TEETH

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With respects of the

Author

Preservation of the Teeth:

A FAMILY GUIDE,

BEING

Familiar Observations on their Structure and Diseases;

WITH

PRACTICAL ILLUSTRATIONS AND ENGRAVINGS;

EMBRACING THE

MODERN IMPROVEMENTS IN DENTISTRY.

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THIS WORK

IS RESPECTFULLY DEDICATED

TO

AMASA WALKER, ESQ.

AS A TOKEN OF RESPECT FOR HIS

LONG-TRIED FRIENDSHIP,

BY THE

AUTHOR.

PREFACE.

Others as well as myself have thought that a plain system of dental instruction would be well received by the community. Nearly all the books upon the subject are too voluminous and scientific for general reading; but no such objection can with propriety be urged against this. If it accomplishes the design of the author, he will have the satisfaction of having contributed something towards the general good.

ON THE TEETH.

CHAPTER I.

THE TEETH.

In all countries and in every age, the teeth, those organs on which facial expression and health depend, have been regarded with undiminished interest. It is one of the tendencies of civilization, owing to the arbitrary customs of society, to bring premature decay upon these necessary and almost indispensable instruments. They were intended, in the constitution of our physical structure, to endure as long as other parts of the living machinery of the human body; but the heats and colds to which we are subjected, both in diet from day to day, and in the temperature of the apartments we inhabit, be-

side a multitude of incidental causes which it were useless to enumerate in a treatise like this, designed for a plain guide in the management of the teeth, particularly in this section of the continent, predisposes them to a premature decay.

A principal object, therefore, of the author, is to present an intelligent community, exposed to the now common misfortune of defective teeth, with a plain statement, based on a scientific knowledge of the anatomical organization of the manducating apparatus, and show, clearly, the only methods discovered by experienced dental operators, how they may be preserved to old age, in all their original effectiveness and beauty.

Such is the general effect which well-formed or a forbidding set of teeth produce on others, in respect to personal appearance, that were no other object gained by them than securing the admiration of those with whom we associate, it would be a compensation for any extra care bestowed upon them in attaining even that desirable object.

Aside from any considerations of beauty, or even symmetry, our health is very intimately concerned with the varying condition of the teeth. So universally is this fact admitted, that no argument can be necessary to enforce its truth upon the understanding of the reader.

If the teeth, being sound, white and clean, prepare the food properly for the stomach, the individual certainly is less liable than those who have carious ones, a diminished number or spongy gums and their concomitants, to maladies that are alike uncomfortable to bear, and, in the sequel, destructive in their tendency to life itself.

In the course of this treatise, I shall particularly advert to those vices of the age which operate with exceeding power in bringing on a rapid decay of the teeth in youth, and suggest the proper antidotes. It is needless to remark, that the seeds of premature destruction in them is laid in the constitution of some families, and they are developed generation after generation. Under this mis-

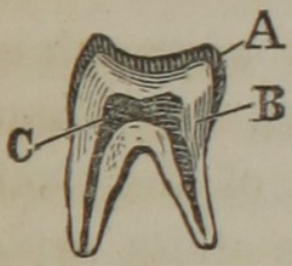
fortune, the advice of the dentist becomes indispensable, and it is the province of his art to arrest the progress of disease, or supply the loss which local disease has occasioned.

CHAPTER II.

ANATOMICAL STRUCTURE.

Our teeth are constructed of particles of lime, held in contact by animal glue. Those parts which are exposed to the atmospheric air, and consequently liable to injuries from attrition against each other, are covered over with an exceedingly thin, delicate coat of enamel, bearing some slight resemblance in its chemical composition to highly glazed porcelain. The fangs are lodged in deep sockets in either jaw, which are spongy beds, raised on a ridge, and above the hard bone of the jaw. These sockets are lined with a thin vascular membrane, in which the blood circulates freely. From the bottom of each pit,

an artery, vein and nerve, lying side by side, run into the very extremity of each root, through a minute hole, traversing the entire length of it, till they reach the centre of the body of the tooth. At that point there is a small cavity in which the nerve enlarges itself into the form of a pad. This is the seat of the tooth's vitality, and the point to which sensation is referable in all forms of toothache, in the incipient stages of disorganization.



Explanation of the Engraving.

Here is the inside of a molar or double-tooth. A shows the enamel composing the surface of the tooth, which is the hardest production of the animal body. B represents the bone of the tooth. C the cavity in the body of the tooth, for the lodgment of the nerve.

The gums are a mass of compact, condensed substance, unlike any other tissue of the body, abundantly supplied with blood, which serve to box up the teeth on all sides, —standing, as it were, between the place where the enamel is discontinued, and the margin of the socket. The same membrane, which dips into the socket between their

walls and the roots of the tooth, also passes over the margin and is the common covering and protecting skin of the whole body of the gums.

By this simple anatomical description, which contains the essence of all that is known in the most elaborate works upon the subject, we are enabled to explain, with facility, the cause of very many complaints in which the teeth are involved. We are also, by the same guidance, directed in the successful application of remedies.

If by accident, or the gradual approach of an insidious constitutional cause, the enamel is injured, the soft, bony part of the tooth becomes exposed to the agents of its rapid destruction. These are the air, a variety of articles in food, hot drinks as well as cold, and, lastly, our own instinctive mechanical agency. For no sooner is there a sense of fullness or inconvenience by the lodgment of particles, after eating, than we endeavor to dislodge them with pins or picks, and thus

increase the difficulty, permanently, in the act of securing a little temporary relief.

Should the lining membrane, in consequence of some unnatural violence, arising, for example, by a sudden pressure, as in cracking a nut, inflame and thicken it, suppuration would follow, and perhaps the destruction of the tooth, owing to the injury inflicted on the nerve at the extremity of the fang.

If by any event the circulation of blood in the root is destroyed, the tooth, to all intents and purposes, becomes a foreign body—for its vitality can only be maintained by its immediate connexion through the nerve, with the system. When the cavity containing the pulp or nervous expansion in the body of the tooth becomes exposed, the simple atmospheric air is a prolific source of pain. Unless the cavity made by a fracture of the enamel, is filled before an inflammation ensues, the death of the tooth cannot be prevented.

Whatever has a tendency to effect unfavor-

ably the chemical composition of the tooth, is prejudicial to its permanency. Acids, if highly concentrated, are amongst the most active agents of destruction, because they produce a separation of the particles of lime, and thus break down the structure.

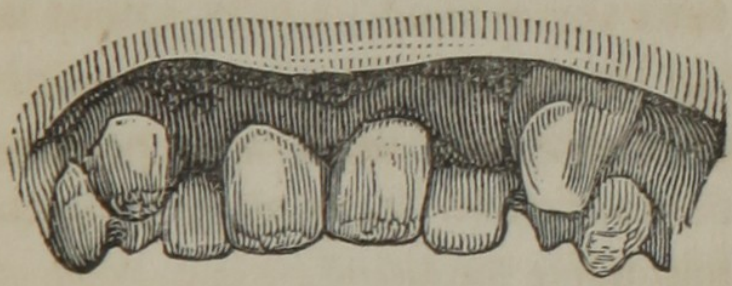
On the other hand, if by the formation of abscesses in or near the alveolar sockets, or the surrounding bone is fractured or splintered by the unskillfulness of an operator in extracting a neighboring tooth, there is a liability to a suppurative inflammation that may so far extend itself as to effect the circulation of the next tooth, and thus the foundation of subsequent pain and positive loss is laid.

A multitude of evils resulting from the ignorance of those who make pretensions to scientific dentistry, are continually taking place, which are often referred to causes which do not exist. Hence the importance of employing those only, who are known by their success in a wide circle of practice, to be deserving of public confidence.

CHAPTER III.

IRREGULARITY IN DENTITION.

PARENTS should watch the whole process of dentition in their children with vigilance. However irregular some of the teeth may appear when their cutting edges protrude above the gum, by the resources of the dental art, now reduced to a beautiful system, they may be turned from the course of their deformed position, and adjusted with the utmost exactness.



Explanation of the Engraving.

This is a correct representation of 'irregular teeth,' which I took from the mouth of a young lady for whom I extracted a tooth. The canine or eye-teeth, it will be perceived, project so much that they stand outside of the others, thereby producing a most repulsive and deformed mouth. It is a forcible exhibition of the most unpardonable parental neglect; for had a little watchfulness been exercised by the parents, and a competent operator consulted, a perfect and even set of teeth would have been secured.

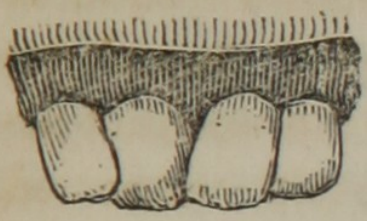
To accomplish a point so essential to the future good looks of the child, the dentist

must be frequently consulted. It is utterly useless to trust too much or too long to nature, where the tendency to malformation or malposition is early manifested. Again, the modulation of the voice, and the distinct articulation of words are intimately connected with the position and arrangement even of the deciduous, or first set.

