

CHAPTER I

GENERAL HISTORY OF THE PRACTICE OF DENTISTRY

A. OUTLINE OF ITS EVOLUTION

DENTISTRY, evolving very slowly for centuries as an unorganized part of the healing art, or as a subsidiary service, attained its first significant stages of growth in France during the eighteenth and early part of the nineteenth centuries. Its greatest advancement has occurred in the United States cumulatively since 1840. Before the eighteenth century, the procedures that collectively constituted the practice of dentistry had never been organized into a systematic art nor designated by a common name. "Dentator" was used during the Middle Ages to indicate a dental specialist of surgery. The modern term "dentist" originated in France during the seventeenth century, but in England and in the American Colonies did not begin to supplant "tooth-drawer" until the eighteenth century.

Dentistry in a primitive form was practised in ancient Egypt as a part of the healing art and was slowly developed as such for many centuries among the peoples of the Mediterranean regions. After the fall of Rome and the Mohammedan conquest of Egypt, the practice of dentistry with that of surgery everywhere fell into disrespect. In Europe throughout the Middle Ages, diseased teeth were usually neglected or extracted but occasionally were replaced artificially. Because dental disorders and the extraction and the restoration of teeth were generally assumed to have no important relation to health, the procedures of removal and renewal were ignored by physicians and surgeons, or given casual attention by them, and were conducted chiefly by barbers. In modern Europe, particularly in France, the esthetic features of dental reconstructions were strongly developed during the eighteenth and earlier decades of the nineteenth centuries. Throughout Western Europe, during the nineteenth century, recognition of the pathological and surgical relationships of dentistry raised it to the status of an inferior specialty of the healing art under the jurisdiction of organized medicine, although this appreciation of the biological significance of dentistry has been attended in Europe by lack of effectual development of its mechanical and esthetic refinements. In the United States, since 1840, dentistry has been organized and developed upon an autonomous professional basis, with only nominal regard for its correlation with clinical medicine. By exceptional inventiveness, American dentistry has attained world leadership in all of the reparative phases of the art.

At the beginning dentistry, chiefly a means for the retention of loose teeth and for the artificial restoration of lost teeth, was practised to disguise disfigurement or disability. In its evolution, dental defects have been repaired and lost teeth replaced with increasing regard for the esthetic and functional aspects of dental reconstructions. Many centuries

passed before correction of irregularities in the position of teeth, and until means of limiting the extension of decay for the conservation of defective teeth, became common objectives in dental practice. Even then, health service continued to be a subordinate purpose and was achieved negatively, in the main, by extraction of diseased teeth. In recent decades there have been notable advances in the technical repair, remedial treatment, and artificial replacement of defective teeth. There has also been marked development of means for the preservation of dental function and of methods for the elimination of dental infection; and oral hygiene, as a prerequisite to the control or prevention of dental disorders, has received increasing attention.

The advent of roentgenography in dental practice twenty-five years ago as an important aid in the detection and diagnosis of hidden ailments of the teeth and supporting tissues, the general recognition during the past decade that infectious maladies of the teeth and surrounding tissues may occasion serious diseases in other parts of the body, and recent findings in chemical biology, which lay new emphasis on the importance of physiological diets and of balanced glandular functions for normal nutrition and dentition, have made the development and application of means for the prevention of dental disorders and of their systemic sequelae the paramount duty of the dental profession.

B. EMERGENCE FROM PREHISTORIC CUSTOMS

The healing art probably arose from fortunate efforts to alleviate prehistoric experiences of physical distress, and surgery was doubtless developed from the need to stop the loss of blood, to extract arrows from wounds, to support broken limbs, and to meet emergencies of similar import resulting from accident, violence, personal combat, or warfare. Presumably at a very early period in human affairs, damage to the teeth by accident or from violence revealed the consequences of gross alterations of the adult dentition, and indicated the degree of damage to which teeth might be subjected without unbearable consequences. It was customary among primitive peoples, as it is among some existing savage races, to subject healthy teeth to many types of mechanical alteration, usually for religious or ornamental purposes, but often with damaging effects on the dental structures and functions, the degree of destructiveness ranging from slight modifications of the shape of a tooth by filing, or of its structure by insertion of mineral or metallic particles into artificial cavities, to the complete removal of its visible parts by direct percussion. The deteriorations in the quality of normal teeth that resulted from such mutilations, and the ensuing unpleasant dental experiences, doubtless facilitated early invention of appliances for the restoration of dental function or of facial comeliness, or for purposes of particular ornamentation. The initial steps in the evolution of dentistry may be traced to such prehistoric reconstructions.

