bion Rose East</td>
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<tr>
<td>1948-1949</td>
<td>Dean</td>
<td>Willard Cole Rappleye</td>
</tr>
<tr>
<td>1949-1956</td>
<td>Acting Associate Dean</td>
<td>Maurice John Hickey</td>
</tr>
<tr>
<td>1956-1958</td>
<td>Associate Dean</td>
<td>Willard Cole Rappleye</td>
</tr>
<tr>
<td>1958-1959</td>
<td>Dean</td>
<td>Gilbert Percival Smith</td>
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<td>1959-1968</td>
<td>Acting Dean</td>
<td>Hiram Houston Merritt</td>
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<td>1968-1973</td>
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<td>Gilbert Percival Smith</td>
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<td>1973-Present</td>
<td>Dean</td>
<td>Melvin Lionel Moss</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Edward Victor Zegarelli</td>
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</table>

REFERENCES

ADDITIONAL BIBLIOGRAPHY


The author wishes to thank Ms. Angela I. LaValle who prepared the illustrations accompanying the article, and the Columbiana Collection for photographs which appear therein, as well as the School of Dental and Oral Surgery of Columbia University for some of the photographs.

(This paper was the winner of the Third Prize in the 1977 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. Dr. Kurtz, who was then a student at Columbia, is currently practicing dentistry in California. His address is 8900 Topanga Canyon Blvd., #238, Canoga Park, CA 91304. Requests for reprints should be made directly to the author.)

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The science of embryology arose from anatomy when the early observers not only wished to study the structures of the body, but began asking where these structures came from and why they developed as they did. Since there could be no direct observation of early development, this area initially lent itself to conjecture, with theories of embryogenesis dependent on the whim of the originator. Gradually, a more scientific approach was used when the proper techniques became available. An opportunity to study this evolution is afforded by a look at the early investigations of tooth formation.

Hippocrates (460 B.C.-377 B.C.), the Father of Medicine, wrote very little on the development of teeth. All his observations were without benefit of dissection, which started in the third century B.C. Hippocrates recognized the two sets of teeth and believed the first set to be formed at first by the nourishment of the fetus in the womb and, after birth, by the mother's milk. From this came the term "milk teeth." The second set, he said, were formed by food and drink, and that these teeth appeared between the ages of seven and fourteen. Hippocrates also noted the late eruption of the "wisdom" teeth.

Aurelius Cornelius Celsus (30 B.C.-50 A.D.), the medical encyclopedist, gave a possible mechanism of formation of the permanent teeth. He said the root of a deciduous tooth produces in children a new tooth, which usually pushes out the first. However, the new tooth may appear either above or below the first tooth. The idea that the permanent tooth grew from the deciduous root would prove to be a popular one, but it obviously does not explain the origin of the deciduous tooth.

Claudius Galen (c.129 A.D.-199 A.D.) was a physician and medical writer who carefully and attentively dissected animals. He believed the mandible was formed by the union of two bones. By the process of elimination, he decided teeth were bones due to their hardness. He also misinterpreted extrusion of teeth to mean that teeth continually grew, a concept which would be repeated by many. An early fifteenth century French surgeon, Valescus, agreed with Galen that teeth were bones, but held that teeth are formed after birth, while bones are formed before birth. In a philosophical vein, he further differentiates bone and teeth: bones are produced from sperm and menstrual blood, while teeth are produced from blood in which remains the virtue of the sperm.

The Flemish anatomist and physician Andreas Vesalius (1514-1564) assembled his famous De humani corporis fabrica libra septum ("Seven books on the structure of the human body") in 1543. It was a landmark in anatomy which replaced Galen's work. However, he paid little attention to teeth. He thought the deciduous teeth were imperfect,
soft, and attached to their roots weakly and temporarily. This followed from his observation of the shedding of the deciduous teeth, which usually involved only the crowns. This led him to adopt Celsus' idea that the permanent teeth arose from the deciduous roots. He postulated that the root lost its temporary crown and gained a permanent crown, with the root in the socket being the only stable element.

BEGINNINGS OF TRUE EMBRYOLOGY: FALLOPIUS AND EUSTACHIUS.

The biggest advances in dental embryology occurred in the sixteenth century with two contemporary Italian anatomists: Gabriele Fallopius (1523-1562), and Bartolomeo Eustachius (1524-1574). Fallopius was a student of Vesalius and in 1562 published Observationes anatomicae. He believed the teeth were generated twice, or in two sets: first, in the uterus after the formation of the jaws, and second, after birth before the seventh year. The first teeth are without roots at birth, completely enclosed in their alveoli. These teeth are formed from two substances. One is osseous and hollow, which the tooth must break through to erupt. The other is soft and "humid" resembling coagulated blood and mucus, and is covered by a thin pellicle. This soft mass hardens and ossifies to form the root after birth. Fallopius likened this to the formation of the feathers of birds: that part of the feather coming out of the skin is hard and corneous, while that part embedded in the skin is soft and humid. This analogy between feathers and teeth was important, because it illustrates Fallopius' understanding of development; both feathers and teeth start to form as epidermal proliferations into the dermis, surrounding a dermal papilla.

Fallopius expounded on the formation of the permanent teeth in greater detail, and introduced the concept of a follicle. A membranous follicle is formed inside the bone with two apices: one toward the crest of the bony ridge, terminating in a filament, and the other into the deeper tissues, joining a small nerve, artery, and vein. The filament extends to the gingiva through a narrow aperture in the bone, near the tooth to be replaced. Inside the follicle is formed a "special white and tenacious substance" which develops into a tooth. It ossifies first nearest the surface and eventually progresses deeper. The tooth finally erupts by following the aperture made by the filament and widening it until the tooth is exposed in the oral cavity.

This description was relatively sophisticated for its time, when compared to what we now know of odontogenesis. It should be noted that although Fallopius did not explicitly consider teeth as bones, he uses the term "ossification" to describe the process whereby the teeth are formed from the soft and humid substance.

Eustachius, in contrast to Fallopius, was especially interested in teeth. His work De dentibus libellum ("Book on the teeth") was published in 1563 and is considered to be the first treatise on dental anatomy. He dissected jaws from stillborn and aborted fetuses as well as cadavers of many ages. He agreed with Hippocrates that teeth are formed in utero, and described developing teeth as "partly mucous and partly osseous." From his dissections, he found that below the deciduous incisors and canines was a thin plate of bone, and below this was an equal number of incisors and canines which he described as
“almost mucous” and much smaller, representing the permanent set of teeth. He did not find the tooth germs of the permanent molars — nor did Fallopius — but Eustachius believed they were there, simply too small to be seen. He thus held that all teeth formed in utero, while Fallopius said that teeth form partly before birth and partly after birth. As often happens, the same observation yields different conclusions.

Contrary to the popular idea, Eustachius did not believe a permanent tooth formed from the root of a deciduous tooth, because the second tooth, as demonstrated by dissection, is present before the deciduous tooth is lost. On this fact he disagreed with Vesalius, and since they were adversaries, Eustachius included in his writings a comment denouncing Vesalius for his careless study of anatomy.

OTHER ANATOMISTS TAKE UP THE STUDY.

A German student of Fallopius and Eustachius named Volcherus Coiter (1534-1600) was particularly involved with studying the development of bone. He said teeth were not bones because they do not go through a cartilaginous stage; rather, they are derived from a mucous substance. What was once thought to be an ossification process was in reality something else.

Up until this time, the anatomists relied on gross dissection in formulating their explanations of development. In the seventeenth century, the work of three men opened the way to the refinement of the science of embryology through their association with the microscope: the Italian anatomist Marcello Malpighi (1628-1694), the Dutch anatomist Frederic Ruysch (1638-1731), and the Dutch microscopist Anton van Leeuwenhoek (1632-1723). Though these men never did work in embryology per se, their basic techniques offered anatomists the opportunity to study the necessary minute structures of early embryo formation. From this point on, less conjecture and more substantial facts were employed in order to unfold the laws of development.

This is evident in the work of Joseph Guichard Duverney (1648-1730), a French anatomist whose Memoire sur les dents (“Treatise on teeth”) appeared in 1689. He described the tooth primordium (which he called a “nucleus”) as a soft, viscous mass enclosed in an alveolus. This nucleus was surrounded by a membrane which Duverney called a choroid membrane because of its resemblance to the corresponding fetal membrane. This contained blood vessels and nerves which maintained the vitality of the teeth. Duverney believed the membrane remained after eruption to become the periodontal ligament. A gelatinous juice was produced by the nucleus which, he thought, thickened in layers to form the enamel and eventually the rest of the tooth. This was the first alternate explanation of the formation of the hard substance of the teeth since Volcherus Coiter stated that teeth were not bones. Duverney also found an important analogy, as Fallopius did, between teeth and birth feathers, as well as elephant tusks and mammalian hair.

Even with the advent of the microscope, there were still some expressions of opinion being made on scientific matters. For example, an obscure Dutch anatomist named Gottfried Bidloo was of the belief that air hardened teeth after eruption. With this unfounded statement he has ensured his own obscurity.
FAUCHARD'S WRITINGS ON TOOTH-FORMATION.

In 1728, the first comprehensive book was published on the state of the art and science of dentistry: *Le Chirurgien Dentiste* ("The Surgeon-Dentist") by Pierre Fauchard (1678-1761). Though extensive, there is little original embryological work. Fauchard's account of the development of teeth is basically a repetition of the work of Urbain Hemard in his *Recherche de la vraie anatomie des dents* ("Research of the true anatomy of the teeth"), published in 1582. This work was the first dental monograph published in France. Fauchard used this book because he presumably paid little attention to the Italian anatomists. Ironically, Hemard copied, sometimes verbatim, from Eustachius.

One of the interesting aspects in *Le Chirurgien Dentiste* was Fauchard's original observations on what we know to be root resorption. By simply extracting a deciduous tooth before it was to be shed, he dispelled once and for all the idea that there was only one root with first a deciduous crown and later a permanent crown. A root was clearly present. Fauchard decided the deciduous root was worn away before the tooth was shed, but he never offered an explanation. He did not think the deciduous tooth was worn away by the action of the succeeding tooth and the particles consumed by the friction involved, or even that the particles were carried away by the saliva. He concluded that Nature uses "other means more applicable and more likely." Fauchard also agreed with Duverney that the enamel formed in layers as the product of a hardened gelatinous juice. The remainder of the odontogenic theories are derived from Eustachius via Hemard.