Should the milk teeth show themselves divergent from the curved line of the jaw, riding one upon the other, or forced out of their apparent place of destination, it is pretty certain that the second or permanent set will follow the same departure. No one, therefore, thus warned of this law of contingency, should rest satisfied a moment till the best advice has been obtained.

A common distortion, and one exceedingly neglected, too, is the protrusion of the eye teeth, high up on the side of the gum, so as to lie actually over one of the incisors. The deformity is very striking, especially in laughing. In a majority of instances, the lodgment of food between the two, lays the

foundation of premature decay in one or both of them.



Explanation of the Engraving.

The most common irregularity of the teeth is here shown. It will be seen that one of the first incisors or front teeth laps over the other, while the second incisors on either side are similarly displaced.

Nothing is more simple than to remedy this lamentable state of the young teeth. But to accomplish it effectually, unless the patient is placed under the care of the dentist seasonably, the perfect restoration of the aberrating tooth is almost hopeless. Even in adult life, it is always worth while to take advice, for such are the resources of modern art in combination with the discoveries of science, that extraordinary cases are met most happily by extraordinary means.

Cases not unfrequently present, especially in young female children, where the front under teeth shut over the front upper teeth, instead of passing in behind them, when the mouth is closed. This malformation calls for immediate relief.

By neglect, as soon as the teeth are fairly developed, the chance for their restoration to their proper position is greatly lessened. There is the appearance of a lengthened under jaw, which by and by really becomes longer than nature originally intended. By constantly shutting outside the upper incisors, they act upon the principle of a wedge, constantly forcing the jaw further and further outward, till the articulating surfaces at the joint are dragged considerably forward, out of the shallow depression in which they play.

An instrument of very simple construction can be worn by the child, if seasonably applied, which gradually and without pain, and almost without inconvenience, directs the wanderers under the upper ones. After a while, they begin to shut their edges over those which were once outside. No sooner is so much of the labor accomplished, than the perfect and complete restoration is effected. Each day the lower teeth are pressed a little further by the common exercise of the

muscles, and finally close completely, and all the grinders meet at every point.

An ingenious device of springs, of difficult description, is applied to a single awry tooth, to force it into place, which is equally deserving the consideration of all persons even remotely concerned in the appearance and physical welfare of children.

These are a few of a countless variety of defects and liabilities of the teeth of children and youth, for which the counsel of the scientific dentist should be in constant requisition, till his further services become unnecessary, from the stability and success of the operation he may have performed.

CHAPTER IV.

FILLING TEETH.

One of the discoveries of modern times, which has conferred a lasting benefit on mankind, is that of filling decayed teeth. At

first view it seems like a trifling affair that such importance should be attached to an operation apparently so trivial. Still, it is the concurrent opinion of those most competent to decide, that nothing pertaining to the manipulations of dentistry, is of more importance. Perhaps there are about as many teeth positively destroyed as there are saved in this way; but it arises from the criminal ignorance of those base pretenders whose only object is to profit by the misfortune and misplaced confidence of their fellow beings.

It involves the highest attainments in the whole range of practical dentistry, to fill a carious tooth as it may and always should be executed. If the operator is ignorant of the minute anatomy of the organs of the adjacent parts, how can he appreciate the value of the operation? Should he inflict a wound upon the nerve in consequence of not knowing its contiguity to any particular division of the tooth, where he is about to use his instruments, he may not only create disease,

but prodigiously aggravate that for which he pretends to apply a remedy.

Scarcely one in ten enjoy a reputation worth coveting, in this department of the arts;—and the reason is obvious—they are adventurers and not dentists.

Impositions are without number which are practiced in this branch of the profession. Base metals are sometimes introduced, but in the end they are detected, when it is too late to obviate the difficulty resulting from them. Amalgams of metals, too, the basis of which is quicksilver, under the specious name of *lithodeon*, or tooth-stone, it is pretended will crystalize or harden in the cavity, and thus become as resisting as the tooth in its best estate.

The imposition, however, is certain. Gold, of the purest kind, can only be advantageously used. The excavation for the removal of every carious roughness—the introduction of the gold foil—the subsequent management in securing it in place, can only

be accomplished by a most adroit and experienced hand.

In view of the transcendent advantages to be realised by this curious invention, every person, even those with beautiful, sound, regular teeth, should have them examined as often as every six months, to ascertain their exact condition. It is a neglect of this precaution that many apparently sound teeth are undermined by disease, and the remedy applied too late.

My injunction cannot be misapprehended —especially by ladies. Consult your dentist as frequently as you would your physician when in danger of some malady of a serious character, which is menacing you with its paroxysms.

CHAPTER V.

DENTIFRICES.

Although great good may be accomplished by the habitual use of dentifrices, lotions,

and various astringent washes, many evils are produced. Whilst some act chemically and destroy the integrity of the tooth, others, from their corrosive character, operate equally destructively on the tender gums. Hence it is of vastly more consequence to be particular in the choice of an article for cleansing the teeth, as it is familiarly called, than might at first be supposed.

Ingenious, unprincipled men are not wanting, who avail themselves of this prolific source of profit, the necessities of their fellow creatures, to enrich themselves, without conferring a corresponding benefit.

In the first place, in regard to dentifrice powders, an essential recommendation is—that there is no grit: it must be an impalpable dust, so finely should it be levigated. Secondly, nothing should enter into the composition that might even remotely affect a chemical action on the lime of the tooth; and, thirdly, no abrasion should be made on the shining surface of the gums.

One of the bad effects arising from the

constant resort to a coarse powder, of any sort, is a recession of the gum from the neck of the tooth, so that, in process of time, it seems and in fact actually does stand out unnaturally long. It is quite observable in ladies at about the age of thirty, who have long been accustomed to cleansing the teeth with pulverized charcoal, that both the upper and under front teeth have become unsymmetrically long. This is brought about, usually, by the forcing of particles down by the side of the tooth, till it overcomes the adhesion of the shining membrane that is reflected from the gum to the tooth.

By degrees the whole border of the gum lessens in volume, becomes smaller, and the teeth seem to protrude unnaturally. Perhaps the continued violence of a stiff, harsh brush, may be partly instrumental in bringing about this disastrous result. Cold water, it will be admitted by every candid dentist, where no disease has appeared, is decidedly the best of all applications.

Very many fine teeth are worn out by the

attrition of coarse tooth powders ; the enamel is positively rubbed so thin that the bony texture of the tooth is made susceptible to impressions even from the air.

Whenever a fetid breath, ulcerated teeth, or gums, small abscesses, discharged from the root of some old, long neglected stump, require a remedy, consult the dentist again, and be sure to follow his prescriptions with undeviating exactness. He, of all men, is most competent to decide what remedy, under any peculiarity of circumstances, is indicated. Let this be kept constantly in mind, that since this class of professional men exclusively devote their lives to this one department, it is reasonable to believe that they must, consequently, be the best qualified to judge and to sit in judgement upon the remedies that may be indicated.

CHAPTER VI.

CLEANSING TEETH WITH INSTRUMENTS.

Before entering upon the consideration of topics no less important than we have already been treating, I feel it incumbent on me to make reference, at least, to an evil of considerable magnitude, within the pale of dentistry, of which there seems to be insufficient popular information.

Very commonly, individuals have the upper half of the upper front teeth considerably discolored,—sometimes there is a disagreeable, dark, yellowish hue. In another instance, on the margin of the gum, there is a dark line, like a stain produced by the juices of wild berries. Others present the appearance of being partially coated with charcoal.

All sorts of shades are noticeable in a company of persons, who may happen to be the subjects of observation—varying from a deep, dingy, yellowish incrustation, to the deep, black stain, which runs in the form of rays quite down to the cutting edge.

When one for the first time is informed that this appearance is fraught with danger to the teeth, in the excitement of alarm at information altogether new to him, he sometimes seeks a remedy in the moment of alarm, and as often as otherwise, makes bad worse, and thus hastens an event which he is solicitous to avoid.

Formerly it was more the custom than at present to remove these discolorations by scraping the whole front surface. To effect the entire removal, particularly when the enamel was stained considerably deep, the operator did not hesitate to carry his excavations unpardonably deep, till the tooth's casing was nearly all scraped off. Those itinerant dentists, who travel about from town to town—whose whole object is to get as much money in as little time as possible,—feeling no kind of responsibility,—for, being strangers, they fully intend to remain so, spoil teeth without mercy. They are the operators who make white teeth almost instantly, but they are nearly destroying them

at the same time. When the enamel is made preternaturally thin, by this abominable process, the defect is not spontaneously repaired again. It ever after remains too thin for the protection of the inside bony substance of the tooth :—ever after, the teeth, thus injured, have a bluish tinge,—crumble, or present very small patches, here and there, over the front surface, where the enamel is abraded or scales off entirely. In the latter case, minute pits are discoverable in a favorable light.

When a dentist of competent abilities and judgement uses an instrument in cleansing, it is for the express purpose of removing extraneous matter, but never to grind down the enamel—any attempt at so doing is presumptive evidence of the ignorance, recklessness and irresponsibility of the operator, who proposes it. Even the passing of a file or saw between two teeth, if the enamel or the proximal edges are injured, is the precursor of subsequent decay at that point.