Diseases and imperfections of the teeth and adjacent oral parts have been noted in the

recorded experiences of all peoples. The ancient history of every important civilization mentions methods and prescriptions for the treatment of dental and oral disorders, including painful dentition, and refers to appliances for the retention of loose teeth or for the installation of substitutes. Extraction of diseased teeth has been practised everywhere from time immemorial.

C. MAIN DEVELOPMENTS BEFORE THE RISE OF DENTISTRY IN AMERICA

a. Growth among ancient peoples

Among the ancient Hindus, physicians were held in high esteem, but tooth-drawers were classed with hair-cutters, ear-borers, nail-trimmers, and bloodletters, in an inferior order outside of the Brahmanical caste. In very early times, the Chinese physicians recognized varieties of toothache and diseases of the gums, and punctured the gums and different parts of the body systematically with metallic needles (acupuncture) for the relief of pain and of abscesses. Several thousand years before the beginning of the Christian era, dental treatment attained a useful status in Egypt, where the healing art was then developed by the physician-priests, some of whom gave attention exclusively to dental disorders. These dental physicians, who were members in good and equal standing of the priestly fraternity of medicine, treated toothache and diseases of the gums, extracted teeth, used wire attachments for the retention of loose teeth, and probably devised and adjusted crude substitutes for natural teeth.

Egyptian physicians were among the attendants of kings and conquerors for centuries, and knowledge of dentistry was disseminated wherever Egyptian culture extended. The Etruscans and Phœnicians, who were highly proficient in mechanical arts and probably copied and improved the Egyptian dental appliances, used gold crowns and gold bridges. Dentistry was extensively practised by the Grecians and the Romans, and a number of important developments were made by them. Hippocrates (460-377 B.C.) wrote of dental diseases and their treatment, devised a number of simple dental instruments, practised extraction of loose teeth and cauterization of aching teeth, and described operations for fractures of the jaws. Galen (131-201? A.D.) was the first to note the presence of nerves (pulp) in teeth. Believing that those in the upper canines were branches of the nerves to the corresponding eyes, he called these canines "eye" teeth. Early in the Christian era, Roman dentists "stuffed" badly decayed teeth with lead or lint to prevent their fragmentation under pressure during extraction with a forceps, a procedure that foreshadowed use of metallic filling materials to arrest the progress of dental decay. After extracting temporary teeth in the path of irregularly placed successors, they applied force daily with a finger to push the new teeth into their proper places, thus initiating procedures that have culminated in modern orthodontia.

b. Status during the Middle Ages

Throughout the medieval period, the healing art not only failed everywhere to advance with the momentum it had acquired, but also suffered a serious decline in quality and in general esteem. Physicians continued to regard surgery disdainfully as mere hand-work and surgeons as ordinary artisans and therefore as inferiors, and harassed the progress of surgery by devices best known to the times. Dentistry, which consisted chiefly of extraction of teeth and of their artificial replacement, was regarded by surgeons, in their turn, as so completely lacking in the requirements of surgical skill and ability that it was unworthy of their capacity and dignity and fit only for barbers, the minor surgeons of the age. Later, the surgical barbers, insisting upon recognition of the importance of their attainments in surgery, obtained public recognition of their equality with the surgeons, and for several centuries in western Europe all types of surgery were performed freely by "barber-surgeons." Ultimately, however, growth of the medical sciences, and increasing public appreciation of the importance of precise knowledge of anatomy for the proper conduct of surgical operations, elevated the status of surgery toward the higher plane of the practice of medicine. The union of barbers and surgeons was dis severed and the barbers were excluded from the surgical fraternity. But, after the barbers had again been reduced to an inferior position, they were entirely free to proceed with dentistry, the practice of which, because of its assumed triviality, did not seem to require any more knowledge of anatomy or of surgery than that needed in cutting hair or shaving beards, or in making and fitting wigs.

