The parents' dental guide : a treatise on the diseases of the teeth and gums from infancy to old age : with observations on amalgams, cements, & etc. and remarks on the construction of artificial teeth / by William Imrie.

THE

PARENTS' DENTAL GUIDE;

A TREATISE ON THE DISEASES

OF THE

TEETH AND GUMS,

FROM

INFANCY TO OLD AGE;

WITH

OBSERVATIONS ON AMALGAMS, CEMENTS, &c.

AND REMARKS ON THE CONSTRUCTION OF

ARTIFICIAL TEETH.

By WILLIAM IMRIE, Surgeon-Dentist.

LONDON:

PRINTED FOR JOHN CHURCHILL,

Medical Bookseller and Publisher,

16, PRINCES STREET, SOHO.

1834.

HOWLEIT AND BRIMMER, PRINTERS, 10, FRITH STREET, SOHO.

CONTENTS.

Page

INTRODUCTION i
Attention of Mothers directed to Tooth-ache in Children . iii
Improvement in the Construction of Artificial Teeth..... iv

CHAPTER I.

DENTITION IN INFANTS.

Effects of Constitution on the Teeth 5
Defective Organization of the Teeth 7
Symptoms of Dentition 9
Danger attending Dentition 10
Order and Protrusion of the Milk Teeth 11

SECTION I.

Of Convulsions and Treatment required..... 13
Groundless Objections against Scarifying the Gums..... 14
Repetition of the Operation sometimes necessary 15
Bad Effects of Coral and Bone Rings 16
Utility of Indian Rubber 16

CHAPTER II.

DENTITION IN CHILDREN.

Page

Decay in Milk Teeth, how produced 18
Teeth Decaying by Pairs in both Jaws 18
Necessity for Brushing Children's Teeth 19
Care required in extracting Shedding Teeth 24
Irregularity induced by Premature Extraction 25
Removal of Tartar from the Milk Teeth 27
Preserving the Teeth by Plugs 28
Of the Rabbit-mouth and Under-hung Jaw 31
Bandage described..... 31

CHAPTER III.

OF PERMANENT TEETH.

Irregularities produced by a want of Development of the Jaws..... 33
Eruption of the Permanent Teeth 35
Utility of preserving the Shedding Teeth..... 37
Examination of a Perfect Set..... 39
Irregularities of the Front Teeth..... 41
Danger of Extraction 42

SECTION I.

Of the Mechanical Means used in obviating Irregularities. 43
Effects of the Constitution on the Development of the Jaw Bones..... 44
Danger of Filing the Teeth..... 45
Cases of Irregularity and Description of the Treatment... 46

CHAPTER IV.

DECAY OF THE TEETH.

Page

Preservation preferred to Extraction 61
Loss of the Front Teeth following Extraction of the Grinders 63
Mastication—how Performed..... 64
Remarks on Extraction, addressed to the Medical Profession 66

SECTION I.

Defective Organization, a Cause of Decay 67
Lateral Pressure, a Cause 70
Accidental Causes 72
Injurious Effects of Acids on the Teeth 72
Effects of *Acid Saliva*..... 73

SECTION II.

Rapid Decay of Primary Teeth..... 76
Remedies to Relieve Tooth-ache 78
Plugging Decayed Teeth 80
Prevention of Decay in Teeth, denominated "Chalky"... 81

SECTION III.

Predisposition of some Persons to collect Tartar..... 84
Symptoms and Effects of Tartar..... 85
Removal of Tartar..... 86

SECTION IV.

Instructions for Preserving the Teeth..... 89

all-important; and who, from the comparative delicacy of their structure, are rendered more liable to the ravages originating in neglect and disease. What, indeed, can be more melancholy than to see the attractions of youth and beauty disfigured and marred by loss of teeth, or by teeth in a bad and discoloured state? And yet what sight is less uncommon? That a female so situated should be reluctant to smile lest she should reveal an uncomely mouth, is to be deprived of one of the most charming graces of her sex; not to mention the more lamentable and permanent injuries she is doomed to suffer.

Were it possible to ascertain the amount of accurate information possessed by persons who have arrived at the middle period of life, regarding the nature and diseases of the teeth, and of the alterations which the mouth is daily undergoing, it would be found to be so little and so erroneous, as to convince every one that such a work as the present is, at least, not superfluous. It is a fatal error in the subject now under treatment, to believe, that Nature is in herself compe-

tent in all cases to fulfil her intention of arranging the teeth in perfect order in the jaw; the present artificial mode of living has a tendency to frustrate her; and unfortunately the great bulk of the medical profession (which ought to be the guide in this matter,) appears to be as unacquainted with dental diseases as the public at large; and a patient is too often subjected to a long course of medicine in the hope of relieving a malady, which might be better and more speedily remedied, by restoring to the teeth their power of mastication, on which the comfort of the stomach mainly depends. Were medical gentlemen more observant of this, the teeth, by the timely assistance of the dentist, might be perserved to a very late time of life, and the phrase "old age" would cease to be synonymous with "a toothless person."

The Author of the following work hopes, therefore, to effect some good by what he now ventures to lay before his readers. He has not confined his observations solely to the means of preserving the teeth, but has endeavoured to

demonstrate the method of supplying them when lost; and to show what may be obtained by mechanical skill in ensuring the health and comfort of society in relation to that particular part of the human structure of which he treats.

10, WOBURN PLACE, RUSSELL SQUARE.
January 1, 1834.

INTRODUCTION.

SENSIBLE of the importance of every design having for its object the alleviation of pain, the author feels it incumbent on him to lay before the public his particular views respecting Dental Surgery, and earnestly to direct the attention of parents and guardians to the beneficial results arising from the methods he employs in removing the causes which so frequently prevent a due development of the jaw-bones of young persons, occasion irregular positions of the teeth, and, in consequence, deviations from regularity of features. These defects are still more conspicuous and lamentable when they occur in the female branches of a family.