It is because there are such numbers of

strolling quack dentists here at the North, that I have been thus particular. A little pulverised pumice stone, taken up on the moistened extremity of a pine splinter, may be rubbed over the face of a tooth, slightly, with impunity; this is, perhaps, a practice by no means rare with some of the best operators in New-England, to whiten a tooth that does not precisely correspond in color with its fellows. Still, I regard it as a decidedly bad practice, if too frequently repeated. It is in fact equivalent to scraping with an instrument, only it is attended with less parade and less violence.

A conscientious operator, endeavors to assist nature in a majority of his labors, and this constitutes the science of the profession. No one can detail with an exactness that may be comprehended at once, by a written description;—it is sufficient here to put the reader on his guard against the wiles of those who have done and I fear are still doing an immense deal of injury.

Perhaps these discolorations, from the fre-

quency and the anxiety generally expressed to restore the teeth to their pristine appearance, demands further attention; but I have given a warning voice, and now trust to the intelligence of the reader to avoid the evil. Still, without consulting a regular dentist, which is the only safe way, the individual should on no account attempt to operate upon himself—under such circumstances he might very much aggravate the malady. Every well instructed dentist is fitted by his acquirements to give opinions which should command implicit respect.

CHAPTER VII.

TARTAR.

Nothing is more familiar than the fact, that there is a most singular disposition in our organization to accumulate a foreign matter about the teeth, which is called tartar. Now this is a common name for a kind of calcare-

ous deposition that no one precisely understands, and yet we all talk about the destructive tendency of this singular accumulation, because it really produces most lamentable effects.

Specimens are occasionally met with in cabinets, to illustrate the excessive injuries this tartar occasions. By little and little,—and it may by the work of successive years, this semi-stony incrustation fastens, perhaps more generally, on the inside of the teeth, just at the union of the gum with the neck, like a thin wedge—additions seems to be made at the base—which drive it further and further, whilst it gradually insinuates itself down into the socket. To get there, the periosteum, or lining membrane of the socket, which is also a covering of the roots, is pealed off, as it were, and this denidation constitutes a disease,—a homely name for which is *tartared teeth*.

As my object is instruction, I shall not discuss the question—how the tartar is formed, nor suggest a theory :—suffice it,—the

disease exists, and there is a positive remedy for it.

One of the evils growing out of this aggregation of particles of lime round the teeth, beside the one just adverted to—is this: the tooth is loosened—the gum at the same time, if it does not ulcerate, by no means rare in extreme cases, is kept constantly inflamed. It is not only always turgid with blood, so that it bleeds at the slightest touch of the brush, but the breath is excessively fetid. In a word, there are a score of intolerable inconveniences attending the accumulation and presence of tartar, that cannot be readily described. But, in addition to them all, the mouth cannot be opened in the presence of another without disclosing an appearance that is forbidding.

In those who habitually use a brush, if the tendency to an accumulation of tartar exists at all, it is kept off tolerably well in front, but it hides itself deep down behind the front under teeth, and the sides of the

back grinders, quite out of the reach of the brush.

Wherever it is, by close inspection with a mouth glass, it will be seen that the gum is a little pressed off from the tooth, thickened a trifle on its margin, and quite red and inclined to inflammation.

Some persons have constitutionally, or in other words, inherit sound teeth, in whom this predisposition to a deposition of tartar is so strong, that they are wholly bereft of them by the time they are forty five years of age, solely by its intrusive agency. Thus the teeth, one by one, as it were, are lifted out of their beds—and with the fingers they are finally plucked from their slender hold, perfectly sound, but sadly crusted and roughened by a load of tartar.

Further, in extreme cases, a distortion of the mouth is brought about by this same sad and unfortunate tendency. Those powders and washes with which the shops teem, are not specifics, as often represented, for this

difficulty :—nor are they beneficial in removing the complaint. Perhaps the chronic inflammation of which I have spoken, may be partially subdued by a topical application of an astringent lotion; but that is the extent of the operation of such alleged remedies.

As this subject is one of deep concern to those who are the subjects of its ravages, I have devoted more than usual attention to it in this place, with a hope of inducing those who may examine these pages, to ward off the danger.

In connexion with this topic, the question may naturally arise,—what should be done? As in a former chapter, I am obliged to say, consult a skillful dentist. His knowledge embraces this complaint, as it does every other belonging to the domain of the teeth: with a carefulness—nay, more, with a dexterity that is encouraging, he will remove every particle of this extraneous matter;—in detaching it from the neck of the tooth,

where it adheres with extreme tenacity, a steady hand is required, not to wound the the turgid vessels.

Instruments of singular forms, nicely fitted to the convexities and depressions of the teeth, are expressly made for the purpose of dislodging tartar. If by any indiscreetness in the operator, the enamel is injured, then the foundation is laid, deep and abiding, for the ultimate destruction of the tooth. A dentist,—an experienced one, and no other, should be trusted in the management of this department of the art.

Since it is a well established point that the tendency to the formation of the tartar exists in many persons, parents should once or twice a year subject their children to the strict scrutiny of a dentist,—upon the well known principle that "a stitch in time, saves nine."

CHAPTER VIII.

INFLUENCE OF TOBACCO ON THE TEETH.

EUROPEANS are astonished, in traveling over this country, at the legion of tobacco chewers;—and well they may be, since it surprises ourselves to look into the statistics of this abominable custom.

Thousands are habitual tobacco chewers, who cannot assign one rational excuse for it:—even small boys are often seen, sadly addicted to this vice. Others find an apology for it, in supposing that it keeps off something else, in the form of a distemper. Yet this is all idle: it is not so. When the habit is fairly established, all moral effort to abstain is quite hopeless. It is even worse than opium eating, so far as uncontroled dominion is concerned over the mind.

But I have no disposition to declare war against a great army;—let them grind their quids in quietness,—trusting that after ages will correct this monstrous evil in civil-

ization. Aside from a host of miseries consequent upon chewing tobacco, I am concerned only in relating the consequences that follow to the teeth—which is bad enough to discourage a veteran consumer.

Tobacco, when used in the very best manner, contains considerable grit, or sand, which grinds down the face of the teeth, in process of time, prodigiously. A few chewers out of a hundred, wear their teeth down evenly. Such is not always the state of things. If a tooth has been extracted, it produces an irregularity in the lateral grinding movement of the jaw, that ultimately makes an unevenness some where on the line. Not uncommonly, half of the lower part of the teeth, on the side particularly where the tobacco is chewed, are actually worn off down to the gum. On the other side, the equal pressure having been taken off, they are too long—so it is in respect to the molars. Let this pass however.

The essential oil of the tobacco stains the

teeth a deep, filthy yellow,—too permanent for removal by the ordinary process—they cannot be bleached out in inveterate chewers. This same oil, too, undermines the enamel, the protecting shield of the teeth, in some individuals, hence they crumble, and are lost without redemption.

Both of these agents are positively destructive to the teeth, habitually used. Lastly, it is notorious in New-England that tobacco chewers, as a distinct body of men, have proverbially bad teeth.

Smoking is a vice too—and a national one, of such magnitude that railroad corporations throughout all their routes in the United States, have a special command in large letters, conspicuously placed at depots and inside of the cars—"*No smoking allowed here* ☞." Less injury is inflicted on the teeth by smoke than by chewing, of the two, though the last is bad enough. An incessant current of hot smoke, saturated with that same essential oil, plays destruction

also ;—but the process is much slower, hence no one stops to reflect upon it.

A quantity of saliva is poured out by the salivary glands in the act of smoking, which collects copiously round the whole circuit of the under teeth, that consequently protects them:—they are the last to suffer, whilst the upper front incisors, in some extreme cases, are lamentably injured and defaced.

Such are some of the effects to be apprehended by tobacco chewers. Therefore, it being easier to warn one of approaching danger, than to extricate him when surrounded by it,—I say, emphatically, never allow your son to chew tobacco under any pretext whatever. Ladies require no admonitions in this respect.

CHAPTER IX.

DENTISTS.

Before entering upon an important division of this work, viz: the extraction of the teeth and the insertion of artificial ones, I am disposed to devote a page to the profession of dentistry,—distinctly.

In this, as in medicine, there are quacks. Still, there is another grade of imposters, equally obnoxious, better known to dentists themselves than to others. They are the praters, or alarmists, who are continually crying out to beware of their neighbors,—as though none but themselves or the numbers of their immediate clique, could possibly be qualified either to advise or operate. They harp however about the *science* of the profession, as though that enabled a man to work miracles.

Dentistry is an art;—yes—actually a business that requires the use of one's hands,—if he is not a mechanic, the whole matter

turning on that one pivot, a dentist cannot succeed:—with a scientific knowledge of the general anatomy of the parts concerned in his vocation, together with a nice development of his constructiveness, he becomes all that can be desired in an operator.

Dentistry is acquired, with us, slowly and cautiously, under the instruction of competent and deserving teachers; therefore, there are not so many poor dentists about as formerly:—common ambition prompts those who might perhaps have been indifferent artists or operators, in these days of competition, to labor incessantly, to be competent to all exigencies, and in our cities they are so. Extensive experience gives the individual a higher claim; and his patronage depends upon the success of an application of his knowledge and ingenuity in benefiting those who resort to him for counsel and mechanical aid.

