A treatise on the structure, diseases, and management of the human teeth / By Eleazer Gidney.

A

TREATISE

ON THE

STRUCTURE, DISEASES, AND

MANAGEMENT OF THE

HUMAN TEETH.

BY

Eleazer Gidney, Dentist.

"The teeth are worthy objects of the anatomist, the physiologist, the chemist, the naturalist, and the practical surgeon."—DR. HARE.

FIRST EDITION.

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ERRATA.

Page 7, line 9, for artieles read articles. p. 8, l. 8, for tempory r. temporary. p. 11, l. 16, for the safety r. that safety. p. 17, l. 8, for the decay r. their decay. p. 19, l. 1, for tempory r. temporary. p. 21, l. 18, for thus becoming r. this becoming. do. l. 19, dele at. p. 23, l. 11, for tempory r. temporary. p. 24, l. 26, for with the r. with a. p. 27, l. 13, for designated r. designed. p. 28, l. 8, for at the r. at their. do. l. 17, for nitche r. niche. do. l. 19, for of a r. of the. do. l. 28, for forty r. forty-eight. p. 30, l. 28, for crystilization r. crystallization. p. 31, l. 6, for too r. two. do. l. 9, for yery r. very do. l. 20, dele the word and. do. l. 22, for internal r. external. p. 32, l. 5, for for the fifth pair r. arise from the fifth pair. do. l. 13, for form the infra orbiter r. forms the infra orbiter nerve. do. l. 25, for gustutory r. gustatory. p. 33, l. 2, for tooth r. teeth. p. 35, l. 23, for like bones r. like other bones. p. 41, l. 16, dele the word from. p. 45, l. 27, for permament r. permanent. p. 57, l. 11, for above r. about. p. 66, l. 5, for the teeth r. the permanent teeth. p. 80. l. 7, for and produce that r. and thus producing that. p. 86, l. 7, for to brought r. to be brought. p. 88, l. 18, for the teeth r. several of the permanent teeth. p. 94, l. 7, for the teeth r. these teeth. p. 96, l. 24, for has been r. have been. p. 119, l. 9, for progress r. process.

Dentifrice, in several places is spelled dentrifrice, &c.

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CONTENTS.

Among the many letters received, recommendatory of this work, the author has selected the following:—

From the Hon. JOSEPH WHITE, M. D. *President of the College of Physicians and Surgeons of the Western District, located at Fairfield, state of New-York.*

Cherry Valley, June 9th, 1824.

SIR—I have read with much pleasure your "Treatise on the structure, diseases, and management of the human teeth." A work of this kind has long been called for. Your little Treatise ought to be in the hands of every family and read with attention—especially by those who have the direction and management of our youth.

I firmly believe that a strict compliance with the directions given in your work, would wipe off the opprobrium cast upon our climate as being unfriendly to the preservation of the human teeth.

Accept, sir, of my best wishes for the success of your laudable endeavour to ameliorate the condition of your fellow beings.

Respectfully,
J. WHITE.

E. GIDNEY, Dentist, Utica.

From HENRY DAVIS, D. D. *President of Hamilton College.*

The subscriber has read, with much interest, "A Treatise on the structure, diseases and man-

agement of the human teeth, by ELEAZER GIDNEY, Dentist;" and judging from his Treatise and from information otherwise received respecting him, he has no hesitation in saying that Mr. Gidney is, in his opinion, entitled to the thanks, and highly deserving the patronage of the public.

H. DAVIS.

Hamilton College,
18th June, 1824.

From ALEXANDER COVENTRY, M. D. *President of the Medical Society of the State of New-York.*

MR. ELEAZER GIDNEY,

SIR—I have perused your Treatise on the structure and diseases of the human teeth with much satisfaction, and can truly say that I have very seldom found so much useful information comprized in so small a compass. Your little volume is worthy the perusal of every individual of competent age to understand its contents; would make a valuable addition to every private library; and the Parent who regards the future comfort of his children would do well to furnish himself with one of your treatise.

Respectfully yours.

ALEXANDER COVENTRY.

Utica, July 7, 1824.

PREFACE.

In presenting the following work to the perusal of the public, the author has been influenced by a desire to promote the knowledge of a science, which, at the present time, is little understood in this country. Among the various diseases which are incident to the human system, none, he believes, are less attended to, either as to the means of their prevention or cure, than those of the teeth.—Yet the painful consequences which are attendant on the disorders of these important organs, certainly afford a sufficient inducement to pursue that knowledge, by which we may be enabled with proper care and attention, to preserve the teeth in a healthy state. Every one

who has ever experienced the excruciating pains of the tooth ache, or the inconveniences which result from a loss of the teeth, must be fully sensible of the effects of inattention to this subject. Prejudices, indeed, have long existed in the minds of many persons, against any operations on the teeth. But this prejudice arises wholly from ignorance, and from the fatal consequences which such persons have often seen resulting from the operations of empirics, and of mere pretenders to skill in dental science.

In the following work, the formation and structure of the human teeth, as well as the causes by which diseases of these important organs are produced, and the mode by which those diseases may be prevented or remedied, have been illustrated in such a manner as cannot fail to be useful to every person who may find leisure to peruse it, and the

author doubts not but that it may prove of singular advantage to practical physicians, surgeons and dentists.

INTRODUCTION.

It is an uniform law of nature, that the operation of the living functions of all animal bodies, has a constant tendency to consume the substance of which they are composed. A certain and regular provision is therefore necessary for the reparation of those losses which the body has sustained. The animal and vegetable kingdoms are abundantly stored with artieles of food which by a bountiful Providence are adapted to the tastes and instincts of all his creatures. But before these articles of food can become nutriment for the body, they must undergo certain processes. The first is that by which they are broken down into small particles, which by being mingled with the fluids of the mouth, are comminuted into a fine mass, and thus prepared for the action of the stomach, in the process of digestion.

The teeth are the organs provided by nature for the mastication of food, which is an operation so essential to health, that

without its due performance, the digestion must be always more or less deranged.

Those teeth which appear in the early part of life, are adapted to the state of childhood, and at a certain period are succeeded by a second set, which are designed to continue during the remainder of life. The first, or tempory set of teeth, are very liable to become diseased, and in the majority of cases, do not of themselves, fall out in sufficient time for the permanent or second set of teeth to arrange themselves in their proper order.

A knowledge of the change which the teeth undergo, is a very interesting part of natural history, and is absolutely requisite to enable a practitioner of the dental art, to render such assistance during the progress of the second dentition, as may preserve the permanent teeth from being injured by the diseases of the temporary ones, or from acquiring that irregularity which always occasions much deformity, and often prevents correct pronunciation.

Attention to the appearance and preservation of the teeth is an object of much importance. When we take into consideration the advantages which have

arisen from the separation of the different branches of surgery, no one, it is presumed, will hesitate to acknowledge the great benefits which have thus been produced to mankind. But while examining the progress of improvements in the different branches of this science, it is to be observed with regret, that the dental art has not kept pace with many others of less real utility. And we believe that one great cause which has retarded its progress, is that the subject hitherto has been considered as not forming an essential part of professional education, but the practice of it has generally been regarded in no other estimation than that of a mechanical occupation or trade. Although many valuable publications from able and skillful Dentists have preceded this treatise, yet it is melancholy to reflect how limited has been the usefulness of their labors. Experience evinces that all their instructions are but ill adapted to answer the extensive calls for information on this subject. Conscious, therefore, how much remained to be done in every thing relating to the management of the teeth, I was induced to direct my attention very early to the subject; and from experience

have generally found it necessary to regulate my practice by the principles of my own system. How far it has been satisfactory, must be decided by those who have experienced its effects.

Whenever, in the following treatise, I shall take the liberty to differ from the opinions or practice of my predecessors, I can truly say, that I am influenced only by a desire of improvement, founded in experimental knowledge. But where their sentiments have appeared to be founded on just observation, I willingly adopt them, and in doing so, I shall not scruple occasionally, to borrow their language.

A great improvement in this department of surgery, will depend on pointing out to society the importance and means of preventing diseases of the teeth, and their connexion, in almost every instance, with the general state of the health and preservation of the system. By no means could this object be so effectually accomplished as by the establishment of an institution for the exclusive promotion of Dentalogical science. The wants of society, as well as the disposition of the present enlightened period, so favorable to the universal diffusion of knowledge,

demand such an institution, and such, we flatter ourselves, we are authorized shortly to anticipate. Then will this useful art be rescued from the undue degradation to which it has been exposed in the hands of ignorant practitioners, or of mercenary pretenders, who by the monopoly which they have established, have prejudiced those who have spared no pains or expense in obtaining a scientific knowledge from the best professors in this department of surgery, without regard to the sufferings of mankind or disgrace of the profession A want of that knowledge which is indispensably requisite to enable an operator to act with the safety and success which so delicate and valuable an organ as the teeth demands, will readily account for the low estimation in which our profession is held by a large part of the community. Numerous, indeed, are the injuries caused to society, by these pretenders, and it is heartily wished that they had more information, or less patronage from an enlighted people ; a patronage which is the bane, and almost total ruin of our profession, and for which we have such frequent cause of complaint.

Very different, indeed, is the reputation of our profession in Europe. The services of a Dentist are there considered indispensable in almost every family, and in public seminaries, which are regularly visited from two to four times a year, or oftener if necessary, that the teeth of the family or pupils may be inspected so that timely assistance and directions may be given; and in this manner almost every deformity and decay of the teeth may be prevented with a trifling expense. I am happy to state that a similar practice is coming into fashion in our large cities, and which I have no doubt will produce the happiest effects. But here I would remark, that there are many important considerations which should induce those who wish the professional assistance of a Dentist, to pause before they proceed to employ a person with whose character or abilities they are unacquainted; for in the hands of Charlatans or quacks is generally some powerful medicine, the efficacy of which profers some miraculous cure of the tooth ache, or some remarkable quality of whitening the teeth, or some other pretended valuable properties. Therefore these remedies are frequently applied by the

unwary, on recommendations of a person wholly destitute of a knowledge of their qualities, and perhaps of the pernicious effects which they are liable to produce: But they answer his purpose. The remedy is applied; he gets his money, and is soon beyond the reach of his unfortunate patient, and of the protecting power of justice. But too soon the fatal deception is discovered; an invaluable set of teeth are wholly ruined, and many painful consequences ensue. But if the impostor has placed in the hands of the unwary, some powerful pretended specifics for the tooth ache, what has experience proved to be the result of its application? Not less than five fatal occurrences from this source have fallen under my own observation, besides almost innumerable instances of much pain and danger. I would therefore recommend the public to consider all medicines dangerous in the hands of the ignorant, and as they value life, to reject from their hands every preparation for the teeth, with the properties of which they themselves are unacquainted.

Those who wish to extend their inquiries further on this important subject, I would refer to the justly celebrated publi-

cation on the teeth, by Mr. John Hunter. This was the first scientific treatise that was ever published on this subject, and as an anatomical work, must ever stand high in the estimation of every professional Dentist. It was this gentleman who first tendered the fostering hand to this noble art. His opportunity, from being frequently consulted on the subject, by Dentists of his day, gave him a complete insight into the miserable condition in which this branch of physiology then existed.—His views were accordingly given to the public in a manner which soon procured gentlemen of elevated talents and respectability to embark in its cause, and from these gentlemen light and knowledge in this science have been promulgated to a very considerable extent, and which have tended much to put down those practices of imposition which I have already mentioned, and have established a permanent foundation for the further elevation of this science, which I fondly trust will not be easily shaken. Dr. Blake's dissertation, published in Edinburgh, in 1798, contains many correct and valuable observations. Mr. Rosini's work on this subject is filled with interesting matter, and may

be perused with advantage by all who regard the preservation of their teeth as an object of any importance.

The late Mr. J. Fox, it is presumed, has done more for the elevation of this science than any other man. Several courses of lectures on this subject were delivered by him at Guy's Hospital, from 1799 to 1814. The first volume of which, containing the natural history of the human teeth, &c. was published in 1803, and a second volume on the diseases of the teeth, &c. was published in 1806. And both volumes, with further improvements and illustrations, with twenty-three copper plate engravings were republished in 1814, under the title of the "Natural History and Diseases of the Human Teeth." This work contains a comprehensive view of the origin, rise, progress, and all the various deformities and diseases of the teeth. It is executed in a manner which shows very accurate observation, and I presume it will ever be regarded as a work of great merit. It is not, however, without some imperfections, which, in the course of this treatise, I shall notice, and, as far as possible, correct. There are many other smaller works in the hands of the public, of differ-

ent degrees of merit. In fact, within these few years, in this country, as well as in Europe, it must be admitted that considerable improvement in dentalogical science has been made, and especially in our large cities. It is generally established on a respectable footing, and conducted by those enlightened principles which are the fruits of a liberal education and practical experience. Such are the improvements in this branch that the complicated diseases of former times now yield to a mild and natural treatment, and by the skilful Dentist, operations are daily performed, of that bold and decisive character, which, at a former period, would have been thought impracticable and beyond the power of art to accomplish.—Indeed, if mankind in general, could be suitably impressed with the utility of the many improvements in the dental art, and timely application made for relief, much suffering would be prevented.

That much may be done for the preservation of the teeth by the individuals themselves, is a fact which needs no proof; but that every person is not acquainted with the most approved or necessary means, to effectually guard their teeth from all dis-

ease, is also a fact, which, it is presumed, will not be contested. Therefore, when teeth are sound, the advice and directions of a skilful dentist, if strictly adhered to, will generally preserve them so, to the most protracted period of life; but if they have already began to decay, and especially if the decay is produced from external causes, which five times out of six is the case, a proper dental operation will not only stop its further progress, but by filling the decayed cavities with gold, suitably prepared for the purpose, will render them artificially sound, and in every respect as good and likely to be durable as ever. But here let me observe that this is an operation which can only be expected to prove effectual, or in fact of any particular benefit where it is well done and that with the best materials. A word, it is presumed, will be sufficient to convince every one that this operation, particularly, should be attempted by none, but those who are possessed of the necessary knowledge, manual dexterity, suitable instruments and the best materials. The want of some one or all of these qualifications in those who have attempted this operation, is the cause of the want of success, and consequently

of the low estimation in which this useful branch of our art is held by so large a class of community. I could wish the public might be induced to correct this erroneous opinion ; as it is a fact that very many, and even almost every decayed tooth, if taken seasonably, may be so effectually stopped that it will be in every respect nearly as serviceable and durable as if no disease had ever effected it.