OTHER EIGHTEENTH CENTURY THEORISTS.

After Fauchard came two outstanding Frenchmen who, rather than compile and repeat previous notions on tooth formation, published their own personal researches and experiences. The first was Robert Bunon, a dentist, traveler, and devourer of texts, who published two books: *Essais sur les maladies des dents* ("Essays on the diseases of the teeth") in 1743 and *Experiences and demonstrations* three years later. The main topic of interest here was the exact positions of both sets of teeth with respect to each other and the jaws. The second man was Anselme Louis Bernard Jourdain (1734-1816), a theorist and general surgeon of oral disease, who wrote *Essais sur la formation des dents* ("Essays on the formation of the teeth"), published in 1766. He described with great accuracy the dental follicle from its first appearance to the moment of birth. With men like Bunon and Jourdain, the fallacies of science due to opinion and repetition of opinion were gradually disappearing.

However, absurdity appeared again in 1771. In that year, a work was published by Pierre Auzebi entitled *Memoire d'odontologie* ("Treatise of odontology") which was purported to be a new system of the origin and formation of the teeth. It was a step backward. For Auzebi, teeth were bones and bones were folded membranes. He could not accept the theory of tooth germs, because he said the forming teeth were all in identical conditions of heat and moisture and therefore should all develop at the same time, like grains of corn in a field. He believed teeth were derived from lymph, which he considered the fundamental substance for all hard tissues. A drop of lymph gathers in the
bottom of a hollow in the bone and hardens. More lymph collects and
causes the tooth to grow, surrounding the nearby blood vessels on its
way to eruption in order to gain vitality. Auzebi even resurrected the
idea that deciduous teeth had no roots of their own.

JOHN HUNTER’S MONUMENTAL WORK.

Fortunately, another work was published in 1771 whose impor-
tance far outweighed Auzebi’s trivial text. It was Natural history of the
human teeth by the Scottish-born surgeon John Hunter (1728-1793).
Hunter’s writings on practical dental treatment are inferior to those on
anatomy and physiology, the latter two being recognized as his greatest
contributions. He realized there was an important link between science
and the art of dentistry. Like Bunon and Jourdain, he used his own
personal research as the basis for his work, which included many new
ideas. He said there were distinct germs for the enamel and the dentin.
He stated the deciduous teeth are not shed by the mechanical action of
a second tooth but, like Pierre Fauchard, did not offer an alternate ex-
planation; he only intimated some organizing law of Nature. Hunter
also realized that teeth did not grow continually, saying that if a tooth
was opposed by another tooth, both were stable; if the antagonist was
lacking, the tooth was pushed out by the alveolus tending to fill up.

Hunter’s work, which may be considered indicative of the state of
the art in the late eighteenth century, sets the stage for the explosion of
knowledge in the nineteenth century. It is with Hunter that the
previous two thousand years of the study of tooth development rests.
In only eighty-two years, Albert von Kolliker’s manual of microscopic
anatomy would be published in Germany with an account of odon-
togenesis basically as we know it today.

In applying the knowledge of dental embryology and its history to
dentistry, we can take direction from Fauchard, who writes in Chapter
III of Le Chirurgien Dentiste: “The origin and formation of the teeth
are the work of nature alone. Their preservation depends as a rule
upon the help afforded by art.”

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MR. DONAHUE is a senior dental student at the School of Dentistry, State
University of New York at Buffalo. This paper was the winner of the Second
Prize in the 1977 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. Donahue’s address is 394 Grover
Cleveland Hwy., Buffalo, N.Y. 14226. Requests for reprints should be made
directly to the author.
Oddments in Dental History:
The "Very Simple" Lip Retractor
of Dr. C. Edmund Kells.

MALVIN E. RING, D.D.S., M.L.S.
Batavia, New York

This marks the hundredth anniversary of the entrance into the profession of dentistry of one of its most illustrious members, C. Edmund Kells.

Of all the benefactors of mankind through the agency of dentistry, one of the most outstanding was Dr. Kells. A man of great curiosity and an insatiable desire for learning, Kells heard of Roentgen's finding of the X-ray soon after its discovery in 1895. He immediately cabled Europe and ordered equipment in order to build his own X-ray machine. He was thus the first in the world to take a dental radiograph. In July, 1896, only eight months after the X-ray was discovered, he gave the first dental X-ray clinic ever presented, in North Carolina. And Kells had to transport his own equipment from Louisiana for the occasion, since not another X-ray machine existed in the entire state of North Carolina.

Kells was graduated from the New York College of Dentistry in 1878 and joined his father's practice in New Orleans. He soon proved himself an outstanding dental operator and his fame quickly spread through the South. But skill in dentistry was only one aspect of Kell's makeup. He was also a great innovator, unafraid to try new ideas. Thus he created a stir when he became the first dentist in the nation to hire a young woman as a dental assistant. His dental office in New Orleans was the first in the country to be connected electrically to a central power station. Not only did Kells wire the entire office himself, but he built the first dental engine to be run by electrical current from a power station instead of from a battery. He also pioneered in the use of compressed air in the dental office, harnessing it to perform a variety of tasks.

Kells had a genius for invention, with over thirty patents issued to him. Many of these are for products outside the health fields, such as the electro-magnetic automobile clutch; an automobile jack; a sanitary drinking fountain; an automobile self-starter; a fire extinguisher; and one of the most significant — the safety brake for the passenger elevator which is still the one used today.

Kells lent his genius to inventing for the medical profession as well, and to his credit are a trochar used in surgery today; a special surgical cleansing apparatus and various syringes. For dentistry he devised an adjustable bracket table; a mechanical chair elevator and numerous hand instruments. The first patent was issued to him in 1880, the last in 1922. But the issuance of that last patent didn't mark an end to his inventive drive.

He was anxious to devise a method to better expose the operative field so that the dentist didn't have to use one of his hands to hold
back the lip and cheek. And so in Volume 65, Number 1 of the *Dental Cosmos* for 1923 he describes, in these words, his frustration with the apparatus he had purchased for this purpose:

It goes without saying that the more clearly one's operative field is laid to view, the better it is for the operator, and, incidentally, for the patient as well. Whatever facilitates an operation, tends toward better and more rapid work.

To procure this accessible operative field in the upper jaw, the well known head band was introduced some years ago. (Fig. 1)

One of these head bands was immediately procured at that time, as it looked very good, but as far as I was concerned, I soon discovered that its "looks" *in the catalog* were the best part of it, as I never have been able to use it.

The objections to it are that it is harsh, unyielding and uncomfortable. These are, of course, personal objections, as assume the apparatus is used by others, but that fact does not help me. I just can not use it, and it lies in the drawer as good as new, and I wonder if there are not many like me who would like to use it but can not.

The objections to this apparatus being so plainly to be seen, it was but natural to attempt to make something that would carry out its intentions and yet not have its bad faults, and this was a very easy thing to do.

So he set about devising his own contraption, using for his head band "... soft grosgrain belting, fitted with tapes by which it is tied on the head ... A lot of ordinary dress hooks are sewed on ... criss-cross tapes are sewed on, which are taped lightly over the head when the band is in place, and these prevent the band from being pulled down and out of place when the retractors are hooked onto it." Then he went on to describe its use more fully:

Now then, the head band and the retractor are ready. To use them, first place the head band in position, well on the forehead and tie tightly, around the back of the head. Next, tie the stay tapes lightly together. Then select a suitable retractor; dry the lip, place a small fold of gauze in the bend of the retractor, place in position, draw it up so that the field is well exposed, and then slip
on one or more rubber bands to that hook on the head band, which is so placed as to produce the traction in the direction desired. Rubber bands of various sizes must be at hand in order to produce the desired amount of pull.

Orthodontists' ordinary bands, and others of the same thickness but longer, are used. Usually two or more bands are placed upon the same retractor. That is one of the features of this appliance, as many bands as are needed to produce the desired traction, must be used.

Now here is the advantage of this appliance. The rubber bands being flexible, there is a certain amount of play to the retractors, which is necessary. In the retractor shown in Fig. 1, everything is rigid (except the lip) and it is this rigidity and the general clumsiness of the outfit that render it so unsatisfactory to me.

Kells then goes on to ask: "If a retractor is advisable for the upper lip, why is one not equally advisable for the lower lip?" So, with his brilliance, he set out to correct this sad defect in our armamentarium and "... a sand bag — a simple sand bag — solves the problem. This is so very simple... A slip-on cover is used over the sand bag and it is to this cover that tapes, for tying around the neck, and the anchor hooks are attached."

And thus when Dr. Kells commenced his dental treatment, his trussed-up patient looked like this (Fig. 2), for the photograph is Dr. Kell's own. I wonder why this "very simple method," as Dr. Kells characterized it, never caught on with his fellow practitioners!
TRICKS OR TWINS?

An intriguing item has been purchased by the Edward G. Miner Library of the School of Medicine and Dentistry of the University of Rochester, Rochester, N.Y. It is a carte-de-visite, about 3x5 in size, of a patient in a dental chair and what appear to be twin dentists ministering to him. Each holds something in his hand — the one on the right a beaker, and the one on the left what appears to be a hand instrument (an extraction key?). The chair is Archer's improved dental chair No. 2 from the 1860's. However, it was sold well into the 1870's. A notation on the reverse of the card states that it was photographed by "N. O. Morgan, Photo Artist, 166 Main Street, Norwich, Conn., Next to the Post Office." Perhaps some of our Connecticut members will be able to fill in some information as to the identity of these dentists, if twins they truly were, rather than the object of some trick photography. This fascinating bit of old dentistry was made available to us through the courtesy of Mr. Philip Weimerskirch, History of Medicine librarian at the Rochester library.
MORE ON EARLY FRENCH DENTISTS IN AMERICA

Dr. Louis B. Amyot of Schenectady, New York, feels that Dr. Foure' did not go back far enough in establishing who the earliest French dentists to practice in this country were. (French Dentists and Their Contributions to Colonial American Dentistry, Bulletin, Vol. 26, No. 1, April 1978.) Dr. Amyot writes the following and cites J. Ben Robinson's book The Foundations of Professional Dentistry as his source:

The first person in America to practice the art of dentistry in its best manner was a French trained dentist, Sieur Roquet, who came to Boston from Paris in 1749. In a press announcement Roquet stated:

He also cures effectually the most stinking Breaths by drawing out, and eradicating all decayed Teeth and Stumps, and burning the Gums to the Jaw Bone, without the least Pain or Confinement; and putting in their stead, an entire Sett of right African Ivory Teeth, set in a Rose-colour'd Enamel, so nicely fitted to the Jaws, that People of the first Fashion may eat, drink, swear, quarrel, and show their Teeth, without the least Indecency, Inconvenience, or Hesitation whatever. He deals only for ready Money, the Quality and Members of Parliament, but will give reasonable Credit to Citizens, Tradesmen, and Gentlemen of the Inns of the Court.