CHAPTER X.

EXTRACTION OF TEETH.

PREVIOUS to discussing the details of this painful, yet very necessary operation, much might be advanced advantageously, perhaps, upon the subject of tooth-ache, as denominated in common parlance. Since it is quite impossible to embody all the practical remarks that might be concentrated here, without defeating the original intention of constructing a compact pocket manual, I shall at least defer a consideration of the painful diseases of the nerve, till a more fitting opportunity.

To extract a well formed, tolerably well located tooth, if not far gone by caries, involves no great effort of mechanical ingenuity :—any one who can fit on a hook, and turn the bar of an instrument upon its own axis, can twist it out. But there is a wide difference between this twisting and lifting a tooth from its bed. By the former, the

alveolar is crushed, the gums bruised, and the offending tooth as often as otherwise broken off in the middle. This is vulgarly called *tooth pulling*.

There are all kinds of contrivances for removing diseased teeth,—but, after all, they are only modifications of a primitive invention, the *lever*—for all of them act upon that principle, with a few exceptions.

One lever may be better than another, and succeed well or indifferently, in different hands: all this depends on the good judgment and experience of the operator. Some men never succeed in extraction, without mangling the jaw, splintering the bone or inflicting some gross injury that is about as intolerable as the misery that was to have been cured. This results from an utter ignorance of the manner of adapting the instrument.

Physicians, as a general rule, have but one key, which answers for all cases, through an entire professional life. The dentist can-

not, without degrading the craft, practice on such an economical system. He must have very many instruments, of various sizes and shapes—and it is in being thus prepared, that he possesses such a manifest advantage over ordinary practitioners of medicine.

It is inexcusable in a dentist of any pretentions to experience, not to extract a tooth with adroitness. Since great pain, tedious and protracted suffering frequently arises from the very miserable mode of drawing teeth, that I feel it a duty to warn the reader against these unnecessary torments.

If there is any one branch of operative dentistry in which I excel more than another, it is in this. From the commencement of my practice, the number extracted yearly, has been almost incredible ;—hence, without wishing to misrepresent in any manner whatever, I do not hesitate to say that an extensive experience, justifies me in speaking here very decisively. All surgeons study the same leading authorities, and provide them-

selves with knives and forceps from celebrated manufactories,—yet something more is requisite to constitute an operator. One of a thousand monopolizes all the surgery,—while the nine hundred and ninety-nine, apparently equally well qualified, never get a chance to splinter a broken finger.

How does this happen? One man possesses the happy tact of applying his knowledge to conduce to the well being of his fellow creatures; whilst others, educated to the same pursuits, cannot succeed. Such too is the fact in the practice of medicine. There are invariably some two or three persons in every city, town and village, who are always sought after, to the entire neglect of others who think themselves fully equal to their more fortunate competitors. How is this?

As it is with them, so it is with dentists: some obtain all the patronage of the public worth having—and others, equally eager in the pursuit of fees or food, perhaps both,

lead a life of disappointment:—hope deferred.

No one can deny, therefore, that some are better constituted than others, to conduct the unpleasant manipulations of dentistry. Genius, united with experience and judgment, in connexion with philosophically constituted tools, must all meet in the person who can extract a simple tooth as it should be drawn.

Here, too, is involved the consideration of painful affections of the face, arising from a wide circle of nervous sympathies, having their immediate rise in the extremity, perhaps, of a tooth apparently sound. Collections of pus in the antrum, a cavity in the upper jaw, under either eye, extremely formidable, at times, are also associated with this apparently trifling affair of extraction.

In the course of my observations, the fault chiefly to be dreaded in unskilful hands, is a fracture of a root,—a portion of which may be left in the socket to be a source of exces-

sive irritation and subsequent pain. Ordinary instruments are not fitted for exigencies, and the patient, therefore, is tortured unnecessarily. Were people to reflect with more care upon the hazard of allowing any and every one to extract their teeth, or those of their young children, it is certain they would have fewer to be drawn. A mishap, lays the foundation for an extension of diseased action,—and thus the evil keeps extending itself, to be developed in full, perhaps, at some remote period. Allow me again to caution the reader with regard to the proficiency and judgment of the dentist who is permitted to extract his teeth.

We before stated that some physicians, who pretend to great experience in extracting, have but one instrument—and that, perhaps, may be one of the most objectionable kind, which is used indiscriminately in all cases. But the general medical practitioner is not always successful in this labor of all work, and they have generally the frankness

to acknowledge the superior qualifications of the dentist.

Not long since, one of our most intelligent and influential physicians, residing in a populous village in the neighborhood of Boston, called upon me with one of his students, and emphatically inquired—"*Can you extract that tooth, Sir?*" showing one of a formidable character, it would seem, to himself. It struck me that I could, and without producing much suffering. The young gentleman took a seat in the operating chair, and with one of the improved instruments, it was removed with comparative ease, by a slight effort of strength on my part. The physician involuntarily exclaimed, "that was well done —for, to be candid with you, I must acknowledge that I tried on that same tooth, and was fearful of breaking the jaw, and therefore abandoned it. It was given up to a physician of the next town, and he also gave up the removal as impracticable." Now the physician was not unsuccessful because he

was lacking in muscular power: no—for he possessed vastly more strength than myself: his difficulty proceeded from a defective instrument, together with a knowledge of its use.

Again, one of the most esteemed clergymen, who has been for a long while a settled preacher in this city, called on and desired me to remove an aching tooth. Having reresorted to the gum lancet, as a preparatory step, I placed the instrument on the tooth, and took it out instanter. I then asked him if the pain was very intense? "But you have not got it out, Sir!" He could hardly credit the fact of its removal, even when shown to him in my hand, and he manifested his embarrassment. He then remarked, that one of the most expert dentists of the city had broken off a tooth for him—and, furthermore, advised him never to submit to another trial.

These facts, selected from many marked cases, are cited simply to illustrate the im-

portance of resorting to operators who are provided with instruments constructed for meeting all emergencies.

CHAPTER XI.

ARTIFICIAL TEETH.

IMPROVEMENTS have been so rapid in the art of manufacturing artificial teeth, within the last few years, that, in appearance, nature is certainly rivaled.

Several articles are substituted for the original teeth, and each has its advocates. I shall advert to them in rotation, but confine my remarks especially to the consideration of the superior advantages of porcelain or mineral teeth, to all others known to dentists.

One of the earliest, and in this country most familiar substance for making teeth, was the enameled side of the tusk of the sea-horse. It is still in very considerable de-

mand with second rate workmen. We frequently notice these teeth in persons who have had the misfortune to require one or two. They may always be detected by their bluish hue, after remaining long enough in the mouth to imbibe the saliva, which they do very speedily. Another criterion of the sea-horse tooth, is its uncommonly smooth face,—which never corresponds with the uneven faces of the natural ones by the side of it.

When a vacancy of three or four incisors is to be filled, the space, for example, between the eye-teeth, it has usually been customary to make them in one block, in using this material. The exact curve is ascertained by frequently trying in the piece, and carefully fitting it in all its relations to those of the under jaw which shut against or within the line. If the stumps of the old teeth happened in this case to be still remaining, they are dressed down to a level, or perhaps excavated down below the gum. This done,

the whole block, made to resemble as much as possible, or rather as far as practicable, those which had formerly been there, it is confined by pivots, dowels, or wires.

A row of teeth, all united in one piece, are much firmer than if—provided there were stumps enough—each division were separated into an independent tooth, unconnected with others. After a while, even with exceedingly careful usage, from the imbibation of the saliva, and its action on the gelatin of the ivory, these teeth become offensive to the wearer. They are sometimes intolerably so to those who are obliged to inhale the breath of the individual who has them. I have sometimes thought the sea-horse teeth were even more objectionable on this account, for ladies, than for men. Even frequent washing does not overcome the peculiarly disagreeable breath belonging to these otherwise tolerably good substitutes. Were it not quite certain that the public sentiment has set strongly against the sea-horse tooth, so that, with

other causes, dentists of any reputation will wholly abandon the article, I should dwell with far greater interest on the disadvantages just enumerated, and illustrate my position by a sufficient number of cases to establish all that might be said, clearly and convincingly.

Another substitute which has also had its advocates, was the tooth of a calf. It could be set very well by being ground at the lateral edges, and from the top, downward towards the cutting part. The value of this, over and above the sea-horse, arose from the fact, that the color of the enamel, as well as the surface, corresponded exceedingly well with those by the side of which it was to be inserted. All the workmanship, therefore, was necessarily expended on the base, and widthwise sides. An ingenious dentist sometimes succeeded admirably with one solitary tooth, fixed to a pivot. If several were required, then the artificial character of the operation could not be concealed. This plan,

like the other, is now scarcely practised in the Atlantic cities. Not satisfied with either of these, it was thought that the insertion of human teeth could not fail to achieve all that was desirable in point of effect. At one time, within the recollection of those of middle age, it was a common object with some dentists to procure all the finely shapen, sound front teeth from the dead, in alms houses and other public institutions, to which they or those who conducted the enterprise, could gain access.