The foundation of irregularities, and other unfavourable affections of the teeth is laid at a much earlier period than parents imagine. Fortunately, however, these diseases are easily

prevented, if proper attention be directed to them at the right time; though when neglected until a late period, they admit of successful treatment only with great difficulty and perseverance.

The experience of the author for a series of years in regulating the teeth of young persons, has been extensive. A long period is indeed necessary to make observations in this department of the dental art. When it is remembered that the interval from the age of six or seven years to that of fifteen is required by nature for the full development of the beauty of the permanent teeth, the effects of judicious treatment, and the utility of early attention, become apparent. It will be evident, therefore, that deep study, combined with extensive opportunities for observation, during a number of years, are requisite to perfect the dental practitioner.

During the above period the author has too frequently been accustomed to witness cases of irregularity of the teeth arising from neglect, sufficient to convince him of the necessity of early attention.

Mothers should keep a strict watch during the time of shedding the teeth, and occasional examinations should be made by the scrutinizing eye of the experienced dentist, or the little patient is doomed to suffer to an unlimited extent. Tooth-ache and tenderness of the teeth in children at the early age of four years, is an occurrence more frequent than parents are disposed to believe. True it is that pain is not the only consequence of neglect of the teeth at this age; such neglect may, and frequently does, produce diseases of which, with few exceptions, the medical profession would not conjecture the cause.*

Considerable improvements have lately been made in the construction of artificial teeth; but it may be remarked that there are many persons in possession of artificial teeth which are ill adapted to answer the intention of natural ones,

* Very foul ulcers on the *lips* of children are frequently dependent on the projection of a sharp rough tooth against the parts. The most common cause of suppuration in the *antrum*, is a caries of some of the molar teeth in the upper jaw.—Cooper's First Lines.

and cannot be worn without producing pain and inconvenience. Others fancy factitious teeth cannot be constructed without the few remaining natural ones are extracted, to which they feel a repugnance. They therefore wait until deprived of them by a process of nature. Such persons are referred to the part of this work wherein the best methods of constructing artificial teeth are considered.

These remarks cannot be better concluded than by the following insertion from the valuable treatise on the teeth, by the celebrated John Hunter. "The importance of the teeth is such that they deserve our utmost attention, as well with respect to the preservation of them, when in a healthy state, as to the methods of curing them when diseased. They require this attention, not only for the preservation of themselves, as instruments useful to the body, but also on account of other parts with which they are connected; for diseases in the teeth are apt to produce diseases in the neighbouring parts, frequently of very serious consequences."

PARENTS' DENTAL GUIDE.

CHAPTER I.

OF DENTITION IN INFANTS.

EFFECTS OF CONSTITUTION ON THE TEETH—SYMPTOMS OF DENTITION—DANGER TO WHICH INFANTS ARE EXPOSED.

In this division, the dentition of infants will be considered. It is obvious, from the great number of little sufferers carried off yearly by this process, that some remarks should be addressed to parents.

There can be little doubt that the causes of difficult dentition may indirectly lead to, or lay the foundation for, that want of development of the jaws, so apparent at the adult age. The inflammatory state of the gums at this period

may interrupt the course of nature during the secretion of the osseous particles of the permanent teeth, before they emerge from their bony cells in the jaw. It is a fact admitted by physiologists, that the disturbance of the general health of infants usually frustrates secretion, and may affect the several parts composing the teeth equally with other portions of the body.

The principal cause, then, of a faulty state of the teeth is the primitive one, namely, a want of vigour and energy of the constitution.

This want of development of the teeth is induced in the same way as is occasionally seen in persons with one limb (generally the arm) shorter than its fellow, as though the arm of a child had grown on the body of a man.

Parmly observes, "In the teeth of all animals in a state of nature, we discover no diseased structure or deformity, and therefore we ascribe it in the human subject to *fortuitous*, not *constitutional*, or hereditary causes."

The term "fortuitous," in this instance, amounts to causes unknown to the above

writer, yet he rejects those of the constitution, which will readily explain the matter, especially when it is considered, that the human subject is very far removed from a state of nature, and that art has effected alterations prejudicial to the animal economy sufficient to account for defects observed in the human teeth. The same author also states, "That their premature loss or decay cannot arise from any defects of original organization, but it is to be ascribed *solely* to the action of impure matter; the result of uncleanliness on a part incapable of freeing itself from extraneous accretions, as in the other parts of the living body; and to supply that want of natural power, the interference of art appears indispensable."

The above quotation is replete with erroneous information, as the very reverse of the opinion therein expressed would be more correct; viz., that defect in original organization, and not the action of impure matter, is the primary cause of decay of the teeth. That this defect of

original organization is a cause of decay cannot be disputed, from the simple fact that impure matter applied to a well-organized tooth, will not affect it in the least, though if applied to one of defective structure, decay will ensue. That impure matter is not the only cause of decay, may be inferred from the food of carnivorous animals being generally filled with this pretended destructive solvent.

It was a remark of John Hunter, "that decay of the teeth does not seem to be so entirely the effect of accident as might be imagined; for it sometimes takes place in them by pairs, in which case we may suppose it owing to an *original* cause coming into action at a stated period." Here it plainly appears that the word "original" conveys the idea of a constitutional defect, and tends very strongly to bear upon the conclusion which the author has arrived at, namely, that want of vigour in the body is the original cause of decay and deformities in the positions of the teeth. Other causes are also in operation at different periods of life, the

effects of which are fully exemplified in their respective places in other divisions of this publication.

