Brockway (J.)

AN

INTRODUCTORY LECTURE

DELIVERED

BEFORE THE THIRD DISTRICT DENTAL ASSOCIATION OF THE STATE OF NEW YORK.

AT THEIR

FIRST MEETING AFTER ORGANIZATION, JANUARY 12, 1869.

BY

J. BROCKWAY, Sr.

SYNOPSIS OF

Dentistry as it was, as it is, and as it ought to be.

A POWER TO MOVE AND MEND THE WORLD.

Vivida vis animi.

ALBANY, N. Y.:
J. MUNSELL, STATE STREET.
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LECTURE.

The first annual meeting of the Third District Dentist Society of the State of New York was held at Temperance Hall on Tuesday, Jan. 12, 1869. The President, Dr. Young, in the chair. Dr. J. Brockway read, by appointment, an introductory address: Subject—Dentistry, *as it was—as it is—and as it ought to be.*

At the conclusion, Dr. Perkins *Moved*, That the thanks of the society be tendered to Dr. Brockway for his very able and instructive lecture, and that it be put on file, and

Resolved 2, That the doctor be requested to furnish the society a copy for publication under the direction of the executive committee.

Both of which were unanimously adopted.

WILLIAM F. WINNE, *Secretary.*

INTRODUCTORY REMARKS.

Gentlemen of the profession, all of you my juniors, and most of you by many years. It is my pleasure to congratulate you on the prospect that isolation, with all its repellant forces, is among the things that *were;* and fellowship, association, and mutual reliances, among the things that *are*, and shall remain as the foundation of our future increase in all that is lovely and of good report. And let us cherish the hope and the faith, that the transactions of this day may leave an impress, giving delightful promise, that unity of purpose, counsel and action, shall characterize the future.

Within the half century of my practice, dentists have increased, from a single score, to ten thousand four hundred in the United States and Canadas. This is equal to a double every five years. The same ratio of increase for another half century would give us ten millions of dentists. But we may well suppose that in numbers, apportioned to population, we have reached, if not passed, our zenith. While we possess attainments and power for good, let us cherish the hope, that we are but in the morning of our existence.

The term dentistry, is appropriately used to denote the business, or the place, of business. As a business it includes both the science and the art of treating, preserving and artificially substituting teeth. Dentistry is both a science and an art, while it evolves much that is purely mechanical. Science is the architect; mechanical art, the builder; science discovers the want and the means of supply; art attains the end. Science *prevails*, art avails. Science, like "charity, seeketh not her own, vaunteth not herself;" but art is fond of pecuniary reward. Hence, the scientific are few, the artists many. Consulting ease of enunciation, we say, "arts and sciences," but, in fact, science occupies the foreground, art following, reaps the harvest. Science acquaints herself with the whole economy

of animal teeth, with their matter and their manner; their origin and their end, with all their facts, in all their forms and in all their varieties, their connection with and adaptation to the varied modes of animal existence. And why, properly formed teeth, are unnecessary to some forms of existence, and indispensable to others? Why wanting, in reptiles, creeping things and flying fowl? Why the higher order of animals scarcely subsist without them? Why, with many, the duration of the teeth is the measure of their existence?

Science would know why the infinite variety of form and size, from the thistly jaw of the smaller aquatics, to the movable envenomed fang of the serpent, up to the powerful war weapon of the tiger, the lion, the bear, the whale, and the mastodon. And why the peculiarity in number, in structure and form, of the human teeth? Why both deciduous and permanent? Why come in the time and order they do? Why partly vital and partly not? Why incapable of extension and growth and of repairing their fractures or abrasions? Why subject to decomposition and rottenness? Why the medium of so much pain? And what are remedies for their diseases? Science, too, must understand the chemical, as well as vital, organism of the teeth; the matter and the manner of their composition and formation, the arteries, veins and nerves, and all the ramifying capillaries, and nerve-fibrils, as well as the corpuscles, tissues and granules, that enter into their composition and organism. Science would understand the entire functions of the teeth and the means of securing them in their normal condition and appropriate use.

Mechanical dentistry, as such, has little or nothing to do with the animal economy; but, as an art, dentistry seeks the hand of science and by her would be led and guided. It would supply the artificial remedies and mechanical appliances agreeably to the teachings of science; adopt and adjust all her fixtures and mechanical powers and agents; remove all obstructions to the health of teeth, and supply losses in accordance with the laws of nature as discovered by science.

The dentistry of the operating chair is no less mechanical, though more artistic, than that of the laboratory. Indeed mechanical skill and artistic display make their happiest efforts in perfecting the form and external condition of the natural teeth. While some operations are more *strictly surgical*, the whole class of operations of the dentist, when performed in accordance with scientific principles, deserve as they have received, the appellation of dental surgery.

DENTISTRY AS IT WAS THE FIRST QUARTER OF THE NINETEENTH CENTURY.

Both the dental science and art are of European birth, but of American growth. It was not until the latter part of the eighteenth century, that France began her survey of this hitherto uncultivated field. It was in Paris; the source of scientific inceptions, as well as fashion, that dentistry was conceived. It was cradled in England, while it required the atmosphere, the soil and the culture of America to mature it.

High on the catalogue of American pioneer dentists, will be written, in unfading colors, the name PARMLY. Two Vermont families have given our profession, one for each day of the week. But Eleazar, whose professional days are numbered, stands in the eye of the public as did the

father-in-law of David a head and shoulders above his brethren. Always a gentleman. Now a retired millionaire. But, as he has favored me with a few items of his own and his family history he shall speak for himself:

No. 19, West 38th street, New York, Dec. 3d, 1868.

My dear sir:

I commenced practice in Montreal in the spring of the year 1815, with my brother Levi Spear Parmly one of the pioneers of the profession in this country, who was one of the first of his day and a very remarkable man. He had the advantage previously of the instruction of Dr. Petrie and Dr. Randall of Boston. The latter, with Dr. Greenwood, had the control of the practice in Boston. Mr. Parkhurst, Wooffendale, Gaeten and Greenwood had all that was worth having in New York. Philadelphia was more fortunate, having Gardette, Hudson and Koecker, all of whom in that day were remarkably clever men. The two first having the advantage of being educated to the profession. The second being the son of a distinguished dentist in Dublin, Ireland. Hayden of Baltimore was an exceedingly clever man, being a mineralogist as well as dentist.

In 1817, I met with a young gentleman by the name of Shymanski. Gentlemanly in every respect, who had studied and practiced dentistry in Poland as they understood it there.

These were the principal dentists of that day.

I met with no other person who even called himself dentist from Philadelphia to New Orleans, and I practiced in the principal towns going west between the two places; but feeling my total want of a knowledge of the profession, I then went to Europe to study, where I became thoroughly acquainted with silicious teeth. On my return to New York in 1822, my brother Levi S. Parmly settled in New Orleans. My brother Jehial going south during the winter. My brother Samuel settled in New York. My cousins Jehial and David are still in New York; their brother Ludolph settled and died in Mobile.