Reference to teeth set in a base of "Rose colour'd Enamel" suggests the influence of Fauchard’s method of employing the services of a professional enameler in the processing of artificial dentures. It is the first reference to the use of this technique in America, and its use is not recorded again until thirty-five years later.

NEWLY DISCOVERED INFORMATION ABOUT JOSIAH FLAGG

The following interesting communication has been received from Dr. Milton B. Asbell of Cherry Hill, New Jersey. He writes:

The life and career in dentistry of Josiah Flagg has been written by the late B. W. Weinberger in his An Introduction to the History of Dentistry in America (pages 193-207). In this account, Dr. Weinberger notes Flagg's newspaper advertisement dated July 22, 1797 (page 204) and in the next paragraph (page 205) he refers to Flagg's experiences during the War of 1812. There is no indication of his whereabouts from that date until 1812. The following information gives evidence of his presence in Massachusetts in 1798.

The excerpt is taken from "John Seymour & Son, Cabinet-makers" by Mabel M. Swan in The Antique Book, edited by Alice Winchester, Bonanza Books, 1950 (?), page 114:

In Russell's Gazette for June 28, 1798 is found the following advertisement

To be sold at Public Auction at the house of Dr. J.
Flagg next door to Rob't Hallowell, Esq., north side of Port Hill near Oliver's Dock all the Household Furniture viz. Bed Carpets Chairs China Mahogany Dining Pembroke and Card Tables of the workmanship of Mr. Seymour four post & Field Bedsteads Looking Glass 1 pair Stones 38 by 14, plates of a Lapidary cut; 1 hand mirror Mahogany bureau & double key'd Harpsichord with four stops in good order & with improved jacks.

Josiah Flagg

Dr. Asbell questions whether it was possible that Dr. Flagg was selling out because he was preparing to enlist in the military service.

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HISTORICAL COLLECTION AT THE A.D.A. LIBRARY

The Bureau of Library Services of the American Dental Association has within its jurisdiction the Archives of the Association. This collection along with a collection of historical materials which relate to dentistry, but not necessarily to the Association is valuable to historians and writers of many kinds of publications. The Archives collection is available for use in the Bureau with permission of the Director of the Bureau. These materials are not allowed to circulate because of their unique value, but in many cases copies can be provided. A few items are labeled CONFIDENTIAL and are only available for use with the permission of the Secretary of the Council concerned.

The historical collection contains letters, newspaper clippings, pictures, biography files, etc. Many of these materials are the source of information for biographical genealogical searches, for placing a bit of research in perspective, for information in dating old equipment and instruments, and many other miscellaneous uses. This collection too is available for use within the Bureau and may be copied under some conditions.

Finally, the Bureau has a small museum collection of various artifacts which have been given to the Association over the years. The artifacts vary from gifts received at the time of the Centennial, to gifts for the dedication of the building, and gifts given in order to preserve items of Association interest. The latest gift is a collection of dental instruments used by the Parmley brothers in their dental practices in the first half of the 19th century. Some of the hand instruments have wooden handles, some ivory, and some carved mother-of-pearl. Museum items are exhibited within the Archives area of the Bureau, and also in offices throughout the Association so that they can be seen by the maximum number of people. Special exhibits using any of the collections in the Bureau are arranged and displayed in the exhibit cases just within the main door of the Bureau.

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THE NAME'S THE GAME--WITH PUN AND CHIMERA THROUGH THE ADA DIRECTORY

It's called onamastics, and the dictionary defines it as the science or study of the origin and forms of proper names or places. It's been
fascinating people for thousands of years — what is the effect of this trademark that our relatives, our friends or our enemies have given us to identify us from the rest of the world? Can the connotation of a label picked by or wished on some remote ancestor affect our lives and lead us in a foreseeable direction? Physical characteristics can be traced through genetic control; a tall Celtic farmer dubbed Longman by his envious neighbors may have been able to pass on to his present day descendants those genes for long bones and tall stature, but are there any other pressures on one's lineage in its choice of work or inclination to follow an occupation or profession?

It's a fanciful thought, and Richard Armour, in *Family Health*, March, 1971, turned his fancy to the medical profession. A perusal of the AMA Directory turned up surnames of pronounced medical leanings among the doctors listed, e.g.: Dr. Doctor, Dr. Doktor, and Dr. Docter. If our fancy is let loose in the computerized printout that makes up the 1971 American Dental Directory, we can find many a listing where the name's the game. No parallel to Dr. Doctor, but how about Dr. Dent (in 7 states) or perhaps Dr. Pullman (in New York). Going through the list from Topps (W. Va., Wisc.) to Bottoms (down south in N.C. and Fla.) we find a close relationship between the name of a man or woman and some aspect of the profession practiced. There's Crown (N.Y.) and Lipp (Pa., N.Y., Calif.), Bridge and Bridges, Drill, Arch, Ridge and Cheek, Gum and Toothman, Brace and Chart. If we are allowed to make our own combinations (and stretch the point a bit) we have Dr. Cavitt (of Nebr.) and Dr. Tease (of Pa.); The Drs. Root and the Drs. Canal; many Drs. Carey and a couple of Drs. Capps. Inveterate punsters should not mind our including Dr. Plack (of the Public Health Service) and Dr. Palat (N.J.), Dr. Jawor (Ill.) and Dr. Portzline (Ind.). How useful and relevant are all the Drs. Gold and Dr. Alloy (of Pa.).

There is no lack of evidence that the profession has a royal following — we go from Drs. Count (Tex. and Tenn.) through Baron, Duke, Prince and King (over 200 Kings). There is a Caesar in California and even a band of Angels.

From Dr. Aaby of California to Dr. Zyskowsk of Oklahoma, from Dr. Alpher (Md.) to Drs. Ome (California) + Dr. Aga (Minn.), the directory points out the connections. With a tip of our typewriter to Dr. Pun (Calif.) and a Champagne (La.) salute to all the Champions (4 in all) we look forward to the latest edition of the directory for more fun and names.

Adrienne Berenbaum

(Reprinted from the *Health Sciences Library Newsletter*, State University of New York at Buffalo, February-April, 1973-1974, No. 1.)
WANT-ADS: DENTAL MEMORABILIA

WANTED—Turnkeys; hand drills and hand instruments with ivory, bone, ebony or pearl handles for private collection. Will buy or trade. Also old copies of Polk's Dental Register.
Dr. Gary D. Lemen
2650 21st Street
Sacramento, CA 95818
Phone: 916-452-6084

WANTED—Back issues of Dental Cosmos magazine, either full or partial run.
Dr. Jerry J. Herschfeld
2169 Galloway Road
Cornwell Heights, PA 19020

WANTED—old postcards with a dental theme: humorous, Valentine, advertising, historical, etc.
Dr. Malvin E. Ring
216 East Main Street
Batavia, NY 14020

FOR SALE—Ritter electric engine, suspended ball and two pulley sheaves and counterweight, flexible shaft driving No. 7 slip-joint handpiece. Manufactured circa 1906. In operating condition but needs power cable; have red fabric covering the original cable.
Set of approximately 125 tooth-form dies for swaging stainless crowns, swaging anvil and retainer rings, latter two in only fair shape.
Press for drawing seamless crowns from plate. Series of bronze positive and negative dies with screw-drive leverage.
Gysi articulator with extra lower arch.
Fidelity electric lathe with speed control by moving external yoke which carries the brushes.
Dr. N. Landon Ray
1486 Avenue H, N.E.
Winter Haven, FL 33880
WHAT WOULD TODAY'S
"WOMEN'S LIBBERS" MAKE OF THIS?

OUR BEARING TOWARD LADY PATIENTS.

Dr. C. N. Johnson, Chicago.

In these latter days, when the blessed privileges of the "new
woman" are being heralded as indicative of the coming emancipation of
the sex, when woman is pushing her way into various walks of life
which heretofore have not been considered available to her, I fear there
is growing up on the part of the men a tendency to fall away from the
courtly bearing and gracious gallantry toward women which to me
marks the highest and most appropriate phase of manly demeanor in the
relationship of the two sexes. I am a believer in that dignified condescen-
sion which makes a man intuitively doff his hat in the presence of a
woman, and I am not even beyond admiring a man who refuses to sit
while a woman stands. I am willing to accord to a woman every privilege
that belongs to a man — except one — the privilege of standing in a
public conveyance while men are sitting. I am willing to grant her equal
rights with man — and one more — the right to be protected. You, young
men as you go out into the world and meet your lady patients day after
day, may do something toward the revival of that delightful spirit of
chivalry which ennobles and elevates the man who grants it no less than
it inspires and pleases the woman who receives it. Treat your lady
patients with the utmost respect and consideration. Do not forget for
one moment the reverence that is due every woman, because she is a
woman. Train your hand and brain to do her work with the least possi-
ble suffering, for woman is called on to suffer enough, let her pathway
in life be made as easy as it may. Your success in practice will depend
largely on your ability to understand and please your lady patrons, and
while I may warn you now that you need never hope fully to understand
a woman, yet there are many ways in which you may please her, and the
surest way is to invariably show her kindness and respect. Do not be
above receiving counsel from women as to the conduct of your affairs. I
am free to acknowledge that some of the best advice I have ever received
has been given me by women, and I know of no surer safeguard over a
young man's conduct and practice in starting out in life than the interest
and admonition of a pure and loyal woman. May it be the good fortune
of each of you to be made the recipient of some good woman's con-
fidence, and may you follow this as your guiding star to success.