When the time arrives at which the four incisors (front teeth) in the jaws begin to force their way through the gums, the infant becomes restless and irritable. Among the first symptoms of dentition, little white spots will appear about the point of the tongue, extend to the gums, and the lining membrane of the mouth, known as the thrush; the gums in a few days commence swelling, and the salivary organs at the same time have their action increased, as is perceived from the dribbling of a limpid fluid from the corners of the mouth; nausea and frequent vomiting are more or less urgent; the skin is dry, and the face alternately pallid or flushed; the functions of the stomach become deranged, a state with which the bowels frequently sympathise; and the intestiual secretions are unhealthy, as is apparent from the clay colour and sour fœtid odour. Even in the most favourable states of dentition, the action of the intestines is generally irregular.

The danger to which infants are exposed during the period of dentition, arises from pressure of the teeth against the gums, irritating them, and exciting pain and inflammation.

Nature sets up this process to cause a separation of the gums; for at the time of birth there is a very perceptible line, or seam, situated at the edge of the gums, which may be traced from one extremity of the jaw to the other.

The presence of this white line is thus accounted for: during the growth of the infant, some weeks previous to birth, the gums are in two portions, one situated on the outside, the other inside the jaw bones. In proportion as the body of the infant increases, so the two parts of the gums continue to grow, and at last unite; the white line marks the place of union, and the object to be attained previous to the protrusion of the teeth, is a division of the gums.

The effect therefore of pain and irritation is, that the gum wastes, becomes gradually thinner, and at length the tooth protrudes.

While the roots of the teeth are forming, the upper parts or crowns are constantly projected outward; and from this continued action, it occurs about the sixth or eighth month after birth, that the incisors, being the first secreted and perfected in the jaw bones, begin to pass through the gums. The incisors of the lower jaw generally appear first; the *canine* (eye-teeth), and *molares* (grinders) not being perfected so quickly as the incisors, remain in the gums until the twentieth or twenty-fourth month. Sometimes one of the canine, but more frequently a molar tooth, follows the eruption of the incisors.

About this period the mother's anxious fears for the health and safety of her infant are strongly excited; the most alarming symptoms rapidly ensue, and from great tenderness and extreme delicacy of construction, connected with a disposition to an increase of any inflammatory action, the termination is generally more fatal than favourable.

The irritation caused by the sharp edge of a tooth against the gum produces derangement

of the nervous and circulating systems, to which inflammation extends its baneful effects, laying the foundation of, or calling into action, complaints of an incurable nature; convulsions, diseases of the intestines, or water in the head.

It should be borne in mind that the nerves and blood vessels of infants are larger in proportion to the body than at any future period of life; their fragile constitutions are not so well calculated to resist, and less able to overcome, disease when it has once fairly manifested itself.

SECTION I.

TREATMENT OF DENTITION IN INFANTS.

Of Convulsions; how remedied—Groundless objections against scarifying—Injurious effects of Corals, Bone-Rings, &c.—Utility of India Rubber.

THE unexpected appearance of two central incisors in the mouth, without the mother having observed her offspring to experience any pain or indisposition, is a very rare occurrence; more

frequently some of the symptoms already detailed announce this operation of nature.

Healthy robust children generally suffer very little pain, nor do those living in an open atmosphere; while such as are of a weak habit or nervous and vascular temperament, and confined in large towns, do not so readily overcome the difficulties and irritation attending the cutting of the teeth. The process of dentition is sluggish, and the life of the child in considerable jeopardy.

It is unnecessary to have the assistance of art in every case, yet whenever the pain and indisposition arise to a certain height, and convulsions begin to manifest themselves—as may be foretold by the thumbs twisting into the palms of the hands, accompanied by slight twitchings of the muscles of the mouth, with a dark appearance about the lips,—the infant should be immediately immersed in a warm bath, or a foot-bath used while the other is being made ready, and the gums freely *scarified.* This operation is attended with very trifling pain; the gums possess little sensibility, and they are often

accidentally wounded without the least painful sensation being induced.*

Many persons object to a division of the gums, supposing the admission of the tooth will be more difficult than before, should it not protrude after the first incision; this objec-

* The gum, in substance, has something of a cartilagenous hardness and elasticity, and is very vascular, but seems not to have any degree of *sensibility*; for though we often wound it in eating, and in picking our teeth, yet we do not feel much pain upon these occasions. In infants and old people, where there are no teeth, the gums bear a very considerable pressure without pain.

The advantage arising from this degree of insensibility in the gums is obvious; for till the child cuts its teeth, the gums are to do the business of teeth, and are therefore formed for this purpose, having a hard ridge running through their whole length. As, therefore, the gums are not easily irritated by being wounded, they are not so liable to inflammation as other parts, and soon heal.

A vulgar prejudice prevails against this practice, from an objection that if the gum is lanced so early as to admit of a reunion, the cicatrised part will be harder than the original gum, and therefore the teeth will find more difficulty in passing, and give more pain. This is contrary to fact; for we find that all parts which have been the seat either of wounds or sores, are always more ready to give way to pressure, or any other disease, which attacks either the part itself or the constitution. Therefore each *operation* tends to make the passing of the teeth easier.—JOHN HUNTER.

tion is not founded on truth, and its fallacy may be detected by referring to the part of the publication which treats of the formation and growth of the gums.

" When a front tooth is a cause of irritation and other bad symptoms, a complete division of the gum should be effected, by an incision made in a longitudinal direction, and sufficiently deep for the operator to feel the edge of the tooth; a crucial incision becomes necessary when a molar tooth is about emerging from the gums." *

Other diseases have their origin in difficult dentition; they, however, do not come under the cognizance of the dentist; the services of the medical attendant are generally required in these cases.

If the tooth do not protrude after the first division, and the symptoms return, a repetition of the operation must be persisted in until the edge of the tooth has cleared the gum.