CHAPTER I.

Formation of the tempory Teeth.

At a very early period we may perceive the preparatory steps for the formation of the teeth. As soon as ossific or bony deposits commence, both jaws are filled with small membraneous sacs, which are the rudiments of the teeth. The blood vessels and nerves belonging to the teeth run along at the bottom of the cavity, in which these pulps are contained; but afterwards a distinct canal is formed, through which the principal blood vessels and nerves pass, separate filaments being sent off to the several teeth.

The alveolar processes or sockets, soon become distinct; for the bony partitions, which divide the longitudinal cavity in the jaw, rise to the upper margin, and thus those membraneous processes, now enlarged, become more evolved and begin to be contained in separate cells. Upon examining those sacs or substances found in

the jaws, they are seen to be soft or pulpy bodies, bearing a resemblance to the figure of the body of the tooth to be formed, and each of them is contained in a membrane proper to itself. For some time during the formation of the teeth, the alveoli grow much faster than the teeth themselves, which are consequently but loosely contained within them, and so as nearly to enclose or cover the teeth, and thus giving a firmer support to the gums, and enabling the infant to make the necessary pressure in taking nourishment without injury to the parts going on underneath. The ossification of the teeth begins to take place very early; it is first visible upon the tips of the front teeth, next the cuspidati or canine teeth, and soon the molares or grinders. This gradually advances and extends itself over the pulps. At the time of birth the bodies of twenty teeth are distinctly formed, ten in each jaw. These are the teeth designed to serve during the years of childhood, and are commonly called the temporary, shedding or milk-teeth. They are divided into three classes, incisores, cuspidati, and molares. In each jaw there are four incisores or front teeth, two cuspidati or ca-

nine teeth, and four molares, two on each side—the teeth on one side of the mouth corresponding in figure with those of the other, so that they are situated in pairs. Besides these twenty teeth, there are in a very early stage of their formation the rudiments of some other teeth which are to form part of the permanent or adult set. As the growth of these teeth goes on they become too long to be contained within the alveolar cavity. They therefore begin to make pressure upon those parts, which cover them. This produces the process of absorption, which proceeds with the enlargement of the tooth, first removing the membranes which enveloped it, and afterwards the thick gum with which it is covered, thus becoming thinner and thinner, till, at at length, the tooth is suffered to pass through.

Sometimes children have one or two teeth at the time of birth. These premature teeth have no fangs and are only attached to the gums. They soon get loose and produce inflammation in the mouth, & are inconvenient to the mother. It is therefore advisable to extract them immediately. In general, children begin to have their teeth about the sixth, seventh or

eighth month. Those which correspond with each other generally appearing about the same time, first in the under jaw and then in the upper. The first set of teeth is generally complete at the age of two and a half or three years; but this frequently depends on the health and vigor of the child. Among the robust, it is not uncommon to see the teeth begin to protrude as early as the fourth or fifth month, while those of more delicate and weakly constitutions will require from ten to fifteen months before any teeth make their appearance. It some times however happens that the teeth seem not to be influenced by the state of the health.

The following is the order in which the teeth of a child generally appear. The first teeth are the central incisores of the under jaw, one generally coming a few days before the other, then in the course of a month the two central incisores of the upper jaw. These are succeeded in a few weeks by the lateral incisores of the under jaw, and then soon after by the lateral incisores of the upper jaw.

The cuspidati are generally slower in completing their growth than the molares. They are placed deeper in

the jaw, and therefore are preceded by the first molares of the under jaw which usually come before those of the upper. They commonly appear about the fourteenth or sixteenth month, & are soon met by those of the upper jaw. After these the cuspidati come through, first in the lower jaw and then in the upper. At sometime between two years or two years and a half, the second molares make their appearance, and thus complete the tempory set of teeth. Though this is the regular course observed by nature, there are at times exceptions to this order of protrusion for instead of the front *incisores*, the lateral *incisores* are sometimes discovered first, through the gums, and the small *molares* before the lateral incisores.

The period of dentition is often highly critical to the constitution of the child, as it not only occasions disease, but generally aggravates any other disorder which may occur at the time. Yet it is well known that this period sometimes elapses unaccompanied by any particular symptoms of pain or uneasiness. The appearance of the teeth is clearly an effort of nature, in which she affects the absorption of the investing membrane, the alveolar

process, and the gums to make way for their passage. But the teeth somtimes advancing too rapidly occasion a strong tension and pressure on the vessels of the gums, which produce pain and irritation in the surrounding parts. Hence the gums appear swelled and inflamed, a constant discharge of saliva takes place from the mouth, and often a general sympathetic fever prevails over the whole system.

At this period the mode of treatment demands our particular attention. The child is frequently indulged with some hard substance to bite or press upon the already inflamed gums. This practice is highly pernicious, as it tends much to increase the inflammation and uneasiness of the parts. Some recommend the use of salt with a gentle friction on the gums with the finger. But experience has proved this mode of treatment to be highly improper. A gentle cathartic or any other means by which the increased action of the system may be reduced, will prove useful. But nothing will so effectually and safely relieve the little sufferer, as an incision made with the lancet, over the tooth which is the cause of irritation. This would not only administer instantaneous relief to the child, but

will prevent or remove every distressing and dangerous symptom, with which dentition is often attended. Little skill is required in the performance of this simple and safe operation. The operator should be certain that the instrument reaches the seat of the mischief. Not only the gum, but the membrane immediately over the tooth, must be effectually divided. No mischief can ensue from the lancet being pressed sufficiently hard upon the tooth as to leave no doubt of the entire division of its covering.

CHAPTER II.

Formation of the permanent set of Teeth.

In the management of the teeth of children, it is highly necessary that the surgeon, or whoever may have the care of them, should have a perfect knowledge of the order in which the teeth of the permanent set are formed, and of the time when each tooth is expected to pass through the gums. The formation and perfection of this set of teeth occupy a very important portion of our limited existence. No less

than twenty years, and often more being necessary to their complete evolution. Nature begins to attend to the production of these permanent instruments of mastication at a very early period, and in many instances they are not wholly completed before the twenty-fifth, thirtieth, and somtimes the fiftieth year. The permanent set of teeth are much larger, differing essentially in figure from the temporary set, and are twelve more in number, making, in the whole, thirty-two. This set of teeth may be divided into two classes. Those which are to succeed the temporary, and those which are superadded. The formation of both these divisions begins nearly about the same time, & the progress furnishes one of the most curious changes the animal economy can exhibit. The incisores and cuspidati of the child are succeeded by teeth similar in form, but larger in size. But the teeth which take the places of the temporary molares are much smaller & being divided at their grinding surfaces into two points are called bicuspides. The molares of the adult, are the teeth which are superadded, and these succeed one another as the jaw advances in growth. The permanent set of teeth are subdivided into four

classes, viz. the incisores, cuspidati, bicuspides and molares. There are in each jaw four of the first class, two of the second, one on each side, four of the third, two on each side, and sixth of the fourth class, three on each side. The front teeth of the upper jaw are much broader and larger than those of the under jaw. The cuspidati are more conical, and have much longer and larger fangs than any of the other teeth, and are of a middle nature between the incisores and bicuspides. They seem to be particularly designated for the laying hold of and tearing substances.

The bicuspides have an intermediate resemblance between the last described teeth and the molares. Those in the upper jaw generally have but one fang, those in the under jaw, two. The molares are the three back teeth on each side of the jaw, making twelve in the whole. Their crowns are much larger than those of the other teeth. Their grinding surface is furnished with several points, which fit them for their office. The upper molares generally have three fangs, and those of the under but two. The third or last grinder is called *dens* sapientiae. The fangs of these teeth are often so much curved as to render their ex-

traction extremely difficult. They seldom appear before the twentieth or thirtieth, and sometimes even the fiftieth or sixtieth year of age. At the time of birth, on examining the membranes of the temporary teeth, small membraneous sacs or pulps containing a jelly-like substance, will be found attached to them at the posterior and upper part. These are the early rudiments of the permanent molares. At the age of two or three years the position of the teeth is much altered. At first the permanent teeth are contained in the same socket as the temporary. But as the formation of both sets advances, the permanent teeth by the growth of the alveolar processes become placed in a kind of nitche. There is also a small bony process shooting across the bottom of a common socket, which gradually increases, till at length, nearly a complete separation is produced, and the permanent teeth are contained in sockets of their own. At about six years of age those teeth designed to succeed the temporary ones and the first and second molares are in considerable forwardness; and if none of the first set have yet been removed, there are at this time in the head forty-teeth, twenty in sight; and within the jaws

beneath the gums in the progress of formation, twenty eight. At about the ninth or tenth year the formation of the the third molares or dens sapientiae, begins. This description differs considerably from Mr. Hunter's treatise, for by some means, inaccuracies have been suffered to creep into his work. But the above is the order in which the formation generally takes place.

CHAPTER III.

Formation and structure of the Teeth in general.

The teeth are formed in a manner peculiar to themselves, differing materially from the formation of other bones. They are formed from a soft pulpy substance, which possesses the shape of the body of the tooth to be produced. Each pulp is covered by a membrane strongly attached to the gum and to the pulp at its base, and is slightly connected with the socket. These pulps and membranes, on examina-

tion, are found to be vascular. The membranes derive their vessels from the gums, and the pulps receive theirs from the artery which passes through the jaw.

We are indebted to Doct. Blake for the discovery of the manner in which the permanent teeth derive their origin.

We have observed that from the membranes of the temporary teeth are given off small sacs from which the permanent set are produced. The second and third molares are in like manner formed from the first.

A tooth is composed of two substances, one of which, called enamel, is spread over that part which is not covered by the gums. The other substance is bone. It consists of the fang and all the body of the tooth situated within the enamel. The bone of the tooth is formed from the pulp, and the enamel from the investing membrane. This membrane secretes a fluid, from which a very white soft substance is deposited upon the bony part of the crown of the tooth. This at first is of a consistence not harder than chalk, but afterwards seems to undergo a process similar to crystilization. The deposit of the enamel continues nearly as long as the tooth

is contained within the membrane, but receives no addition after it has protruded. This enamel when perfect is so hard as to elicit fire, if struck with steel.

Sometimes in the formation of the teeth, too pulps unite, and upon their serfices appear as two distinct teeth, but on attempting to remove one it is discovered to be united to the next. Yery often the fangs of the teeth become crooked from some obstruction to their growth, and teeth having two or three fangs are now and then met with, so much bent at their points as to occasion them to be very firmly placed in the jaw. When these circumstances occur, the extraction of the teeth is unavoidably an operation of the utmost difficulty.

The arteries which supply the teeth with blood, are called the dental; and they are branches of the internal maxiliary artery, which arises from the internal carotid. It sends off numerous branches to the parts belonging to both jaws, and to the teeth of the upper jaw. It then gives off one branch to the lower jaw, called, by some, the inferior maxillary, and by otthers, the dental. This enters the posterior maxillary foramen of the jaw bone, passes

through the maxillary canal and gives off branches to the fangs of each tooth, and also supplies the substance of the bone.

The nerves which are distributed to the teeth for the fifth pair, the *trigemini*.—This pair of nerves divides into three branches; the opthalmic; the superior maxiliary, and the inferior maxillary.—The opthalmic branch is distributed to the parts in the neighbourhood of the eye.

Branches from the superior maxillary nerve enter the canal under the orbit, and form the *infra orbiter*. At the posterior part small filaments of nerves, accompanying branches of arteries, enter the superior maxillary bone by the foramina which lead to the molares, and whilst in the canal it sends off branches to the other teeth in the upper jaw.

The inferior maxillary nerve passes through the *foramen ovale* of the sphenoid bone, and is distributed to the muscles of the lower jaw: It sends off a large branch, the lingual, which goes to the tongue, which is the true gustutory, or that nerve which produces the sense of taste; it then enters the maxillary canal of the lower jaw, passes through the bone under the *alveoli* and gives off branches which enter-

ing the fangs, ramify upon the membrane within the cavities of the tooth; it passes out at the anterior maxillary foramen and is spent about the chin and lip.

There is another set of vessels called absorbents, of the existence of which in the structure of common bone there can be no doubt: and on account of certain effects produced upon the teeth, we have reason to conclude that they are not destitute of them.

During the progress of the second dentition the fangs of the temporary teeth are absorbed; and even the permanent teeth, when diseased, often loose a cousiderable portion of their fangs. Some suppose that these vessels are seated in the socket, but from frequent ulcerative processes occurring in the cavity of a tooth, by which a considerable portion of its internal structure is destroyed, we may reasonably conclude, that absorbents also accompany the other vessels into the internal cavities of the teeth.

The teeth are fixed in their sockets by that species of articulation called gamphosis They are attached to the alveolar cavity, by a strong periosteum, which is

extended over the fangs, and which also lines the socket. It is connected with the gums at the neck of the tooth. Mr. Hunter considered the teeth devoid of internal circulation, and destitute of a living principle. But Mr. Fox very justly supports an opposite theory. He considers that the blood sent to the teeth is designed for their nourishment and support.

That blood does circulate in the internal cavities of the teeth, it is presumed no one will attempt to deny, and as blood carries with it the principles of nutrition, and is sent to those parts only where renovation is necessary, it is but reasonable to suppose, that the blood imparts nourishment to the teeth, the same as it does to other bones. It is always observed, that as persons advance in life, their teeth lose that whiteness which they possess in the time of youth. This change seems to depend on one which takes place in their cavities, by which the vessels entering them are gradually destroyed and the supply of blood proportionably diminished. In the teeth of persons advanced in years, the cavity is very frequently obliterated, in consequence of a deposit of bony mat-

ter, which destroys the internal organization. When a tooth has once been completely loosened, by accident or otherwise, and remains in the socket, it will become of a darker colour, on account of the loss of its nourishment from the destruction of its blood vessels.

The teeth being similar in their construction to other bones, are governed by somewhat the same laws, and are liable to like diseases; and like them they are affected by the various causes of inflammation, and when diseased, are subject to similar appearances.

In bones the power of resisting the effects of disease, is in an inverse proportion to their density. The teeth being the most compact and solid bones in the system, possess the least power of resisting disease, and in them, the general result of inflammation, is gangrene.