Notwithstanding the natural appearance, these teeth were difficult to set. The aperture of the nerve did not always exactly correspond with the one in the stump to which it was to be joined. If it were too thick, the enamel must necessarily be sacrificed on some part of it, before the body could be fitted in place. Beside these objections, a belief seems to have been entertained that loathsome diseases were introduced into the system, as it were, by inoculation, through

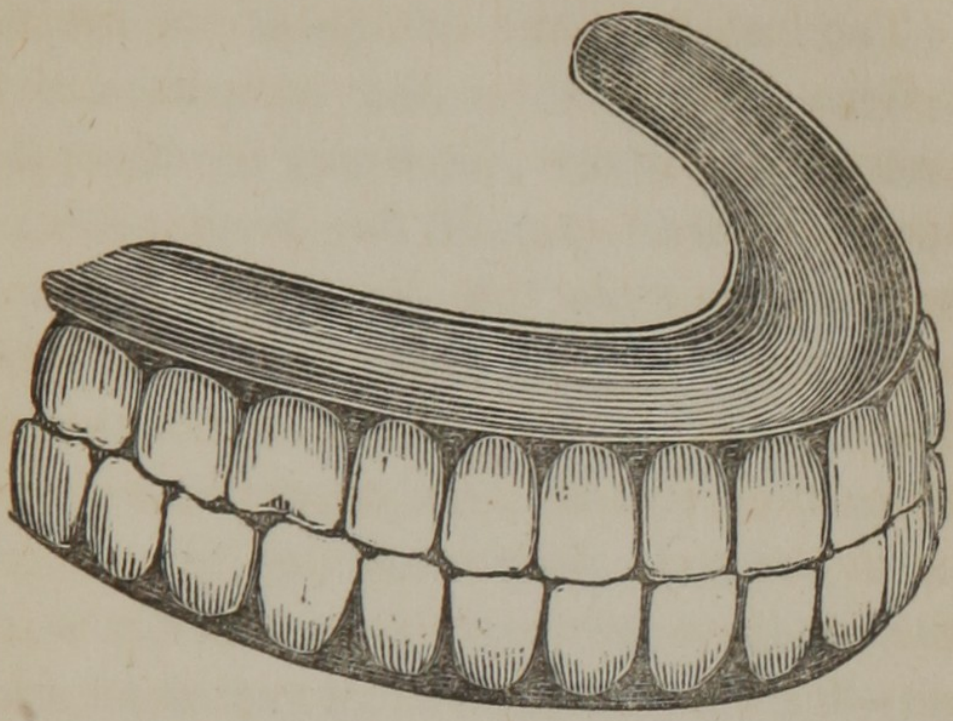
the instrumentality of these dead men's teeth. Some of the journals of medicine have recorded strange accounts of the misery inflicted in this way on ladies. Perhaps there was some truth in the stories, and perhaps not. In a word, the dead teeth mania has entirely subsided: I doubt whether they are now used at all.

However successfully transplantation may have been conducted in Europe, in this country it never became a favorite operation. Accounts may be found of the extraction of a sound tooth from one person, which being inserted into the socket of another the instant a defective one had been drawn, adapted itself to its new location, and established a vital connexion,—lasting for years,—being both beautiful and useful. Occasionally an aching tooth may be extracted and instantly forced back again:—an adhesion will apparently follow, to the periosteum, but the circulation and nervous communication being cut off, the tooth will always be sore, the

jaw tender and inflamed, and therefore an imperfect organ, inferior to an artificial one.

The last, best, and I fully believe most excellent substitute for the natural, are the comparatively new discovery of mineral, or incorruptible teeth, of the present day. It seems impossible that they should ever be superseded by any subsequent invention. They are made of any dimensions or supposable shape, to match the natural ones retained in the jaw. It matters not what may be the condition of the niche in which it is to be set—for a model is constructed, from which the tooth is made, so that the color, exact length, breadth, and whole physical aspect, is precisely like the one whose place is to be supplied.

Here is an advantage which the dentist of the present day holds over those of the olden time, that is not sufficiently prized. A revolution has been effected in the whole business in less than twenty years. Since the art of making the teeth as they are required,



Explanation of the Engraving.

The above represents an upper and under set of *Artificial Teeth*. When persons have lost all of their teeth, it is expedient to insert whole sets. They have been brought to such perfection, that they can be worn without any inconvenience, and are of the greatest utility both in speaking and mastication, as well as adding greatly to one's personal appearance. Sometimes it is necessary to use Artificial Gums, which, like the Teeth, are correct representations of Nature.

to suit in all cases, is clearly understood, it is certain that no dentists in the world are superior to those in the United States. There cannot be better or more beautiful work produced any where than in Philadelphia, New York, and Boston. Without wishing to appear egotistcal, I shall not attempt to conceal my opinion that no more perfect specimens of highly finished artificial teeth can be found, any where, than in Boston.

In comparing Paris work, London, &c. with that produced in this city, I am sure it cannot be better, more enduring, or a closer imitation of nature. My object has been in this chapter, to present a chart of the past and present estimation of the various elementary material used in making artificial teeth, before treating of the intrinsic value of silver, gold, platina, wooden dowels, &c. and gold plate foundations.

CHAPTER XII.

MECHANISM OF ARTIFICIAL TEETH.

When an artificial tooth is to be set, the question naturally arises as to the particular advantages or disadvantages of the general methods adopted by dentists. At one time, if the pivot were made of any metal less valuable than gold, however perfectly adjusted and enduring the work might be, there was a seeming inferiority about it, not at all agreeable to the patient. It will be perceived, by these remarks, that the value was an imaginary one, mechanically, or even philosophically considered.

If the new tooth is fitted with such exactness to the prepared end of the stump, as characterises the workmanship of every responsible, conscientious dentist, it is scarcely possible for food to be forced in laterally. Even the atmospheric air is pretty nearly excluded. No injury will be sustained to the pivot, or, more properly, dowel, from either

of these sources. Then why is gold preferable to wood? Surely, it cannot be.

A metalic pivot cannot be so introduced into the central canal of the stump, as to fill it perfectly and keep its hold. By use, the tooth becomes loose, and drops out, if in the upper jaw, by its own gravity, if the mouth happens to be unguardedly opened.

Various schemes have been devised to retain the pin, but all of them equally unsatisfactory, because the tooth would become infirm. By first filling the canal of the stump with wood, the dowel driven into it with considerable force, would swell and thus hold on with greater energy. This, all the while, was unnecessarily multiplying the mechanism. Triangular, square, hexagonal, and other shapes have been quite as unsuccessful.

With a wooden dowel, all the vexations here recounted, are at once obviated. It imbibes saliva that swells it to fit the canal, and the new tooth is held with a tenacity that cannot be brought about by any other means.

It is also economical, and therefore an important consideration—all persons cannot afford the expense of gold; but all who require the assistance of art in this respect, wish for something serviceable.

My observations here are by no means new to dentists: they are introduced with reference to those who may have occasion to ask their assistance, that they may not harbor the idea of being wronged or turned away with inferior workmanship, should the wooden pivots be recommended above gold.—Again, should it be necessary to alter the dowel, or put in a new one, in consequence of any alteration in the condition of the stump, the repair is neither attended with a heavy expense or loss of time to the patient.

One of the reprehensible practices of this particular dental epoch, when new teeth are to be inserted, is taking out the stumps. They never should be removed if it is possible to save them; no, even if they are retained but a few years, it is far better to keep them

than to allow their extraction. I am now referring to spaces in which two or more artificial teeth are to be placed.

Some dentists make formidable preparations, even beginning whole months before hand, to get what they consider the jaw in order. The roots are drawn, and as a matter of course, absorption of the walls of the alveolar margin follows slowly. When the healing process is complete, and the prominent ridge of bone is absorbed,—a cast is then taken of the space, in plaster, and subsequently a metalic model. On this a gold plate is beaten into the exact shape, the teeth are rivetted to it, and generally by the air-pump principle, or pressure of the atmosphere, the whole is kept in place. A slight assistance, at any rate, is all that is usually required.

Now I object to the extraction of the stumps. Fill them well with foil, and file them down to a level with the gum, as circumstances require. Finally fit the plate

to the stumps. The teeth are only separated from them by the thickness of the plate.

Such teeth may be used advantageously as very tolerable substitutes for nature's handy work. Those which bear directly on the gum cannot be firm and resisting. Mastication is never complete, because there is a tenderness, never wholly overcome. Beside, in such cases, something more than the teeth are wanted to perfect the imitation of nature. Artificial gums are to be appended, to meet the deficiency induced by absorption of the dental ridge.

Thus, weight is added to inconvenience; the more ponderous, the less adhesive power, —or in other words, gravity fairly overcomes the suction, and down they drop on the tongue, if they pertain to the superior jaw. These remarks will apply with equal force and truth to whole sets. It is an imaginary hindrance to the proper performance of the functions of the artificial teeth, if stumps remain. Save them, and that invariably—nor

should any one be argued out of them, when about submitting to toil through life with artificial teeth. A whole upper or lower set will hold on, based upon the stumps, just as well and securely as though none were there. Thus the contour of the mouth is neither injured or lost.