* As far as my experience has taught me, to cut the gum down to the teeth appears to be the only method of cure. It acts either by taking off the tension upon the gum, arising from the growth of the tooth, or by preventing the ulceration which must otherwise take place.—HUNTER.

The use (or rather abuse) of corals, bone-rings, and other hard substances, so commonly placed in the hands of infants, cannot be too severely reprobated; they bruise and irritate the gums, producing the very disease intended to be obviated; and in every instance of difficult dentition the symptoms are aggravated.

The best substances are of a soft, elastic, or gristly nature. Rings formed of india-rubber, made expressly for the use of infants, are most excellent of their kind, and are the only articles that should in this way be allowed to enter the tender mouth of a child.

Particular mention is therefore made of the evil consequences where corals and similar substances are used; the author has witnessed in many cases very deplorable results.

CHAPTER II.

OF DENTITION IN CHILDREN, AND OF DISEASES TO WHICH THE FIRST, OR MILK, TEETH ARE LIABLE.

THE opinions formerly entertained by various writers, medical and anatomical, upon the formation and protrusion of the milk-teeth, were at the best speculative, though in many instances of an ingenious nature; equally erroneous opinions were formed concerning the permanent teeth. A knowledge of these subjects has advanced so rapidly, that at the present period they are well understood.

The milk-teeth consist of ten in each jaw; those of the lower front appear about the sixth month (as already observed), and, between the second and third year, primary dentition may be considered as completed; it may be also observed that no alteration of the mouth ensues

up to the sixth year, when some of the permanent teeth begin to protrude.

The good or ill effects of possessing either a vigorous or weakly constitution will be manifest, at the time the shedding grinders are appearing through the gums. The author has, in numerous cases, observed the correctness of this remark.

Very frequently it happens that soon after a molar tooth has cut the gums, many indentations and cracks are seen to exist on the grinding surface; on further examination it is perceived that the enamel is deficient, or that there is a want of union at several parts, through which a finely-pointed instrument may be passed into the body of the tooth; these are certain indications of defective organization, and will account for the rapid decay of such teeth.

These appearances are not confined to a solitary tooth; but it always happens that its fellow in the other side of the jaw is equally faulty in construction. Similar affections also exist in the crowns of the teeth which are opponents in the opposite jaw.

The destructive influence of particles of food deposited in these irregular surfaces of the molar teeth, coupled with the constant application of moisture, tend to hasten the process of decay. The neglect, therefore, of frequently brushing and washing the teeth and gums, calculated to remove foreign or extraneous matters that occasionally insinuate themselves between the teeth, is always accompanied with serious consequences, whereby premature decay and subsequent loss of the teeth are much facilitated.

A caries of the teeth may be considered as much a casualty in children as in adults.*

Whenever the teeth are in a state as above described, considerable detriment to the child's health speedily ensues; for, when we consider the numerous substances to be broken down in the process of mastication, it becomes obvious that, unless the masticatory organs are perfect,

* "This disease and its consequences seem to be peculiar to youth and middle age; the *shedding* teeth are as subject to it, if not more so, than those intended to last through life; and we seldom or ever see any person whose teeth begin to rot after the age of fifty years."—HUNTER.

the food must pass into the stomach in a very unfit state for digestion, and must be equally imperfect for the absorption of those nutritive particles which are to supply the growth, and keep up the healthy condition of the body. Hence, children with their mouths filled with teeth more or less decayed, are generally of a weakly and languid constitution.

To counteract these effects, it is of the utmost importance that the child's mouth should be examined by the dentist soon after the primary molar teeth have appeared, to discover if any are defective in organization or are passing into decay; if this period should be neglected, the teeth become so much and so quickly diseased, that no alternative is left but extraction.

The occurrence of pain in a tooth is frequently the first inducement to a parent to have the child's teeth examined, when perhaps one or more are found so much diseased as to be useless for the purposes of mastication.

Regularity of features and full development of the jaws depend so much upon the management of the shedding teeth, that the character

and expression of the adult face will correspond with the judicious or injudicious treatment of the child's mouth.

The preservation of the temporary teeth during the formation of the permanent ones, is of great importance.*

Many persons suppose that decay of temporary teeth is an operation ordained by nature to

* "At the early periods of the formation of the permanent teeth, the connexion between their rudiments and the temporary teeth still exists, and the structure of the former would be probably injured by the too early destruction of that connexion; in addition to which, the loss of the temporary teeth before the permanent ones are ready to fall into their proper situations in the maxillary arch, has been shown to lead to the probable contraction of its span, and subsequent irregularity of the teeth.

"The temporary teeth, as long as they remain in the sockets, from being arranged in a continuous and even series around the arch of the jaw, tend to preserve its form, and prevent its contracting during the growth of the child, when every part of the body is undergoing continual alteration in form as well as in size."—Thomas Bell.

"The shedding teeth are, however, equally liable with the permanent ones to be affected by external caries, and for that reason they should be objects of equal care, as on their timely and proper shedding must depend much of the good

allow the permanent ones to protrude; it has however been remarked, that the shedding teeth, either from constitutional weakness, from their shape, or other accidental causes, suffer from external decay in the same manner as permanent ones in the adult.*

Whenever extensive decay has involved the shedding, or even the permanent teeth, they do not perform their functions with accuracy and precision; where the alimentary substances are soft, and admit of being easily broken down, a few masticatory movements of the front teeth divide what is contained in the mouth; but

or ill which will attend their successors; and although in some instances it may be improper to delay the extraction of a shedding tooth, more mischief has certainly arisen from premature extraction than from cautious delay."

PATTERSON CLARK.