The teeth have not the power of exfoliation like bones, and it is not necessary they should, for the system in general, sustains no injury by the loss of a tooth, and no one would have sufficient patience to endure the pain attending upon, or wait the completion of so slow a process.—

Like other bones, the teeth are subject to that inflammation called the ossific, by which they become enlarged by an additional deposit of bony matter, and exhibit all the appearances of exostosis.

It may not perhaps be uninteresting to know the substances which enter into the composition of the human teeth. I will here enumerate them, and give the proportions in which they are respectively found, as ascertained by Mr. Pepys.

One hundred grains of the enamel of the human teeth (carefully rasped) being decomposed by a chemical process, was found to consist of the following substances :

Phosphate of lime	78
Carbonate of lime	6
	84
Water of composition & loss	16
	100

A loss of sixteen grains here takes place, which is easily accounted for, from the impossibility of directly ascertaining the state of dryness in which the ingredients existed originally in the enamel.

Bone or roots of teeth yielded by analysis, in 100 grains,

Phosphate of lime	58
Carbonate of lime	4
Gelatine	28
	90
Water of composition & loss	10
	100

The teeth of adults yielded on analysis in 100 grains,

Phosphate of lime	64
Carbonate of lime	6
Gelatine	20
	90
Water of composition & loss	10
	100

The specific gravity of adults' teeth is found to be 2.2727.

The shedding or primary teeth of children yielded, on analysis, in 100 grains.

Phosphate of lime	62
Carbonate of lime	6
Gelatine	20
	88

Water of composition & loss 12

100

The specific gravity of children's teeth is 2.0833.

CHAPTER IV.

Shedding of the Teeth.

The falling out of the temporary teeth, to give room for those which are designed to be permanent, is usually termed, the shedding of the teeth. It is the effect of one of the most curious operations of nature, and is of great importance to mankind, since the beauty of the face, and the proper articulation of sounds, depend in a great measure upon the regularity with which this process is accomplished.

The necessity of teeth for the mastication of food, commences as soon as the time of support from the mother ceases, and therefore a set is provided at a very early age, which occupies but a few months

in formation, and continues without decay only a few years. These teeth are only proportioned to the size of the mouth during childhood, and would consequently be too small and too few in number, for the extended state of the jaws in the adult.—This renders the formation of a new set indispensable, and agreeable to the manner already mentioned, a set of teeth is formed of a magnitude and number proportioned to the mature state of the body, and designed from their very dense structure, to last through life.

It is during the formation of the permanent teeth, that the very curious process of absorption takes place in the temporary ones, which quickens their removal from the socket, and opens a free passage to the permanent teeth. The pulps of the new teeth are placed behind the temporary ones, and thus situated they are very much crouded, and fill but a small space. Now it is evident, that as they advance in size, they will require an increase of room, to obtain which, they must come forward so as to form a larger circle. This effort first produces a pressure against the bony partition situated

between the temporary and permanent teeth. This pressure causes an absorption of those parts upon which the pressure acts, and as the new teeth augment, the fore part of the socket, which contains the pulp and separates it from the shedding tooth, is taken up by the absorbents and carried out of the system.

This process of absorption gives to the fangs the appearance of being broken, but when compared with a fracture, will be seen to differ very essentially. While the absorption of the fangs of the temporary set of teeth seems to depend so much on the pressure of the rising permanent ones, it is often found to go on without such pressure, for in some cases the temporary teeth will drop out long before the new teeth appear, and some times the same effect is produced where a new tooth does not rise to fill the place of the one that has fallen out.

Cases of deficiency of the permanent teeth are frequently known to occur.

The appearance of the teeth when absorbed, has frequently given rise to a popular but erroneous opinion, that the first teeth have no fangs. It has also been er-

roneously conceived, that the temporary teeth are pushed out by the permanent.—Now, that this is incorrect, will appear obvious, by observing the state of the two sets of teeth. The temporary are firmly fixed in sockets, whilst the new teeth, during their growth, are contained in cavities larger than themselves, and can only make such pressure as their gradual increase will permit. Hence, if the absorption of the old teeth be retarded, or the formation of the new ones takes place too quickly, the latter will take an improper direction, when they come through the gums, and form partially a second row of teeth from the temporary ones still remaining. Further, if the old teeth were crowded out by the new, we should always find those teeth about to be displaced, forced out of the line of the others, a circumstance which never occurs.

Children generally begin to shed their teeth between the sixth and seventh year. The teeth of the permanent set which usually appear first, are the *anterior molares*, which being somewhat earlier in their formation, generally precede the *incisores*, and soon after the cutting of one or the

other of these teeth we may expect that the shedding of the temporary teeth will begin.

Soon after the first permanent *molares* have appeared, the two central incisores of the under jaw become loose, and when they are but slightly attached to the gum, easily come away. The permanent central *incisores* soon after appear, one coming a little before the other. In about two or three months the central temporary incisores of the upper jaw become loose and fall out, and the permanent central incisores succeed them.

In about three or four months more, the under lateral *incisores* having lost their fangs, come away, and the permanent lateral *incisores* succeed them. The lateral incisores of the upper jaw are the next that drop out. and the permanent ones appear shortly afterwards. In about six or eight months more, the temporary *molares* begin to loosen; they generally come out before the *cuspidati*; the long fangs of which take a much longer time to be absorbed.

The first *bicuspides* take the places of the first *molares*, and about the time they

appear, the second temporary *molares* and the temporary *cuspidati* become loose, and having been shed, are succeeded by the permanent *cuspidati* and the second *bicuspides*.

CHAPTER V.

Irregularities of the Teeth.

During the shedding of the teeth, there are several circumstances which prevent the permanent teeth from acquiring a regular position, and often give rise to very great irregularities in their arrangement. The most frequent cause is a want of simultaneous action between the increase of the permanent teeth and the decrease of the temporary ones, by the absorption of their fangs. It rarely happens that so much of the fang of the temporary tooth is absorbed, as to permit its removal by the efforts of the child, before the permanent tooth is ready to pass through, on which account the new tooth receives an impro-

per direction, and generally comes through on the inside. Sometimes, from some deficiency in the absorbing vessels, the fangs of the temporary teeth are not taken up, previous to the protrusion of the permanent teeth. On removing the temporary teeth, to give room for the permanent ones, it is frequently found that no absorpton of the fangs of the shedding teeth has taken place. The permanent teeth are often turned out of their proper direction, by the resistance made by the nearest temporary tooth, especially if the temporary ones are small and close set, as the permanent front teeth are much larger than the temporary.

Another cause which often produces irregularity of the teeth, arises from the permanent teeth being too large for the space occupied by the temporary ones, those parts of the jaw not being sufficiently extended to permit a regular position of the new teeth. In this case the irregularity is considerable, and occasions great deformity in the appearance of the mouth.

When the jaw of a child is compared with that of an adult, a very striking difference is observed. That of a child forms

nearly the half of a circle, while that of an adult is the half of an ellipsis. This comparison clearly points out the part in which the jaw receives its greatest increase, to be between the second temporary *molares* and the *coronoide* process; and this lengthened part of the jaw is destined to be the situation of the permanent *molares*.

By this elongation of the jaw, a great change in the form of the face is produced; that of a child is round, the cheeks are plump and the chin flat. In an adult the face is more prominent, with a flatness of cheek, and a considerable length of chin.

This change begins to take place at about three years of age, and acquires its full proportion, generally about eighteen or twenty years of age, when the third *molares* or *dens sapientiae* makes its appearance, and the teeth are seen in the figure of their arrangement to form part of an ellipsis.

The growth of the jaw being principally confined to that part situated behind the shedding teeth, where the permament grinders are placed. The anterior part

of the jaw undergoes but little more than alteration in form, adapting itself to the permanent teeth, and receives very little increase in size.

Nature frequently requires assistance in the process of throwing out the temporary teeth, before the permanent ones appear. If this be done at a proper time, the teeth will always take a regular position, and every deformity arising from irregularity be prevented. During the progress of the second dentition an opportunity presents itself for effecting this desirable object; but every thing depends upon a correct knowledge of the time when a tooth requires to be extracted, and also of the particular tooth; for often more injury is occasioned by the removal of a tooth too early, than if it be left a little too long, because a new tooth which has too much room, long before it is required, will sometimes take a direction more difficult to alter, than a slight irregularity occasioned by an obstruction of short duration. If an improper tooth be extracted, irreparable mischief will ensue; as in the case where young permanent teeth have been extracted instead of

the obstructing temporary ones. The performance of any improper operation will be prevented by a knowledge of the progress of the formation of the teeth, combined with observations on the appearances of the gums, which become full when a tooth is about to pass through them.

The advantages, therefore, which attend the extraction of the temporary teeth, depend upon its being done at the precise time, when nature is tardy in effecting the absorption of the fangs. To assist the permanent teeth in acquiring their proper arrangement, the mouth should be frequently inspected, that if necessary, the operation should be performed at the proper time, for if the new tooth has from obstruction, acquired an irregular position, some time and trouble will be required to bring it into its proper place, and if not properly attended to the irregularity will remain unaltered.

When either of the permanent *molares* of the under jaw make their appearance, or one or both of the central incisores in the under jaw begin to loosen, we may expect that the shedding of the teeth is about

to take place. But the temporary teeth are not always loose at the time they ought to be removed ; for sometimes the new tooth passes through the gum behind them, and they remain to all appearance firm in the jaw.

From the foregoing observations it must appear obvious, that the too frequent practice of permitting the first set of teeth to remain till they become loose, often causes much deformity in the arrangement of the teeth. Much therefore will depend on a correct knowledge of the proper time for removing the first set of teeth.

CHAPTER VI.

Diseases attending Dentition.

The period at which dentition takes place, is generally considered one of the most critical in life. In infancy the animal frame is so delicate, that the least local irritation produces a sudden and uni-

versal sympathy throughout the whole body. Hence the excitement occasioned by the passage of the teeth through the gums, often gives rise to the most alarming constitutional symptoms, which are alleviated with difficulty, and not unfrequently terminate in death. The mode in which the teeth pass through the gums is generally very much misunderstood. The prevailing opinion is that as the teeth advance in growth, they find their way through the gums by their own mechanical pressure. This idea has given rise to the common expression ofcutting of the teeth.

A passage for the teeth in the natural way is opened by the process of absorption. By the natural pressure from the growth of the tooth, the investing membrane and gum,immediately over the tooth, is absorbed. When the absorption takes place early, the child suffers no inconvenience during the progress of dentition. The teeth advance without any trouble, and their appearance is discovered by those who may have the charge of them, with some degree of surprise. But when the growth of the teeth is too rapid for the absorption of the gums, dentition is

often attended with much pain and derangement of the system.

Under every circumstance of indisposition arising from dentition, the lancing of the gums ought never to be omitted.—The benefit which always attends this operation is so sudden, and if performed sufficiently early, is so certain, that it ought never to be neglected. As soon as the gum is lanced, and the membrane is divided, the tooth obtains an increase of room. The pressure is immediately taken off from the socket, and the cause of irritation removed.

It is very surprising, notwithstanding the manifest advantage which attends the lancing ofthe gum, in cases of painful dentition, there are many persons who entertain strange prejudices against this safe and important source of relief. But the uniform experience of its good effects, and no instance of its doing harm ever having occurred, should produce an unanimous consent for adopting it. No injury to the tooth can possibly occur from the operation, and the blood which is let is always beneficial, the vessels become unloaded and the inflammation is more or less dimin-

ished. The most convenient instrument for this purpose is a round edged gum lancet. This cuts much easier than a pointed one. It is necessary that the incision be made quite down to the tooth, else the membrane may still be left stretched over it and no other benefit will be derived from the operation than that which proceeds from the bleeding.

During the second dentition scarcely any pain is felt except at the protrusion of the *dens sapientiae*. They often produce great uneasiness in their progress. Sometimes considerable inflammation and swelling of the face takes place, and the pain in many cases is so considerable, that fever and general indisposition ensue. The timely use of the lancet, cannot fail to afford almost instantaneous relief in this case.

CHAPTER VII.

Caries or decay of the Teeth.

This is a disease of very frequent occurrence and important in its consequences. Different theories have been devised to account for causes by which it is produced, one ascribing it wholly to internal and the other to external causes. In support of the former of these theories, are found the names of Hunter, Fox and Blake.

Mr. Hunter observes "that it does not arise from external injury or from menstrua which have a power of dissolving part of a tooth. But we may reasonably suppose that it is a disease arising in the tooth itself." Mr Fox, on this subject. remarks, "At first it has its origin in the bony part of the crown of the tooth, the structure of which is gradually destroyed;" thus, continues he, "it is that in the first instance *caries* originate." Mr. Blake's opinion on this subject concurs precisely with the above. In support of the latter theory are found the names of

Messrs, L. S. and E. and J. Parmly. Mr. L. S. Parmly, mentions, (speaking on this subject) 'that relics of what we eat or drink (without regard to its quality) being allowed to accumulate, stagnate and putrify either in the intersticies of the teeth, as is most commonly the case, or else in those indentures on their surface, favorable for the lodgement of the food, is universally the cause of their decay and generally of most other disorders to which they are exposed.'

Mr. E. Parmly, in his essay on teeth, speaking of *caries*, says, "from my own observations, I am induced to believe that *caries* is universally caused, by the action of external agents, and therefore cleanliness after the proper offices of the Dentist is performed, is the only safeguard against it." Here seems to be two diametrically opposite opinions as to the true cause of this destructive malady. From this diversity of sentiment and the importance of the subject, I have been induced to give it my careful attention, the result of which, I can say, has in this point proved, to me, satisfactory. From the numerous evidences exhibited in the course of my practice,

I am prepared to state my full conviction, that this disease proceeds both from internal and external causes ; but according to my observations those proceeding from external causes is far the most numerous, in proportion of about five out of six.

An artery, vein and nerve enter the cavity of the tooth, by a very small orifice at the extemity of the fang, which give nourishment and sensation to the tooth. These vessels are liable to be inflamed by whatever produces an irregular action ; as extreme heat or cold, and the immoderate use of mercury. The natural tendency of inflammation is an extension or swelling of the parts, and the acuteness of pain is regulated by the resistance and compression which the inflamed vessels may suffer from the surrounding parts. Thus it may be seen, that an increase in the dimensions of these vessels, not only causes exquisite pain, but is liable wholly to stop their internal circulation, and thus produce suppuration ; and matter being formed in the cavity, without vent, will soon become sufficiently corrosive to commence its ravages on the part with which it comes in contact, destroying the internal part of the

crown, until the enamel loses its support, when, from some slight accident, it breaks away, leaving an extensive cavity the whole length of the fang destitute of sensation.