(Reprinted from Welch's Monthly, Vol. 1, No. 1, August 1896.)
Frederick S. McKay and the "Colorado Brown Stain."

— JERRY J. HERSCHFELD, D.D.S.
Cornwell Heights, PA

In 1901, while stationed in Naples, Italy, Dr. J. M. Eager, a surgeon in the U.S. Public Health Service, described a condition in the teeth of emigrants embarking at Naples for the United States. It was to become the first accurate account in the scientific literature of the unusual enamel defect known as mottled enamel.

On the examination of certain Italian emigrants embarking at this port, one is struck with the frequency of a dental peculiarity common among the inhabitants of the Italian littoral and known as *Denti di Chiaie* or "Chiaie teeth." This defect was first described by Prof. Stefano Chiaie. The etiology seems to be connected with volcanic fumes or the emanation of subterranean fires, either fouling the atmosphere or forming a solution in drinking water. In Naples it is more often attributed to water than to the air and since the Serino water brought in conduits from a distant mountain height has been in use and local wells condemned, the incidence of the disease among infants has greatly diminished.

The condition of which Eager wrote was by no means new. In North Africa it was called "darmous;" in Iceland, "gaddur;" in England, "tooth-marks;" in Argentina, "dientes veteados." In the United States it became known as "Colorado brown-stain" or "Texas stain" as well as mottled enamel, dental erosion or dental atrophy, long before any attempt was made to discover its causes or subsequent cure.

In that same year, 1901, Dr. Frederick S. McKay had come to live in Colorado Springs, Colorado. A graduate of the University of Pennsylvania Dental School the previous year, young McKay soon noticed that many of his patients showed signs of permanently stained teeth. He attempted to contact other dentists in the Rocky Mountain region hoping to shed some light on the extent of this "brown stain." Unfortunately he met with a marked lack of interest. In 1905, McKay moved to St. Louis where he practiced orthodontics, but ill health necessitated his returning to Colorado three years later. Upon his arrival he renewed his interest in the stain problem more forcefully, for while in St. Louis, McKay had not encountered even one case resembling this "brown stain."

At the May, 1908, meeting of the Colorado State Dental Association, McKay brought the question of the "Colorado stain" before his peers. He succeeded in arousing the interest of dentists from all over the state. McKay next decided to engage the help of one of America's foremost authorities on dental enamel, Dr. Greene Vardiman Black, dean of the Northwestern University Dental School in Chicago. It was
his hope that Black might provide the necessary insight needed to help the investigation. Dr. Black agreed to come to Colorado and study the stain. Specimen teeth from the Colorado Springs area were provided. Black and McKay conducted tours throughout many of the areas around Colorado Springs. They accumulated statistical data detailing the prevalence of the lesion. In one study of 2945 children, it was discovered that 87.5% had mottled teeth. Dr. Black addressed the 1909 Colorado State Dental Association meeting with their findings, but he was met with minimal enthusiasm. Only McKay's investigative interest persisted. He continued his research believing that a mysterious "trace" element in the water might be the cause. He had numerous chemical analyses of the water performed with no conclusive results. After countless frustrations and disappointments, McKay decided that it was time to publish the data available. In the February, 1916, issue of *Dental Cosmos* Black and McKay published their joint paper, delineating the histological aspects of mottled teeth as well as the field investigations substantiating them. (The original communication is printed in part below.) Black believed that this dystrophic condition of the enamel was due to defective constituents of growth. He was convinced that the causative factor was present and effective only during the growth and development of the teeth, and therefore the mottling could not develop after the teeth had formed and had erupted. In addition to this, McKay had shown that the distribution of mottling was limited to definite geographic areas, affecting only those born and living in those areas during the years of tooth formation. However, he insisted that there was still the possibility that something undetected in the water might yet be the cause.

In 1917 McKay moved to New York City where he changed his specialty to periodontics. His travels to areas exhibiting similar conditions made his research studies international. In 1925 he persuaded the civil authorities in Oakley, Idaho to change their water supply from deep artesian wells to a new source of surface water, an act which eliminated mottling from that community. McKay continued publishing in various journals and in 1928 one of his articles clearly noted the connection between mottled teeth and decay-resistant teeth. That same year the U.S. Public Health Service sent McKay to Bauxite, Arkansas to help in a study of a mottling problem among the children living there. As a result, subsequent water analyses of Bauxite water by H. V. Churchill in 1931, established that the "trace" element in the water which caused mottled enamel was fluorine. These efforts enabled the U. S. Public Health Service to establish an index that showed the fluorine concentrations responsible for mottling, and consequently the relationship between fluorine, mottling and decay. In 1938, H. Trendley Dean of the U.S. Dental Health Service wrote:

> Probably the first attempt to study specifically the relation of mottled enamel to dental caries was made by McKay who in 1929 attacked the hypothesis that dental decay might be superinduced by "defective" enamel structure, by citing as evidence the observation that mottled enamel teeth, which probably constitute "the most poorly constructed enamel of which there is any record in the literature of dentistry," do not appear to show any greater liability to dental caries than do normally calcified teeth.

Under the sponsorship of the U.S. Public Health Service, studies
were initiated to determine the optimum level of the fluoride content of communal water supplies. It was soon suggested that the addition of fluoride to the water, bringing its level to 1 p.p.m. might provide a novel and effective method of limiting the incidence of dental caries.

The persistent efforts of Dr. McKay had finally brought success. Not only had the mystery of mottled enamel of teeth been solved, but the public health profession was elevated to new heights. Dentistry had made a significant step forward in bringing better dental health to millions of Americans.

MOTTLED TEETH: AN ENDEMIC DEVELOPMENTAL IMPERFECTION OF THE ENAMEL OF THE TEETH HERETOFORE UNKNOWN IN THE LITERATURE OF DENTISTRY

By Greene Vardiman Black and Fredrick S. McKay
(Reprinted from Dental Cosmos, 58:129-56, February, 1916.)

In the years 1906 and 1907 several dentists resident in the Rocky Mountain region told me of a peculiar condition of the teeth in certain areas of their neighborhood, which they said was not found elsewhere, and which had not been described in the literature. This condition they called mottled enamel, or mottled teeth. These men claimed that a very large proportion of those born and reared in these areas had teeth of this character. I requested that some teeth be sent to me for examination, and after a time (1908) I received the crowns of a number of incisors with the astonishing report that the teeth of a very large proportion of the children in the areas mentioned were of the same character.

GENERAL DESCRIPTION

All of the crowns received were of incisors that had been cut away for the purpose of putting on artificial crowns to improve the appearance of the persons. Each of these was of normal tooth form. The lingual surfaces of these teeth were generally an opaque paper-white, but mottled with normal spots and clouded areas. The labial surfaces were in part of an abnormal white color resembling white unglazed paper, but a considerable portion of the surface was mottled with dark brown. Some had black bands running across the labial surfaces; some had dark brown bands bordered with yellow which faded away into a paper-white with normal enamel toward the gingival portion; some of them had enamel of normal color over the immediate incisal edge, but this did not extend to the labial surface. All of the paper-white and discolored portions were opaque, having none of the translucency of normal enamel.

In all of these teeth the usual glaze of the surface of the enamel was complete. That is, Nasmyth’s membrane, which covers the outer ends of the enamel rods, was normal. An exploring tine, the point of which was very hard and sharp, would glide over the surface without catching, the same as it would do over normal enamel.

The greater number of teeth sent for examination had split through the center of the crowns lengthwise, and it was easily seen with a hand lens that the abnormal portion of the enamel was generally confined to the outer third, more or less, of its thickness, in all of the central part of the labial plate. The inner half of the enamel — that next to the dento-enamel junction — seemed more generally to be normal, or nearly so, in all of the teeth. The imperfect enamel thinned away toward the gingival line in some, and in others retained its thickness until it included the whole thickness of the enamel where this thinned away toward the gingival line. The dentin was normal in all of the teeth. It was evident
that this condition of the enamel did not carry with it any deformity of the dentin, and the general form of the teeth was normal.

It became clear to me during this superficial examination that this was a type of dystrophy of the enamel of which nothing had appeared in dental literature. Not only this, but if the statements were correct, it was endemic in type. Heretofore no endemic conditions of the teeth had been known. Further, if the reports that $87\frac{1}{2}$ per cent of the children reared in these areas were afflicted with this endemic condition, the cases were numbered by thousands, and the individual deformities were of a very grave character.

I went into the examination very thoroughly aroused to its impor-
tance, and in 1909 visited a number of susceptible areas and studied the conditions on the ground. On account of the intrinsic importance of the general subject, I will give a brief summary of the dystrophies of the enamel known at this time, at the close of this article.

ESSENTIALS

The essential malformation in this condition is the failure of the cementing substance between the enamel rods in the outer one-fourth to one-third, more or less, of the surface of the enamel. When this exists alone the enamel is dead paper-white. In many of the cases a coloring matter is found in place of the cementing substance between the enamel rods, and on this hinges the great variety of appearances. Some of the teeth are a paper-white that glares and impresses itself as something ab-
normal whenever the person opens his lips, some are brown, some nearly black, some quite black. Every degree conceivable of the co-mingling of color — natural white, paper-white, dark and yellow, is found. This condition is found in from 70 to 100 per cent of the persons born and reared in certain afflicted areas.

As everything we do in the study of this condition of the teeth will have to do with this coloring, had better state here as concisely as possi-
ble what I have found this coloring matter to be, before proceeding

"BROWNIN."

Since I commenced the study of mottled teeth seven years ago I have, as occasion has offered, been studying the coloring matter, which is one of the ugly features of this condition. In this study I have found this same coloring matter, so far as I am able to determine, in most kinds of malformation of the enamel. Especially it is abundant in the contemporaneous accretional deformities, commonly known as atrophy or hypoplasia of the teeth, and in what we call enamel whorls, and various other dystrophies of the enamel of lesser note. It is a dark brown coloring matter that is deposited in much more than half the cases in which the enamel rods are not cemented together with the normal cementing substance.