* "It is certain that children's teeth are often affected with caries at the time of shedding, but it is as certain that this is not a means taken by nature for their expulsion. If the contrary opinions were adopted it might be attended with serious consequences; for the commencement of a dangerous disease might then be neglected or improperly treated, from a supposition that it were only a natural defect."—MURPHY.

when, on the contrary, the substances are of a fibrous or tough nature, the molar teeth must be employed, and a longer continuance of masticatory movements becomes necessary in proportion to the hardness of the food.*

In children whose molar teeth are extensively decayed and painful, mastication is imperfectly performed by the front teeth, which are not competent to bear such action, and either spontaneously drop out, or are improperly removed when they become loose.

At the same time, it not unfrequently occurs, during the operation of extracting the decayed temporary teeth, that one or more of the perma-

* "The teeth, during mastication, have sometimes very considerable efforts to support, which would inevitably loosen, or even detach them, were it not for the great solidity of their articulation with the jaws. The root of each tooth acts like a wedge, and transmits the force with which it is pressed to the parietes of the alveolar process. The molar teeth having the greatest efforts to support, have either several roots, or one very large single root. The incisors and canine have but one very slender root, and are not subjected to any very considerable pressure." — MAJENDIE'S ELEMENTS OF PHYSIOLOGY.

nent ones, wherein decay has commenced early, are removed; the irremediable consequences of such mal-practice are want of development of the jaw, and irregularity of the adult teeth to an indefinite extent.* This error is not perhaps discovered until the unfortunate patient arrives at maturity; for the permanent molar teeth, at the sixth year, resemble the shedding ones, both having their roots defective—those of the former not being fully formed, while the latter are undergoing absorption.

Temporary teeth occasionally remain in the mouth. The author has, in several instances, observed them in people of fifty years of age; then, whenever they drop out of the jaw, their

* "A mouth thus cleared looks clean, and is calculated to please parents who know no better; but experience will inform them that the second teeth do not come on so early as was expected after the *extraction* of the shedding ones; for the process of absorption of the roots of the first teeth, seems to open the way for the easier advance of their successors. Besides, young persons are thus often prematurely deprived of the use of their masticatory apparatus, to the detriment of their general health."—PATTERSON CLARK.

places are not filled up by permanent teeth: this is a deviation of nature, and may originate in want of vigour of the constitution.

From the above observations, it behoves parents and others to be careful in the selection of an experienced and judicious operator, whose practiced eye will readily recognize the different teeth.

It sometimes happens that the permanent front teeth make their appearance inside the temporary ones, without the roots of the latter being absorbed; they do not therefore loosen, or become detached from their sockets, and a double row of teeth is thus formed, which if permitted to remain in the jaw for any length of time, occasion a departure, more or less, of the permanent teeth from natural and regular positions.

The mischief arising from ill-timed extraction has been fairly shown, with the exception of appearances so conspicuous when the person has arrived at maturity. These, however, are fully considered in the third chapter.

SECTION I.

TREATMENT OF THE SHEDDING OR MILK-TEETH.

Of Tartar; how remedied—Of Plugging—Care requisite in Extraction—Mal-practices—Of Under-hung Jaw, and bandage for.

"DEFECTIVE organization, or structure of the teeth, has been pointed out as a cause of decay; indentations and the numerous cracks visible on their grinding surfaces, indicate a want of union of the enamel at those parts. Teeth thus situated will be sure to decay, with the intervention of moisture, &c.; this, however, is denied by some authors."*

That decay of teeth with injured or defective enamel is not universally the result, the author freely admits; he however maintains, that in every case of defective enamel decay will ensue, unless that portion of the tooth is freely exposed to the friction produced by the frequent use of a tooth-brush. Where the enamel be-

* Vide Murphy's Natural History of the Human Teeth, p. 60.

comes injured in a part not within the action of a brush, or to which it is not applied, caries will most certainly attach itself. This more particularly applies to the teeth of young persons, as those of elderly ones receive injuries of the enamel with impunity.

The collection of *tartar* about the necks of the shedding teeth frequently occurs; there is also occasionally deposited a greenish matter, of a destructive and pernicious nature, the immediate effects of which are decomposition of the enamel, and rapid decay of the teeth.

The effects of tartar on the gums,* render them liable to assume a soft and spongy appearance, inclined to bleed upon the slightest pressure; it moreover imparts to the breath a most unpleasant and unwholesome odour.

* "The gums being furnished with a smooth surface, and dense texture, and placed around the neck of the teeth, fill up the space between them; they are in consequence liable every moment to laceration, for in masticating hard and uneven substances, they are forcibly pressed upon by the edges and angles which these often present. This inconvenience always happens whenever their texture becomes soft, as in *scorbutic affections*."—MAJENDIE'S ELEMENTS OF PHYSIOLOGY.

In all cases the removal of tartar is the only effectual remedy. The quantity that is sometimes found adhering to primary teeth is surprising; but as the operation is unattended with pain, children readily submit.

So prone are the shedding teeth to collect tartar, that it requires, in some cases, more than one removal during the period they remain in the jaws; wherever a repetition of the operation is necessary, a want of cleanliness, and neglect in the use of a brush, were the principal causes of its re-appearance. The utility and necessity, then, of frequent brushing of the teeth is sufficiently manifest. By this is prevented decay in teeth whose defective enamel is favourable for the development of such disease; the friction of a brush, a soft towel, or even the finger, induces and preserves a healthy state of the gums, while the absence of tartar renders the breath pure and wholesome.

The only effectual preservative of temporary teeth, when decayed or defective in structure, is filling the cavity with a *stopping*.

The materials for this operation should be a

substance whose insertion can be effected without much force or pressure, as the primary set of teeth are, more or less, without stumps, and the stopping is only to continue a short time, unlike the permanent plugs necessary in decay of the second teeth.

Juvenile patients are proverbially restless and fidgety; the saliva is with the greatest difficulty prevented not only from filling the mouth, but entering the cavity of the tooth, thereby frustrating to a certain extent the object of the operator.