It is very remarkable that those gentlemen who contend that caries is never produced from internal causes, should never have met with any of these cases in their extensive practice.

Caries proceeding from external causes is by far the most frequent. As already observed, it comprehends every species produced by foul matter which is suffered to remain in or about the teeth.—Uncleanliness of the mouth is therefore the most prolific source of diseases to which the human teeth are subject.

Mr. Fox observes, that there is no one part of a tooth more particularly liable to become diseased than another. But this, I conceive, is contradicted by plain facts, which have probably fallen under the observation of all.

The very nature of the cause which produces a large proportion of caries, viz. the relics of the food lodging in the interstices, proves that those are the parts in

which diseases generally commence. The *molares* are usually more decayed than any of the other teeth. This arises not only from their being more neglected than those placed in the front part of the mouth, but from their indented surface affording easier lodgements for food than the other teeth. The decay often begins on those sides of the teeth which are placed in opposition to each other ; and from the nature of the cause which acts, by a putrefactive process, there is no doubt that among the sound teeth, any one that is contiguous to a tooth that is decayed, is most liable to diseased action. The *incisores*, or front teeth of the upper jaw, are also very frequently affected in this way, while those of the under jaw are very seldom known to decay.— Their preservation arises from the under jaw being more exposed to the action of the saliva, the solvent powers of which, prevent the relics of the food from injuring the teeth. Caries proceed in a direction towards the center or cavity of the tooth, till the investing membrane and its ramifying nerves and blood vessels become exposed to the action of external matter and air ; thus producing tooth ache and

the ultimate destruction of these vessels.—When the whole crown is removed, the progress of disease seems somewhat to be suspended, and the fangs will often remain for many years with little alteration.

It is further evident, that external agents are the most frequent cause of caries, from the fact that those who daily and regularly clean their teeth, even in the common method, are not so subject to this disease, because less lodgements can take place above them.

Mr. Fox has endeavored to account for this disease in several other ways, which might have some slight foundation, but by no means to that extent which he has attached to them. He ascribes it in the first place, to a state of ill health during the formation of the teeth, which renders them unable to resist the causes of disease ; but this cause, I conceive, would extend equally to all the teeth, if it arose from a general weakness of the system. He next attempts to account for it, from a state of the constitution connected with dyspeptic symptoms, or stomachic complaints. But this cause, like the other, could only act by depriving the body of its due por-

tion of nourishment, and the teeth of course as a part. To this must be ascribed the pearly white appearance he remarks on them, but in my view it could never produce a specific action on particular teeth.

Certain kinds of diet, he next mentions as a source of caries; but whatever we eat or drink (if not extremely hot or cold) can only act on the teeth while it remains in the mouth. Yet, so far I agree with him, that relics of any food, allowed to remain and stagnate in the interstices, will be sufficient to produce the disease.

The same objections apply to the influence of the atmosphere, for in all countries teeth are found sound and healthy. This I think is a proof that the cause is most frequently of a local nature.

The teeth of many persons are formed of a less quantity of earthy matter than of animal substance, on which account they do not acquire such a density as is necessary to make them durable and resist the various causes of decay to which they are constantly exposed. Teeth thus formed are very white, and have a certain trans-

parency, and are generally most liable to decay.

Great changes also are often produced in the economy of the teeth, in consequence of continual fevers. This, it is presumed, is caused by the use of medicine, and the total neglect of the mouth at such times. This may be remedied by proper care in conveying such medicines beyond the teeth, or cleaning them immediately after they are administered. In all cases of sickness, a special regard to cleanliness of the mouth will prove in many ways beneficial to the invalid, and tend much to the preservation of the teeth.—A very important means of preserving the teeth from decay, will depend upon paying a suitable degree of attention to them during the second dentition, so as to allow the permanent teeth to acquire a proper regularity, without pressing too much upon each other. They should also be kept from coming in contact with any diseased temporary tooth. The same may be observed with regard to persons more advanced in years. Should a decayed tooth be in contact with a sound one, and not sufficiently injured to render its ex-

traction necessary, so much of the decayed tooth should be filed away, as to make a complete separation between them.—This will prevent the caries from being communicated.

If the teeth have become so much decayed as to leave only stumps, then they should be extracted, because they are not only liable to cause the other teeth to become diseased, but they often produce gum-boils and diseases of the socket.—The decay of the teeth does not appear to be peculiar to any age, temperament, or state of health. The teeth of children are very subject to this disease, and those of the robust and healthy, are equally liable to caries as the delicate and less healthy.

CHAPTER VIII.

Of the structure and diseases of the Gums.

The gums, in a healthy state, are of a red colour, of a semi-cartilagenous consistence, and considerably vascular. They are attached firmly to the necks of the teeth, passing between them, and attaching to the bony divisions of the *alveolar* processes (which connect the inner and outer gums,) and their extreme edges lie upon the enamel. In their natural state they possess little sensibility, but from accumulations about the teeth, they acquire such an extreme degree of it, that the least pressure occasions pain. They are liable to bleed and become considerably discoloured, thickened and enlarged, which proves exceeding troublesome in infancy, during the progress of the first dentition, but which, in a healthy state, are so insensible, that children are pleased with sucking or biting a hard crust. In old age, when there are no teeth, the gums

possess so little sensibility, that the chewing of food is attended with no pain, and it is well known, that those who have lost all their teeth, enjoy their food much more than those who have diseased ones. It is clear, therefore, that all diseases of the gums, at every period of life, originate either from dentition or from uncleanliness of the mouth, and are not peculiar to the gums themselves, as many authors have supposed.

That common disease termed by some the scurvy in the gums, from their assuming an appearance similar to that of the scurvy at sea, unquestionably proceeds from uncleanly teeth. The disorder is marked by the gums becoming redder than ordinary, spongy, discoloured, and bleeding from the slightest touch, caused by the fulness of the vessels. I consider this disease entirely of a local nature, and when neglected is productive of much uneasiness and distress, for besides their being soft and spongy, the mouth becomes very painful and sore, and the teeth so tender as scarcely to allow the mastication of food. Matter forms and oozes out near the necks or lower part of the teeth

in consequence of ulceration taking place between them and the gums. The natural arch of the gums is thus destroyed; they become uniformly straight, recede from the enamel, and thus exposing the fangs of the teeth to whatever is taken into the mouth. This affection next attacks the *alveolar* process, where absorption taking place, the teeth are gradually destroyed, and thus loosing their support, become loose and successively drop out, until the person is rendered toothless. Persons who loose their teeth from this cause, complain that their teeth came away perfectly sound, not considering it the effect of uncleanliness. When the disease has proceeded to such a length, a dental operation is the only remedy, which will generally restore them to healthiness in a short time.

Where unhealthy or decayed teeth or fangs are suffered to remain in the mouth, they are liable, from slight colds and the action of foul matter which remain in and about them, to produce an inflammation in the membrane lining the socket, which frequently terminates in suppuration.—Thus matter is accumulated as in a sac at the extremity of the fang, the pressure of

which produces the process of absorption in that part of the *alveolar* process situated on the outside of the teeth. This ulceration continues until the gum bursts, nearly opposite to the place where the point of the fangs is situated, and thus the matter escapes from the opening.—These are termed gum-boils, or abscesses. The inflammation or fungous appearance. will sometimes subside after the discharge of matter, but an opening generally remains for a length of time, through which matter continues to be discharged. As this is caused by diseased teeth, it is seldom cured without their removal. But as extraction will not always be submitted to, it is highly necessary, that means should be employed to render them as little injurious as possible. This may be accomplished by making a puncture with a lancet, as soon as the swollen condition, soft feeling and throbbing sensation indicate that matter is formed. But where the tooth has become loose and sore, this operation can never be serviceable, but its extraction should be strongly recommended, as its extraction will prove a cure to the gum-boil. Some suppose it danger-

ous to extract a tooth, when the gum is inflamed, but this opinion can only arise from ignorance. It may cause a little more pain for the instant, but as the diseased tooth is the cause of the excitement, its removal will prove a certain cure, and the discharge of blood, by unloading the vessels, will afford almost instantaneous relief. When the influence of fear has so completely overcome the unhappy patient, that neither acute pain or protracted suffering, will produce submission to the extraction of the diseased tooth, the inflammation of the jaw bone is often so great as to result in mortification of a large piece of its substance, thus unavoidably giving rise to the tedious process of exfoliation, accompanied with a considerable discharge of offensive matter, and often the loss of several teeth. Poulticing and fermentation, as is usually the practice in such cases, is highly improper, as it is likely to produce ulceration in the cheek. These are often with great difficulty healed, and generally leave a scar near the center of the cheek, which will ever prove a source of mortification to a person of delicate feelings.

When abscesses form in the mouths of children, from diseases of the temporary teeth, the greatest care should be taken, as by an exfoliation of a piece of the jaw bone the teeth may be destroyed. A knowledge of the evils which may result from a carious tooth, ought to influence all persons who may be afflicted with this malady, to take such steps for its prevention as prudence shall dictate.

CHAPTER IX.

Morbid growth of the Gums.

The irritation produced by decayed teeth, on the circulation of the vessels which pass through the gums, often causes a preternatural growth, by which excressences or tumours of various sizes are formed. Carious stumps are the most frequent source of this morbid growth, by producing inflammation in various ways, and no cure can be expected to take place,

till the cause be removed. As this disease is generally caused from back teeth that are much decayed, I would always recommend their extraction ; but if it proceeds from a front tooth, especially if desirous to save the fang, for the purpose of engrafting an artificial crown, other means are to be resorted to. In this case bleeding will prove highly beneficial.

Sometimes tumours of different sizes form on the gums, of various degrees of hardness, and which sometimes also show a cancerous disposition. These are at first wholly local, and may be removed by excission or ligatures. Tumours of this kind, if neglected, may become *carcinomatious*, & contaminate the system with a dangerous *virus*. But there is nothing from which the gums are more apt to suffer, by changing their consistence and texture, than the use of mercury, administered in various diseases

CHAPTER X.

Alveolar processes and their Diseases.

The *alveolar* processes are to be considered as necessarily belonging to the teeth, and not essential to the formation of the jaw-bones. They are elongations of the external and internal tables of the maxillary bones, which being united by transverse processes, are divided into cavities, called *alveoli* or sockets, for containing the fangs of the teeth, and acquire a form exactly suitable to the shape of the fang. Their cavities are lined with a vascular membrane, bearing a near resemblance to the periosteum in other bones. This membrane also attaches the fangs of the teeth to the socket. These *alveoli* are larger than the fangs of the teeth, which allows them a certain degree of motion which is of immence importance in mastication, by preventing their injury when coming in contact with hard substances. This motion is more evident during inflammation in

the teeth and gums. The *alveoli* are liable to be sympathetically affected by all diseases of the teeth and gums, by producing an increased action of the absorbents, which causes their substance to be taken up. The loss of the teeth from any cause, unavoidably produces the absorption of the greater part of the *alveoli* immediately contiguous on each side.

The *alveolar* processes have certain diseases peculiar to themselves, independent of affections arising from the teeth or gums. The most frequent disease to which they are subject, is the absorption of their substance, by which the teeth lose their support, and by degrees come away. At the age of between forty and fifty this disease usually makes its appearance, and generaly when the teeth are apparently sound.

The causes of the *alveolar* absorption are continued inflammation of the gums; an accumulation of tartar; that affection of the gums called scurvy, and diseases arising from an excessive use of mercury.

The symptoms of this diseased state of the *alveolar* processes having commenced, are the length of the teeth; a wider space between them, and a difficulty in mastica-

tion. There is also an opposite affection of the *alveoli*. Sometimes deposits of ossific matter take place in the bottom of the socket, by which it becomes filled, and is proportionably shorter, forcing the teeth out of their natural situations, while the gums seldom undergo any change, but the teeth continuing to advance, gradually lose their support, and finally drop out.

When a number of contiguous teeth have become loose, as often happens with the incisores, they may be strengthened in an artificial manner by tying them with a fine gold wire, or sea grass prepared for the purpose, to those neighboring teeth which happen to be firm. By this treatment the loose teeth are supported, not only giving comfort to the patient, but also arresting the progress of the disease, by removing that irritation which is kept up in the gums and sockets by the looseness of the teeth.

The treatment found to be most successful in stopping the progress of this disease, is the removal of that which appears to be the exciting cause. If this be tartar, it should be removed, and if there be a tendency to a habitual deposit, the person should be careful, by frequent attention, to

prevent its accumulation. In some cases this disease is accompanied with inflammation, extending along the fangs of the teeth, giving the sensation of tension, and occasioning great uneasiness. This is relieved by scarifying the gums, a practice which should always be had recourse to, as the loss of blood, by abating the inflammation, relieves the pain and checks the progress of the disease.

CHAPTER XI.

Diseases of the Antrum Maxillare.

The *Antrum Maxillare* is a large cavity in the superior maxillary bone. It is situated over the *molares* and under the orbiter plates. It is lined with a membrane, and has communication with the cavity of the nose, by a small aperture in that part of the *antrum* which is membranous, and which is situated between the superior and inferior turbinated bones.

Diseases of the *antrum* proceed from inflammation of the teeth and gums of the upper jaw. When considerable and long continued, it often communicates to the membrane lining the maxillare cavity, which terminates in suppuration. This matter in the cavity having no vent or passage, destroys by its corroding effects and pressure, the contiguous bone. As soon as the symptoms of this disease are discovered, (a fact very difficult to ascertain till matter is actually formed) the great point is to give it a free opening or discharge. The readiest manner of doing this, is to extract the middle grinder, or *molaris*, the situation of which is immediately under the *antrum*, and thus perforate through the socket from which the tooth was extracted, into the *antrum*, and by suitable injections the disease may soon be cured.

The commencement of this disease is sometimes distinguished by a deep throbbing pain, which appears to be seated at the roots of the *molares* of the upper jaw. In its progress it affects the eye, nose and ear. During inflammation in the *antrum*, the patient at first conceive the pain to

proceed from the tooth-ache, but if the teeth should not be diseased, a more accurate observation is made upon the peculiar sensations excited. The pain usually extends towards the forehead, in the direction of the *frontal sinus*, and a sensation of tightness and pressure, with throbbing, is felt on the side of the face. In a short time the cheek becomes red, and appears as if swollen: It feels very hard, and on raising the lip, a considerable fulness above the fangs of the teeth may be observed.