I have already given you the names of the principal men of 1815, and now at seventy-one I have seen the profession grow from an art to a science, with societies, colleges and schools, where little else is taught, and the number of dentists beyond counting; and of this number, a few have been successful, but the greater number have lived along as you see them now.[1]

Very truly yours,

E. PARMLY.

Dr. Eleazar Parmly, for some eight years after his return from Europe, and up to about 1830, sought his pleasure and his profit in occasional itinerant practice. Troy was among the places visited by him.

So early as 1810, an elder brother of mine, Wm. Wolston Brockway, went from Newbury, Vt., near the birth-place of the Parmlys, and went into the practice of dentistry in the city of Boston. In about one year

[1] Some isolated historical facts have been cited as evidence of a knowledge of dentistry among the ancients, especially the Egyptians. The time and the occasion forbid an investigation of the dubious evidence. That different tribes of men have manipulated their teeth agreeably to their tastes and superstitions, and, occasionally, by accident, or design, filled their cavities, there is no doubt. One of our encyclopedias records a case where a boy pressed a leaden shot into a carious

death ended a prosperous and prospective business. I inherited his instruments, and ultimately, his profession, although I did but little until 1822. But at that time I was about the only dentist *known* from Canada to Albany, and from the Rocky to the White mountains. I knew of but one other who visited that territory anterior to 1822, and that was a Dr. Lyscomb, educated to medicine, from whom I received some instructions.

The little state of Vermont, whose population was less than three hundred thousand, supplied more of the early dentists than all the other states. Seven Parmlys, two Brockways, Fitch, Brewster and Davidson, who itinerated in Vermont. Of the three first dentists of Philadelphia, I think neither were of American birth, and but two of the New York and two of the Boston pioneers.

The dentists who occupied the field during the first quarter of the century gave a better *average* of educated training and capacity than those of the present. Hudson, as a practical operator, has no superior at this day, being educated by his father, the best dentist in Dublin, Ireland. Gardette too, was a European and well educated. And Keoker, as every one who has read his *Practice* will admit, was not behind the best of his day; while Hayden, of Baltimore, was an educated and scientific practitioner. The New York and Boston dentists were but little behind them. Randal and Greenwood gave character to the profession in Boston. And Greenwood of New York immortalized his name by an entire set of teeth for the greatest and best — Geo. Washington; he extracted and wore, as a watch seal, his last tooth. And Dr. Parmly yields to Wooffendale of New York the credit of introducing, in this country, the use of gold foil, for plugging teeth. I had supposed it to be due to Hudson. But the gold foil of 1830 and 1840 was, as a whole, superior to that made since. That manufactured by the elder Kearsing was not less cohesive than the best now made. Fitch, of Vermont, was the first American writer on the teeth who ventured upon a large royal octavo volume. And Brewster, after having attained some notoriety in this country, obtained royal favor in France, and a knighthood from the emperor of Russia.

The junior, as well as senior class of dentists, were largely from the north and east. Of these, six were students of mine. I will name them in the order of seniority: First, Bigelow; who opened the practice in Buffalo, and was successful. Second, Blakely; who settled in Utica, and

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tooth, where it remained, doing valuable service, as a plug, for ninety years, until the centenarian died. This suggested the idea and utility of plugs. In our own days, leaden and iron balls have been found in the teeth of elephants and whales; gunpowder, no doubt, was the savage operator.

But of dentists, no doubt, the ancients could boast,
Though much that they gained, to us is now lost;
Old Noah's aching tooth, he tied to his foot,
And with a good kick threw it out by the root.
Solon, to his arrow his tooth he would tie,
And telegram like, from his mouth let it fly.
Women, when weded, filed their teeth like a saw,
Others, when widowed, plucked them out of their jaw.
Even men have been drilled to the tactics of wooing,
By dyeing their teeth, their faces tattooing.
Modern Japs, in science and arts more refined,
If to aching their incisors or molars inclined,
Batter their walls with mallets and rams,
Wrenching them out with fingers and thumbs.
Their dentists as best their arts now afford
Artificials, supply from the walrus and gourd.

See *American Journal of Medical Science*, article by Dr. Alex. M. Vedder.

sustained a good reputation. Third, Clute; the first located in Louisville, and the first in Kentucky; as a plugger he has had few equals. Fourth, Robert Nelson, who, in a double sense, was first, permanently located on North Pearl street, Albany. Fifth, Williams; who settled in New York city, but since left the profession. He, together with Bigelow, Blakely and Nelson, sleep with the fathers.

Clute survives, but has retired with money, reputation and gray hairs. My sixth was my son, Wm. W., whose practice in the city and country, has been successful. Besides the above, Gedney left Albany for England about 1827, acquired a fortune and returned; he is now in this vicinity. Dr. Young, who, it will do to call our venerable president, commenced practice in Troy, in 1829, where he has remained a valuable fixture. Douglass was, for years, the only dentist in Albany; his first colleagues were Cuyler and Nelson. And now, in 1869, their successors number fifteen. My place in Vermont was first supplied by Read and Stratton, both of whom are long since dead. Vermont, with little increase of population, now supports about sixty respectable dentists. Of the junior class to which I have referred, were four of the Parmlys; and of the sixteen I have named as my northern successors, seven only survive, and of the seven but three remain in practice. From 1826 to 1829, I was alone in the practice in Troy, leaving it in 1839 to be supplied by a respectable corps of twelve, in 1868. It has been my pleasure and privilege partially to fit and send into the field, eighteen young men, who, nearly all, have profited by a profession and a religion which honors all who honor them. I stand before you to-day, broken, though little bent, under the weight of three score and fourteen years, the oldest of any one now in practice in the United States.

I have now briefly sketched the history of nearly all the first class of dentists in the United States, and given the names with little comment, of sixteen northern successors, who, I think, were all in the field in 1832. Of these two generations, but eight survive, and but four remain in practice. Two generations of dentists have come and gone, since my elder brother, W. W. Brockway, a very remarkable young man, learned and talented, operated in our American Athens, the city of Boston. As with every enduring edifice, so with dentistry; its foundation was laid by skillful hands. England to-day, with her increase of material, can scarcely supply a match for Hunter and Fox and Bell.

We are not quite in the position of the Jews when the second temple was built. Their young men *shouted* and their old men *wept*. The glory of Solomon was not there. But I have seen myself many of Hudson's plugs after a service of thirty years as clean and as clear as the very best specimens of this day.[1] Dr. Parmly and Clute bear the same testimony. Surgical dentistry may have advanced in some particulars, and possibly as a whole, but has no demonstrator to take the crown from the head of Hudson.

[1] Scarce a month now passes but my attention is called to teeth, with plugs in good order, that I put in thirty and thirty-five years ago. In 1823 I plugged a molar tooth with tin foil for Rev. Dr. Merril of Vermont. He died about ten years since, with that plug and tooth remaining, the sole representative of an entire sound set thirty-six years before. During the first decade of my practice I think I averaged ten plugs a day of tin foil. In cases exposed to wear by mastication, tin foil wears dishing, otherwise it preserves the teeth equal to gold, and for most cases is preferable to amalgam; but no dark plug should ever be used in the incisor teeth.