During the long medieval period, methods for the superficial mechanical treatment of diseased teeth and gums were diversified but not materially bettered; replantation of teeth was extensively practised; special attention was given by some practitioners to the systematic removal of dental tartar; operative instruments were occasionally invented and improved, including sets of scrapers (scalers) suggestive of the variety of similar instruments now employed by periodontists and indicating early attention to periodontoclasia ("pyorrhea"); new mixtures were tried in dental cavities for the purpose of arresting the progress of decay, and gold-leaf came into use as a filling material.

c. Progress in modern Europe

The modern era in surgery dawned during the sixteenth century with the classical achievements of Paré (1510-1590), who was successively a barber, barber-surgeon, master barber-surgeon in the French army, and surgeon to the French court. In his books, Paré discussed dental disorders, evidently in the light of his special dental experiences as a tooth-drawer while a barber. He was one of the first to describe a procedure for the transplantation of teeth and to use appliances for the improvement of speech and of swallowing after damage to the roof of the mouth through faulty development or by violence or

disease. During the period of Paré's activities, the classical anatomical researches of Vesalius, Fallopius, and Eustachius included fundamental contributions to the morphological aspects of dental science. The initial responsible book on the subject of dentistry, by a practitioner and distinguished from several earlier anonymous pamphlets, was published in German in 1548 by Ryff (Gualtherus H. Rivius).

In the seventeenth century the general histological structure of dentin and the presence of microorganisms in dental tartar were discovered; the maxillary sinus (antrum of Highmore) was described and its anatomical relationships with the teeth were defined; a correlation between conditions of the teeth and tic douloureux was suggested; and wax models were first used in the work of perfecting dental reconstructions.

In the eighteenth century the outstanding event of dental history was the publication in 1728, by Fauchard (1678-1761), of the first complete work on dentistry, entitled *Le chirurgien dentiste ou traité des dents*, which indicated the character and scope of dentistry as it then existed, explained and illustrated its ways and means, suggested and described important improvements, quickened public appreciation of its utility, aroused the interest and encouraged the attention of prospective practitioners, and received the commendation of contemporary medical authorities.

Tooth-brushes had come into vogue but, believing that the bristles damaged the gums, Fauchard recommended, instead, the use once a day of small sponges rubbed over all the surfaces of the teeth. He made full upper and lower sets of teeth that were held in place with flat steel springs, retention of dentures by atmospheric pressure having been uncommon before 1800. He began the systematic correction of irregularities in the position of teeth (orthodontia); improved palatal obturators; employed enameled dentures in his restorative work, and speculated on the probable utility of porcelain as a substitute for bone, ivory, or similar material in the preparation of artificial teeth; pictured a machine used for the production of artificial teeth and for drilling into teeth—the precursor of the dental engine; recommended scraping a carious cavity clean before filling it; indicated the value of fine tin as a cavity filling, and mentioned a lead filling which had remained in perfect condition for forty years; opened abscessed teeth to afford relief by drainage, and kept cotton-wool and oil of cinnamon in the cavities for some time before filling them. Fauchard noted the need for a school of surgery that would include instruction in dentistry, deplored the fact that so little had previously been written on the practice of dentistry, and ascribed this condition to the selfishness of able dentists who regarded their procedures as trade secrets. He described his own improvements, declining to exploit them commercially; strongly condemned elixirs and cures by magical means; and lamented the steady increase in the number of dental quacks and the growing danger from charlatanry.

The eighteenth century was notable, also, for its diversified improvements of dental reconstructive procedures (prosthesis). Gold crowns, plain or enameled, were applied

for the preservation of decayed teeth, and clasps instead of ligatures were used for the retention of partial dentures. The clumsy pelican, which had succeeded the forceps and had long been employed for extractions, was replaced by improved keys, various forms of which are still in use to some extent in France and in several other countries of Europe. In France, during this century, growing appreciation of esthetics in dental prosthesis led to the production of porcelain teeth for dental reconstructions. Philip Pfaff, author of an early treatise on dentistry, and dentist to Frederick the Great, initiated the practice of protecting an exposed dental pulp before placing a filling in the cavity; constructed artificial teeth from silver, mother-of-pearl, or enameled copper; and improved dental prosthesis by inventing the plaster model prepared from an initial beeswax impression. John Hunter, eminent English anatomist and surgeon, published many important anatomical contributions to dentistry, promoted the practices of replantation and transplantation of teeth, and fully described these operations, which were performed frequently in his day. In 1768, Thomas Berdmore, dentist to George III of England, published one of the most useful books on dentistry, an American edition having been printed as late as 1844. He gave instruction to Robert Woofendale, an Englishman, who from 1766 to 1768 was the leading dentist in the American colonies.

The history of the dental art during the sixteenth, seventeenth, and eighteenth centuries was chiefly a record of the progress of dental practice in France and, in the eighteenth century, along the lines laid down by Fauchard, but the turmoil of the French Revolution and of the ensuing wars interrupted that development. In the succeeding century, leadership in the march of progress in dentistry having passed to the dental profession in the United States, Thomas W. Evans, an American, became dental surgeon to the Emperor and Empress of the French.