Tin-foil is the best material for plugging the shedding teeth; it is introduced with facility, requiring much less force than gold to enable it to accommodate itself to the decayed parts, and generally resists oxidation until the permanent ones are ready to appear.

Gold is of less use in these cases, as considerable pressure must be used to insert it into the carious tooth; more indeed than can consistently be used upon the jaws of young people, and therefore the folds of the gold leaf do not form a compact and solid substance.

When the permanent teeth are making their

appearance, being of larger dimensions than the temporary ones, they naturally require a greater space in the jaw; and if the jaw bones are not properly developed to allow sufficient room for the forthcoming teeth, it often becomes necessary to remove four of the shedding teeth to admit two of the permanent, and thereby prevent irregularities; the extraction of three teeth might afford ample space, but when this is practised the front teeth are apt to take erroneous positions.

It is at this time that the attention of parents ought to be directed to some habits which children frequently imbibe, and which should be corrected; if the child continue to keep the thumb in the mouth for hours during sleep, the front upper teeth must be naturally forced outwards, and the lower front ones inclined inwards, more than nature intended; the result is, that the upper lip projects beyond the under one, and thus injures the appearance and natural contour of the mouth. This is denominated the receding chin or rabbit mouth. The thumb employed in the above way becomes

a complete lever, and being affixed to the hand is used at pleasure.

Another habit is the turning the tip of the tongue to the roof of the mouth, or, as it is usually called, "sucking the tongue;" this action is effected by throwing out the under jaw bone from its articulations. The result will be an under-hung jaw, and the lower front teeth will consequently shut outside the upper ones.

A similar state of the teeth and jaw bones is induced when attempts are made by the inexperienced to regulate them, by the extraction of teeth in the upper jaw, and neglecting to remove an equal number in the lower.

The author has frequently suspected these habits in persons when the teeth are under examination. It may be almost superfluous to mention that the cure and prevention of the receding or projecting chin, are to be effected by a discontinuance of the causes.

In young subjects a bandage (such as is used in cases of fractured jaw bone) applied around the chin, and fastened at the crown of the head and back of the neck, prevents the jaw being thrust forwards.

CHAPTER III.

OF PERMANENT TEETH — NECESSITY FOR EARLY ATTENTION—OF IRREGULARITIES, AND OF MEANS USED FOR REMEDYING THEM—CASES, &c.

In comparing the teeth in the lower animals with those in the human subject, remarkable differences present themselves, from which the following facts may be deducted:—that *irregularities* are very rare in the inferior animals, while in the human race nothing is more common; and that decay, and other diseases connected with the teeth, are rarely observed in the brute creation.

Irregularities not only detract from personal beauty, but also from the beauty and durability of the teeth; for in cases wherein one or more front teeth in the lower jaw shut outside the upper, the entire shock of the jaws during mastication is received by three or four incisors,

and considerable injury is also occasioned by too much compression of the nerves and blood-vessels supplying the teeth.

The causes of decay in the human teeth, are probably identical with those which subject their possessor to a much longer train of diseases, and it is impossible to say but that particular complaints of the teeth may be inherited. Premature decay may thus be induced, from an unhealthy or deficient organization, and occasion irregularities from a want of development in the jaw-bones.

Intemperance of various kinds, combined with artificial modes of living, introduced by civilization, and the sudden transitions from heat to cold to which the teeth are subjected, have undoubtedly a tendency to prevent development of the bones, thus contracting the space for due arrangement of the teeth, and inviting decay.

Nations in northern latitudes are observed to have the teeth much distorted; these decay very rapidly; while others, in southern latitudes, particularly those who eat their food cold, as the

original inhabitants of New South Wales and New Zealand, have the jaws filled with teeth of a beautiful shape and colour, and remain exempt from disease up to extreme old age.

All the above causes, as well as those already enumerated in the preceding chapters, are in operation, and combine in producing the several states of disease to be considered in the following pages.

About the sixth year the milk-teeth loosen, and soon afterwards drop out, and the permanent ones take their places. This process commences in some persons at the fifth year, while in others it is delayed until they arrive at seven or eight years of age. Considerable importance ought to be attached to this period of dentition; the teeth should be frequently inspected, so that any incipient distortions may be corrected; "for as the twig is bent, so the tree's inclined." The teeth bear indeed a remarkable similitude to young trees, and may, like them, be made to assume any shape which utility requires. Should, however, this period be suffered to pass by, they rigidly adhere to their unnatural situations, until

brought back by energetic measures, applied for a considerable period.*

When the time has arrived for the shedding of the primary set, the jaws have become considerably enlarged, and the permanent teeth being ready to appear, the gums must of necessity occupy and form a dental circle of larger dimensions than their predecessors; to this may be attributed the several unnatural positions which the permanent set occasionally take, the eight molars excepted.

The order of dentition of the *permanent* teeth takes place generally in the following manner.

About the time at which the lower central incisors protrude from the gums, four large grinders, situated at the back of the jaw, may be expected; soon afterwards the upper central incisors make their appearance, followed by the lateral lower and lateral upper ones; next in

* "The time to effect any material alteration in the position of the teeth, is before thirteen or fourteen years of age; for after that time the sockets acquire a greater degree of strength; and if the irregularity be left to a much later period, it becomes a great deal more difficult, and frequently all attempts are fruitless."—Fox.

succession are the bicuspides, and the lower canine teeth; the remaining molars then succeed each other. When these last-mentioned teeth have protruded, considerable prominences may be seen and felt in the gums, where the upper canine teeth are situated; these are the last which appear, until the coming of the "wisdom teeth."

These occurrences generally occupy a period extending from seven to eight years.

From various causes, especially those referred to when treating of the milk-teeth, the permanent ones appear in positions deviating more or less from the natural.