CHAPTER XIII.

TOOTH-ACHE.

How dreadful are the sufferings produced by an aching tooth! Those who have been spared that severest of all distracting pains, cannot conceive of the intensity of the misery. Some are so injuriously affected and prostrated by suffering from this source, that the digestive powers are seriously impaired, and perhaps death may have been induced by it, in feeble, delicately organized females, or young children.

Unless there should be an ulcer at the extremity of a root, by no means uncommon, the pain is in consequence of an exposure of the bulbous portion of the nerve in the central part of the diseased tooth. An inflammation ensues,—and those applications which act either as patritives, being mostly anodynes, cannot be relied upon. They are but temporary comforters. Nothing short of the actual cautery is worth attempting—provided that extraction will not be submitted to. Opium, ground pepper, pearlashes, salt, cajaput oil, kreosote, &c. &c., effect quite as much injury in some instances, as good. But they are the standard articles throughout the country, and it may be considered heresy to defame any of them.

In the 6th number of the American Journal of Dental Science, is a valuable paper, extracted from Koecker's Principles of Dental Surgery, that deserves the special consideration of those who are predisposed to painful teeth, from an exposure of the lining membrane.

It relates to the cauterization of the nerve, by a heated wire, and when the effects of the application of the cautery are passed, the operation is completed by the ordinary course of filling.

There is nothing acutely painful, as might be supposed, in touching the spot with a hot wire: the patient sometimes questions whether it has reached the seat of the exposed nerve, so unconscious is he of the sensation. A merely red hot wire is felt to be severe; whilst the white heat produces no sudden twinge. The first induces an inflammation that is not easily overcome; but the latter, as it were, instantaneously subdues the sentient extremity of the nerve. Surgeons, who resort to the actual cautery for stanching the flow of blood in those parts where ligatures cannot be readily fixed to small, deep-seated vessels, long since discovered the value of the white heat over an iron barely red hot. The cause of this difference has not been very satisfactorily explained by physiologists. I consider

it of so much value to the community to have Mr. Koecker's method understood, that it is here transcribed. Professional gentlemen already know it; but it is so new, comparatively, with us, that a dentist who should propose the operation, might not always succeed in gaining the confidence of the patient. With such authority, the applicant for relief would not long hesitate.

Previously, however, to making a quotation from Mr. Koecker, I cannot forbear mentioning the unnecessary havoc that is made with molar teeth of middle-aged persons, of both sexes, who sacrifice whole hecatombs, which might be secured for future years of service.

Some teeth are sympathetically painful; some ache from a diffused tic, or painful state of the nerves of the whole face. This is quite common with young mothers while nursing. Without a cautious examination, the first thought is to have the offending tooth removed.

Now, unless a caries is perceptible, or a

tumified gum, or some other strong evidence is discoverable of a diseased state that cannot be subdued by local or general treatment,—then extraction is justifiable. But it is a loss of incalculable worth to lose a tooth, therefore make every possible effort, by frequent consultations with the family dentist—it being always possible for him to suggest, at least, temporary relief, and he may wholly save it.

"I require for this the following apparatus," says Mr. K——: "1. A small iron wire, fastened to an ivory handle. The extremity of this wire I file to the size of the exposed surface of the nerve, and bend the wire in such a direction as to enable me to touch the exposed part of the membrane, without touching any other part of the tooth or the mouth. 2. A thick tallow candle, with a large wick.

"I direct the patient to discharge all the saliva he may have in his mouth, and then to incline his head backwards against the head support of my operating chair. I put the candle into his left hand, and direct him

to hold it in such a position that the flame of it may be on a level with his mouth, and about eight inches from it. I now place myself on the right side of the patient, and holding his lips sufficiently open, with my left hand, to prevent the instrument from touching them, I again dry the cavity as perfectly as possible with a lock of cotton fastened to the point of the cauterizing wire. Having effected this, I throw away the cotton from the extremity of the wire, and make it red hot in the flame of the candle. With the wire, thus heated, I touch the exposed part, very rapidly, so that its surface contracts, without, however, suffering it to penetrate deeply into the nerve, or to touch any part of the bony structure; as this would, inevitably, bring on suppuration and destruction of the whole lining membrane. The bleeding spot must be touched, very quickly, with the hot wire, which is sometimes necessary to be repeated two or three times before the parts are sufficiently contracted. The wire should be

perfectly red hot, for in this state the cautery acts suddenly, and almost entirely without pain; but when heated to any temperature short of that of red heat, much pain and inflammation are generally produced. This operation is, indeed, so slightly painful, that I have been solicited by my patients to repeat it, although they had required much persuasion to induce them, in the first instance, to suffer its application. It, however, must be performed very adroitly, and without any loss of time. To prevent the flow of saliva to interfere, the patient must be desired not to close his lips, but to keep his mouth wide open until the whole of the operation is finished, which he is capable to do for a certain time only.

"When the hæmorrhage has been arrested in this way, and an artificial cicatrix formed, I wash the cavity, as before the cauterization, with warm water. I carefully remove every particle of the ashes or matter that may have

been left by the cauterization, taking great care not to wound the membrane again.

"The nerve, which, before cauterization, had a fleshy appearance, is, after this operation, like a black point. I take care not to disturb this point, for if the black scar be removed, a new wound will be formed, and bleeding again will ensue ; but I leave the future healing altogether to nature, and only caution my patient against using such things as might interfere with its salutary operations.

"Having, thus far, removed all possible cause of future disease and irritation, in order to prevent any unnecessary exposure of the nerve, by which inflammation and destruction of it might be produced, I now terminate the operation by fulfilling the third indication, that is, to protect the nerve against injurious impressions from without, by filling up the cavity of the tooth with metal. Having again perfectly dried the cavity, I now take a small plate of very thin lead leaf, and lay it upon the exposed nerve, and on the immediately sur-

rounding bony parts. I next carefully fill up the whole cavity with gold. The dressing of the cavity, and the firm insertion of the two different metals, also, must be completed before the patient can be allowed to close his mouth, which is, not unfrequently, very difficult."

Exfoliations of the jaw, and even enlargements, are often the result of some malpractice in drawing defective teeth. The surgeon dentist, who has a scientific knowledge of the domain to which his operations are confined, is rarely in danger of committing such gross faults as occasionally take place under the rough management of a vulgar tooth-puller,—a class of adventurers which are becoming hopefully scarce.

When a collection of matter forms at the bottom of a diseased tooth, which threatens to force its way through the side of the jaw, even sometimes becoming formidable as an abscess through the cheek, the case then properly falls under the jurisdiction of a surgeon. Thus,

too, when the antrum, a large chamber in the upper jaw, just above the location of the either eye-tooth, is distended by an accumulation of matter, the lining membrane is inflamed, or the bone falls into disease, and the removal of a tooth does not give vent to the pus, the province of the dentist seems to be at an end. He should never hazard a reputation in prescribing beyond the legitimate sphere of his profession. Any such departure shows a want of proper regard for the best interests of those who confide in his knowledge and integrity.

CHAPTER XIII.

INFANTILE DENTITION.

Parents are not sufficiently alive to the importance of a vigilant oversight of children through an important era in their lives,—dentition.

From the development of the milk teeth to the period when they are superseded by those which are to remain permanently, the whole system undergoes physical revolutions which exercise an enduring influence over their future condition, that has been criminally neglected in some families.

Parents are not unmindful of the moral culture of their children; yet they too often forget that the complicated mechanism of organic life must necessarily be liable to derangement, if the organs, on which the preparation and digestion of aliment depend, are imperfectly formed, or feeble in the performance of their appropriate functions.

Mothers are quick to perceive the protrusion of the first tooth, which is hailed with a delight that is only known to them; but natural solicitude should never rest till the last one has also taken its place in the series. I shall not detail a variety of complaints incident to infantile life, having their origin in inflammations of the mucous membrane of the mouth,

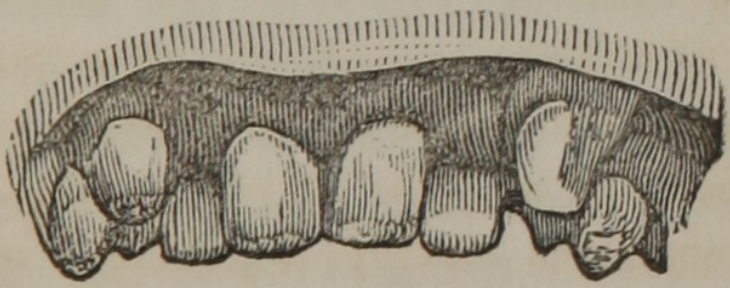
by the severity of this trying epoch—it pertains to the province of the physician to prescribe for convulsions, agues, and that train of bowel difficulties that are referable to the teeth-cutting of children.

Nor should this watchfulness, which I would urge upon those who have the care of infants from the nursery to the seventh and ninth year, pass unheeded by those having the control of institutions in which children are confided to the moral management of persons selected to preside over them. In New England, a most praiseworthy oversight is maintained in some of the best female seminaries, where a dentist visits regularly, twice a year, for the express purpose of seeing the progress of dentition. Even in public schools, the authorities could not institute a more popular regulation than requiring the regular attendance of a dentist, at suitable periods.