When I wrote the articles on the "Physical Characters of the Teeth," I noted certain facts regarding the color as it related to the strength (Dental Cosmos 1895, pp. 410 and 411), and from the fact that these tests all gave results that were opposite to and contradicted the general notions of dentists, they made a deep impression upon my mind. The supposition before was that a person with very light teeth would be more susceptible to caries, while a person with dark teeth would be more nearly immune, the idea being that light teeth were soft and that dark teeth were hard. My instrument tests showed exactly the opposite. The dark teeth were less strong than those which were lighter in shade. A tooth from which a slab was cut and which when held up toward the light showed a translu-
and a changing light as it was turned about, could always be depended upon to bear a high crushing stress before it would break.

Recently I have found a brown coloring matter continually in the dark teeth, not only in the dentin, but more prominently in the enamel, which may be removed by solution and the teeth rendered white without appreciable injury to them. The enamel is weaker for the reason that this brown coloring matter takes the space of the normal cementing substance between the enamel rods wherever it occurs, and this coloring matter seems to have no strength. The more of this material there is in the enamel of what we call the normal tooth, the darker will be the color and the weaker the tooth. Where there is so little brown coloring matter in the enamel that it would not be spoken of as abnormal, the teeth are a shade or several shades darker than the whitest teeth. It lends a harmony between the teeth and the general coloring of the features of the brunette type that makes a soft graceful expression of the countenance. This brown coloring matter is normal to the teeth if the amount is not so large as to cause disfiguration.

This material appears regularly in very noticeable amount in about one-half the cases of the various dystrophies of the teeth. The coloration in all of these cases is from the deposit of a brown coloring matter, not only in the normal teeth, but in the abnormal teeth as well. In the enamel whorl, which will be illustrated under the head of dystrophies, we find this coloring deep in the enamel, sometimes actually lying against the dento-enamel junction, making a very dark spot in a section, while the surface of the tooth is fair. The coloring matter is the same material, and its reaction to dissolving agents is the same in all of these various conditions. I have dissolved it out and made such teeth very white.

What the relation of this brown stain may be to melanotic growth in the soft tissues, I have not yet made an effort to determine. I have a distinct opinion — not founded on proper investigation, however — that the substance is the same, no matter where found, and is always the result, not the cause — as so often stated — of a failure of proper development of the tissue in which it is located. It is therefore a material thoroughly deserving of some name. In an effort to find a suitable name for use in dentistry I have used the word brownin, which seems to me in good form as a nomenclature word . . .

The sections were thin enough to afford an excellent view of the tissue. They presented a very considerable variety of injuries. The teeth were all from young persons, and were practically unworn except for a few on the incisal edge. The enamel was normal in thickness in all of the specimens, but not normal in color. The group presented, as I found later by personal examination of many children, a series of bad cases of mottling. Some portions of the enamel were perfectly normal, both in color and histological development, in the majority of specimens. A number of them were of a very dark brown color over a considerable portion of the labial surfaces, shading from the brown areas through varying shades of yellow, to opaque paper-white, and from this into the normal enamel color. All of the abnormal areas showed the same lack of development of the cementing substance which usually binds the enamel rods together. The degree of this injury varied in the different parts of the crowns of individual teeth. Later, in examining the children, I saw many teeth that were much darker in color than those I had for cutting. This, however, was only a matter of degree of injury without difference in kind.

In all of the specimens the enamel rods were well formed throughout the enamel; in the imperfect areas the enamel rods seemed as regular and perfect in form as in the areas in which the cementing substance between them was normal. In areas in which the difficulty was
simply a lack of the cementing substance which should be between the enamel rods, the spaces were empty, or filled with air. Such areas were opaque paper-white because of the presence of air between the enamel rods.

In the dark-colored areas the brownin was found to be in the spaces between the enamel rods. The enamel rods themselves were as perfect and presented the same cross markings as in normal teeth, but they very often made very dark photomicrographs. The lines of accretion in the growth of the enamel were about as usual in normal enamel. It was particularly notable that the lines and depths of the abnormal condition had no reference whatever to the lines of accretion or growth in the formation of the enamel, thus showing a remarkable difference from the contemporaneous accretional deformities of the enamel, in which the lines of accretion in the growth of the tooth are very closely followed.

MOTTLED ENAMEL: A NEW PROPOSITION IN DENTAL PATHOLOGY

Endemic white enamel, or mottled enamel, is an entirely new proposition in dental pathology. Nothing of the kind seems to have been discovered heretofore in any part of the world. This endemic feature gives this description unusual novelty. When I visited a number of susceptible areas during the summer of 1909 I examined the children, and many of adult age, myself. Great numbers of children seemed to be easily gathered. It was quickly seen that the reports had not been exaggerated. The settlement of these regions is comparatively recent, and about half of the children were born and passed the earlier part of their lives elsewhere. When these were excluded, it has been found by the examination of the children in the public schools, that a little more than 87\% of those born and reared in these areas have teeth of the character described. The examination and compilation then made included about thirty-six hundred children. Very many more examinations have been made, and those are still in progress. This will be fully elaborated by Dr. McKay. (Following Dr. Black's writing, McKay supplied the statistical data.)

THE ESSENTIAL INJURY

The most essential injury occurring in this mottled enamel is in the appearance of the teeth and the general evil effect on the countenance of the individual. The teeth are of normal form but not of normal color. When not stained with brown or yellow, they are a ghastly opaque white that comes prominently into notice whenever the lips are opened, which materially injures the expression of the countenance of the individual. When this opaque white color is mingled with spots of brown, or a very large proportion of brown, the injury is still greater. In very many cases the teeth appear absolutely black as one sees them in ordinary social intercourse. I spent considerable time walking on the streets, noticing the children in their play, attracting their attention and talking with them about their games, etc., for the purpose of studying the general effect of the deformity. I found it prominent in every group of children. One does not have to search for it, for it is continually forcing itself on the attention of the stranger by its persistent prominence. This is much more than a deformity of childhood. If it were only that, it would be of less consequence, but it is a deformity for life. The only escape from the deformity is by the placing of crowns, and possibly of bridges or artificial dentures later in life.

The proportion of the cases so bad as this is really very large. They are not all of the worst type by any means, but the struggle for a better
cent and a changing light as it was turned about, could always be depended upon to bear a high crushing stress before it would break.

Recently have found a brown coloring matter continually in the dark teeth, not only in the dentin, but more prominently in the enamel, which may be removed by solution and the teeth rendered white without appreciable injury to them. The enamel is weaker for the reason that this brown coloring matter takes the space of the normal cementing substance between the enamel rods wherever it occurs, and this coloring matter seems to have no strength. The more of this material there is in the enamel of what we call the normal tooth, the darker will be the color and the weaker the tooth. Where there is so little brown coloring matter in the enamel that it would not be spoken of as abnormal, the teeth are a shade or several shades darker than the whitest teeth. It lends a harmony between the teeth and the general coloring of the features of the brunette type that makes a soft graceful expression of the countenance. This brown coloring matter is normal to the teeth if the amount is not so large as to cause disfiguration.

This material appears regularly in very noticeable amount in about one-half the cases of the various dystrophies of the teeth. The coloration in all of these cases is from the deposit of a brown coloring matter, not only in the normal teeth, but in the abnormal teeth as well. In the enamel whorl, which will be illustrated under the head of dystrophies, we find this coloring deep in the enamel, sometimes actually lying against the dento-enamel junction, making a very dark spot in a section, while the surface of the tooth is fair. The coloring matter is the same material, and its reaction to dissolving agents is the same in all of these various conditions. I have dissolved it out and made such teeth very white.

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The proportion of the cases so bad as this is really very large. They are not all of the worst type by any means, but the struggle for a better
appearance of the teeth, or the stoical endurance of a terrible affliction, is
certainly upon from 30 to 100 per cent of the persons being reared in
various areas where this deformity is endemic. Many of those counted as
having mottled teeth are injured in such slight degree as almost to pass
unnoticed. Every degree of injury, from solidly brown front teeth to the
white flecking here and there, is represented.

SPORADIC CASES

A few sporadic cases have been seen from different sections of the
country which, in considerable part, simulate the endemic cases. I have a
photograph showing the upper incisors of a person born and reared in
Chicago which are much like the endemic condition. There are also some
white flecks on several of the other teeth, but these are slight. Another
case is that of a boy who grew up on a farm in Indiana. The incisors
were badly marked with a dark band across their labial surfaces. All of
the other teeth were normal. I have seen two other sporadic cases of this
character, but failed to obtain photographic records of them.

I have found that one must be especially careful in tracing histories
of the cases. For instance, a lady brought her boy of about thirteen years
to see me because of the very distressing appearance of his teeth. This
presented a complete picture of the endemic mottled enamel. The incisors
were badly flecked with very dark browns and yellows, mixed more or
less with paper-white. The mother stated very positively that the child
was born in Chicago and had always lived in Chicago, and I was unable
to get any other statement from her.

A few days later an older sister came to ask my advice about her
own teeth. In talking with her the statement came out that the family had
spent much time in an area in which happened to know the condition
was endemic, locating the time as "when Johnny was a baby." They had
visited the region, remaining there a part of each year for a number of
years. This girl had mottled enamel on her bicuspids and second and
third molars, but her incisors and cuspids were normal. It was true that
Chicago had been the home of the family, and when asked about their
wanderings the mother had not recalled the visits to this region.

DIAGNOSIS

This brings up the question of diagnosis of mottled teeth. Before I
saw a case, dentists had endeavored to describe the condition to me. I got
no mental picture that was at all like what I saw when I visited the areas.
If I could not recognize the picture drawn by the dentists who had long
observed the condition, how could I expect others to do so? How could I
expect others to differentiate this condition of enamel from various
dystrophies? The whole matter became clear very readily when I saw
some of the teeth, and cut them and made sections and brought them un-
der the microscope, but not before. The histological study of such teeth
is so recent that few men have had any knowledge of it.

TIME OF LIFE AT WHICH THE INJURY OCCURS

One thing I wish to impress particularly upon the mind of the
reader just here. Faults in the form or color of the teeth may occur from
errors in growth, or may occur from causes acting upon them after the
teeth have fully formed. Any departure from the normal in the enamel of
the teeth, the dentin, or in the form of the teeth, from errors in develop-
ment, must occur while the teeth are growing. This must be differenti-
tated sharply from deformities that are acquired after the teeth have
grown, about which more will be said later. The tissues of the teeth are
not changed in any wise by physiological processes after they are once formed. This explains the fact that some teeth of an individual are found to be marked and others not, and why the incisors are more persistently marked than other teeth.