Much depends on the judgment and skill of the dentist in regulating the extraction of the primary teeth, and in preserving them in the mouth to a proper period. In cases where they have been improperly and prematurely removed, the gums and alveolar processes shrink back to the permanent ones, which are not yet sufficiently advanced to occupy the places of the temporary set, so that the space naturally becomes diminished. An attempt is made by

nature to fill up the opening by inducing the adjacent teeth to approximate in such a manner as to prevent the jaw enlarging in proportion to the increased number and size of the permanent set; the inevitable result is, that, when the second set have protruded, they are forced into irregular positions, deteriorating much from the form and beauty of the face.

The permanent teeth are in every way of larger dimensions, and require the jaws to be of greater magnitude, than was necessary for their predecessors. Hence arises the propriety of bringing to aid all such means, as have a tendency to promote ample and full development of the jaw bones.

To satisfy the minds of parents upon the accuracy of the above observations, let the mouth of a healthy child be examined, whose teeth are perfect in every respect; at the age of three years, the teeth will be discovered nearly touching each other at their sides; if the mouth be examined at the fifth year, or a few months previously to the commencement of shedding, the teeth will be perceived to have

separated themselves to a considerable extent; this is effected by expansion of the jaw bones, an operation of nature to allow the permanent and larger teeth to assume correct positions.*

Irregularities in the teeth of the upper jaw are of frequent occurrence; in some instances one or both of the front central incisors project much beyond the dental circle. This prominency is usually denominated "*the rabbit mouth;*" occasionally a front tooth is found widely separated from its fellow; the four front teeth may, from a want of space, have uneven positions, so as to shut partly inside and partly outside the teeth of the lower jaw. The incisors, canine,

* "The expansion of the jaw (the consequence of the proportionable growth of the animal, and of its skull) necessarily separates the teeth of the first set, however compactly disposed, to a distance from one another, which would be very inconvenient. In due time, therefore, i. e. when the jaw has attained a great part of its dimensions, a new set of teeth springs up (loosening and pushing out the old ones before them), more exactly fitted to the space which they are to occupy, and rising also in such close ranks, as to allow for any extension of line which the subsequent enlargement of the head may occasion."—PALEY'S NATURAL THEOLOGY.

and bicuspid teeth often appear in erroneous positions.

Departures from the natural position of the teeth are as frequent, though not so apparent, in the lower as in the upper jaw; they however differ in some respects, principally by the defects being confined to the six front teeth, though it sometimes occurs that the bicuspides are affected. The four incisors are generally very regular when they first protrude, and maintain their positions until the time arrives for the appearance of the canine teeth, when, if the jaw bone is of confined dimensions, they have the effect of forcing the incisors behind one another, so as to resemble a double row of front teeth.

"*The projecting chin*" is also a consequence of deformities of the teeth, commonly the lower, though irregularities of the upper ones may produce it.

The projection of the lower front teeth prevents the upper taking their natural places; in those cases wherein the teeth of both jaws come in contact at their edges, the upper gradually

incline inwards; the lower teeth have an inclination outwards, and, as the teeth protrude themselves further through the gums, this deformity is at length confirmed.* This is readily accounted for by the canine teeth in the lower jaw protruding through the gums at a time when there is not sufficient space to admit them in a line with the incisors, and it is at this period that the under-hung jaw becomes manifest.

* "It is about the time of the completion of the first teeth that the projecting under jaw begins to show itself, and shortly before the appearance of the second set from the surface of the gums. At the first commencement it occurs that one or both of the first eye-teeth in the under jaw, are somewhat longer than the rest and are pointed on the top, so that in shutting the mouth the under jaw is thus prevented taking its proper direction. The child not being aware of the pernicious consequences, stretches out the lower jaw, attempts in that manner to overcome the free action of the teeth, and constantly is seen in the act of pushing the lower jaw outwards; this unobserved or neglected at first, grows into a determined habit; and a mischief at first easily controlled becomes the foundation of this defect; for the jaw gradually lengthens itself out from the articulation on each side, to relieve itself from the bad position in which it was placed, and thus the jaw becomes completely under-hung. The remedy in the very early stage of the deformity is very easy, simple, and satisfactory."—SIGMOND.

The generality of cases of irregularities of the teeth may very readily be obviated by mechanical pressure, though if no attention be paid until after the period of puberty, relief is only obtained with considerable difficulty by the dentist and a corresponding perseverance on the part of the patient.

The means resorted to by different practitioners in regulating distortions of the teeth are various. A knowledge of the principles connected with the teeth is only to be gained by long experience; and the dentist, however ingenious he may be, who is not acquainted with these principles, will be constantly foiled in his endeavours to rectify deformities, while the patient meets with nothing but disappointment, and, in many cases, an increase of the malady.

The principal methods in use are—extraction of one or more of the irregular teeth; pressure by means of springs attached at their extremities to other teeth, assisted by ligatures of strong silk; a variety of gags; there is also the wedge, a simple and effective instrument. All these mechanical contrivances can be applied without

inducing pain, and are attended with little inconvenience to the patient.

With reference to the extraction of irregular teeth, the operation should never be attempted but by those who have acquired considerable experience and dexterity, and have in their possession numerous instruments well adapted to individual cases. Cases are constantly brought before the author's notice, wherein fruitless attempts to extract irregular teeth were followed by detaching portions of enamel from a neighbouring tooth and loosening adjacent ones. Besides, it has sometimes occurred, not only in extracting irregular teeth in the front of the mouth, but also in teeth painful and decayed, that a sound one at the same time slips from its alveolar cavity; this untoward event arises from a want of skill or nerve in the operator. It may, however, be great consolation to the suffering patient to be informed that, in cases of this description, the sound tooth will, if re-adjusted in its socket, become securely and permanently fastened.

SECTION I.

TREATMENT OF IRREGULARITIES.