When the roots of the deciduous teeth are absorbed, the upper or exposed portions drop off themselves rarely requiring assistance,

before the appearing of many of the second set. Still, cases are continually occurring where the permanent, or, as usually denominated, permant ones, peep out, here and there, before all of the first crop have disappeared.

A fine little girl, the daughter of Mr. C——, may be cited with propriety, because it illustrates a point too instructive to be passed over. The parents, being in affluent circumstances, certainly were not disposed to neglect any expense that might conduce, in the sequel, to the personal appearance of the young Miss. Unfortunately, in the early periods of dentition, the nursery police of the parents took no cognizance of the distortion that was going on in the mouth. This drawing represents the appearance which was presented when the teeth were exposed to view.



Such were the melancholy consequences of inattention, or, what in fact was worse, positive neglect, at the very period when the teeth should have been frequently brought under the eye of a dentist.

Notwithstanding the awkwardness of the position of some of these teeth, the whole of them might have been trained with exactness, and the young lady have had a beautiful set. She always suffered extreme mortification when obliged to open the mouth in a manner to show their strange irregularity. In all other respects, her figure is exquisitely proportioned, with an intelligent facial expression to correspond. She is, moreover, highly accomplished, but never learned to sing, solely because she could not endure the thought of opening her mouth in society.

This drawing explains the lamentable effects of criminal neglect. The eye-teeth were suffered to shoot out at random, as it were, before the first ones had let go their hold. Thus, in rising to the surface, the lips

were thrust out of place, vexatiously distorting an otherwise charming face—for the eye-teeth actually looked like tusks.

This random development of the canine teeth is one of serious moment, yet so perfectly manageable, so entirely within the business control of the dentist, that there can be no justifiable apology for not shaping them in their course.

To say nothing of the feeling of disgust which this deformity inflicts upon those who must see it, there is another evil, of no less real magnitude, connected with an irregular protrusion of the first teeth. The interstices between them, when they stand leaning at all angles, constitute so many little traps in which portions of food are caught.

In some children, I have noticed a disposition of an early decay of the milk teeth. They wear down short, crumble, become loose, black, and disagreeable. They have a second set, usually, pretty early,—between the years of seven and nine,—which are much superior

to the first in size and whiteness. With the tendency discoverable in the speedy failure of the deciduous ones, it generally follows that the second manifest symptoms of early death. It is in such persons that the assistance of art is required, seasonably. No spot nor crevice must be passed by,—no, a little gold, skilfully pressed into the orifice, will certainly arrest the evil.

Other children are distinguished for the ivory whiteness of their first teeth. No accumulations of tartar mar their color, nor are there any indications of caries to the latest hour of their connection with the system. When they are shed, they appear rather to be pressed out of the way, than otherwise. The next set are characterized by being of a medium size, having a thick coat of enamel, broad, spreading roots, firmly implanted. Such teeth last to extreme old age, if they are not foolishly injured by abuse.

CHAPTER XIV.

ANATOMY AND PHYSIOLOGY OF THE TEETH.

No division of the living system can be viewed without admiration. Every fibre operates with a degree of mechanical exactness and precision, at once perfect and appropriately. There is no misapplication of power —no useless waste of material, but order and precision in the arrangement of the whole apparatus composing an animal body. The anatomist contemplates the location of muscles, the articulation of bones, the nice packing of the viscera, the tissues, the ramifications of the vessels, the location of the organs of sense, the distribution of the nerves, and the relation which one part bears to another. On the other hand, physiology explains the functions, traces out the dependence that one system has upon another, and gives a rationale of those sympathies which pervade the whole, influenced by that inexplicable some-

thing denominated vitality. Still, the phenomena of life are but poorly understood. Science, with all its high pretensions, neither expounds the law that determines our existence, or clears up the mystery in regard to the connexion of body and mind.

By the study of these two departments of human knowledge, the comfort and daily happiness of the race is promoted, the expectation of life calculated with astonishing exactness, and the sphere of thought is greatly enlarged. We discover, by their assistance, an important truth,—that, since man did not create himself, he proves, in his own specific organization, the existence of an all-pervading Intelligence, by whose uncontrolled energy the fashion of our bodies is determined, the gradual development of the intellectual powers decreed, and that the universe, with its countless accompaniments, were established in wisdom.

As I have, thus far, confined my observations, in this essay, to the consideration of one

particular subject, it would be a departure to seek any greater proof of design in animal mechanics than afforded by the teeth alone.

Every animal is characterized by its teeth:—in one they are long and slender, with cutting edges like a chisel, which are kept sharp by constant use; another possesses an immense crushing mill, by which the largest bones are broken down instantly; and another, widely removed from either, both in habits and propensities, has none at all:—yet there is an equivalent somewhere, so that the food is subjected to the same alterations in the end, whether it is ground in the mouth, or gorged without mastication. The correspondence, too, between the construction of the claws, the talons, or the human hand, as the case may be, to the mechanism of the teeth, is exceedingly striking. Arguments, deduced from these manifestations of contrivance, have been used, to great advantage, by writers on natural theology. Naturalists were never unmindful of these harmonies, though they have been

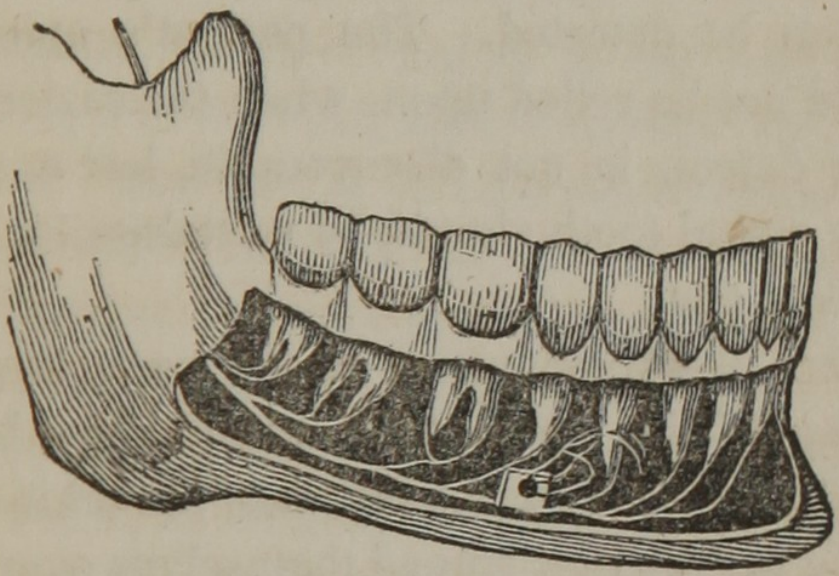
chary in introducing them, as they always should be in the preparation of elementary works on science, designed for youth.

Thus the field we are especially cultivating is one of vast dimensions. Whilst studying upon methods of repairing the infirmities of humanity, there is ample scope, were it consistent with the design of this family manual, to philosophize, and to discourse on the goodness of God.

Those who have had the pleasure of listening to Dr. J. V. C. Smith's instructive lectures on the evidences of design, a gentleman extensively known in the annals of medical literature, will doubtless recollect the many curious and beautiful illustrations which he brought forward in proof of his positions. None of them were more striking than those relating to the teeth;—and I have often wished that those arguments, so cogent and irresistible, were more extensively known. But it is quite impossible to pursue the subject, however gratifying it might be to myself, without

exceeding the limits proposed at the commencement of this undertaking.

The engraving introduced here is a dissected front view of the lower incisors. All the exterior plate of solid bone is cut away, exposing the extremities of the roots, with their thread-like nerves in sight.



By following the main shaft of the nerve, as it enters at the angle of the jaw, on the inside, we notice how twigs are given off to each tooth, and to each individual root too. This will explain the apparent difficulty, how

one or more teeth may sympathetically ache, when any one of the series is in a state of disease.

I am occasionally exceedingly perplexed to determine which tooth is primarily diseased, as the patient feels a diffused pain through the whole side. It is only by a rigid scrutiny, under such circumstances, that the offending one can be detected. The patient's opinion should not be relied upon, when the caries, or other defect, is not discoverable, lest a perfectly sound tooth should be mistaken for the diseased one.

Were the dimensions of the page larger, a map of the whole face might have been introduced, to show the intimate connexion of all the nerves that spread themselves over the muscles of expression. Suffice it to remark, that they all come directly from the brain. Within the cranium, there is one particular nerve, known to anatomists by the numerical cognomen of the *fifth*. It is also called the *trifacial*, on account of its wide distribution

over and through the bones of the face. The superior branch of this fifth nerve makes its appearance through a small orifice just above the eye ; the second division, called the *infra-orbitar*, makes its exit below the eye, where it subdivides into numerous little, shining, silvery cords, that creep into the muscles about the mouth and neighborhood.