This has relation to the time in the life of the child in which the enamel in different groups of teeth is growing, having reference now only to the permanent teeth. The deciduous teeth are always normal in this respect. The permanent teeth are naturally divisible into three groups. The first group includes the first molars, the incisors, and the cuspids. The enamel of this group is growing during the first five years of the child's life, excepting that the cuspids frequently continue to the seventh year. The second group includes the bicuspids and second molars. The enamel of this group begins growing at from five to six years, and is completed at from nine to eleven. The third group includes the third molars only. The enamel of these is growing ordinarily from the tenth to the fourteenth or fifteenth year, but presenting considerable variation of the time of completion of the growth. This is an approximate statement.

It occurs, therefore, that if the child is not in the locality of endemic mottled enamel during the time of the growth of the enamel of any one of these groups of teeth, that group will not be marked. Or if a child is in the locality only during the time of the growth of one, and elsewhere the rest of the time, only that one group of teeth will be marked. It therefore follows that if a child born in the locality is removed and lives elsewhere for the first five years, the first molars, incisors, and cuspids will be normal. If the child returns to the locality at the end of five years and continues to live there, the other two groups of teeth will be mottled. Having lived a part of the time in this area does not seem to carry with it a continuance of the injury after removal. Neither does living elsewhere during the growth of the enamel of the incisors, and then coming into the endemic area, prevent the injury to the teeth which have yet to grow their enamel.

Among the children examined there was every opportunity for the study of this feature of the difficulty, for among them were many who had come into the territory at any and all periods of the growth of the enamel. By examining the teeth one could tell pretty closely the age at which they had come into the locality. This, then, expresses the general idea of the susceptibility of the different groups of teeth. Lines cannot be drawn too sharply, however, for we must remember that among those born in that region, about one in every ten persons is immune — that is, has normal teeth. This presents some curious features. Some one child in a family may have normal teeth, while the teeth of the brothers and sisters are mottled. I saw a pair of twins, a girl and a boy. The girls' teeth were horribly brown, while the boy's teeth were normal. These two children were seen together so persistently as to occasion general remark. They ate at the same table, slept in the same house, played together, and their habits and environment had been the same since birth.

The rule is, other things being equal, that the younger the child at the time of the occurrence of any injury to the development of the enamel, the more grave the injury. According to this rule the incisor teeth are more persistently and more severely mottled than any other group of teeth. Curiously enough, however, the first molars, which have generally just begun formation of the enamel at birth, are notably less severely mottled than the incisors, which begin the development of their enamel a little later. In the contemporaneous accretional deformities, the first molars are more severely injured than the incisors, as the rule. For all the other teeth the general rule stated seems to hold true. Dr. McKay's paper will deal especially with this feature, from information derived
DENTAL CARIES

As to caries, the teeth of these children compare favorably with those of other communities where endemic mottled enamel is unknown. They have a mild climate and almost continuous sunshine during the day. The children are out practically every day the year round, and this in itself certainly has its effect in limiting the amount of dental caries. But when the teeth do decay, the frail condition of the enamel makes it extremely difficult to make good and effective fillings. For this reason many individuals will lose their teeth because of caries, though the number of carious cavities is fewer than elsewhere. Yet I was of the opinion, at the end of several weeks’ examination and study of the conditions, that if the appearance of the teeth could be endured, the injury in their development would, on the whole, not reduce the general usefulness of the teeth.

A matter that should not be overlooked in this is the mental attitude of these persons. I have found it very difficult to obtain a good opportunity to examine these teeth in the mouth, because the persons have been so sensitive to such observation. One of them told me that he had almost completely retired from society because people stared at him as though there was something about his countenance that was uncanny. Otherwise than this, these teeth have always been normal in form, and observed with the lips closed, these people would not attract any especial attention. This class of cases has been very rare.

Mottled enamel. This deformity is distinguished especially by the absence of the cementing substance between the enamel rods in the outer fourth, more or less, of the enamel, and presenting great variety of color, rendering it totally different from anything else I have known. In certain areas of our country this is endemic and occurs in many thousands of persons, as mentioned previously in this paper.

Acquired defects. In order to emphasize the differences between the dystrophies, in which the deformity occurs during the growth of the teeth, and the acquired defects, which occur after the teeth have been formed, I have included a few illustrations of erosion and abrasion. In each instance these defects have occurred to teeth which were of normal form and structure, but which were subsequently injured. In all cases of dystrophy, the deformities occur during development and the teeth erupt in the malformed condition.

REFERENCES


DR. HERSCHFELD is a member of the Editorial Board of the Bulletin of the History of Dentistry. His address is 2169 Galloway Road, Cornwall Heights, PA 19020. Requests for reprints should be made directly to the author.
Before we take up the new "mystery" object, let's go back to the last issue and see what happened. We had several correct identifications, and some interesting correspondence in connection with the subject. Dr. Gary D. Lemen of Sacramento, California, correctly identified it as a Bonwill gold foil plugger. Dr. Lemen wrote that it "...attached to the cable of the old foot-pedal dental engine. I am enclosing an advertisement from the November, 1903, issue of Dental Cosmos (see cut) which explains what it is all about. Judging from the difference in design between the picture in the advertisement and the one in the April Bulletin, I would say that the one you showed in the Bulletin was of an earlier design. Anyway, it was used to condense gold foil into the prepared cavity. The various sizes and shapes of condensing points fit into the tip of the mallet."

A picture of the same mallet which I ran in the last Bulletin appears on page 502 of the 1896 edition of Chapin A. Harris' Principles and Practices of Dental Surgery and was attributed to Dr. W. G. A. Bonwill, who is also noted as the inventor of a very popular articulator. Although the S. S. White Company manufactured both the mallet pictured in the last Bulletin and the one in the ad sent in by Dr.

"What Is It?"

-ROBERT C. SPROULL, D.D.S.
El Paso, Texas
Lemen, the patent dates are completely different, although they overlap. The patent dates I had found originally were February 18, 1879; September 29, 1885; and August 19, 1890. Those in the *Cosmos* ad are August 24, 1886; April 15, 1890; and September 5, 1893. It makes one wonder how they decide which patent dates to use.

Another interesting letter containing an identification came from Dr. J. A. Donaldson, the Honorary Curator of the Museum of the British Dental Association in London who enclosed several pages from an English dental supply catalogue of 1893. He writes:

The instrument is the Bonwill Improved Mechanical Mallet No. 1. Although you are probably right in saying that the example in the photograph dates back to about the year 1891, because it has a fitting for No. 2 Slip Joint, the mallet was originally made and patented almost exactly 100 years ago.

In the B.D.A. Museum we have examples of this mallet, as well as its predecessor, an earlier Bonwill model, and also of the Bonwill No. 2 and Bonwill No. 3 Mallets. The No. 1 mallet used short mallet points, and the No. 2 and No. 3 mallets used long handle pluggers, made either for hand use or for the Bonwill Electric mallet. We have a wide range of examples of both kinds of points.

* * *

Now for our current "poser". This little item dates back to the 1930's. It is made of brass and is 98 mm. high, with the name COE embossed on it. It accomplished the task for which it was made, but probably not for the reason given by the manufacturer. Any reader wishing to take a stab at what this item is should write to me directly at 2601 McRae Blvd., El Paso, TX 79925.
To the Editor:

Thank you for the reprints of my article "A History of Porcelain in Dentistry." (April, 1977) I feel honored to have had the article published in the Bulletin. It was assuredly in good company — you consistently come up with outstanding articles. Thank you for a great editing job.

Sincerely,
Robert C. Sproull, D.D.S.

To the Editor:

I want to thank you for the way my article "Milestones and Millstones" was presented in the last issue (April, 1978). You fitted it exactly onto four pages, which is what I always tried to do when I was editor of the Journal of Dental Research.

The best of good luck and good fortune to you and the Bulletin which are inseparable in one's thinking.

Frank J. Orland, D.D.S., Ph.D.

To the Editor:

We are trying to build a much-needed pamphlet file at our college library. In this way we may keep students informed of the latest developments in their field.

May I ask that if you have brochures or pamphlets that could be of interest to students entering this career, please send them to us for our library files.

Sincerely,
Cheri Fleck, Librarian
Southern College
Orlando, Florida
To the Editor:

I sincerely appreciated being honored by the American Academy of the History of Dentistry. As some slight evidence that I am also interested in the history of dentistry, I am enclosing a reprint of my article "The Disciples of Eugene W. Skinner: Philander B. Taylor and George M. Hollenback."

Best wishes for the continued success of the Academy under your long-time guidance.

Sincerely,
George C. Paffenbarger, D.D.S.

(Dr. Paffenbarger, who was named an Honorary Member of our Academy, is the Senior Research Associate of the A.D.A. Health Foundation at the National Bureau of Standards in Washington, D.C.)

To the Editor:

I am a member of the American Academy of the History of Dentistry and I have spent 15 years at work on a 3-volume history entitled The World of Teeth and Their History. It is about 1400 pages in size and will contain over 1000 photographs, both in color and black-and-white. The first two volumes have already been released; the third is about to be issued.

In the October, 1977 issue of the Bulletin is a very interesting picture representing a dental operatory, circa 1875, which is on display at the Cedar Point Amusement Park in Sandusky, Ohio. I would like permission to include this photograph in the third volume of my work. I thank you very much for your kindness, and hope that you grant this request. Awaiting an answer, I pray you to accept my best greetings.

Yours sincerely,
Prof. Dott. Placido Micheloni
Rome, Italy

To the Editor:

Your position as editor of the Academy is a difficult one, what with the problems of material, deadlines, etc.

I just wanted you to know that I feel that you do an excellent job and to tell you that I enjoy the Bulletin and Newsletter.