D. ADVANCEMENT IN THE UNITED STATES BEFORE THE ESTABLISHMENT OF THE FIRST DENTAL SCHOOL IN 1840

a. Colonial era

Dentistry in the United States, before the nineteenth century, was a weak reflection of dental practice in the mother countries of the respective colonial groups, and was practised by an occasional physician or surgeon, many barbers and mechanics, and an increasing number of charlatans. As early as 1636, if not before, physicians and barber-surgeons entered the Plymouth Colony; and it is definitely known that in 1639 one of the barber-surgeons gave attention to dental ailments. Throughout the colonial era, there were few events in the record of American dentistry beyond indications of its humility and the superficiality of its service. Newspaper advertisements constitute the chief items of that record, in which, as a rule, individual practitioners presented routine statements

of their proficiency and readiness to apply their art. One of these early American dentists advertised himself also as by trade a hair-dresser and maker of wigs (New York, 1768); another, as "a midwife, oculist, and dentist from Europe" (New York, 1777).

Paul Revere (1735-1818), famous for his midnight ride, a goldsmith and ivory-turner by trade, also engaged in copper-plate engraving, in printing, and in the practice of prosthetic dentistry. Evidence regarding the latter appears in the terms of the following advertisement in the *Boston Gazette and County Journal*, for August 29, 1768:

"Whereas many Persons are so unfortunate as to lose their Fore-Teeth by Accident, and otherways, to their great Detriment, not only in Looks, but speaking both in Public and Private:— This is to inform all such, that they may have them replaced with false Ones, that looks as well as the Natural, and answer the End of Speaking to all Intents, by PAUL REVERE, Goldsmith, near the Head of Dr. Clarke's Wharf, Boston. All Persons who have had false Teeth fixt by Mr. *John Baker*, Surgeon-Dentist, and they have got loose (as they will in Time) may have them fastened by the above, who learnt the Method of fixing them from Mr. Baker."

Significant conditions in early American dentistry are suggested by a series of facts beginning with the career of a son of the first professor of mathematics and natural philosophy in Harvard College and the pastor, for a time, of the congregation of the Old North Church in Boston. The son, Isaac Greenwood, Jr., was a wood- and ivory-turner, a maker of mathematical instruments, an umbrella manufacturer, and a dentist, all of which trades he followed simultaneously in Boston as early as 1750. He had five sons, four of whom were taught mechanical trades and dentistry, and became mechanics and dentists. One of them, John Greenwood (1760-1819), a skilled mechanic and maker of cabinets and mathematical instruments, practised dentistry successfully in New York City from 1784 until his death. He was the first American to treat an abscessed maxillary sinus through the socket of a molar tooth. During the period from about 1791 to 1798, he made several sets of full upper and lower dentures for George Washington, by whom he was highly esteemed. The example and personal guidance of John Greenwood were important influences in the career of Horace H. Hayden (1768-1844), who was one of the chief factors in the inauguration, in 1839-40, of the modern era in American dentistry (pages 38-40).

b. Early period of American independence

Conditions in an army camp at the close of the Revolutionary War prepared the way for accelerated development of the practice of dentistry in the United States. During the winter of 1781-82, after the war had been practically concluded and while the allied Continental and French armies were encamped side by side near Providence, Rhode Island, Jacques Gardette (1756-1831), a French naval surgeon who was also a trained dentist, relieved distress among many of his comrades by giving them skilful dental treatment.

Surgeon Le Mayeur, one of Gardette's colleagues, occasionally performed similar operations. The peaceful conditions of the winter camp facilitated extension of this dental service to an increasing number of Americans. Josiah Flagg (1764-1816), a private in the Continental Army, having been attracted to the dental achievements of Gardette and Le Mayeur, became an apt pupil and soon independently attended to the dental ailments of some of his comrades. Visitors to the camp and returned soldiers, impressed by the dental practice of Gardette, Le Mayeur, and Flagg and recounting its benefits, created new demands for dental surgery.¹

Gardette practised dentistry from 1784 to 1829, in Philadelphia, where he acquired a high reputation. For many years he continued, as a private preceptor, to teach dentistry and to promote its development in this country. After an itinerant practice, in the vicinity of Boston, Flagg established himself as a surgeon-dentist in that city, where, for nearly thirty years, he engaged in the general practice of dentistry and in the instruction of apprentices. Flagg was the first native-born American who received a preliminary dental training that involved the point of view of the surgeon, and who devoted himself entirely to the general practice of dentistry.