Nor is it singular. The architect is always greater than the builder, and the builder greater than the workmen. The corner-stones of nations, religions, professions and arts, have always been laid by strong hands, and on shoulders *par oneri*. Judaism had an Abraham and Christianity a greater. The Jewish state a Moses, and Egypt her Pharaohs. Media and Persia her Cyrus and Darius, Macedon her Philip and his son, Rome her Romulus and Cæsars, modern France her Napoleon, Russia her Peter, and America a greater and a better, our Washington. Demonstrative sciences and literature in England and America were swaddled by a Locke, a Bacon, a Newton and a Franklin. The Protestant faith glories in her Luther and Calvin, and Reformation in her Wesley and Whitefield, and American theology in her Edwards and Dwight, while the law delights in one Story, and medicine in her Rush. And as early demonstrators of American skill in the dental art, the name of Hudson and Heydon will always stand at the head. The force that removes the inertia of a ball, a pendulum or locomotive, will, if continued, accelerate their motion. We needed none greater or better than our founders in France, in England and America, to carry our art to its culminating point.

But this leads me to call your attention to the opposing forces which had to be met and overcome by the founders of dental art and science; and

1st. It was opposed by the history of the world. For nearly six thousand years, and two hundred generations, the nations had lived and flourished without dentistry, why not follow the foot-prints of the fathers? The molar teeth of the antediluvians for sixteen centuries served them as their only and sufficient flouring mills. And from Egypt, entire sets of sound teeth that have served the octogenarian, have come down to us grinning in mummies, embalmed three thousand years ago. And in the days of Solomon, the teeth of his spouse were likened to arches of ivory, and still more poetically to a flock of sheep coming up clean from the washing, whereof every one beareth twins. They were well without dentists, why not we?

2d. Science and the arts, with instincts long petrified, would have it that teeth were the better the more they were left alone.

3d. Superstition cried loudly, protesting against all attempts at frustrating the plans of him who takes but what he gives. It were wickedness to attempt to restore what God has taken away.

4th. And ignorance, always clamorous, was loud in asserting the utter worthlessness of all dental help, save the relentless hawk's bill and turnkey. Having got her key-note from science, she could raise and fall a dozen octaves. A concern, equaled only by ignorance, for the tooth's enamel, induced a horror of tooth brushes and dental instruments. Above all things their swollen gums must be saved from the touch of a brush lest fatal bleeding should follow. Such were some of the prejudices of education and habit.

But another class of difficulties was found in the absence of tried and approved instruments and appliances for proper treatment. And here art was slower than science. The disease was seen and understood, the remedy indicated, but the means and the manner of treatment was yet in abeyance. But Hunter and Fox, and their colaborers applied themselves diligently to the work. Their first effort was to seek the *cause*, and then the remedy. But in the mean time the difficulty, as it already existed, called for treatment. They soon learned, that the removal of extraneous

matter from the teeth, and *excess of blood* from the gums, must be effected; and to this end, they summoned to their aid the tooth brush, the astringent, and the alkali, as well as the scaler, the excavator and the plug. But last and least, artificial substitutes for the teeth. But the necessary instruments and agencies were to be invented and proved, before there could be progress.

The desirableness being admitted, the practical method of supplying artificial teeth was long in abeyance. The first method, practiced only in a few cases, was transplanting from the heads of the poor to the rich, this soon lost all favor, as by it disease was sometimes transplanted. This practice was succeeded by *pivot teeth*, and blocks of sea horse teeth attached, first by silken, and afterwards by gold, ligatures, these succeeded by clasps. Entire sets were very rare, but were set upon ivory base, with sea horse, animal or human teeth. These were held to the jaws first by plain, and afterwards by spiral springs. The use of impression cups and of plaster of paris and swadges were unknown to our early dentists. From 1824 to 1828, I occasionally got up teeth on gold plates, raised and fitted to the mouth with a hammer and pliers. I never saw or heard of a swadged gold plate till about 1830. Mineral teeth were used occasionally in France and England as early as 1810, but I never saw one till 1829, when I inserted the first two for Philip Dorlan, Esq., of Troy, which I believe remain to this day. They were a coarse clay half tooth with platina clasps baked in, to which I soldered a gold pivot, and having filled the pivot hole, in the root, with red cedar, and pressed a small instrument into its centre, shoved up the artificial crown; the roots, with the teeth attached, remained unmoved the last time I saw Mr. Dorlan. This is, doubtless, the best method ever adopted for setting pivot teeth.

Had this method been skillfully carried out in connection with thorough surgical treatment it would have greatly diminished the demand for artificial dentures. And now having glanced at dentistry "as it was," we will give a passing notice of

DENTISTRY AS IT IS.

The length and breadth of this field will scarcely allow us a birds-eye view of its outlines, much less a survey of its apartments. Our time forbids to follow the progress of dentistry through the second quarter of the nineteenth century. We can barely indicate results. Indeed, we can do no more than garner the fruits of forty years' labor, which yields us the whole success of the manufacture and use of silicious and aluminous or mineral teeth, as well as the adaptation and use of metallic and suction plates as their base. The invention and use of impression cups, of plates, of plaster of Paris for dental purposes, of metallic swadges and counter-swadges, or hard fac similes of the jaws, with all the varieties of teeth with and without gum, rivetted, soldered, keoplasty, continuous gum, or *en masse*. This period yields us no unfruitful history of dental literature. We now have our schools and colleges, our periodicals, our dictionaries, and, with the help of England and continental Europe, our libraries; and in almost every state and city, our societies and fraternal associations, our dental depots and museums, our operating chairs, and almost the entire paraphernalia of the receiving room, the operating room, and the fixtures and furniture of the laboratory. I am thankful that our subject, broad as it is, necessarily includes no per-

sonal criticisms. Our profession can be viewed and reviewed in the concrete. Nor could I wish to say more than to relieve myself of all sympathy with those who find their daily bread in personal detraction.

The place which mineral or porcelain teeth now occupies will not allow us to pass them without notice. Their history would require a volume. France introduced, England improved, America perfected them. But America and England, no less than France, invented them. Neither built on the foundation or with the material of the other. The first teeth, properly silicious, were introduced into this country by Dr. Villars, now of New York, about 1830. Dr. Clute and myself paid him five hundred dollars for recipes, etc. Before this, and as he left for France, I had bought C Starr Brewster's recipes, and a thousand of his teeth. The Villars teeth were two-thirds silex. The Brewster teeth chiefly clay, chalk, and glass of borax. While Brewster was experimenting in Charleston, S. C., Dr. McIthenney was experimenting in Philadelphia. He claims to be first in success. He says he succeeded satisfactorily in 1827: does not state the material of his teeth. He also states that about 1850, he invented and patented the present method of enameling in the mould. About 1830, Stockton, of Philadelphia, came up as manufacturer-in-chief of teeth. His teeth were substantially clay and feldspar, strong and good. But to these have succeeded the present, chiefly feld-spar teeth. What they have gained in beauty is lost in strength.

Douglass of Albany was among the early manufacturers of teeth; his were pretty, but not well colored. Vitrified at a low heat, he obtained a better gum than Villars, which required intense heat. Neither stood the blow pipe well; they were rivetted to their base. I was first to mingle gold and tin for gum color. I took the medal for the best gum at the American Institute, in 1848.