Sincerely,
Joseph Coss, President
Norton-Starr Dental Supply Co.
Syracuse, New York

To the Editor:


Yours sincerely,
Miss Doreen M. Land,
Lecturer in Dental Health Education
Gibbs Oral Hygiene Service
Portman Sq., London, England

When a fine history of a fine dental school is written, it is a good thing. But when that history can stand as an inspiration to future generations of dentists as an indication of what dedicated scientists can do for human betterment, then that book becomes a noteworthy achievement.

A hundred years have passed since the founding of the School of Dental Medicine of the University of Pennsylvania, and those hundred years have seen this school take its place as one of the foremost centers of dental education and research in the world. To chronicle the history of this school, one of the most eminent dental historians was chosen, Dr. Milton B. Asbell, the president-elect of the American Academy of the History of Dentistry.

Dr. Asbell has made notable contributions to the literature of dentistry in the past: almost a hundred articles in a variety of journals, as well as three books. He was a founding member of the Academy and has over the years received numerous honors from American and foreign scientific and historical societies. He is a Fellow of both the American and International Colleges of Dentists; one of the few dentist members of the College of Physicians of Philadelphia; the past-president of the Southern Dental Society of New Jersey as well as that state's Board of Dentistry; and is at present the secretary of the Middle Atlantic Society of Orthodontists.

The book has taken over three years in preparation. It begins with an excellent short history of dentistry in Colonial America and a description of dentistry in the early days of the nation. There follows a marvelously interesting recounting of the beginnings of dental education in Philadelphia, which went through so many turns and twists until the schools as we know them evolved.
The living conditions of the students of a century ago are
graphically described:

Students were lodged at the dormitories or at approved boarding
houses in the vicinity. The dormitories were most sought after; for
$60 to $140 per year one could rent a single or a double room; suites
cost from $115 to $260. All rooms were heated by steam and lighted
by electricity! "On each floor and on every staircase are lavatories,
with hot and cold shower baths and almost all the double and many
of the single rooms have open fireplaces." Food could be secured at
the "Commons" for about $3.50 per week "including service." Those
students who wished to live off campus found suitable food
and lodging in private homes near the school for about $5.00 per
week, or $1.50 for the room only.

So many of the graduates of Penn became world-famous that it
would be impossible to list them all here; a few noted ones are Zane Grey
and Thomas W. Evans, who became dentist to royalty and confidant to
Napoleon III. Evans rates a complete chapter which describes how he
acquired his great wealth (mainly through shrewd real estate transac-
tions all over Europe) and the intricacies which eventually connected his
wealth and estate to the Penn dental school.

About thirty-five graduates of Penn have gone on to become deans
dental schools in this country and abroad, and Dr. Asbell supplies a
roster of Penn alumni who became dentists to American Presidents as
well as foreign heads of state.

Dr. Asbell utilized the oral-history technique in gathering his
material and almost every living graduate of Penn was contacted, the
oldest being 101 years old. The story comes alive because it is seen
through the eyes of these graduates.

The book is organized sequentially by the administrations of the
various deans, and it provides a marvelous chronological picture of the
changing scene of American dentistry over the past hundred years.
There are many excellent sharp photographs which augment the story,
and the book’s usefulness is heightened by a complete list of every
graduate of the school in the last hundred years; a comprehensive index;
and an extensive bibliography which can serve as a spring-board for
further study in the history of American dentistry.

The book is a handsome one of a large 8x11 format and beautifully
printed on excellent beige stock which is easy on the eyes. It’s a joy to
own this fine book!

—Reviewed by Malvin E. Ring, D.D.S.

Letters From the Past: From John Hunter to Edward Jenner. Edited by A.
J. Harding. 40 pages. Not priced. London. Royal College of Surgeons of

One of the most remarkable thinkers of the eighteenth century had
a tremendous influence on the development of dentistry. He was John
Hunter whose recognition as the "Father of Modern Surgery" belies his
unlettered background. Hunter’s very first scientific investigative work
resulted in his monumental Natural History of the Human Teeth, a
work considered a classic to this day. Numerous other experiments, such
as his successful transplantation of a tooth into the comb of a rooster, added to our knowledge of dental history and morphology.

Hunter took under his wing the young Edward Jenner, destined to become the discoverer of vaccination. The friendship lasted many years and resulted in each stimulating the other’s creative talents. Hunter was an indefatigable researcher, and he successfully communicated his enthusiasm to the younger man. This is very clearly brought out in a collection of thirty-two letters from Hunter to Jenner in the library of the Royal College of Surgeons of England which cover a twenty year period, roughly from about 1770 to about 1790, and which were issued in a small 40-page pamphlet by the Royal College. They provide fascinating insights into the workings of the great man’s mind. “What became of Jenner’s letters to Hunter? . . . One may only conjecture, but hope that some day a Jenner to Hunter letter will be found.”

Hunter was interested in everything, and especially in physiology. In one letter he urges his pupil

If you catch any Batts, let me have some of them, and those you try yourself, open a hole in the belly just size enough to admit the Ball pub the Ball down towards the pelvis and observe the heat there, then up towards the diaphragm and observe the heat there, observe the fluidity of the blood, do all this in a cold place . . . If the frost is hard, see what vegetable freezes, bore holes in large Trees, and see whether the sap runs out, which will show it is not frose.

More than this, the letters also show the human side of the master. Hunter apparently saw patients referred to him, and in one letter he complains to Jenner that “ . . . I saw a Mr. Mathews of Barkly recommended by you. He did not pay me.”

All in all, this collection of letters is one of the most fascinating, interesting and entertaining that this reviewer has ever been privileged to read. The Royal Society is to be commended for releasing them so that we all may benefit from them.

Reviewed by Malvin E. Ring, D.D.S.


Dr. Walter C. Alvarez, one of the most influential physicians of recent times, takes us on a tour of his 67 years of medical practice, research, teaching and writing. He made medicine available to all people through his syndicated newspaper column and became the “family doctor” to literally millions of people. In a bold, and straight from the shoulder style, he writes on a wide range of subjects ranging from sexual deviation, drugs and suicide, to death. He criticizes the use of artificial means to maintain the lives of suffering and dying patients. He condemns the depersonalization of modern medical care and the prevalence of thoughtless diagnosis. His book is full of fascinating details concerning his discoveries of diagnostic procedures for migraine, depression and a variety of G. I. symptoms. Case histories and many colorful anecdotes enliven his writing, including colorful biographical sketches of some of the great medical pioneers. This book was compiled by David H. Scott from Dr. Alvarez’s editorials from Modern Medicine. It provides an enormous variety of information on plain human nature, health and
disease and the general practice of medicine in America today. A dentist reading this book will benefit from the many ideas that will help him in his own practice. He will be interested from start to finish. It is an excellent addition to any library.


The study of anatomy is lost in antiquity and the many extant descriptive and illustrated texts of anatomy are too numerous to even begin to describe.

However, once in a lifetime there appears upon the scene an anatomical atlas that fills the complete need for those who desire current material for study with vivid, detailed and exciting illustrations as well as accompanying descriptive text. They will find all these in the 3 volumes of Atlas of Human Anatomy.

The work has the following arrangement:

Volume I. Regions, Bones, Ligaments, Joints and Muscles.
Volume II. Visceral Anatomy
Volume III. Central Nervous System, Autonomic Nervous System, Sense Organs and Skin, Peripheral Nerves and Vessels.

This absolutely magnificent work, originally authored by Johannes Sobotta, M.D. at the turn of the century, is based on the 17th German edition, edited by H. Ferner, M.D. and J. Straubesand, M.D. It has undergone many editions and translations and has recently established itself as the most widely sold atlas published.

Each volume is brilliantly organized to present anatomical structures, topography and interrelationships that can be readily understood. Sobotta's atlas derives its exacting strength from its completeness, its excellent illustrations and the detailed clarity of its descriptions. It is an invaluable guide to students, an excellent teaching aid for faculty and completely unsurpassed as a reference work for those engaged in research. Sobotta's original concept of an atlas is carefully retained with more than 60 new illustrations. 50 synoptical tables have been added. All plates are arranged in the sequence of dissecting order, from the superficial to the deeper structures. All nerves and vessels of each region are shown in the same illustration. The quality of the anatomical illustrations are absolute perfection. The areas of particular concern to dentists are absolutely flawless.

This atlas can be purchased as a set or individually. Those interested in anatomy or the history of medicine in any of its aspects can now own a part of history by having Sobotta's Atlas of Human Anatomy. It is already becoming a collectors item and should be in every library.


This is a book that deserves to be in every home, Jewish or non-Jewish. M. Hirsh Goldberg presents a fresh new look at history and the
part that Jews played in all of man's endeavors since the days of Abraham. Everyone is aware of the contributions of Freud, Marx and Einstein; but few know that there was a Jewish Pope; a Jew who discovered oil; one who invented the telephone; another who influenced the Wright Brothers. Mussolini had a Jewish dentist and Hitler had a Jewish cook, Fraulein Kunde, whom he refused to remove. It is well known that one of Hitler's trusted physicians was Dr. Edward Bloch. Many interesting profiles of Jews who have contributed to almost every field of human endeavor, ranging from gloves to medicine; entertainment; atomic research and religion make this book incredible, ironic, funny and provocative. Yet it contains the uncontested facts that Jews were and are where the action is. You will enjoy every page and, if you like history, you will have it from a completely different viewpoint.


In 1976 the people of Scotland celebrated a proud event. More than 250 years ago, in 1726, Edinburgh was the scene of this significant event. Four physicians, all engaged in extra-mural teaching, were instrumental in convincing the Town Council of the need for a school of medicine in the University. All had studied at Leiden. Their ambitions coincided with an awakening of public conscience to the extreme poverty and unsanitary living conditions obvious to all. Medicine was practiced under difficult conditions, with even taverns being used for consultation. Much of medicine was botanical, and an herbarium run by a doctor who founded the faculty was within 100 yards of the Royal Scottish Museum.

Forty years before 1726 events moved rapidly. The College of Physicians was founded in 1681 and published the first Pharmacopoeia in 1699. Within the next decade Edinburgh appointed the first Professor of Anatomy in Britain and it was to that chair that the first of the Monroes succeeded in 1720, after Adam Drummond and John McGill retired. Within six years the school of medicine was born, followed three years later, by the opening of a hospital destined to become the Royal Infirmary. Here in 1746 John Rutherford gave the first clinical lecture at the bedside. The commemorative program of lectures takes one through this period of formation and development in exciting detail.