CHAPTER XII.

Exostosis of the Fangs.

This is an enlargement of the fang of the tooth, produced by a deposit of bony matter, so dense in its structure as very much to resemble ivory. The cause which produces this disease, says Mr. Fox, is obscure, and the slow increase in the size

of the fang, is the reason why pain is not produced until a considerable augmentation of its bulk has taken place. It sometimes appears to arise from indolent inflammation, produced by *caries* in the body of the tooth, and extending to the fang; and at other times it is found to exist where the crowns of the teeth remain perfectly sound.

Suppuration is not produced by this kind of disease. The gum continues quite healthy; but whenever pain occurs, as no permanent relief can be obtained without the extraction of the tooth, it becomes necessary when the teeth are sound, to be very attentive to distinguish this disease from mere rheumatic affections of the jawbones. Where this disease occurs in teeth already decayed, the patients are not afflicted with extreme tooth-ache, but have occasional uneasiness, which gradually becomes more uninterrupted, and the tooth projects to a certain degree from the socket, so that in closing the mouth, it feels as if out of its natural situation, thus rendering mastication very painful. When extracted, the fangs are found enlarged.

Some persons will refer this appearance

upon the fangs of the teeth, to an original mal-formation; but so unlike is it in appearance from the smooth structure of any ill-formed, crooked or undiseased tooth; and when extracted, so much whiter than any other part of the fang, that it can only be referred to diseased action, producing a deposit of bony matter, as in other cases of *exostosis*.

CHAPTER XIII.

Denuding process, Necrosis affecting the Teeth and Spina Ventosa.

The denuding process is a disease causing a change in the teeth, by which they receive an appearance different from that of *caries*, but attended with a loss of substance.

The tooth does not, as in cases of *caries*, grow softer, nor like that disease, does it originate in inflammation, but it consists in a removal of the enamel from the bone

of the tooth, as if by solution and gradual abrasion.

The *incisores* are affected by it much more than any other teeth, and in all cases its operation is limited to the exterior surface of the teeth.

In its incipient stages its appearance is discovered by one or more of the *incisores*, becoming thinner, and appearing as if a small portion had been scooped or filed out, occasioning a slight depression. Thus the enamel wastes, until so much of it is removed as to leave the bone exposed, as this process advances, the tooth changes its colour, gradually becoming yellower as the bony part is more exposed. When the whole of the enamel is destroyed, part of the bone is also removed ; the remainder acquires a brownish hue and will often continue in this state for a number of years.

Sometimes teeth affected with this disease, become very tender, sensible in an unusual degree to the application of heat or cold. The cause of this disease, by some, is attributed to the use of acids entering into the composition of Dentrifices, that are employed in cleaning the teeth ;

but there certainly must be some other cause, as it not unfrequently happens, that only one or two teeth in the mouth are affected by it, and even sometimes I have known artificial teeth to lose a portion of their substance, from the same cause.—From these circumstance, I think it not improbable that the *denuding process* is caused by an acrimonious discharge from some salivary gland contiguous to the tooth affetced.

Necrosis affecting the Teeth.

This disease proceeds from a destruction of the vessels which supply the teeth with nourishment, by which the tooth loses its living principle. It then, like other dead pieces of bone, becomes an extraneous body. When this takes place the socket becomes inflamed and matter forms within it; the gum loses its natural texture and appears of a darkish red colour, and the matter sometimes discharges itself through the gum by several orifices, but generally it escapes between the necks of the teeth and the gums. It is attended with considerable pain and a discharge of offensive matter. This disease is generally confined to the front teeth, and

those which are wholly free from *caries*.

Often considerable portions of the *alveolar* processes are absorbed, and the teeth become loosened and productive of much inconvenience.

In this disease the most common remedy is the extraction of the tooth affected. The scarification of the gums in the early stage of this disease, by abating the inflammation, often affords a temporary relief.

Spina Ventosa.

This is an abcess formed in the cavity of the tooth. The ulcerative process removing a portion of the bone from the inside, whilst there is a corresponding increase on the outside, forming an irregular, bony tumour on the extremity of the fang. It is generally confined to the upper front teeth.

This disease proceeds from an inflammation of the membrane lining the cavity of the tooth, by which matter is formed, and which discharges itself at the point of the fang, into the *alveolar* cavity.

During the progress of the disease, the gum contiguous becomes inflamed, and acquires a spongy texture, and the matter

generally makes its escape from the socket into the mouth, by a number of openings through the gum, which is thus kept in a constant state of irritation. The discharge produces great fetor of the breath, the taste is constantly affected, and the socket is gradually absorbed until the tooth becomes quite loose.

During the progress of this disease, the body of the tooth assumes a different appearance, and gradually acquires a dark colour; the internal part of the fang is much enlarged, and the external part has a rough, scaly appearance. The best paliative treatment of this disease, is occasional scarification of the gums, and frequent washing of the mouth with astringents. The infusion of roses and tincture of myrrh is useful for this purpose. As no cure of this disease can be expected, the extraction of the tooth should always be recommended, as soon as the gums have acquired a truly diseased appearance; for if the disease be permitted to proceed in its natural course, the gums become so extensively affected as to induce absorption of the *alveolar* processes belonging to the neighboring teeth, which is followed by their consequent loss.

CHAPTER XIV.

Tooth-Ache.

The ultimate effect of *caries* or decay of the teeth, is to denude or remove a portion of the crown of the tooth, and thus exposing to the air and to every species of matter taken into the mouth, that delicate and sensible nerve situated in the cavity of the tooth, & produce that very unpleasant and painful sensation, termed tooth-ache. The pain attending it is various, according to the influence of external agents on the parts. The decay has generally made considerable progress before the tooth-ache commences. The pain is commonly sudden in its attacks, darting from the tooth through the head, and affecting the whole jaw. When fits of tooth-ache frequently occur, they often become so violent and constant that the rest is disturbed, the appetite fails, and the person is unable to pursue his usual avocations. In the progress of the disease, the

membrane and all the contiguous parts become inflamed, occasioning considerable swelling, which sometimes terminates in suppuration, and frequently produces the tedious process of exfoliation of a piece of the *alveola*. When it proceeds from a tooth in the upper jaw, it seems to shoot more directly up to the temple. In all cases a remarkable sympathy seems to prevail between the affections of the teeth and those of the ear, for pains in the teeth often cause a similar suffering in the ear, and in like manner harsh and discordant sounds produce an unpleasant sensation, known by the teeth being set on edge.—These sympathetic pains probably proceed from the intimate connection which exists between the branches of the fifth and those of the seventh pair of nerves. The pain in the ear is therefore sympathetic, arising most frequently from disease in the *dens sapientiæ*. It is caused by an union of a branch of the seventh pair of nerves with the *lingual* branch of the fifth pair.

Another disease, which is generally supposed to have its seat in the teeth, is an affection of the nerves; called *Tic douloureux*. It is confined principally to the

fifth and seventh pair of nerves. The pain is most excruciating, and occurs in fits, on the slightest agitation. It is fortunately but of rare occurrence. I have met with but four cases in the course of my practice. A cure is sometimes effected by completely separating the nerves, but should only be attempted by a skilful hand.

Sometimes, in cases of tooth-ache, it is extremely difficult to fix upon the tooth from which the pain proceeds, and it is not uncommon for those who are affected with it, to suppose that a tooth not in the least diseased, is the seat of the pain; it also often happens that the pain is conceived to originate from a tooth of the upper jaw, instead of one of the under jaw, and *vice versa*.

When any doubt is manifested, great caution should be used previously to the extraction of the tooth. The teeth may be examined by striking them with the end of some instrument, in order to discern that which is most tender, as it usually happens that a tooth in a state of inflammation is so sensible, that it will not bear to be struck without pain.

If this mode of examination be not satisfactory, and there should be more than one decayed tooth, they should be carefully examined, by picking the hollow part with the point of a probe, or other small pointed instrument, bent in the form of a hook. By doing this the nerve that is exposed, and which has caused the pain may be touched, which will immediately assure the patient and the operator, of the tooth from which the pain proceeds.

CHAPTER XV

Wearing and Fractures of the Teeth.

Wearing of the teeth is the natural effect of mastication, by the friction and attrition with which it is accompanied.—Thus when the front teeth of the upper jaw are so situated that they overlap the corresponding ones of the under set mastication can be performed with much less lateral motion of the jaws, and cause less

friction than where they meet each other at the cutting edges. Wearing of the teeth generally happens in the front, ones when the *molares* have been lost, in the early part of life and often the whole crowns have been removed. The effect of this process is to render the teeth tender and occasionally subject them to pain by the application of cold or acids. But this soon subsides, for during the time that the teeth are wearing away by their action upon each other, a process is going on in the cavity, by which their sensibility is destroyed. The vessels take on a new action, and deposit *ossific* matter, until the whole cavity is completely filled. This circumstance also happens very frequently in the teeth of old people, which accounts for their not being so liable to the tooth-ache.

Fractures of the teeth, frequently occur from injuries, from accidents, or blows received in quarrels, or otherwise. Mastication of hard substances sometimes will produce the same effect. In accidents of this kind, the treatment must be regulated by the extent of the injury done. If the fracture be confined to the point of the

tooth, nothing more will be necessary than to remove the unequal surface with a fine file, and no *caries* will be likely to proceed from this operation. But if the injury extend into the cavity of the tooth, it will then become tender, and for some time be subject to occasional fits of pain; but nature often repairs this mischief by a fresh deposit of bone in the cavity, which defends the nerve. When fractures are of a more serious nature, and the cavity is completely exposed, the remainder of the crown may be taken away, and an artificial one engrafted. Sometimes, where the tooth is completely knocked out, and not broken nor the socket injured, it should be immediately returned to its place, and secured by ligatures around the adjoining teeth, when it will be likely to become firm, but its colour will be changed to a dark hue. But when the alveolar processes have been essentially injured or fractured, the teeth seldom become perfectly fast, inflammation arises and nothing but their entire removal will effect a cure.

Fractures of the Enamel.

The enamel of the front teeth becomes sometimes fractured or cracked and sepa-

rated from the tooth, caused by the too frequent or violent action of the cutting edges against each other. This circumstance arises in a great measure from the loss of the back teeth, which causes the front ones to be used more frequently in mastication, and to brought together with greater muscular power.

Whenever such cracks or separation of the enamel appear, it is advisable, in order to stop its progress, to file away the part that appears thus disfigured.

CHAPTER XVI.

Occasional effects of Diseased Teeth.

Diseased teeth often communicate diseases to the contiguous parts, and especially to the gum immediately surrounding the tooth. That affection of the gum termed by Dentists *epulis*, or gum-boil, arises from this cause. The inflammation of the diseased tooth extending to the ves-

sels at the point of the fang, and thence to the *periosteum* and sockets ; the circulation becomes necessarily impeded, and the inflammatory action thus begun, ends in the formation of matter within the *alveolar* cavity. While this matter is confined, it excites considerable pain ; the face is swelled and inflamed, which continues till the collected matter escapes.—This it does by corroding the socket on the outer side, where a natural opening or ulceration takes place The sore occasions a constant discharge, and the skin rises and becomes fungous, with a red spongy appearance. If the diseased tooth which is the source of the evil, be removed, the discharge then gradually diminishes, and the sore heals externally, but in healing, the former destruction of the parts occasions a contraction of the skin, and a deep scar is formed, which (as has already been observed) to many persons, cannot fail to be a source of great uneasiness. When under these circumstances decayed teeth are extracted, a fleshy substance appears to cover their fangs, which extends to the bottom of the *alveolar* cavity.

Where this disease is entirely neglected, the inflammation often extends deep into the jaw bone, and the consequence is, that a part of it suppurates, and exfoliation takes place.

Before this exfoliation is accomplished, a constant uneasiness prevails, and a continual discharge takes place in the mouth. As this disease progresses, the gums gradually recede from the alveolar processes, and the bone separating and gradually loosening, should, as soon as the suppuration is completed, be taken away.

When a gum-boil forms from any of the temporary teeth, it requires very particular management, for if allowed to proceed so far as to cause an exfoliation of a piece of the jaw-bone, the teeth may be entirely destroyed. These circumstances show the necessity of early attention, to prevent a malady of this kind. At other times hard lumps form on the gums, from the same cause, which often prove troublesome, and sometimes dangerous, for there is no dependence on their continuing in an indolent state.

CHAPTER XVII.

Tartar.

This is an earthy substance held in solution by the saliva and is deposited on the teeth during its decomposition. Nothing, except *caries*, is so injurious to the healthy condition of the mouth, or durability of the teeth, as a deposit of this substance. The teeth of all persons are liable to a formation of it, in a greater or less degree. In some the quantity is so small, that little care is sufficient to keep the teeth perfectly clear from it, while in others the deposit is so constant and copious, that the teeth can only be preserved in a decent state, by the most unremitted attention.

The state of health has considerable influence in the formation of this substance, for in febrile complaints, in which the secretions of the whole alimentary canal are disordered, the teeth are covered with a thick mucus, hence there is usually a very large deposit.

The same effect is also observed during confinement, from any cause whatever,

when the teeth cannot be constantly cleaned. And it is remarkable, that the teeth after sleep are found covered with a vicid yellowish mucus, which, if not removed by a tooth brush or washing, gradually accumulates, depositing itself in layers un-, til it acquires a hard consistence and firmly adheres to the teeth.

When the tartar is soft, it has a yellowish appearance, but as it grows harder, it changes to a dark brown or black colour.

The tartar, after it has accumulated about the teeth, insinuates itself under the gums, and causes them to recede from the necks of the teeth, thus producing diseases of the gums, and causes absorption of the alveolar processes, by which the teeth lose their support, and at length, by some accident, a large piece of tartar is broken off, when the tooth, deprived of its artificial support, drops out

Persons who lose their teeth from this cause, complain that they came away perfectly sound, not considering it the effect of their own negligence, and it is but too commonly the case that nothing less than a commencement of the loss of teeth induces them to pay attention either to their cleanliness or preservation.

These accumulations are greatest about those teeth situated near the openings of the salivary ducts, and those least used in mastication.