Dr. McClelland of Louisville, Ky., has recently brought into notice, collodion, to supply the place of metals and rubber, for the base of dentures. The success is hopeful, though not yet fully established.

The manufacture of porcelain teeth has become an important business in the United States. The most extensive establishments are in Philadelphia. Dr. S. S. White's dental products of teeth, material and fixtures, overleaps a million dollars a year; he largely supplies the European market. This prince of teeth manufacturers gives, and he may be supposed to know, the number of dentists—10,000 in the United States, and 400 in the Canadas. And to this statement he adds: "I have no doubt there are more artificial teeth used in the United States than in all the world beside." And yet we are but about a three-hundredth of the world's population.

For the education of our annually increasing corps, we now have nine colleges; the first opened in Baltimore, November 1st, 1840; to this has succeeded, two in Philadelphia, two in Boston, one in New York city, one in Cincinnati, one in St. Louis, and one in New Orleans. We have about an equal number of dental periodicals. That the number of dentists, of colleges, and of periodicals equals the present demand, I think may be conceded. But that the majority of dentists, now in the field, are improperly educated and trained, will not be questioned. Nor could it be otherwise expected of the infancy of a profession, especially so long as there was a demand for so rapid an increase. Among the older professions — medicine, law, divinity — there is now, as there ever has been, a plebeian majority. Scarcely a dozen are to be found in any age or country who are num

bered with the giants. The masses of professional men are of and for the masses of the people. Our young country has produced but one Franklin, one Dwight, one Washington, two Websters, and a Clay. No Shakspeare, no Locke, no Newton. Nor has America produced a Hunter, a Fox, a Bell, a James, or a Nasmyth on the teeth. To them we can but oppose a triplet of H's, Hudson, Hayden and Harris. There are, indeed, among the living operators, many whom posterity will delight to honor, but to name them now would be invidious.

Although we have no scientific writers, like the English authors named, still our Harris has done good service. He has translated, collected, collated and published much that is now, as it has been of great value to the profession. Keoker's *Dental Practice*, and he was a colleague with Hudson, is still in advance of any other in the same line. Perhaps no writer has done more for surgical dental practice in Europe or America. Fitch, too, showed industry and intelligence, although much that he wrote has lost its value as greater lights have sprung up. Bond, Robertson, Taft, Richardson, Henley, and Pigot, are among the recent and worthy contributors to dental science and literature. As in every great enterprise, so in dentistry; the fountain head of supply has been in the *north*. The little state of Vermont supplied full one-half of the early dentists, several of whom wrote a little, and well. But Baltimore and Philadelphia were the *radiant* points from which light and heat went out to every portion of the dental world. Boston and New York have followed close in their wake.

I do not propose to criticize our dental periodicals, although they have sometimes taxed our discriminating powers to sever the chaff from the wheat. They have, perhaps, not improperly, been open to the maiden efforts of juveniles, who take pleasure in unearthing and revitalizing fosselized remains, and clothing them with the cast off garments of the past, and sometimes they have seemed to betray an interest in the advertisement of favored names and specialties. But they have published much that has been worthy of the cause and of the patronage they have gained, and I am happy to know that their patronage increases with their power for good. And their power for good will always be equal to their ability to instruct. Progress has marked their history.

Operative surgical dentistry has made little advance upon the practice of Keoker, as every reader of his book will be constrained to admit. Indeed, I know of nothing essential added to what was known and practiced fifty years ago. Much that is said of restoring lost periosteum and alveoli and of healing diseased pulps, is doubtless but the boast of empiricism. The treatment of diseased antrums of the gums and alveolar abscesses was as well understood then as now; free ventilation is the remedy, nature usually effects the rest. True, in the dreaded operation of extraction, there has been improvement in instruments; but this is mechanical. Whether the introduction of anæsthetics is an improvement, is questionable. That they are productive of as much pain as they relieve, and lessen security to life, will hardly be questioned.

I think the history of the profession justifies the conclusion, that the chief improvement in surgical dentistry, for the last fifty years, is in an increase of numbers, who come up to the standard of Keoker, Hudson and Hayden. But to their honor let it be said, a few have nobly contended for a practice, as it should be; although the popular ear has not been open to them.

But in mechanical dentistry, improvement has kept pace with the increased demand. Yet, in its onward march, it has left behind much that should have been advanced. It has been too much the policy of dentists to create wants, in order to supply them, and to this end comes the advice so popular with the people: "Have out all your old roots and teeth, have in a full set, new and beautiful, and see how much art is ahead of nature." There is now fifty entire sets of teeth put in, where there was one twenty-five years ago. And why? It is not that the want of them has so much increased. But the advice and the practice of dentists has been the motive power in this rapid movement. And now, instead of the advantage of surgical remedies, the people will accept miserable substitutes, pay for anæsthetics, and jeopardize their lives, for the sake of a show of silex instead of nature's own ivory.

It has been the policy of a large number of dentists, to increase the sore in order to enlarge the plaster. Sweeping extractions have been *in*couraged and fillings and pivot teeth *dis*couraged, and the practice has been suited to the advice. Plugs, properly put in, with suitable after treatment, are for life; and pivot teeth, inserted skillfully, will average fifteen years of hard service; but, as recently set, they will hardly serve for one year.

I will mention two, out of several, methods of inserting pivot teeth, which should never have gone into disuse. First, the old style of pivot teeth, as made by myself, half silex, with a deeply threaded screw pivot hole, into which was screwed a strong straight-grained hickory pivot, with a gold wire passed through its centre. The hole in the roots being drilled, all its length of a size, was then enlarged at the upper end by means of a spring-reamer. The drill and the pivot should be passed through the same hole in a wire plate; one end *screwed* into the crown, the other pressed into the root. To part them is impossible, without drilling. The other method, I would name, is this. Use the plate tooth, made of the old strong material, with two good pins, solder on a strong gold pivot, drill the root *tapering*, fill it with red cedar, pierce the centre, and drive the tooth home. In either of these ways skillfully done, the tooth will last on an average fifteen years, and give more satisfaction than any plate tooth ever can. For teeth inserted in this style we used to get five dollars each, and they were worth it. This practice has been superseded, it may be, for the profit of the dentist; but not for the people.

It is not then in *pivot teeth*, or in substituting plate teeth *instead*, that mechanical dentistry has advanced. But in the plate teeth, and the manner of adapting them to the mouth, there has been confessedly a radical improvement. The metallic plates, as got up for the last twenty-five years, are a decided improvement upon the ivory or sea horse base.

Rubber, as a godsend to the poor, would deserve more favor of the profession, but for the sharks, whose insatiate maw is not satisfied with its pound of flesh. Men, without genius to invent, or wisdom to improve, like starving leeches, have fastened upon us; and we deserve, as we shall have, their contempt rather than sympathy, if we refuse to unite to shake them off. United we could *stand* and *withstand* them, but isolated and divided we fall an easy prey. Monopolies and patent rights are on the increase; before one is gorged a hungry swarm succeeds. And yet, as a body, we refuse to defend ourselves against them. Even now, while I am writing, an agent of a patentee appears, with an instrument bearing the seal of the patent office, for a method of using aluminum precisely as used by me for

three years, and shown to hundreds of dentists. Continuous gum, air chambers, keoplasty, sets of teeth, *en masse*, were all *patented* years after I had them in use.[1] But it seems to have been left to the present rubber company, to demonstrate the power of money, and the dread of law suits. This company, having learned their power, will use it under some pretense of right, just as long as dentists will submit. They demand of the dentists about $750,000 a year, and that for fourteen years to come, and by that time, they will find some new claims, that they can with equal justice sustain; they will have put down all opposition, and accumulated an immense fund, with which to compel future concessions. But this is among the things that are, but one that hangs heavily upon the verge of dental progress.