Lastly, the third branch is the true dental nerve, and devoted, almost exclusively, to the teeth. One part of it, after subdividing into a multitude of fine threads, pervades the spongy texture of the superior maxillary bone, and reaches the extremity of each tooth. The other part is destined to the under jaw, where we see it, as displayed in the cut. Thus, it will be perceived that the dental nerves of the two jaws actually unite near the articulation, and are, really and truly, one nerve.

By sympathy, therefore, an upper tooth may seem to ache, when the pain is truly caused in one directly opposite, in the under set,—and vice versa. A knowledge of this ele-

mentary anatomy, therefore, must be of service to every individual, whether he has good teeth or bad teeth.

A copious supply of arterial blood is directed to the teeth, by the arteries,—vessels which conduct it directly from the heart. As in all other parts, the veins return it again, when its vitalizing properties have been expended. It is the rupturing of these vessels, principally, which causes a hemorrhage after extraction. The arteries are, undoubtedly, the artisans of the teeth. They not only supply the materials of which they are constructed, namely, lime and gelatin, but fashion the tooth also. When in the last stages of old age a new tooth unexpectedly shows itself, the arteries are the agents. There is sometimes a singular activity manifested in the arterial system, by the development of a third set of teeth. Instances are by no means very unfrequent of a sudden effort to regenerate some important organ. And none are, on the whole, when thus brought forward, more perfect than the teeth.

Such a determination of arterial power, however, is commonly at the expense of some or all other parts of the body. There is a sort of dying energy exerted, in such circumstances, disastrous to health. Although one or more new teeth are nourished and become perfect, the loss is felt in a corresponding ratio somewhere else ; and, on the whole, so far as my own individual observation extends, may be regarded as ushering in a fatal series of physical changes, against which no frame can be long sustained.

We have in infancy two sets of teeth in the jaws,—boxed up in bony cavities. When the circulation begins to quicken them, they enlarge in size, and finally show themselves. These are the milk teeth. When the term of their existence ends, the other crop is awakened—roused from a long slumber, as it were —and takes possession of the vacancies. Arterial action may, therefore, be considered as the essential one in the development of the teeth.

Exastosis, or an enlargement of the bulk of the roots, or the appearance of a bony tumor appended to any part of a tooth, cannot have been produced in any other conceivable way than through the circulation of the blood. In short, physiologists, I apprehend, all agree in this, that the arteries are the artisans concerned in the production and growth of the body in all its varied forms.

Regarding the origin of the enamel, there is considerable diversity of opinion. Whilst some view it as an inorganic substance, wholly independent of the blood, others, with infinitely better reasons, contend that it is impossible for it to have been deposited by any other class of vessels than the arteries, or elaborated from any fluid beside the blood, from whence all other organs had their origin, and are subsequently, kept in a state of repair.

Considerable difficulty arises in explaining the phenomena of the protrusion of the embryo teeth, in infancy. Like vegetable seeds, closely sealed up within the pericarpium, they

are slowly evolved, and, from a globular mass of a semi-gelatinous appearance, they begin, about the sixth month after birth, to assume an elongated form. A cutting edge is directed towards the point where there is the least resistance offered; and, at the same time, the roots seem to be drawn out, in an opposite direction, with a determinate force that carries them quite deeply into the spongy texture of the jaw. At the commencement of this process, another takes place, no less interesting to the philosopher. I allude particularly to the deposition of bone about the growing teeth, to constitute the alveolar arch—for such the sockets are collectively denominated.

By the time the deciduous or infantile teeth have fairly made their exit above the fleshy gums, the under jaw, especially, has become very considerably wider than before. This has been wholly brought about by the deposition of bone, different, entirely, in its anatomical character, from that which enters into the composition of the jaw. It is lighter, porous,

and darker colored. A necessity for this is very obvious to a physiologist. Indeed, even on plain mechanical principles, the object cannot be mistaken, for it relates to the interlacing of the ligamentary bands of which the florid gum is composed—lacing and strapping down the teeth, as it were, to the places of their destination. This porous structure, too, admits of the freest possible transmission of arterial blood to the periosteum, or lining membrane of the socket, of which I have, heretofore, spoken.

On the loss of these first teeth, we do not perceive a total destruction of this bony box, that lies on the margin of the gum or hard bone. Neither is there a very perceptible absorption of the gum. A depression, to be sure, is noticeable, but there is not that deep kind of excavation that marks the spot from whence an adult tooth has been forcibly taken. With the elevation of the second set, the deposition of new bone recommences, accompanied by all the phenomena which characterized the

first development of teeth. It is memorable that this last act changes the whole order of facial expression, and adds still more to the width or depth, whichever we may term it, of the under jaw.

With this finishing operation, the arterial deposition of bone forever ceases, as though the laborers were removed to another theatre of action, never again to resume the business, excepting in those exceedingly rare cases in which a third set of teeth appear,—an anomaly so rare that it only occurs once or twice in an age.

So completely is the force withdrawn, that no sooner is a tooth of the second set extracted, than we see the absorbents are at once employed in taking away the top of the socket, which is levelled down to the original plane of the jaw. It is admitting, on the part of nature, that the cavity will never be filled again, and she, therefore, takes off the thin sides of it, that we may have the full benefit of a hard bone to oppose the tooth above.

By little and little, as gradually as these

beautiful organs were formed, when disease creeps in upon them, the jaw becomes narrower, and ultimately regains about the original width it had in infancy. When the jaws thus approximate, words can no longer be enunciated with distinctness. A greater effort is required in the respiratory apparatus, and conversation in the aged produces a fatigue unknown to those whose teeth have not been impaired or lost.

Ill health very generally follows the loss of the teeth. The stomach necessarily suffers from the extreme expenditure of vital power. If the food is not first prepared by the teeth, it devolves upon the stomach to make an increased exertion. Hence the gastric juice is the sole agent in digestion in the down-hill of life, when the individual is in the condition I have been supposing.

Finally, having brought these observations to a close, is it not true that the subject of the preservation of the teeth is one that should engage the profound attention of all persons, at every period of life?

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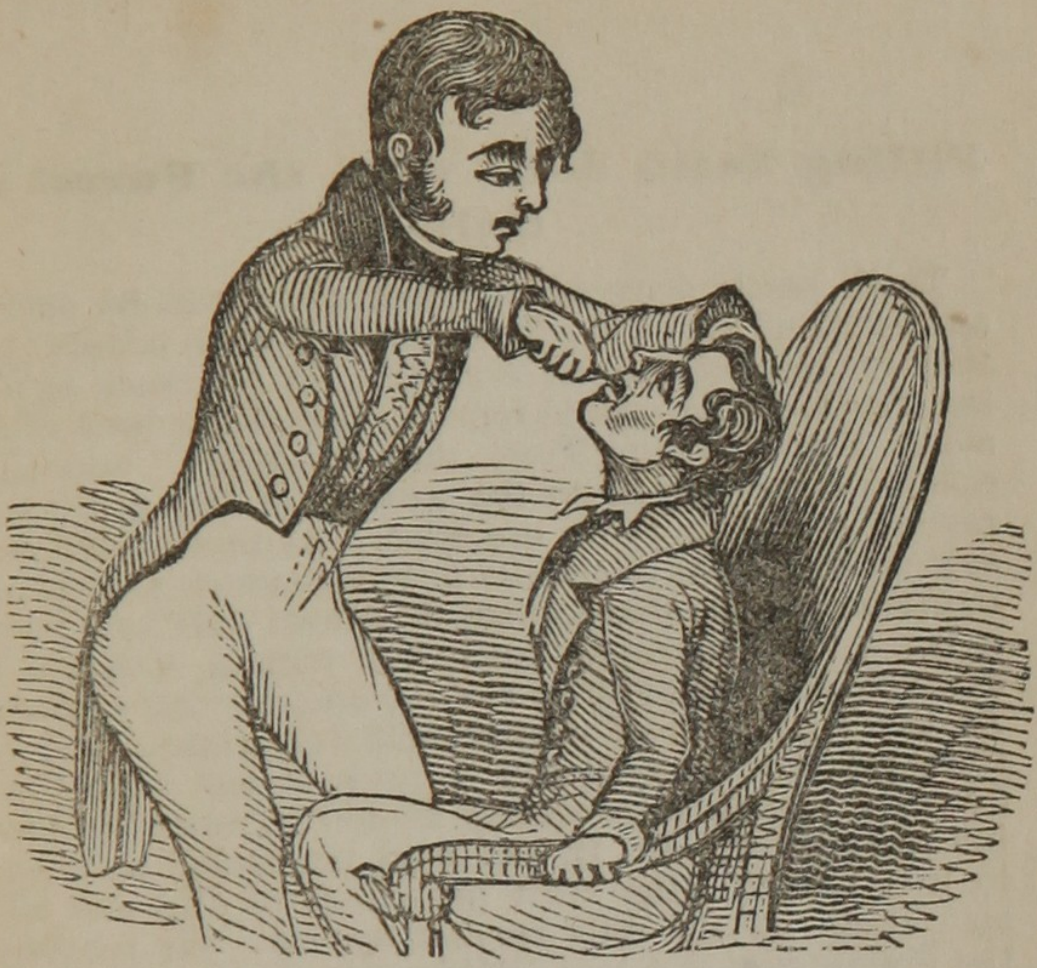

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