There is another species of tartar, peculiar to the teeth of young persons; it is of a dark green colour, rather resembling a stain, than an earthy concretion. It is very injurious in its effects upon the teeth, by corroding the enamel, and disposing them to become carious.

The deposition of tartar is an unavoidable circumstance, depending upon the effusion and decomposition of saliva. But it is in the power of most persons to keep their teeth free from an injurious deposit, after the accumulation has been properly removed, by carefully washing and brushing the teeth.

Fifty grains of this species of tartar, when submitted to a chemical process, was found to yield, by analysis,

Phosphate of lime	35
Fibrina or cartilage	9
Animal fat or oil	3
Loss	3
	50

CHAPTER XVIII.

Cleaning, Scaling, or Removing the Tartar from the Teeth.

This operation is generally termed scaling of the teeth. It is nothing more than removing the incrustations of the tartar, the qualities of which, and its pernicious effects upon the teeth, have already been described in the preceding chapter.

In performing this operation, much care and judgment is required in selecting suitable instruments, as well as in the manner of using them, in order to completely remove every particle of tartar from the inside and between the teeth, as well as from the indentures on the grinding surfaces, with facility and ease to the patient, without any injury to the enamel or gums. A description of the shape of the different instruments necessary in performing this operation will be unnecessary, as it is presumed no one will attempt it, but a Dentist.

The common notion, that this operation of cleaning the teeth, proves injurious to

them, can only arise from ignorance, or the injudicious operations of unskilful Dentists, as no unpleasant or pernicious consequences can possibly result, if it be performed in a skilful and proper manner. And I consider it one of so much importance, that I cannot too strongly recommend it, for I have no doubt that a very large proportion of decayed teeth is produced by the accumulations of tartar and other foul matter being permitted to remain for a considerable length of time on the teeth.

The benefit which results from the scaling of the teeth, depends on judiciously conducting the instruments over the surface of the teeth, with no greater force than is necessary to remove the tartar, and so as not to injure the enamel, a dexterity which can only be acquired by practice and experience.

No acids or chemical solvents of any kind, should ever be employed to remove tartar from the teeth, as the same substances which will act on the tartar, will always injure the enamel.

CHAPTER XIX.

Filing or separating the Teeth.

SEPARATING the teeth, especially the front and side ones, is an operation of the greatest utility ; which, if seasonably and properly performed, and a due degree of attention to cleanliness is preserved, will generally prove a sovereign remedy against every disease of the teeth. This is evident from the fact that may be noticed by every one, that where teeth stand a little distance from each other, and especially where they have been kept clean, very seldom, if ever, any disease affects them.—The reason is obvious. Where the teeth are so closely situated that the edges or points encroach on each other, a space between them, near the gum, may in almost every case be noticed, which is an effectual lodgement for every kind of food or substance taken into the mouth, which being there retained a considerable time, subject to the natural warmth and moisture of the mouth, soon undergoes the putrefactive process, and at length acquires

an acrimonious quality, which commences its ravages on the side of the tooth with which it comes in contact.

These remarks, with common observation, will readily prove this to be a very fruitful source of the diseases of the teeth, which may easily be prevented, at a trifling expence and without pain, by simply passing between them a very fine, thin file, made expressly for the purpose; or if the decay has just commenced, this operation will remove the decayed portion, and at the same time the cause of it; but where the disease has already penetrated deep into the tooth, it may be observed that there is another operation which, if timely and properly performed, will restore them to their former usefulness and durability, by rendering them artificially sound, This is called pluging or stopping the teeth, which will be treated of hereafter. There is no prejudice more common than the very deep rooted one against the application of a file to teeth. It is considered, by many, one of the most fatal operations which can be performed, as it is supposed that the decay of the tooth will inevitably follow the removal of the least

portion of the enamel. These opinions have been disseminated by certain empyrics, who have considered diseases of the teeth as a source of profit, and have therefore paid no regard to the correctness of their statements, provided they could acquire gain.

In those cases where filing or separating the teeth has been recommended, either to prevent, remedy or retard the progress of disease, it is defensible on the most correct principles.

It is a therory justified by uniform success, wherever it is practiced by a man of skill and integrity, especially if it is resorted to before the caries has reached the internal cavity of the tooth.

The decay of a tooth is never caused by the removal of a part of the enamel or bony portion of the tooth, provided it is superficial and does not enter the cavity. This may frequently be observed in those cases where considerable portions of a tooth has been broken off, and no *caries* has been produced. In like manner, says Mr Fox, "a considerable portion of a tooth may be filed away and the remainder will continue perfectly sound."

Upon the effects of filing the teeth, the Abyssinian negroes and the Malay Indians furnish striking examples. The Abyssinian negroes have a custom of cutting or filing off the corners of the cutting edges of all the front teeth, in order to make them all into a serrated form. This operation they perform without penetrating the cavity of the tooth. The teeth thus filed, are not thereby in the least rendered carious; a most convincing proof that the mere filing of a tooth does not cause it to decay.

The custom of the Malay Indians differs from that of the Abyssinian negroes. It consists in filing the *incisores* of the upper jaw, in a direction across the upper part of the anterior surface, so as to give them the appearance of being fluted.

But if those modes of filing be carried so deep as to reach the cavities of the teeth, caries will soon ensue. No person acquainted with the teeth, would, in the least, endanger them in this operation.

CHAPTER XX.

Filling, or Stopping the Teeth.

This operation is productive of so many beneficial effects, that I cannot too strongly recommend it to the public. By stopping a tooth in a proper time and manner, it will be rendered artificially sound. In this manner many teeth which are now prematurely sacrificed to extraction, might be preserved for many years, and probably for the remainder of a long life.

This operation should always be performed before the decay has reached the cavity of the tooth, in order to prove successful. Yet sometimes much benefit results from stopping them after the *caries* has reached the cavity, provided the tooth is sufficiently insensible to permit the operation.

It frequently happens, especially in front teeth, after the *caries* has penetrated the cavity, that from slight colds or other causes of inflammation, suppuration takes

place, destroying the nerve and vessels, thus rendering the tooth wholly insensible. In this case, if the body of the tooth is not too much decayed, the operation of stopping can be performed with success; or, if the tooth is too much decayed, it may be replaced, with an artificial crown.

The most suitable substance for filling a tooth, is pure gold foil, prepared by gold-beaters, for the express purpose. Silver, tin, and even lead, are sometimes used, but they are not so durable, and cannot be used with the same prospect of success. They are more oxydizable, and, consequently, more liable to be corroded by the powerful action of the saliva.

In stopping a tooth, the cavity should be cleared of all extraneous matter, as well as every particle of the decayed portion, and wiped out perfectly dry; then a piece of gold or silver foil, is to be introduced, and carefully and firmly pressed in, so as completely to fill up the cavity. The superfluous parts are then to be cut away, so as to allow the mouth to be closed, without pressing forcibly upon it; the surface of the stopping is then to be

polished, and being left quite smooth, it will produce no inconvenience.

A decay in the central part of the tooth, is the most favourable situation for retaining the stopping. When it is in the sides, or between the teeth, the pressure of the food is more liable to displace it, and therefore, sometimes it becomes necessary to renew it; but this, however, rarely occurs.

CHAPTER XXI.

Extraction of the Teeth.

This is an operation which always creates more or less alarm to the patient, and there are few, we believe, in the ordinary practice of medical men, which are more repugnant to their own feelings, than the extraction of a tooth.

In this operation, both surgeon and patient are equally alike influenced, as it often happens, that the former is quite as

much averse from performing the operation, as the latter is from suffering it. This reluctance in the surgeon, can only arise from deficiency of confidence in his own abilities, producing fear lest he should perform the operation unsuccessfully.—As distrust and timidity, in the operator, have proved the cause of many badly executed operations, he should endeavor to strengthen his fortitude, and act with all the firmness and self-possesion possible.

Having these qualifications, he will not be so confused as to place the instrument on a wrong tooth, nor act with so much precipitation as to endanger the safety of the patient.

The observation of a most distinguished anatomical lecturer, that all operations are performed sufficiently quick, which are performed well, is very applicable to the operation of extracting teeth. But in the hands of the most judicious operator, it is sometimes attended with difficulty and danger. But in this, as in many surgical operations, the ease and safety with which it is executed, will depend on the skill and dexterity of the operator. Though, for the consolation of patients, my expe-

rience warrants me in asserting, that extraction is much oftener resorted to than is necessary. Whenever a tooth is painful, it is advisable to have it examined by some one, who is capable of giving such advice and assistance as may often relieve the pain, without the operation of extraction, and render the tooth useful for many years, if not for life.

This indiscriminate practice of extracting a tooth as soon as it is a little decayed or painful, says Mr. L. S. Parmly, "is a wanton outrage on the unhappy individual, and ought to be strongly opposed."

I approve of it only in a limited degree. There are cases which demand the operation, but it should never be trusted in the hands of the rash and ignorant.

Great judgment and care, in selecting a suitable instrument, are necessary. Particular attention should be paid to the size of the claw of the turn-key. It should be proportioned to the dimensions of the tooth; for if it be too large, there will be danger of breaking away a portion of the *alveolar* process, and if too small, it will

be likely to break off the tooth, and leave the fangs remaining in the socket.

Before the instrument is applied, the gum should be completely separated from the neck of the tooth, with a suitable lancet. The round edged one is preferable.

The key instrument acts on the principle of a lever of the first kind. It will therefore appear evident, that particular attention and knowledge are required in placing the instrument properly on the tooth. As a general rule, the point of the claw should be placed as far as possible on the neck of the tooth, and the fulcrum be fixed a little below it, on the opposite side. The power should then be steadily applied to the handle of the key, till the tooth is moved. The eye should be attentively fixed on the tooth, as it sometimes becomes necessary to change the claw to the opposite side, in order to prevent fractures of the *alveola*.

No tooth can be extracted safely, unless its attachment to the jaw be overcome by a force, which being gradually increased, will cause the parts concerned to yield with safety. There is a practice of ex-

tracting teeth, which cannot be too strongly reprobated, as it is sometimes attended with the most mischievous consequences; this is, the attempting to extract a tooth quickly, by turning the instrument in a sudden and violent manner.

After the tooth is once started, by gradually turning the handle of the instrument, the hand should be raised, in a peculiar manner, so as to draw the tooth in a direction as nearly perpendiculy as possible. This dexterity, however, can only be acquired by practice and experience.

Although the utmost care and skill may be used, in extracting a tooth, a portion of the *alveolar* process will sometimes be broken off.

I would here remark, that the teeth are often seen to possess a certain motion, which appears to have been allowed them by nature, in some degree to prevent injury, as it enables them to yield to the resistance occasioned by hard substances during the process of mastication. This motion is most sensible where the fangs are inflamed; and from the increased sensibility of the periostium, the teeth appear to the patient as if loose, and he is led to

suppose, that the extraction may be performed without difficulty or pain. But experience has often proved this to be a mistake.

In all cases of extraction, the gums and *alveolar* processes, from their intimate connexion with the teeth, are more or less exposed to injury; and diseases affecting the one, readily communicate to the other.

CHAPTER XXII.

Remedying the Irregularities of the Teeth.

The causes by which irregularities of the teeth are produced, and the mode by which they may be prevented, if seasonably attended to, have already been treated of, under the head of irregularities of the teeth. But parents, unfortunately, do not generally perceive the necessity of having recourse to professional aid, until the irregular growth of their children's teeth is so far increased, as to cause a manifest

deformity. When this happens, the irregularity can be obviated, only by removing the cause which produces it, and then applying continued pressure, until the tooth assumes its natural position.

The time to effect, with facility, any material alteration in the position of the teeth, is before fifteen or sixteen years of age, and the operation should always be attended to as much earlier as possible ; for after that time, the sockets of the teeth acquire a great degree of strength, and the teeth are so fixed, that they cannot be moved, without considerable difficulty, but success, even at the age of twenty, should not be despaired of.

The constant pressure which it is necessary to apply, in order to draw the teeth into their natural position, is produced by adapting a gold bar to the curvature of the jaw, and fastening it at each end, by ligatures around the permanent regular teeth, and thus by a ligature being drawn close around the irregular tooth and the gold bar, a constant pressure may be produced, in the direction required. The same effect may sometimes be produced, especially in quite young persons, by ligatures on-

ly, being drawn around the regular and irregular teeth, in such a manner as to produce the requisite pressure.

India grass, or silk, prepared for the purpose, are the best substances for the various purposes of ligatures for the teeth.

CHAPTER XXIII.

Setting Artificial Teeth.

To those who have had the misfortune to lose their teeth, it may be gratifying to learn, that their places may be supplied by artificial ones, which will both remedy the defect and preserve the natural symmetry of the mouth.

Until of late, this important branch of our profession was considered quite limited, being confined to particular situations of that part of the mouth from which the teeth were lost. But the ingenious Dentist is now enabled to supply the loss of teeth in almost every case, but with great-

er or less prospect of utility and comfort to the patient, which must always depend on a variety of circumstances.

In those cases where the fangs remain, and especially if not much decayed, the prospect is much the best, for in such situations, an artificial crown may be so nicely engrafted on the fang, as to elude the notice of the most minute observer, and sufficiently permanent to perform all the necessary functions of the teeth; and with few exceptions, this operation can be performed with little or no pain. This mode of setting teeth is confined to the ten front teeth in each jaw, which in general have but one straight fang.

But we are sometimes called upon to set on an artificial crown, where the old tooth is but partially decayed and the nerve may yet be in a vigorous state In such instances, the remainder of the old crown cannot be removed, and the nerve in its cavity destroyed, without occasioning a shock of pain, but, if properly performed, its duration is very limited, occupying but a few seconds.

It may be an inducement to the patient, to submit to this operation to know, that

the tooth can never be painful afterwards, and that the operation is attended with no danger.

In other situations where no fangs remain, the loss of teeth may be artificially replaced, so as to subserve most of the valuable purposes for which the natural ones were intended; but the utility and comfort, which attends the use of artificial teeth, will always depend essentially, on the skill of the Dentist, which, as it is a mechanical branch, can only be acquired by much labor and practice.

Much time and ingenuity have been bestowed on this branch of our profession, and it is the exactness with which artificial teeth are adapted to the mouth, and the ease with which they can be worn, which constitutes their chief excellence. Their durability and elegance will depend, also, much on the materials from which they are composed. Many substances have been used in their manufacture. The most common is the tooth of the Hippopotamus, Tapier or Sea Horse.* But

* This animal inhabits the woods and rivers, from the eastern side of Asia and of South Amer-

smaller animal teeth are now used, with pleasing success, and are perhaps the best substance for this purpose, with which we are acquainted. They may generally be obtained from Dentists, properly prepared, and who are the only persons capable of selecting such as are fit for use.