But while I must deplore the still lingering tendency to isolation, and standing aloof from each other, I cannot but regard as among the most hopeful of the things that are, the growing disposition to harmony and united action, in many things pertaining to the common good. Dental associations and societies are formed, or are now forming, in almost every state and district of the union. Light is disseminating, knowledge is diffusing, and our art and science is gathering strength and respectability. If but one in ten, now in the field, are equal to the original three in the city of brotherly love, we then have an increase in fifty years, of *three hundred fold*. No other profession has ever exhibited so vigorous a growth. The salt has not lost its savor, nor the leaven its diffusive power. With the experience, the means and the men, now in the field, we have only to go forward to dentistry as it should be, a mighty power for good.

Fifty years ago we were without the helps and facilities of the present. We knew of no impression cups, no plaster of Paris, no swadges, no forceps, of practical value, no dental depots, no books, no periodicals, no colleges, no societies. Indeed, we were without help, entirely dependent on our own individual exertions. Now we are armed and equipped with not a little of the sinews of war; we are able to "move upon the works," building up the fortifications of ivory, and subduing every power that attacks them. Fifty years ago, we were in tutelage to France and England. Now we are giving them their lessons, and furnishing them men and means. Indeed, Europe is now proud to follow in the footsteps of America in dental art. He that would decry the enterprise that has taken possession of such vantage ground, does but belittle himself. But

WHY WAS DENTISTRY SO LONG UNKNOWN?

Before attempting a definition of dentistry as it should be, we may profitably consider the question, Why was dentistry so long unknown,

[1] It was in 1824, in Woodstock, Vt., that I put in the first gold plate, fitted to the jaw, as a base for artificial teeth, that I ever heard of. In 1835, I designed and used the air chamber as now in common use. In 1833, I commenced manufacturing mineral teeth, more than half quartz, very strong, after the Villers recipe, and soon after, adopted the practice of making under sets, *en masse*, a platina wire, only, running through the middle. Several sets of this kind, made more than thirty years ago are still doing service. At the same time I made many sets of upper teeth, "continuous gum," nearly like those now got up. Keoplasty, I used and sold numbers of sample cases to dentists in 1849. At the same time I manufactured for myself, and for sale, quite largely, *moulded block gum teeth*; the first ever made, for which I received a medal at the American Institute, New York city.

and so long unneeded? It is not enough to say *ignoti nulla capido.* No desire is felt for a thing unknown. Pain seeks relief; and where there is a want, there is a way. Nature abhors a vacuum. Wants are never long felt before they are supplied. Why, then, for six thousand years, and two hundred generations, were dentists unknown and unneeded? and why the want so imperative now? What is it that has wrought a change so great and so sudden in the oral and masticatory apparatus of the human family? and especially of the inhabitants of this new world — North America.

Possibly, we may find our fall in the rise of the culinary art. It was, doubtless, left for Europe and America, to disgrace and degrade the natural appetite, by cultivating an unnatural and abnormal one, and then, stimulating that, by the health destroying devices of the cook. And, still worse, by the introduction of excessively hot drinks. As the heart panteth after the cooling water, so did the thirsty man. But now the stomach is converted into a boiling cauldron in which our food is cooked not digested. The tender and active fibrils of the stomach lose their sensitiveness, to the healthful touches of nature's true beverage, and seem to demand the stimulant of boiling hot tea and coffee. It was nearly simultaneous with the introduction of tea and coffee, that the dental art, was called in requisition, and, it is in this country, where tea and coffee are used most and hottest, that dentistry reaps its richest harvest. It is certainly worthy the most diligent inquiry, whether it may not be the par-boiled stomach that refuses the proper work of digestion, and instead of generating alkaline secretions, produces only acidified, to demolish the marble arches that labor to support the whole structure. We know that all animal instincts are opposed to hot drinks. The only case within my knowledge, where animals have been for any considerable time, forced to the use of hot drinks, is the cows, fed upon hot slops, from the distilleries. In this case, the hot liquid runs through the milk capillaries, and comes out a white poisonous fluid, sold for milk; the cows soon loose their teeth, their health, and their lives. This certainly, strongly corroborates other evidence, that hot drinks are unnatural and hurtful; and have the effect to produce that acid state of the secretions which destroy the teeth. This state of the stomach is transmitted. Hereditary disease is the consequence. A very large proportion of existing diseases have been handed down. It would require generations of correct habits, to correct the evil. But, although diseases of the teeth, as well as other diseases, are often hereditary, yet, it may be doubted, whether original sin has anything to do with the premature failure of the teeth. Diseased teeth were not always, as now, the chief of the ills that flesh is heir to. We might give several reasons for supposing that the primeval races were not seriously troubled with rottenness of the teeth. About all we know to be sure of the antediluvian is, that it was with the teeth, that our first mother, divided with her husband, the apple, that brought on us tooth-ache and all our woes. But the primal constitution made stout resistance to disease and death.

It was not till after the Noachian flood had fertilized the earth, with the teeth and bones of a *world of sinners*, that it brought forth abundantly its thorns and thistles, and levied so large a discount upon the health and life of man. And, still longer, did the teeth defy the acids of Eve's apple, and the sour grapes of Sodom and of Noah, as the grinning

mummies of Egyptian octogenarians, deposited in their catacombs three thousand years ago now testify. Nor, does toothache enter much into the history of the Babylonians, or of the Medes and Persians. Nor yet of Greek and Roman citizens, or soldiers. It was not till after the imprecation, upon his enemies, of Israel's glorified king, "Break their teeth, and let rottenness enter into their bones." Nay, it was not till after the eloquence of the first Christian martyr, so enraged his persecutors that they gnashed on him with their *teeth*, that this organ began to feel the full power of the curse; but now it comes as if engendered by the serpent's tooth.

But diseases of the teeth rapidly developed as the civilization of Europe culminated. And no sooner had young America sprang to her feet, than she was taken by the teeth, and in her agony cried out for *dentists*.

The fact that dentists were unknown, is of itself evidence that they were little needed in the olden times. Nature is never slow to supply a want that is felt. Toothache would have sought a remedy as earnestly in the days, and in the teritories of Confucius, and among the early Chinamen, as here and now, had the plague been as common and as *cursing*.

Many are wont to ascribe the slow march of improvement to the ignorance, the sparseness or poverty of the people. But it was not the darkness of paganism, or the poverty of the ancients, that incubated diseases or *neglect* of the teeth. The pyramids and the catacombs of Egypt, no less than her chariots and her armies, testify of her wealth, of her wisdom and her skill. Nor could the mighty prince of Media and Persia, whose palace was of ivory, and his bedstead, as well as his drinking cups, of pure gold, either disregard or neglect the teeth of his Vashti and his Esther.