The following advertisement in a Boston newspaper by Josiah Flagg, in 1796, shows in a striking manner the scope and character of the general practice of dentistry in the United States, at the end of the eighteenth century, by one of the best trained and most experienced surgeon-dentists of the period :

“**JOSIAH FLAGG, Surgeon-Dentist.** Informs the public, that he practises in all the branches, with improvements. [i.e.] Traisplants² both live and dead Teeth with greater conveniency, and gives less pain than heretofore practised in Europe or America; — Sews up Hare Lips; — Cures Ulcers; — Extracts Teeth and stumps, or roots with care; — Reinitates² Teeth and Gums, that are much depreciated by nature, carelessness, acids, or corroding medicine; — Fastens those Teeth that are loose; (unless wasted at the roots) regulates Teeth from their first cutting to prevent feavers and pain in Children; — Assists nature in the extension of the jaws, for the beautiful arrangement of the second Sett, and preserves them in their natural whiteness entirely free from all scorbutic complaints — and when thus put in order, and his directions followed, (which are simple) he engages that the further care of a *Dentist* will be wholly unnecessary; — Eases pain in Teeth without drawing; — Stops bleeding in the gums, jaws or arteries; — Lines and plumbs Teeth with virgin GOLD, FOIL, or LEAD; — Fixes *Gold Roofs and Palates*, and artificial Teeth of

¹ American historians have maintained the venerable tradition that Joseph Lemaire, the distinguished Parisian surgeon-dentist, who died in 1834, was the chief factor in the introduction of French dentistry into the United States. The creators of this tradition failed to ascertain the fact that Lemaire was born on March 26, 1782 — at the close of the winter in which Le Mayeur and Gardette were Flagg's preceptors. The legend originated when some of the founders of modern dentistry in America, aiming to set forth its origin and apparently impressed by the romantic aspects of the reputation of the then late Lemaire, confused his identity with that of Gardette's fellow naval surgeon Le Mayeur. For several years after the close of the Revolutionary War, Le Mayeur practised surgery in Philadelphia, where he specialized in the transplantation of teeth, though with doubtful success. He disappeared in 1787, when Joseph Lemaire was only five years of age. Cf. VIARD: French dentistry in the United States; Proceedings of the Congress of Bordeaux, 1923; *Dental Cosmos*, 1925, lxvii, p. 389 (April).

² The word appears thus in the original.

any quality, without injury to and independent of the natural ones, greatly assisting the pronunciation and the swallow, when injured by natural or other defects. — A room for the practice with every accommodation at his house, where may be had Dentifices¹ Tinctures, Teeth and Gum Brushes, Mastics, &c. warranted approved and adapted to the various ages and circumstances:— Also Chew-sticks, particularly useful in cleansing the fore Teeth and preserving a natural and beautiful whiteness; which Medicine and Chew-sticks are to be sold wholesale and retail, that they may be more extensively useful.

“Dr. FLAGG, has a method to furnish those Ladies and Gentlemen, or Children with artificial Teeth, Gold Gums, Roofs, or Palates, that are at a distance and cannot attend him personally. C A S H Given for *Handsome and Healthy Live TEETH*, At No. 47, Newbury-Street, BOSTON, (1796.)”

In an earlier similar advertisement (1785), Flagg included the following statement:

“Cuts the defects from the teeth and restores them to whiteness and soundness without saws, files, acids and such abusives as have shamefully crept into the profession, and which have destroyed the confidence of the public.”

During the years after the close of the War of Independence and before 1840, important advances were made in the practice of dentistry. Porcelain teeth for more durable and esthetic restorations were brought from Paris and their manufacture on a large scale was begun in this country. The French mode of correcting irregularities in the position of teeth was introduced. The procedure of filling cavities to arrest the progress of decay and to preserve the remaining portions of teeth first came into general application, and plastic materials devised in France were receiving attention for this purpose. Among the chief American contributions were the special preparation of gold for use in filling dental cavities, the invention of a dental articulator for the betterment of reconstructive work, the elaboration of dental bridges, and improved medicinal treatments of diseased dental pulps. The first American books on dentistry were published during this period—by Richard C. Skinner in 1801, and by B. T. Longbothom in 1802.