Human teeth are sometimes used; but the difficulty of obtaining them, in sufficient quantity, and the strange prejudice, so current against their use, as well as the fact, that animal teeth answer as good, if not a better purpose, have caused their use to be mostly laid aside.

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ica, from the Isthmus of Darien to the Amazon river. It is a solitary animal; sleeps during the day, and goes out in the night in search of food; lives on grass, sugar cane, and fruits. If disturbed it takes to the water; swims with great ease, or plunges to the bottom, and walks there as on dry ground. It grows to the size of the ox; its nose is long and slender—extends far beyond the upper jaw, and forms a kind of proboscis, which it can extend or contract at pleasure. Each jaw is furnished with ten cutting teeth and as many grinders. It is mild and inoffensive, and flies on every appearance of danger. This animal forms a species of itself.

Common bone or ivory, is sometimes also used for this purpose. But it is by no means suitable, and is generally used only by empyrics, as it is presumed no respectable Dentist will disgrace himself and profession, so much as to botch in bone or ivory, on any consideration.

But every substance with which we are acquainted, for the making of artificial teeth, is destructible.

The peculiar disservent qualities of the saliva upon all inanimate matter, exposed to its action, is so general, that something more than has yet been introduced, must be discovered, before artificial teeth can be durable.

It is to be desired, that some person may be fortunate enough to discover a substance, from which artificial teeth may be composed, that will possess all the necessary properties to render them natural and not subject to tarnish or decay.

The great inconvenience generally attending the loss of teeth, in respect to mastication, enunciation, and deformity in the features, renders the introduction of some substitutes highly desirable.

In all cases of artificial teeth, strict observance to cleanliness is indispensable, for they, as well as natural teeth, unavoidably accumulate tartar, and from particles of food adhering to them, they become very disagreeable; but the daily use of a tooth brush, with warm water, will generally be found sufficient to keep them clean, wholesome, and in a considerable measure, as pleasant as natural teeth.

The manner by which artificial teeth are secured in their intended situation, is so various, depending on such a variety of circumstances, that a minute description would be tedious and uninteresting, nor will the ingenious Dentist need the description, as his judgment will most readily dictate the best mode, from taking a view of the intended location.

My direction shall therefore be general, and subject to such variations as prudence and circumstances may dictate.

If it is a front tooth to be supplied, and the fang still remains in the socket, so much of its ragged or carious surface should be filed away, as to leave it as low as the gum. The natural cavity in the

fang is then to be made of a suitable size and depth. A similar hole is then to be drilled in the artificial crown, and a pivot of the toughest wood inserted, so prepared as to enter each cavity without much force, where it will soon swell and make the tooth very permanent and durable.—This pivot may be renewed by the patient, when necessary.

In cases where no fang remains, by which the artificial teeth may be fastened as above, the crown may be so fitted as to set easy on the gum, and if there be more than one, they should be neatly and firmly connected; and at each side, adjoining the standing teeth, a clasp, or spring of pure gold, should be permanently fastened, the ends of which should extend partially around the permanent teeth, which if properly done, will often be sufficient to keep them in their place. But if necessary, small holes may be drilled through each end of these clasps, and a ligature of silk, or India grass, passed through them and around the teeth and secured by a knot on the inside, which can easily be renewed as occasion requires.

Any number of teeth from one to a

dozen, may be supplied in this way, if there be but one remaining on each side by which they can be secured. Should there be but one fang remaining, where a number of teeth are to be supplied in this way, great steadiness may be given to them all, by connecting them with a pivot to this fang. Should there be no teeth or fangs remaining in one or both of the jaws, an entire set may be made and kept steadily in their place by means of springs. In a short time, they will become so fitted to the gums, that they can be worn with pleasure, and all the common duties of the teeth be performed with considerable ease and satisfaction: nor is there the least pain attending the setting of teeth in this way, as they are wholly unconnected with any part of the mouth or jaw, and may be taken out and returned at pleasure.

Much prejudice exists in the minds of many, against setting teeth in any manner, on account of great pain which they fancy must be experienced in the performance of this operation. But in no case is any considerable pain caused in this operation, except where the nerve remains sensible in the fang, and in such cases, it is always but momentary.

CHAPTER XXIV.

Importance of cleanliness of teeth.

The importance of a due regard to cleanliness of the teeth would appear, were mankind sufficiently acquainted with the diseases and painful afflictions, which originate from want of attention to this important duty, and were they convinced that from this cause alone numbers drag out a life of distress, they would feel a greater curiosity, and take a more lively interest in obtaining information respecting a duty which the consideration of appearance, comfort and health, renders so essential.

That such an interest has not been felt, is more astonishing, since we cannot but observe, how anxiously solicitous the mind daily discovers itself, to learn subjects of less importance. Indeed mankind in general are not sufficiently impressed with the utility of improvements, till their own feelings convince them of their necessity.

In the present instance the truth of this

observation is but too obvious, for in most cases, it is either the loss of teeth, or the sensation of pain that induces people to pay attention to the cleanliness of the mouth. Though at every time of life, an attention to the teeth is necessary for their appearance and preservation, yet there are certain critical periods, at which we are more particularly led to the contemplation of the subject. Infancy is one of them.—When the teeth successively appear, the constitution of the child suffers from their protrusive power, and a general irritative action pervades the syetem. The anxious day and the watchful night, then, give importance, in the opinion of those who may have the immediate charge of the child, to this part of the human structure, and it is then, the greatest mortality of infancy occurs. It is computed, that no less than one fourth of the human race, die under the age of two years. And I have no hesitation to say, that it is in a great measure attributable to this source of disease.

The next period that calls the particular attention to the teeth, is the time of shedding the temporary set. The habit now is more firm, and the system does not

suffer the same general uneasiness, as at the former period, but the process of nature often imperfectly performed in the removal of the original set, requires to be assisted, in order to prevent that local deformity of features, which is well known to arise from this cause. Hence, this is a period to be earnestly watched, if personal advantages are to be studied, or a pleasing exterior preserved.

The last period of particular attention to the teeth, is when they begin to decay; for not only do they give exquisite pain, as the sensation of tooth-ache convinces, but the cause which moulders them away, like other species of gangrene, affects the contiguous parts, taints the breath, and causes the fœtor of the mouth to be disagreeable, even to the individual himself. Thus, daily experience proves, that the teeth are, generally, the source of pain and disease, and the question to be considered, is, whether this state be naturally entailed upon man, or results from our imprudence and neglect. From the moment that the teeth have protruded, and appear in their proper situation, they are liable to be acted upon, by every article of aliment

that adheres to them. To protect them against this action, they are covered with an exterior coat, termed the *cortex striatus* or enamel, different from other bone, the peculiar structure of which, constitutes their chief ornament, as well as defence of the teeth. While strict attention is paid to cleanliness of the mouth, this enamel, will be a sufficient protection against injuries, arising from any external cause. The teeth of the savage, are generally, sound and regular, and no foul accumulations form to deface them. But this is different in civilized society. Refinements in the culinary art, give the food a greater tendency to acquire noxious powers, & form chemical combinations.

From this, and the causes I have before mentioned, the teeth become gradually destroyed, and the individual suffers successive inflammation and pain for a time, till he is awakened to attention by a perception of the alarming consequences that are likely to succeed.

If cleanliness be essential to other parts of the body, it is peculiarly so with respect to the mouth, through which is the opening, for carrying on the two great pro-

cesses of nature essential to continuance of animal life, the process of digestion, which gives nourishment and support to the system, and the process of breathing, which conveys a principle from the air, connected with vitality. If then the food from uncleanliness of the mouth, be tainted, in the preparatory step of mastication, the progress of digestion, must introduce into the system, a tainted chyle, pregnant with the seeds of putrefaction. If the air inhaled, recieve the same impregnation, which is the opinion of some of the most learned physicians, it cannot animate the body, or give vital energy in a proper degree. These effects, which are independent of its injury to the teeth, I presume have never been sufficiently considered.—Thus, in all cases of unclean teeth, a putrid matter is daily passing into the body, and acting, as a slow and unseen poison, for months and years together, on every part of the frame. When this is reflected on, can there be a stronger inducement to clean the teeth, in a regular and proper manner, as a preventative of general disease.

The more we examine the structure of

the human body, however varied and multiplied its parts, the more we are struck with the intimate connexion of each part with the whole. Numerous as they are, to each is assigned some peculiar and needful office, and in a healthy state, the most perfect harmony subsists between them. No one obstructs, but each assists the operation of the others, and thus promotes the ultimate preservation of the whole. By this wise adjustment, there is no schism in the body; no separate or interfering ends are pursued by the multiplicity of members, but the safety and support of each, are the undivided care of all. Hence, in this view, there is no part of the frame that is not of importance, however trifling, or insignificant it may appear.—The most vital, as well as those on which the lesser energies of the system depend, are all equally essential to life, and its comforts. On these considerations, the teeth certainly claim an important rank in the human structure. To them is assigned the chief power of enunciation.—If the great and preeminent prerogative of man, is the possession of speech, that speech can never be complete or perfect,

without the teeth to modulate the sound, and give proper utterance to the words.—This circumstance, gives them additional value, particularly to a man in public life. Certainly the preservation of the teeth ought to be one of the first objects to those who wish to shine, either in the senate, at the bar, or in the pulpit. Without these instruments of utterance, the graces of their eloquence are lost, and the power of affecting the mind, and convincing the understanding. if not wholly taken away, is considerably diminished.

Another consideration which demands attention, is, that the loss of this part of the structure produces the leading mark of age, and occasions the contracted countenance, the wrinkles of the face, and those unseemly changes, which youth, and beauty, ever wish to see placed at a distance. But the most dangerous effect of neglect of the teeth, and their consequent loss, is the imperfect mastication of food, which produces indigestion, and a variety of disorders, resulting from this cause.

Another disagreeable effect, arising from the neglect of the teeth, is an offensive breath. This fact is susceptible of dem-

onstration, by actual experiment. One is, that the breath which is exhaled by the nostrils, is widely different from that which is expired through the mouth of a person, having diseased teeth and gums.—Fœted breath arises entirely, from the state of the mouth, and has no connexion with that of the stomach or the digestive organs, as is erroneously supposed. Eructation can only produce a temporay effect, from uncleanliness of the mouth—we find the taint constant and habitual, and unless the cause be eradicated, all the spices and perfumes of the east, though they may conceal, cannot remove it.

Besides the reasons already assigned for the necessity of a strict attention to the teeth and gums, may be added their great influence on the state of the general health. The danger to the lungs, says Mr. L. S. Parmly, "has been strongly commented on by the faculty, as a leading cause of pulmonary consumption." The importance, therefore, of an acquaintance with the dental art, as a part of education, appears indispensable,; as it is the only means, by which this department of science can be enabled to take that rank, its

importance in promoting the health and comfort of mankind, so imperiously demands. Nothing will be a source of greater satisfaction to the author, than that his humble endeavors should in any degree be instrumental in effecting so desirable an object, by impressing on the minds of those into whose hands the care of children may be intrusted the necessity of the care and management of the teeth, as a primary duty, with a view, as far as possible, to prevent those unhappy occurrences of dental diseases, and consequent deformity, which so often occur.

While the teeth are kept clear and free from foul matter, seldom will disease affect them. Their structure will equally stand against the summer's heat, and winter's cold, against the changes of climate, the variations of diet, and even the diseases, to which the other parts of the system is subject. From these observations, we may infer the necessity, of guarding the teeth against every foul accumulation.—But where such accumulations have, thro' negligence, been suffered to take place, they can only be properly removed, by suitable instruments, in the hands of a

dentist. When this operation has been performed, and the spaces between the teeth sufficiently widened, they may generally be kept in a clean and healthy state, for any length of time. by the daily use of the tooth brush. But should the removal of such accumulations be attempted by the use of any dentrific substance, that will accomplish the object, its powerful qualities will not fail, essentially to injure, if not wholly to ruin the finest set of teeth.

In order to be able to form something of a correct idea of the pernicious consequences of the dentrifices in general use, it will be proper to take a view of the ingredients which enter into their composition. Tooth powders being generally composed of insoluble or gritty substances, and acid ingredients, are evidently hurtful both by their mechanical and chemical agency. And to shew the injury of these applications, I shall make some observations on their composition and nature.

Sulphuric acid, from its peculiar and well known property of giving a beautiful white appearance to the teeth. forms a principal ingredient, in all those ruinous compositions, sold under the title of tooth-

powders, tinctures or pastes. In tinctures and lotions, it is combined with some spirituous or watery infusion, of an aromatic nature, variously coloured and scented, according to the taste of the composer. In the paste, it is generally united with some gritty powder, to which a light vegetable matter is added, when the whole is made of a proper consistence with honey or other glutinous substance. The powders, not admitting the acid in its natural or liquid form, have corrosive salts substituted, as cream of tatar, alum, &c. &c. united with powder which often consists of brick dust blended with some other ingredient to colour and conceal it.

But besides these compositions which are expressly sold for the purpose, many are in the habit of using substances at their own option, for cleaning the teeth, without having recourse to these specifics. Of this kind, soot is one: which I think a very improper, disagreeable and indelicate substance. Its use cannot be justified on any reasonable principle.

Another substance in much greater use, of late years, for the purpose of cleaning the teeth, is pulverised charcoal; but high-

ly as it is celebrated for its anticeptic qualities, it is very improper as a dentrifrice, for however fine may be the powder to which it is reduced, every person, I presume, knows that it continues perfectly insoluble. The finer, indeed, it is pulverised, the easier is the admission it finds between the teeth and gums, where its insinuation, like every other extraneous matter, is a perpetual source of irritation and disease: and its constant friction may injure the health and beauty of the gums. Its effect also, as a purifier of the breath, is very transient. Dentrifices similar to charcoal, are formed, by the burning of bread, leather, betle-nut, &c. In their effects, however, they all differ little from common charcoal. Gunpowder and iron rust, is another composition in use. Prepared alum, is another substance, used for the same purpose; but being a combination of sulphuric acid and clay, when exposed to the moisture of the mouth, it undergoes decomposition, and consequently, the teeth are exposed to the action of the acid. The same injury is produced by cream of tartar, which though it whitens the teeth, acts powerfully on the enamel.