And it is certain, that the man who lavished upon the temple of his God, an amount of silver and of gold, scarcely less than has yet been gathered from the placers of California, and the mines of Australia and Russia, was not lacking in taste or appreciation of the teeth, since it required no less than forty oxen to supply the teeth at his daily table.

Nor money, nor learning, nor taste, was wanting in the mightiest king of that great Babylon, whose walls and temples, and towers, golden images, gardens and fountains, together with twenty years of stored provisions, have been estimated equal to the entire wealth of our great republic. It was only necessary that his pride should be subdued, when with his *teeth* he was made to eat grass as an *ox*.

Nor was it that the earth's population was sparse, when Xerxes could number soldiers by millions, and the little domain of the Jews, not a tenth part as large as the state of New York, counted a population of *seven millions*.

The population of the old world had probably reached its zenith when the queen of the south was attracted to the harem of Solomon, to admire the ruby lips and ivory arches of its thousand inhabitants.

At this time, the old world was teeming with *venerable fathers* whose only flouring mills were their molar teeth. *These*, enriched the earth by sewing it broad-cast with humanized flesh and bones. Races grew and multiplied, and in the days of Xerxes literally filled the earth with men and women who knew not, nor needed doctors or dentists. Their history was

no more summarily written than ours. They, like us, lived, got married, died. They with mouthsful of natural, we with artificial teeth.

But the question still presses upon us why? Why was it left for Europe, in these ends of the world, first to evolve the doctrines and duties of dentistry? and why the United States, the hardiest of her offspring, made the great field of development of the dental art?

It was when the United States were poor, and lived on porridge, corn-bread, and pork and beans, that Dr. Randal, of Boston, said of their teeth: "They exhibit more the appearance of broken down sheep racks and fortifications of tobacco quids than ivory arches." Corn bread and hard fare refused them assurance of good teeth, although for the time, their tea was thrown overboard; but despite poverty, hard fare, and corn bread, rottenness entered into their teeth and broke down their jaw teeth; and hence the urgent demand for dentists. Doubtless dentistry had been needed for many centuries, but now the want became pressing. It is not therefore, the richness or poverty of living that originates bad teeth, nor yet is it climate, for the cattle upon our thousand hills feel not the evil; but it is to be looked for in some peculiarity of cookery or diet. Indeed, the causes of diseases, their changes and divers phases are involved in mystery, *nec scire fas est omnia.* Why the tardy progress of all the noblest arts and sciences during fifty-seven centuries and near two hundred generations? And why now in this fifty-ninth century, this rapid advance in all that is humanizing and fraternizing?

It is not for ordinary minds to comprehend the far-reaching designs of a master-move upon a chess board; and who shall comprehend the infinite reach of design, in the moves of Him whose chess board is the universe? It is only as designs develop that lesser minds are brought into sympathy with the greater. We may, indeed, count ourselves happy if permitted to see the connection of a few links of the infinite chain. Some of the designs of the wonderful and unprecedented movements of the fifty-ninth century are now less a matter of augury than of vision. Men like matter usually gravitate to a centre; great cities, centralization, gathering around a mighty tower, seems instinct in man. But the whole world was made for man, and in order to populate it, men must scatter. Diverse tongues, diverse interests and tastes must first be cultivated until man should possess the earth, and every part of it feel the impress of humanity. This done, the higher end must be developed — the civilizing and fraternizing of the entire race. The United States is, doubtless, intended to be the key stone in the grand social arch. That the design of filling the earth might not fail, peoples and populations have always first cropt out in the hardest portions of the world, that the people might be attracted by interest, to search out and fill up the remote and better regions. Had we begun to people the rich placers of California or the fertile valleys of the Mississippi, who would ever have gone east, with his pick-axe, to dig potatoes out of the granite pavements of New Hampshire and Maine. But by a hardy New England growth we were enabled to stretch a sinewy arm across our own continent, and seize upon its vast treasures, while the other, nerved and warmed by the heart of kindness, grasps the nations of the earth and offers to gather them around our central fires and social hearths. Yes, young America, whose gymnastics were the rocks and brakes of New England has come up, and is now prepared, with a strong arm to sweep away the fog and debris of crumbling dynasties. She is

now qualified to anoint the gouty limbs, rub open the eyes of dotage, and bring to her own warm bosom the fossilized nations of the earth. Our United States have a destiny. It is theirs to renovate, quicken and revitalize the old world; and to this end American dentistry has a proud work to perform. Already we supply the old world with her silicious teeth and with her best dentists.

It is but a few days since I saw a beautiful specimen of American dentistry got up in one of the cities of the celestials. American dentists are to be found, not only in the European states, but in all quarters of the world. Indeed, American dentistry is adding new power to the civilizing arm of the United States, already nerved to the work of gathering the nations around one common centre, and cementing again a common brotherhood. With these views of our work and our destiny, we address ourselves to the question

DENTISTRY AS IT OUGHT TO BE?

We have already seen that dentistry was healthy in her childhood, and vigorous in her youth, what then must she be in the fullness of her strength and beauty?

As already intimated, it is the work of the dentist, not only to assist nature in giving beauty and symmetry to the human face, and perfection to the oral organism, but to redeem our race from the pains and penalties of toothache, the greatest and commonest ache that flesh is heir to. To learn the cause and the cure, to secure to humanity what is common to brutes, the enjoyment of all the pleasures of a healthy masticatory apparatus. This we conceive will be dentistry as it should be. In two particulars, at least, dentistry in the United States has attained its culminating point. We have nearly one dentist to every three thousand of our white population. In numbers we are equal to, if not in advance of the demand; but to perpetuate this supply, it will be necessary to educate, train and add to the corps, from eight to twelve hundred a year, for the next generation, to supply losses by death and otherwise, and keep pace with a population doubling every thirty years.

And for the education of these, we already have nine colleges, a number quite sufficient for all who seek their benefits. For the present then, we have dentists enough, and dental colleges enough.

But hitherto dentistry has failed in her aims. It has been regarded as sufficient to arrange the deranged, arrest decay, by fileing or filling, remove successfully incurables, and ingeniously supply losses with artificial substitutes. But it *should be the first aim* of the dentist to *prevent* derangement, *prevent* decay, *prevent* the necessity of extraction, and substitution of artificial. Dentistry will not be as it should be, until it seeks this as a *chief end*, and is able in the main to *attain it*. No doubt, as already seen, the primary cause of dental derangements and decay is to be looked for in improper *diet* and drinks, although a *proper* allowance of the fat and sweets of the land are not to be denied us. But were we to follow the dictates of reason, as do the brutes their instincts, we should need dentists as little as they.