E. ORGANIZATION AND PROMOTION IN THE UNITED STATES SINCE 1840

a. Inauguration of the era of coöperation among dentists

The years between the close of the War of Independence and the end of the fourth decade of the nineteenth century were notable, in the history of American dentistry, for a cumulative demand for dental service, an increase in the number and distribution of dentists, a widespread extension of itinerant dental practice, and a menacing growth of quackery. Dental schools had not yet been established, and the medical schools and most of the physicians continued to ignore the dental aspects of the healing art. Dentistry was a trade that might be acquired during an apprenticeship, or undertaken without training

¹ The word appears thus in the original.

and learned through unguided experience; and any one was free to practise, without public restraint, whether he knew anything about it or not. The succession of important developments in the methods of practice throughout this period improved public appreciation of dentistry as an art, and increased the number of self-respecting prospective practitioners who sought the effective preliminary training that could be obtained by apprenticeship in the offices of established dentists. Unfortunately, however, the financial profits that individual dentists were able to derive from the system of apprenticeship encouraged secrecy and selfishness in the use of new methods and of inventions; and, instead of being colleagues in service, dentists in increasing number became rivals in trade, and succumbed to the temptations of charlatany.

Protests by the conscientious and better educated dentists against the continuance of these conditions gradually became more outspoken and influential in the guidance of public opinion. Books, pamphlets, and papers in medical journals delivered broadsides against greed and imposture, and taught the public the importance of the care of the teeth. A small though increasing number of physicians, who had been giving particular attention to dentistry, some of them developing it as a specialty in their practice of medicine, added the weight of their influence against trade secrets and quackery in dentistry. Gradually the prospective value of coöperation for the elevation and advancement of dentistry, and for the consequent promotion of the public welfare, became obvious, and several local societies were organized. Finally, in 1840, leading practitioners of dentistry established the American Society of Dental Surgeons, the first national association of dentists.¹ An important factor in this movement was the *American Journal of Dental Science*, the first journal of dentistry, which had been founded in 1839; and a strong influence in support of the development was the simultaneous inauguration of formal instruction in dentistry by the Baltimore College of Dental Surgery, the first school of dentistry. Within a period of practically one year, constructive leadership such as had never before appeared among dentists laid the foundations of publication, of organization and intercommunication, and of special education, on which has been based the modern evolution of the dental craft into the dental profession.

b. Organizations of practitioners of dentistry

Soon after its organization, the American Society of Dental Surgeons became involved in dissensions that gradually destroyed its usefulness, but the advantages of effective coöperation had been demonstrated; and, after the Society ceased to function, other national bodies took its place. The disruption of the Society was due in the main to an error of judgment in the zeal of some of its members to prevent quackery. Amalgam had recently been introduced from France as a filling for cavities in teeth. Although the relative ease

¹A local dental society was organized in 1834 (page 34). The first medical societies in the American colonies were founded about a century earlier.

with which it could be handled gave it wide popularity, most of the leading practitioners believed it to be unsuitable for the purpose. Its free use by dental quacks increased this feeling. Accordingly, in 1843, the Society formally denounced the use of amalgam as a filling material. Subsequent developments in the use of amalgam failed to justify this decision, but the morale of the dental profession had been seriously affected by the ensuing conflict. The offending resolution was rescinded in 1850, but this action did not retard the decline of the Society, which was disbanded in 1856.

The associations that succeeded the American Society of Dental Surgeons, and which contributed to the ultimate success of the movement for effective national organization of dental practitioners, were the American Dental Convention (1855-1876); the American Dental Association (1859-1897); the Southern Dental Association (1869-1897); and the National Dental Association, which in 1897 was organized by the union of the American and Southern associations, and in 1922 changed its name to American Dental Association.

The membership of the original national Society was composed wholly of dentists, but that of the Convention included also men who were active in the sciences contributory to dental progress. An early attempt by the Convention to establish a special fund for the support of research failed from lack of interest and understanding. Despite the superiority of the Convention over its predecessor, in organization and procedure, it was unable to meet the needs of dentistry, and ultimately was displaced by the first American Association, the membership of which consisted not only of dentists as individuals but also of elected delegates from local dental societies, which had been steadily increasing in number. The events of the Civil War interfered with the activities of both the Convention and the first American Association, and occasioned the organization of the Southern Association; but by 1897, each of the latter two bodies having become national in spirit and their relations having grown intimate, no reasons for separation remained and their amalgamation followed as a matter of course.