Salt is another article highly spoken of by some who profess knowledge in this science, but I consider it too powerful to be used as a dentrifrice with the least shadow of safety. Nitre, as generally used, is equally pernicious.

In fact, the indiscriminate use of any dentrifrice, will be found ultimately to do much harm. I approve of them in a very limited degree. There may be cases, which seem to require something to cooperate with the friction of the brush, in order to keep the teeth from all extraneous matter, especially tartar, but these cases will be found to be very few, after the teeth have been put in complete order, by a skilful dentist.

It is a common practice with most people after meals, to make use of a tooth-pick, to remove whatever may be lodged between the teeth. This practice, however, is highly to be reprobated. The constant use of a tooth-pick cannot fail to make improper openings between the teeth; and, when once that part of the gum, which forms the arch, is removed from their interstices, a small hollow is made, for the reception of accumulating

matter, which if neglected to be removed, will, soon commence its action on the tooth, and rapidly excavate it, and produce early pain, that never would have existed, but for the use of so improper an instrument. If the teeth be properly separated, a silk thread, a strip of a fine rag, or the edge of a handkerchief may be drawn between them, which will more effectually clear them without any injury.

CHAPTER XXV.

Importance attached to the teeth.

The importance of the teeth, seems to be equally appreciated by all nations. In civilized society, their care is regarded, as a matter of fashion and ornament, and among ruder nations, their preservation and cleanliness, is regarded as a religious duty, and their value so highly rated, as even at times, to be offered in sacrifice to their deities. It may not be uninteresting to some of my readers, to briefly state some of the customs and ceremonies of

different barbarous nations, respecting the teeth.

In the East Indies, particularly in Hindostan, the care of the teeth among the Bramins, is made a part of their religious rites. As soon as they rise in the morning, their teeth are rubbed for an hour, with a twig of a fig tree. During this operation, their prayers are fervently addressed to the sun, invoking the blessing of heaven on themselves and families.—This practice it is presumed, is coeval with their religion and government. And certainly, nothing can more shew their high regard for cleanliness, and particularly for the purity and beauty of the mouth, than their making this custom both a law, and religious duty. In some places of India, the teeth are made of a redish cast, by the constant use of betel and areca nut, whilst in other parts they are made yellow by chewing madder.

But not content with changing the natural form and colour of the teeth, many savage tribes try to make an alteration in the very shape of their mouths; and by this means the inhabitants of Prince William's Island, in the south seas, appear at

a distance to have two mouths. In order to do this, an incision is made in the under lip, in a line with the mouth, sufficient to admit the tongue to pass through it, which after being healed continues to have all the appearance of lips. This artificial mouth is adorned with a shell, which is so cut as to resemble a row of teeth.

In one of the tribes of New Zealand, the queen is distinguished by having a piece of gold substituted for her two front teeth. Amongst other savage tribes black is prefered in order to make them differ from the brute creation. Thus the women of the Marian Islands blacken their teeth. The same is done by the Tonquinese and Siamese, and by the inhabitants of Sumatra and Malacca. In Java, this distinction is confined to the married women as a mark of great respect; while in the other parts of the East India islands the two central incisores or front teeth of the upper jaw, are often gilded, and the adjoining ones made of a black, colour.

In New Holland, the beating out of the front teeth is performed by the priests

when a youth has gone through the various ceremonies previous to his being introduced into the class of warriors.

Such are a few of the customs of some savage nations in respect to their teeth.

The importance of the teeth in speech, mastication and in giving symmetry and expression to the countenance, has been already sufficiently insisted on. But it has been attempted to carry their importance further, in supposing these organs to exert an influence in the formation of the human character, and for this doctrine there exists perhaps some slight foundation, but certainly not to that ridiculous extent contended for by some authors—the vivacity of whose imagination on their favorite subject appears to have completely misled their judgment. That the state of the mind is often discovered in the countenance, it is presumed every one will admit, but the countenance is made up of parts in a high degree flexible which vary their motions and expressions with every changing influence of the soul.

When the mind broods over any particular passion, or yields to one continued train of thoughts or feeling, the expres-

sion of such mental affection may remain fixed in the countenance, and give a determined and decided character to the features. The teeth on the contrary are fixed bodies, they can receive no change from the influence of the mind, and they merely fill up or give that finish to the countenance, which can admit of no other change as far as these organs are concerned, than what will arise from their loss.

In the ingenious system of Lavater they have met particular notice, and from the appearance of the teeth and projecting chin, he has drawn many plausible conclusions.

"Thus small short teeth have been considered as denoting a weakness of character and constitution, and, though such have been observed in many persons of extraordinary strength, yet, in those persons they are seldom of a pure white.—Long teeth are considered as sure signs of weakness and pusillanimity. White clean well arranged teeth, visible on opening the mouth, not always seen, have been esteemed marks of good, accute, honest, candid, and faithful men. Where

in some persons they appear otherwise, or are foul, uneven and ugly, it is either the effect of sickness or some mental imperfection which has changed them.—Short, broad teeth, standing close together are the characteristics of tranquillity, firmness and strength. Persons of a melancholy habit have seldom teeth well arranged clean and white."

Such are the maxims laid down by Lavater, but they are not founded in truth.—The size and shape of the teeth, we have seen, are originally developed and arrive at perfection long before the mental qualities are established, and the mind acquires its character.

But though the teeth can have no apparent influence on the mental qualities of individuals, yet, a considerable difference is visible in their appearance, in the inhabitants of different countries, and in this point of view they may be considered indicative of the character of nations.—Thus the Spaniards are distinguished in general for their well arranged teeth, and the Hottentots for their extremely white ones.

Lavater has carried his whimsical sys-

tem so far, as even to form from the teeth ideas of character in the brute creation.—To the sea-horse from the structure of his teeth, he attributes the disposition of foolish self-distructive malignity. To the sheep he gives the character of little or no wildness, from the line of the mouth, or form and position of the teeth. But, as we have already stated, it is not in the teeth, but on the countenance the great lines of character are exhibited. This is the theatre on which the soul delineates itself, and where the muscles of the face give it the expression of the inward workings of the mind. That countenance which can at one moment display the most savage ferocity or the greatest stupidity, will on other occasions exhibit the greatest meekness and placidity, and in all these circumstances the teeth suffer no change. How unjust then to characterise all those who have irregular teeth as possessing the most malignant passions, or to exclude from our friendship all who have long and separated teeth lest they should rob and murder us. But though the teeth can have no influence in the elucidation of character, yet in regard to appearance

their influence is great. No face can be considered as truly beautiful which is disfigured by foul, unsound, irregular teeth. The laugh which is the test of good humour and openness, excites only disgust where the mouth exhibits foulness and deformity. A pleasing countenance, naturally prepossesses but it never can be complete, unless beauty and regularity of the teeth unite in the attraction; so that where a person wishes to please, the care of the teeth forms an essential consideration and hence, with justice, Lavater observes "the form, position, and cleanliness of the teeth so far as depends on the individual himself, is a certain proof of his taste in other matters."

With the following quotation from the Dictionary of Medical Science, published at Paris, I shall conclude the present chapter.

"The teeth are the most lovely ornament of the human countenance; their regularity and their whiteness constitute that ornament; these qualities rivet our regard, and add new charms to the beauty of the countenance.

"If the mouth exceeds in size its ordinary proportions, fine teeth serve to dis-

guise this natural error in its formation, and often, even the illusion which results from the perfection of their arrangement is such, that we imagine the mouth would not have looked so well if it had been smaller.

"Observe that lady smile whose mouth discloses the perfection of their arrangement; you will never think of remarking the extent of the diameter of her mouth; all your attention will be fixed upon the beauty of her teeth, and upon the gracious smile which so generously exposes them.

"The ornament is equally attractive in both sexes; it distinguishes the elegant from the slovenly gentleman, and diffuses amiability over the countenance, by softening the features. But, it is more particularly to women, that fine teeth are necessary, since it is her destiny first to gratify our eyes, before she captivates and enslaves our hearts.

"The influence which the teeth exercise over beauty, justifies the pre-eminence which I attribute to them over all other attractions of the countenance. Let a woman have fine eyes, a pretty mouth, a handsome noes, a well turned forehead,

elegant hair, a charming complexion, but let her also have bad teeth, teeth blackened by caries, or covered with thick tartar, or a viscid concretion, in a word let her exhale a contaminated breath, (which discovers her approach before herself appears,) we should cease to think her beautiful the moment she opens her mouth ; she herself aware of the unhappy effects of her smile, constrains it into a grimace to conceal the ravages which disease has made on her teeth. On the contrary, if she has a large nose or small eyes, if she is even ugly, provided her teeth be regularly planted, that they are white and above all, that she possesses the whole of them, or at least those which are visible, this woman's countenance however frightful she is, will appear agreeable, the moment that a smile comes to her aid, and she will hear whispered around her, these words so consoling to her vanity ; *what beautiful teeth she has.*

" When nature sparing of her gifts, has failed to bestow them on the teeth, making them defective in form and tarnished in colour, care and extreme cleanliness must be resorted to to supply the imperfections

and hide the faults ; in this case, at least if the teeth do not attract our regard, they do not effect us disagreeably."

CHAPTER XXVI.

Conclusion.

It is a fact well known, and which every ones experience daily confirms, that few persons pass through life, without at some period, being subjected to more or less inconvenience and pain from diseases of the teeth.

In infancy, we have seen that their formation and growth is the source of great and constant anxiety to the fond parents, and that they produce deviations from health, which often continue for the remainder of life; for, at that early period constitutional diseases are called into action by the irritation of dentition, which would otherwise have remained dormant. That period of childhood at which the temporary teeth begin to shed,

is the critical time that calls for the assistance of parents,for by neglect at that time, irregularities are, as we have seen, apt to arise which might easily have been prevented, by proper care and attention.

The chief deformities caused by irregular teeth are the rabbit mouth and projecting chin. But these and all other defects may be prevented by timely attention. In proportion as the teeth grow the deformity becomes increased and more conspicuous.

These disagreeable deformities are always in the power of the dentist to rectify, and what parent who has a regard for the personal appearance of their offspring would allow such a deformity to exist.

Nothing therefore is required to render this part of the human structure less destructible than others; but the same attention which from personal delicacy and fashion, is paid to cleanliness of the face and arrangement of the hair.

In selecting a tooth brush much care and judgement is necessary in order that it may be of proper dimensions and a suitable degree of stiffness. This must be regulated by the size of the mouth and

state of the gums and other circumstances. A great advantage will therefore be derived by referring the choice of a brush to a dentist, if convenient.

When children begin to shed their teeth, if irregularities form in their arrangement by one laping over the other, a frequent inspection should be made, for all deformity can at that time be easily rectified, nor indeed should a cure of any deformity be despaired of under the age of twenty.

The most frequent and destructive disease of the teeth we have stated to be *caries*, this affects them at a very early period; indeed it is coeval with their first appearance, particularly when dentition is slow, for then the accumulated matter is apt to lodge on their edges, and, unless carefully removed, disease is entailed for life.

Among the popular prejudices, which have been propagated in the world is, that of bad teeth being hereditary, or running in families. This is a most erroneous idea, & ought to be strongly combated, as under such a prepossession, the teeth will generally be neglected, parents supposing that every means used for prevention of disease will prove fruitless.

I have no hesitation in affirming, that bad teeth are five times out of six, accidental and are to be considered either as the consequences of neglect or improper management, and in fact, a large share of caries proceeding from internal causes, may be prevented with seasonable directions and care. But the management here depends on such a variety of circumstances, that it would be exceeding difficult, if not impracticable to give such directions as would safely lead to a favorable result.

It will be found highly prudent in all cases of inflammation or, soreness in the gums or about the teeth, to consult a dentist immediately, so that the inflammation may be reduced as speedily as possible and thus prevent a gangrenou affections in the cavity of the tooth, which if suffered by neglect to take place will inevitably prove the destruction of the tooth.

The first stages of diseases affecting the teeth, are seldom considered of sufficient importance to merit attention, and thus these important organs are neglected till the inroads of caries, or the agonizing pain of the tooth ache, admonishes us, in a lan-

guage not to be misunderstood, and hence diseases which could have been wholly arrested by seasonable application are placed beyond the reach of any remedy; extraction or some paliative being the only means then left in our power.

The first traces of disease in the teeth, are generally unobserved by the patient. *Caries* in particular, is so insidious in its attacks, that its existence often requires the most minute inspection to detect it.

It will readily be perceived from the foregoing observations, that there is no individual branch of practice of more universal utility, than the one I have endeavored to illustrate; and, at the same time I am well aware, that in this part of the country none has been so much abused.—"If says Dr. Hare, Dentists would content themselves with enterprises, no greater than are sanctioned by the dictates of reason and experience, they would enhance a firmness of reputation, more lasting than the affectation and presumption of doing impossibilities could ever establish, and acknowledge the limitation of their art in common with that of the more weighty branches of chirurgical science."

"The teeth," continues he "are worthy objects of the anatomist, the physiologist the chemist, the naturalist, and the practical surgeon, for it is dreadful to reflect upon the injuries to health, and the actual causes of mortality, which are daily levelled upon the unwary, by buffoons and chatterers—by quacks and mountebanks, and by the most illiterate mechanics in meddling with disorderd teeth."

Dr. Brown, of Edinburgh, observes, in his remarks on the subdivision of surgery, "if surgery has need of being subdivided in order to its advancement and perfection, such subdivision is in a particular manner applicable to the branches which require great manual address; and perhaps there is no one which demands more habit and dexterity than the dentist. If he who embraces it, joins to the knowledge of his art, that which is required of medical men, he will not fail to hold a distinguished rank in science, and to contribute to the elevation of a branch of the healing art, which has been too long usurped and degraded by ignorance and presumption. Without being duly qualified no one ought ever to command the confidence of the world, or induce patients to trust with

security to his care the remedying of affections in organs so precious as the teeth."

In making these quotations, I hope I shall not be misunderstood in regard to this science, as forming a distinct profession. The occupation of a dentist certainly unites as great a variety of practice as in justice ought to be attended to by one person, and therefore, it is my decided opinion that this science should be made a separate profession, in order that by the exclusive attention of its professor it may be brought to that perfection which its importance so justly demands.

FINIS.