Undomesticated animals are not troubled with toothache. But the cow, as we have said, confined to the stall and fed upon *hot slops* loses health, *teeth* and life. Hot drinks, fine flour and excess of sweetmeats,

levy a tax, upon health and teeth, which indulgence is compelled to pay. It belongs to the physician and the dentist to *educate* the people on this subject, but how can they do this, themselves *un*educated. These causes, so far as they have a debilitating effect upon the muscle, bone and teeth, concern the physician no less than the dentist. Rottenness of teeth is not the result of diseased action in the *circulation*. If it were the bones would rot with the teeth. But the effect of improper diet and drinks *is to vitiate secretions*, particularly the *salivary and mucus*. It is *these* that destroy the teeth by *chemical action*.[1]

Here, then, we come to the specialty of the dentist: it is his business to destroy the *powers of these chemical agents*, and prevent the destruction threatened. The man who is unprepared to meet this exigency is not fit to practice dentistry. The teeth being substantially lime, *acidity* is the agent that destroys them. Hence the remedy is obvious: the *frequent*, and if need be, the *constant* use of an alkali. When the condition of the teeth indicate acid secretions, the use of a dentrifice, both alkaline and astringent, should be made habitual and very frequent.

There is no age when the dentist can do so much, as in childhood and youth; from five to fifteen, the teeth should come under the close inspection of the dentist as often as quarterly, at least. Tendency to derangement and decay should be carefully watched, the symptoms noted, and the proper remedy applied. The teeth properly attended to, from five to twenty, there would be, the youth being formed to correct habits, little occasion for dentistry thereafter. This is dentistry as it should be. To this work the dentist should be educated, and to this high aim, his talents and energies should be directed. But his duties, can not, so long as man is depraved in morals and appetite, end here; diseases will still arise requiring varied treatment, to which, none but the educated and trained dentist, can properly address himself. Caries will sometimes steal upon a patient, when the use of the wedge, the file and the plug, may be indicated; giving occasion for the exercise of common sense, of science and of art. But, that dentist is most worthy the name, who most escapes the necessity of artificial substitutes, for this most important organism. The time will come, and let it come soon, when the reputation of the best dentist, will attach to him who most successfully prevents the use of all instruments of torture, and secures the normal condition of the teeth to the octogenarian as well as the child. And he will be, only, second rate, who successfully treats the decaying, while the man who knows only to furnish sub-

[1] In 1829, I published a disquisition on the "causes of the decay of teeth and the remedy," and fully demonstrated what was then a new theory, that caries was the result of chemical action, and not of inflammation, as before held. The argument was summarily this. Teeth are substantially *lime salts*. In all cases where they decay, the secretions of the mouth, for the time, are in an abnormal state, more or less acid; and hence in all places where this lime solvent finds lodgment, decomposition is the result. Hence, decay in teeth never commences internally, nor where the teeth are most exposed to friction; but always in fissures, indentations, at the lips of the gums, or near latteral contact. Forty years of close observation has confirmed my early convictions. Indeed, this theory is the basis of all correct dental practice. Teeth are plugged to shut out external solvents, not to arrest internal disease. In 1839, I published, in pamphlet form, a dissertation, an abstract of which was published in the only dental periodical of the age, on galvanic batteries in the mouth, showing the consequences of using two or more metals, differing in degrees of affinity for oxygen, in the same mouth. Amalgam, in close proximity to gold fillings should be avoided.

stitutes, must be content with his chosen work and wages, and be written a mere mechanic. This, gentlemen, as I can understand it, is dentistry as it should be. And how is this desideratum to be attained?

When, fifty years ago, the great work and want begun to be felt, time for proper education might not be spared, and so long as the necessities of the people demanded the doubling of our corps every five years, there was, at least, an apology for giving indulgence to empiricism. But this necessity can be plead no longer. If dentists hereafter double with the population, once in thirty years, the people will not suffer for want of numbers. Now there is time, and the times demand, that no more should enter this field until fitted for the work. What then are we to demand as necessary qualifications for entrance to the gateway of dental practice?

We answer; *First of all*, good moral character, probity, truthfulness, honesty.

Second. Aptitude, talents, taste and tact for the profession.

Third. Suitable education.

No one should be admited as a student in dentistry, without, at least, a good common school education, and let it be remembered, that a common school education, has had and still has its upward tendency no less that dentistry. When dentistry made its debut, to read, write and cipher to rule of three, was the maximum of the common schools in the United States; but now, in this latter part of the ninteenth century, a good common school education offers, and demands, a thorough knowledge of common arithmetic and English grammar, and, at least, the rudiments of geography and history, ancient and modern. With a knowledge of the common school books, on geology, natural and moral philosophy, physiology, mineralogy, general anatomy, hygiene, chemistry and astronomy. With less than this, no dentist should admit a student to his laboratory or library: and while his muscles, his hand, his eye and his taste, are in training, he should be required to devote every leisure hour to the study of his specialty; making himself thoroughly acquainted with the physiology and anatomy of the head, the face and the teeth, and of the diseases and treatment of the teeth and their surroundings. So much is necessary in order to enter to advantage, or hear, with profit, the lectures of a dental college.

And these necessary attainments of the student in dentistry, sufficiently indicate the duties and the qualification of censors. Of course no one can examine beyond the reach of his own knowledge. No one is fitted to act as a censor, who has not all the qualifications to be exacted of the student. And when it shall come to pass that all who practice our specialty shall come, fully, up to the standard I have indicated, then will dentistry be as it should be, the offspring and the offering of science and art. Then will the natural teeth be saved, as a rule, not substituted. It will be only when men are old, that the grinders will cease because they are few.

In thirty years our home field will give employment to twenty thousand dentists, and, possibly, we may need to educate as many more to go out as missionaries into all the world. Let them be educated and everywhere they will do honor to the name of America.

Every dentist should acquaint himself with the natural history of the teeth, from the beginning of bony formation; certainly, as far back as their condition can be affected by treatment or art.

Analytical and microscopical investigation belongs to dental science, rather than practice; in this, our advance has not been slow. Science delights in the arcana of nature; is elated as she finds in the house-fly the real Argus, and, in the apparently attenuated thread of the spider a rope of a hundred strands. And, her researches are not less fruitful of pleasure, when she traces the small nerve and artery, in their passage at the point of a tooth's fang, until the nerve divides, branches, and ramifies, the pulp and dentine, ultimating in numberless fibrils, which defy the investigation of a microscope of a thousand diameters, and weave themselves into the thin membrane that unites the dentine to the enamel. Such researches, while not wholly barren of interest to the operator, are exceedingly fruitful of enjoyment to the scientific. Such are the developments of the microscope, that science is at loss which most to admire, the smallness of the work or the greatness of the workman; the infinitude of contrivance, or infiniteness of the contriver; the wisdom of the design or the ingenuity of execution; while she wonders at the stupidity, and the credulity, that sees in these displays of infinite skill only the blindness and the blunders of chance.

Practical men are not often disposed to spend time in search of primary corpuscles, of flesh or tooth pulps, or the elementary particles of dentine, enamel or cementum. *Deep research* into the arcana of nature, is less profitable than curious. When the microscope has done its best we are no nigher the life spring than natural vision carries us. Nor is our power to make one hair white or black at all increased.

The practical surgeon, physician or dentist, will direct his studies, chiefly to the attainment of the best practice, and best results. To know that a hair is a barbed cylinder, and that animal corpuscles are cellular, is interesting to the curious, but of little use in treatment. But to know precisely when and how to apply the forceps, the file, the excavator and the plugger is of vital importance to every dentist.