In 1913 the National Dental Association was reorganized on a plan similar to that adopted by the American Medical Association in 1901, and became in effect an organization of the members of the dental societies in the individual states, the legislative authority residing in a house of delegates elected by the component organizations. In 1911 the Association established a Relief Fund Endowment, now approximately \$150,000, with which to assist dentists during disability or old age.¹ In 1913 the Association began the publication of a Bulletin, which in 1915 was converted into the *Journal of the National Dental Association*, was published quarterly from 1915 to 1917, and has been issued monthly since 1917. In 1913 the Association established a fund for the promotion of research, which, derived chiefly from annual contributions by members,

¹The data in this paragraph have been revised by Dr. O. U. King, Secretary of the Association, and are accurate as of October 1, 1925.

now amounts to over \$115,000. Since 1921 this fund, permanently invested at a relatively high rate of interest, has been yielding an annual income of \$4549.20, which, beginning on September 1, 1926, will be \$6823.80. The grants for research in 1925-26, to be paid mainly from the membership dues, amount to \$28,000. In 1914 the Association established a general endowment fund, which is almost \$125,000. The total net assets of the Association, not including the good-will of the *Journal*, have mounted to \$390,000. The number of members has been increasing annually and is nearly 35,000.

In addition to the general association of dental practitioners, which advances the interests of the dental profession and of dentists, the American College of Dentists, an important honorary body, organized in 1920 and consisting of leading practitioners in the United States and Canada, promotes the highest professional aims. There are also numerous national organizations of specialists in the practice of dentistry, the members of which, in nearly all instances, are members also of the American Dental Association.

Dentists began to organize local societies as early as 1834. The first of these, with an indefinite history, was the Society of Surgeon Dentists of the City and State of New York, which originated the D.D.S. degree. The oldest of those now in existence is the Pennsylvania Association of Dental Surgeons, which was organized in 1845. Every state has its general dental society, many of which bear important relations to the selection of the members of state boards of dental examiners. Each of the larger cities has at least one general society of dentists. Such organizations exist in many counties, in rural centres, and in geographical districts of various types and sizes, in all parts of the country. There are also many local societies of specialists in the practice of dentistry. The organizations of Negro dentists are discussed in Chapter V.

c. Educational agencies for the betterment of dental practice

Nearly all of the existing societies of practitioners of dentistry have been organized to improve the quality of dental practice through the presentation and discussion of new observations and findings, and they exercise an important educational influence.

The chief educational agencies for the direct improvement of the practice of dentistry have been schools of dentistry since 1840, national associations of dental schools and dental teachers since 1884, and a national council on dental education since 1909. The relation of the dental schools and these national organizations to the evolution of modern dentistry is considered in Chapter II.

d. Organizations for the public regulation of the practice of dentistry

Before 1842 there were practically no public requirements for admission to the practice of dentistry in any part of the United States. In that year Alabama nominally began to

require an examination by a medical board for admission to the practice of dentistry, but the law appears to have been inoperative from neglect. In 1868, however, Kentucky, New York, and Ohio enacted laws that specified definite requirements for admission to the practice of dentistry within their boundaries, and gave power of enforcement to state boards of dental examiners or to equivalent official bodies. Since 1900, similar statutes have been in force in every state in the Union.

The public importance of the regulative function of the state boards of dental examiners was evident from the outset. It soon became apparent, however, that the boards might also effectually work together for the promotion of the general welfare and for the enhancement of the value of dental service to the individual patient. Aiming to encourage interstate coöperation not only for the advancement of the routine work of the examiners, but also for the elevation of educational and professional standards, and for the attainment of general uniformity in the statutory requirements for admission to dental practice, representatives of the state boards of Georgia, Illinois, Indiana, Iowa, Michigan, Ohio, and Vermont, at Niagara Falls on August 6, 1883, organized the National Association of Dental Examiners. This voluntary association of the state boards, which holds annual meetings and regularly publishes its *Proceedings*, has been one of the most important factors in the improvement of the status and quality of dentistry in the United States. The influence of the state boards of dental examiners and their national association, in the regulation of dental practice and of dental schools, is discussed in Chapters III and VI, respectively.

e. Dental journals

Books and pamphlets on dental subjects were circulated freely during the early part of the nineteenth century, when leading dentists also published occasional dental papers in medical journals, but, before the establishment of the *American Journal of Dental Science* in 1839, dentistry enjoyed none of the advantages arising from periodical publication directly in its interest. In 1841-50 this *Journal*, which had been established by a physician-dentist as a private enterprise, was the organ of the American Society of Dental Surgeons. Although publication of the first dental journal was discontinued in 1860, upon the death of its founder, the important benefits that accrue to a profession from the issuance of such journals had been shown to dentistry from the beginning of the *Journal's* career. New dental journals soon came into existence; many others have been added during the intervening years; and now the dental journals, published usually by dental societies or by commercial organizations, are not only more numerous than the best interests of dentistry require, but some of them, because of their mercenary character, detract seriously from public respect for the profession that supports them.