The Scottish Society of the History of Medicine and The Royal Scottish Museum are to be congratulated on their collaboration which produced a major exhibition, "Edinburgh and Medicine," as well as a symposium "The Early Years of the Edinburgh Medical School." The papers presented enhanced the exhibition to perfection. Those interested in the early years of medical education in America must obtain this publication. All American students are listed by year attended, including why they studied at Edinburgh.
Most Americans have read of the American Revolution and its heroes many times, but it has always been written from the American viewpoint. Now it is possible to read of the revolution from another viewpoint, and an excellent account of the French Navy’s relation to American Independence presents this viewpoint. This book focuses on military needs. The reasoning behind the numerous French naval actions makes fascinating reading, especially where some last minute decisions by Admiral DeGrasse places his fleet at Yorktown instead of New York.

The documented statistics of ships, men and money given by the French in support of the American aims is almost unbelievable in scope and amount.

The political maneuvering involved in the almost miraculous peace that followed hostilities leaves the reader breathless with anticipation and then relief at the final outcome placed against the background of world events. The reader comes away with renewed respect and better insight of the effects of the American Revolution and its position relative to world affairs of the time.

Health played a role in many of the activities. Many naval maneuvers had to be postponed or cancelled completely because of violent outbreaks of scurvy.

Footnotes, 11 appendices, a bibliography of unpublished material from original sources, an annotated guide, bibliography of printed sources and an index make this book an extremely valuable addition to the study of the American Revolution. It is extremely well written and very easy to read. It is highly recommended for everyone interested in history of this period.

How did science and technology begin in America? Silvio Bedini brings to life a remarkable chapter in American history which has never been told or even acknowledged by historians. The material provides an overview of how the practical sciences were required and how they were utilized, for what and by whom. The "Thinkers" included the scientific leaders, but also the self-educated men who were concerned with the theoretical or experimental sciences, as an avocation or for the purpose of teaching. The "Tinkers" were the vastly larger number of colonial Americans who applied the practical sciences to solve existing problems, sometimes a helpless attempt to mend or improve something. These various practitioners left evidence of their work that serves as a record of their skills, such as maps; survey instruments; clocks; archive and navigation records; textbooks; newspaper ads; and in almanacs. This text adds another dimension by recording the development of a movement that was generated in response to the immediate needs of an unknown new world.

An excellent bibliography lists the major works relating to the practical sciences and mathematical instruments in Europe and America. The
glossary explains technical terms and phrases used in this work. It is interesting to note that Isaac Greenwood III and Paul Revere who were trained as dentists also pursued other roles during the revolution. Greenwood became involved in the shipping business and served on armed pirate vessels. Revere was in charge of ordnance repairs for the Continental Army during 1775 and 1776 and engaged in various endeavors for the manufacture of gunpowder and the casting of cannon. Throughout this most interesting book are revelations of how the everyday shopkeeper made his living and the impact of the American Revolution on his life. An absolutely fascinating book to read.


This book traces the changing pattern of the doctor patient relationship through history, from the time when healing was a mixture of magic and witchcraft, up to the present day. The journey has its ups and downs and presents a complex weaving pattern from doctors being automatically awarded knighthood or even made Gods to being put to death if the patient did not recover. Doctors throughout the centuries have been revered, derided, lionized and occasionally massacred, as happened in the middle ages when they failed to conquer the Black Death. In some periods it was a dangerous profession as the doctor was many times held responsible for the patient’s life. In 580 A.D. the Frankish Queen Austrichildia demanded the full penalty that her two doctors be executed on her grave if she died. She did and they were! The very first doctor to be mentioned by name in medical history was Imhotep who was not only a physician to the Egyptian King Zoser but also a magician, priest, architect and reputed builder of the first pyramids. He lived about 3000 B.C. and such was his status as a man of great learning that by the time of the new kingdom, about 1600 B.C., he had been elevated to the rank of a God taking his place alongside Thoth and Isis.

The book takes one to ancient Greece where many suggested courses of treatment included the magic and folklore of the Minoan culture. One case on record, for example, was a woman who was pregnant for five years and who, after sleeping in the temple for a night was delivered of a child the next day. The infant was by then four years old and fully developed, able to walk and to discuss the matter with his mother.

Cosmas and Damian, early Christians were butchered as much for their calling as doctors as for their faith; they gave their names to the first recorded professional medical association to be formed in 1567. They were martyred about A.D. 300 and a special church for healing was established at Constantinople in their honor. Here was practiced a form of “church sleep” or healing by dreams. The medical brothers became in time not only the Patron Saints to physicians and surgeons but also to wet nurses, midwives, apothecaries and, for some unknown reason, haberdashers.

The reader will learn of the dying donor of a healthy leg being a black man, resulting in the gangerous patient ending up with two good legs — one white and one black. The many plagues are reviewed and the
abandonment of patients by physicians, for they left town, along with
the frightened populace to escape the epidemic. As late as 1832 the treat-
ment for epidemics consisted mainly of blood letting, cayenne pepper,
and mercury. By this time there was a distinct vogue for sulphur in any
form, usually as candles to dispel the “miasma.” The reader will be
brought right up to the present with all the new drugs and their many
complications. It seems that the pendulum may swing back to the more
simple methods of treatment, as we find that many of the simple herb
treatments and medicine of many years ago were really not so far off
after all. The author has written with authority and the reader will en-
counter many piquant oddities, some extraordinary characters, both
brave men and charlatans, and a wonderful mixture of scientific insight
and superstition. It is a joy to read this book. It is an excellent review of
the healing arts from ancient times to the present.

Death in Early America: The History and Folklore of Customs and
Superstitions of Early Medicine, Funerals, Burials and Mourning. By
Margaret M. Coffin. 252 pages. $7.95. New York. Thomas Nelson, Inc.
1976.

Our grandparents and great-grandparents very frequently had
premonitions of death and they faced it many ways when it came. They
prepared for death at a very early age, even in their early teens. Families
had four times as many children as do the ones of today, but many died
in childbirth or early infancy. If they did survive, they ran the gamut of
the diseases of childhood. The adult population had its diseases too. The
ague, consumption, distemper, typhoid fever, syphilis, typhus and
dysentery took their fearful toll. Accidents were common; so too was
dueling; and the Indians really got their share of white men. Legal killing
in the form of public hangings were accompanied by bands, picnics and
holiday celebrations. The various gangs on the western frontier took a
frightful number of victims in addition to the cash, gold and silver they
reaped. Doctoring was mostly by herbs as people had little faith in the
local practitioner. One reads with almost disbelief of the medical treat-
ment used on our forefathers. Few early dentists worked at that calling
full time; acting as dentists were jewelers, tinkers, metalworkers, clock
makers and preachers.

Funeral customs were more intimate than they are today. In-
vitations were sent by an inviter and warners, together with a pair of
gloves, a bottle of wine and “dead cakes.” People were laid out on the
cooling board, and preparations for funeral guests many times were
more expensive than today.

Early bodies were not embalmed and many a coffin was sprung
open by the one thought dead, asking for a drink of water. Funeral
feasts included every type of drink and food, often consumed in excess
so that on more than one occasion, mourners had to be rescued from the
open grave. Ever have a piece of “funeral pie?” You’ll enjoy how it is
prepared.

Coffins and hearses had very crude beginnings. Before the days of
embalming, coffins had to be made in one day. Measurements were
hurriedly taken and sometimes the coffin came out too short with no
time to prepare another. You will enjoy learning how this situation was corrected. Special coffins were made especially for those of “doubtful death.” Even “preservers” and “corpse coolers” were used until the late 1800's. “Torpedo coffins” were developed to deter body snatching.

Bodies were buried laid out, sitting, standing and kneeling. They were buried beneath churches; in home plots; in the woods; or stuck in a hollow tree till spring if they had the poor luck to die during a hard winter. A famous London dentist by the name of Butchell employed the services of Dr. William Hunter, John Hunter's older brother, who taught embalming around 1750. Butchell's wife was carefully dressed in her best linen gown and placed in a special coffin with a glass top, which was then placed in the drawing room of the family residence, which also served as his reception room. Thus his patients and others who had not known his wife during her life were permitted to view her “any day between 9 and 1, Sundays excepted.”

Body snatching, mourning customs, memorials and epitaphs round out this volume and they are absolutely unbelievable. A chapter on early cures and remedies makes one wonder how so many survived, viz: “To reduce fever — swallow a spider with syrup.” “Quinsy—to cure: tie a black cord around the neck.” “Toothache—fresh cow manure placed on the side of the face will draw out the pain of a toothache.”

Once you start this book you will not want to put it down. Most of us have experienced some of the events mentioned. A fascinating book to have and enjoy, especially so because it is profusely illustrated with prints and photographs.


This book provides a basic framework for those interested in diagnosing and interpreting bone lesions found in excavated skeletons. It is limited in scope but it brings together the fields of physical anthropology, pathology, radiology, epidemiology and archaeology in its study of diseases in ancient human populations.

Paleopathology is a comparatively new field of science, but it is important in providing information on the health status of human populations and the end result of diseases without medical technology.

It is readily apparent that past civilizations had suffered agonies of diseases somewhat similar to those of present civilizations, and without medical help. Similar diseases occur today but in most instances are not so long lasting. The teeth and facial bones come in for their share of attention, and present most interesting diagnostic features in many of the ancient diseases.

This is a most interesting text to read, not only to review the several disciplines involved, but to visualize the ailments of ancient civilizations around the world. For those interested in teaching and research on this and related subjects, there are copious references. The author discusses the fundamentals of bone in the opening chapter. The remainder of the book describes the major traumatic, infectious, nutritional, metabolic, degenerative and neoplastic diseases of bone related to ancient populations, and how infectious and nutritional diseases affected bone. Iron
and lead played leading roles in many bone diseases as well. A differentia-
tial diagnosis is presented in each chapter to acknowledge the alternate possibilities.

(The preceding reviews were written by Lloyd E. Church, D.D.S., Ph.
D., Book Review Editor of the Bulletin.)

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University Microfilms International

Dept. F.A.
300 North Zeeb Road
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London, WC1R 4EJ
England