Whether the enamel is formed from lime-salts, held in solution in the tooth-sack, and precipitated upon the cementum, or whether it be a capillary deposit, is of much less importance than to understand the fact that enamel is given to protect the highly organized and acutely sensitive dentine, and that it is substantially lime, easily decomposed by acids. And that when abrazed by mechanical or chemical agents, can not be restored, and is, therefore, to be carefully preserved, unless, as is sometimes the case, the removal of a part will subserve the health of the whole.

It is important, too, that every dentist should know that there is an acutely sensitive membrane uniting the enamel to the cementum or dentine, and still more important is it to understand the danger of denuding a pulp, or breaking the delicate membrane, that envelops it. The most skillful treatment of an exposed pulp can never atone for its needless exposure.[1]

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[1] A practice has prevailed, and does still, among good operators, to remove from a cavity all soft bone, although by so doing they bare the pulp. This practice is founded upon the false theory, that caries is cancerous, or gangrenous. All that is necessary to arrest caries is to shut off the bone solvent. Hence, every fissure, crack or lodgment must be guarded against, the plug made perfectly level with the enamel and air tight; then whatever soft bone lies at the bottom, soon hardens and encourages a new deposit of dentine, and is far better than any capping or soft filling; although a soft, temporary filling may be often necessary while the soft bone is hardening.

But as it comes not within my design, I will not further open the wide field of dental practice; and what I have now said is intended simply to indicate the proper field of dental investigation and study. As the surgeon, before introducing his knife, should know what muscles, veins and arteries, tendons and nerves, lay about the parts, so the dentist, should understand the living organism of the parts upon which he operates. When dentistry shall have attained its perfect status it will be, indeed,

A POWER TO MOVE AND MEND THE WORLD.

I have not dwelt upon the short comings of our profession, for two reasons. First, Because I do not think them greater than the necessities of the case; had we waited to educate, our operative force, to-day, would not have been a tenth of what it is. Our founders, like the original Master, and like Wesley, and Whitefield, had a great work before them. Time to educate up to the present demand could not be spared. But my second reason is, I have observed that adepts at fault-finding are usually among the most faulty. Hence I leave that work for those who like the wages. I would fain do what I can to drive back the darkness and let the full light of education shine upon all.

I have shown, I think, that the foundations of our profession were well laid by men of learning and skill. That we have built rapidly, with some wood and stubble, but generally, with granite and marble, not all well hewn and fitted, but in the main with good material.

I have endeavored to show that we are a link in the great chain which is to bind the nations of the earth in one common brotherhood. That it has been left for the new world, especially for these United States, to show an energy and a power in the work of elevating humanity that shall attract, while it wakes up, the slumbering energies of the old world, and draws around its intelligent and working power, all nations and kindreds of men, whose scattering was demanded by the yearnings of an unpopulated world. America has restored what was lost at Babel, a common tongue, by her telegraph; by our steam power, we have annihilated distance, while our improvements in the printing press enable us to teach all nations, and our engines for ameliorating the physical and moral condition of the world are no less efficient. Let us then appreciate our destiny and our mission. Dentistry has an important work in the great missionary field, which is to operate the moral and physical cure of the world. Let us then send out our dentists, educated and fitted to the work, and worthy the wages of benefactors.

I have intimated, that the great design of confounding human design at Babel, was to populate the earth; and while this design was carrying out, socializing and fraternizing agencies were in abeyance, until about the time of the discovery of this continent, the discovery of gunpowder and the printing press. This gave us the field and the great humanizing powers, with which to begin and carry on the work of restoring the world to its family relations. It was about, then and there, the centrifugal forces were expended, and the centripetal began to act. It was left to the energy and inventive genius of Americans to complete the attractive forces, that are to give to the world one motto, *E pluribus unum*. But while the stronger forces must control the weaker, each part that is attracted must have its own attracting power. Every nation and tribe of

men must bring its offerings. Even the most savage have something to contribute to the common weal. The Hottentot, the Esquimaux and the American Indian, each and all, have lessons of instruction, and can contribute a moccasin, or sledge, or a canoe. China comes with her teas and her porcelain; Japan, with her numerous samples of art. The Indies with her spices, her medicines and her rubber. The Andes and Cordilleras, with their Peruvian bark, and quinine, and Europe with her varied sciences and arts. But all will ultimately do homage to American enterprise, science and art, and especially to our dentistry.

To some it may seem incongruous that powder, Paixhan guns and monitors, should come in, as peacemakers, with the printing press and the missionaries of science, of morals, and of religion, to hasten the world's millennium. But this is no less true, than that the dental art has come in its time, and in its place, to act as a power to this end; and that the teeth occupy the very gateway of animal and of social life, is apparent to all. Men must be in a condition to eat and enjoy, as well as to do good and communicate, before swords are beaten into ploughshares and spears into pruning hooks. As the great powers of earth are consolidating, discord must cease among all the subordinate organisms and agencies; not only must tribes and sects cultivate peace and good will, but, the friends of the sciences and the arts must unite with each other, and with all others, to advance the world's chief end — social happiness. The dentists of the United States must stand together, a solid phalanx, and then will their power be felt.

That the United States has become the radiant point, and the well-spring of civilizing and socializing currents, is but a justly discriminating providence. We were the first nation, baptized in infancy, into the name of him whose mission was peace and good will to man; and on whose promise we do well to rest. "He that honoreth me shall be honored of me." Let our dentists, in concert with every civilizing and Christianizing agent, go out, with this faith, under a banner bearing the cross, the stars and the stripes, encircled by a galaxy of American improvements, in arts and sciences, with the motto of newly christened Rome, *In hoc signo vinces*, and all the world will read and understand it. Already the skilled hands of American dentists have pressed the heads of kings and emperors. A dentist, who grew up at my side, in Vermont, enjoyed the royal favor of France, and was summoned to the presence of the autocrat of the Russias, and having done the honors of dentist to the royal family, received from the emperor, a knighthood and a princely fee. And having made a fortune and married a fortune, as did the gentlemanly Dr. E. Parmly, their names will be written high on the scroll of dental fame.

The royal mother of our mother country, whose praises are written on the marble of progress and civilization, has endorsed the superiority of American dentists.

Those hitherto isolated, wonderful and multitudinous peoples, inhabiting China and Japan, are now kissing the hand that America has stretched over them, and there American dentists are holding them by the teeth.

The inhabitants of the Indias, and the islands of the Pacific are opening their mouths to the American dentist. The field is the world; and let but the enterprise of the past characterize the next twenty-five years, and we shall have twenty-five thousand educated dentists to supply it. In

this there is no empty vaporing, it is within the legitimate inferences from the facts of the past.

By means of our telegaaph, American progress is already photographed upon the lintel and door posts of civilization. Let the American dentists go out, with our reapers and mowers, our jennies and sewing machines, our steamers and monitors, to challenge and draw after them the admiration of the world. And in the whole galaxy of American improvements in the progressive and socializing arts and sciences, than dentistry, there is no brighter star. By harmony in action, steadiness of purpose, and persevering aims at excellence, we may acquire a name, and become a praise wherever genius has an altar.