*f. Improvements in dental practice**1. General inhalation anesthesia, as a surgical procedure, a gift from dentistry*

Crawford W. Long (1815-1878), a physician, using ether in 1842, was the first to perform a surgical operation without pain under general inhalation anesthesia. Unfortunately, being unconcerned about the fundamental importance of his achievement, and failing to give due consideration to the distress that might have been alleviated by immediate general utilization of his discovery, Long delayed publication of his experience until an independent repetition four years later, and the promptly ensuing widespread extension of the new surgical benefaction, raised personal questions regarding priority of discovery. In 1844, Horace Wells (1815-1848), a dentist, found that teeth could be painlessly extracted under general inhalation anesthesia with nitrous oxide. Although he and his office associates repeatedly accomplished this result privately, he did not obtain recognition for the procedure because of lack of persistence in promoting it after a seeming failure at an early public demonstration. In 1846, Charles T. Jackson (1805-1880), a physician-chemist, in response to related enquiries from William T. G. Morton (1819-1868), a dentist who had been an assistant in Wells's office, expressed the opinion that ether vapor would do what Wells attempted to accomplish with nitrous-oxide gas. Morton, unaware of Long's prior discovery and testing this possibility, found that a tooth could be painlessly extracted from a patient under the influence of ether, and on October 16, 1846, at the Massachusetts General Hospital, in Boston, publicly demonstrated with ether the surgical value of general inhalation anesthesia, which by one agency or another has ever since been a routine procedure both in dentistry and in medicine.

2. Exceptional advancements

The era in dental history that was inaugurated in this country eighty-five years ago has been notable not only for the development of general coöperation among dentists, for the establishment and development of systems of education and state regulation, and for the creation of a periodical literature, but also for exceptional advancements in the practice of dentistry, of which the boon of anesthesia in its various general and local modes has been the most appreciated. During these years it was definitely established that infections of the dental pulp or periodontal tissues frequently occasion serious maladies in other parts of the body, and the remedial treatment of teeth with diseased or lifeless pulps, or with disordered supporting tissues, was brought into increasing accord with the necessity for the complete elimination of such pathological conditions. The importance of periodontoclasia ("pyorrhea") was clearly realized and its treatment made more direct and effectual. Orthodontia was reorganized and extended. Oral hygiene, especially for the prevention of caries, particularly in children, became a matter of increasing concern, and was made the basis of an auxiliary practice. Oral surgery was created a specialty of

dental service. Antisepsis and roentgenography were made routine procedures of practice. The operating chair, drilling and cutting machinery, and a multitude of operative instruments and devices were perfected. The rubber dam was conceived; cavity preparation for filling was reduced to a scientific technique; filling materials including gold, balanced alloys, and cements were rendered more adaptable or newly devised; and methods of preparing inlays were made practical. Vulcanite was converted to dental uses; continuous gum dentures were invented; all types of dentures and oral appliances, and artificial teeth for use separately or in group, were improved; and artificial repair, with obturators and velums, of defects in the roof of the mouth and in the soft palate was carried to a very high degree of functional usefulness. Theories regarding the origin of dental disorders were placed upon a more scientific basis, and the necessity for research given more general consideration.

F. GENERAL CONDITIONS IN CANADA

The history of dentistry in Canada has been closely analogous, in character, to that in the United States, and, as there has been complete freedom of intercourse between the dentists of both countries, much of Canadian dental history is interwoven with that of the United States. Many Canadian dentists received their early professional training in dental schools of the United States. Canadians are members of several of the national dental associations in this country, and welcome visitors and speakers at the meetings of practically all of the American dental organizations. In each Canadian province the practice of dentistry is regulated by statute independently of medicine. The Canadian Dental Association, an organization of the practitioners, was founded in 1902.

The first dental school in Canada was established in 1875, in Toronto, under the auspices of the incorporated dental profession of Ontario. There are now five dental schools in Canada, the last of which was organized in 1918. The Canadian Dental Faculties Association was amalgamated in 1923, with three similar associations in this country, into the American Association of Dental Schools. These and related aspects of dentistry and dental education in the Dominion are discussed in Chapter XI.