Mechanical Means employed in obviating Irregularities—Of Extraction and Regulation of the Teeth.

THERE is probably no part of a dentist's practice which has given rise to such discrepancies of opinion, and varieties of method, as the treatment and modification of irregularities.

The consequences arising from the mal-practice of extracting the temporary teeth have already been mentioned, as tending in a considerable degree to prevent the natural development of the jaws, and to predispose the permanent set to assume improper and unfavourable situations.

The front teeth in the upper jaw being larger than those in the lower, led John Hunter and other writers to suppose, that irregularities occur more frequently among the upper teeth.*

* "This irregularity happens much oftener in the upper jaw than in the lower, because the difference of the size of the two sets is much greater in that jaw."—HUNTER, p. 198.

It should, however, be recollected that the dental circle of the upper jaw is proportionally larger than the lower; and it will be found by observation, that the teeth in both jaws are equally liable to derangement; for the same cause which operated in the production of these derangements in the one will be just as effectual in the other jaw.

Although mal-treatment of the temporary teeth is occasionally a cause of irregularity, yet disproportion between the jaw and the teeth is the most frequent, arising from a want of development of the bones. The size of the teeth are determined on at an early age, while the jaw bones do not attain their full growth until a much later period; the constitution may be vigorous and healthy during the formation of the permanent teeth, and, from a variety of causes, become unhealthy and debilitated at the time the jaws are acquiring their greatest dimensions. As the proper growth of the body depends upon the constitution being healthy, so also must it determine the magnitude of the jaw bones.

When only a crowded state of the teeth is perceived about the age of puberty, or when irregularity is partial and in its incipient form, Mr. Bell, in his publication on the teeth, (page 94) recommends a very thin file to be passed between each tooth, so as to remove the slightest possible stratum of enamel. The author deprecates this method as dangerous in the extreme; a slight derangement may be thus regulated, but it will have the effect of causing the teeth to approach each other more closely, and, being deprived of a portion of enamel by the file, they are less able to resist the destructive effects of lateral pressure, which will hereafter be shown to be a cause of decay.

The correct treatment of teeth thus situated is related at page 55.

In young persons, when one or both central or lateral incisors have deviated from natural positions, with their edges standing obliquely in the jaw, they admit of being brought back to their proper places in a very satisfactory and expeditious manner. The following Case is an example.

CASE.—Master T——, aged seven years, had the left central incisor in the upper jaw turned. This was a confirmed deformity, as it had come in contact with the lower teeth; and on looking into the mouth, the *side* of the tooth presented itself, one half projecting outside, while the other had a direction inside the lower teeth. The outer edge became a source of irritation to the inside of the upper lip, and had produced an unhealthy sore.

There was a sufficient space to allow the tooth to be brought into a natural position, and in a line with the edges of the adjacent teeth, which was accomplished with an appropriate pair of forceps, and the tooth detained in that position by means of a ligature fastened to its fellow; the tooth having become firm in a few days after the operation, the ligature was removed, and it remains at the present period even in the dental circle.*

* "As neither the bodies nor the fangs of the teeth are perfectly round, we find that this circumstance often becomes a cause of their taking a *twist;* for, while growing, they may press with one edge only on the completely formed

This treatment is only applicable at an early age, as the sockets are at that period comparatively soft and yielding. When it is deferred until the body has obtained its full growth, there is a liability of their being injured by twisting the tooth round, and it does not so readily fasten. The case is however one of interest, inasmuch as the necessity for early attention to these deformities becomes obvious.

Considerable mischief arises from allowing the first set of teeth to remain in the jaws too long; the second set, in consequence, frequently take erroneous positions, as is illustrated in the following:—

tooth; by which means they will be turned a little upon their centre.

"The alteration of these is more difficult than that of the former; for it is in general impossible to apply, so long and constantly as is necessary for such an operation, any pressure that has the power of turning the tooth upon the centre. However, in the incisors, it may be done by the same powers which produce the lateral motion; but where these cannot be applied, as is frequently the case, the tooth may be pulled out entirely, and put in again even, or it may be *twisted round* sufficiently to bring it into a proper position."—HUNTER.

CASE.—Miss B—, aged ten years, daughter of Mr. B—, M.P., had the two *upper central incisors* within the line of the dental arch, as was manifest when the teeth were closed, these being inside those of the lower jaw; the remaining upper ones were in natural positions, viz. shutting outside the lower teeth. Neglect in removing the temporary teeth at the right period was the cause in this instance.

A brief description of the mechanical contrivance had recourse to, in rectifying this deformity, is subjoined; it is also applicable to a variety of cases. An impression of the lower front teeth was taken in wax, and modelled to an inclined plane, resembling a wedge; this was covered on all sides with plaster of Paris, leaving a small opening at the top, through which the wax was removed (having been previously immersed in hot water), the plaster then became a perfect mould, which, being thoroughly dried and hardened, was completely filled up with melted *block-tin;* on breaking away the plaster, the tin was found to correspond precisely with the wax impression, and fitted on the lower teeth

with accuracy, maintaining its situation as firmly as a rock. No *ligatures* were required, nor was there occasion for *caps* to prevent the back teeth coming in contact during mastication.

In a few days the irregular teeth were thrown so far forwards as to shut outside the lower ones; the use of the instrument therefore became unnecessary: nature perfected the cure.

The author has been the more minute in giving a description of the mechanical means employed in the above case, on account of its simplicity and great utility, and because it differs so much from those used by many dentists for similar distortions.

Mr. Bell, in his work on the teeth, has introduced an improvement on the instrument described by Mr. Fox. He mentions (page 99), that "Fox used a gold bar;" and also says, "that, instead of its being quite regular and plane, it should be accurately stamped to a brass cast of the upper teeth, so as to accommodate itself to all the depressions and elevations presented by the series of the teeth, excepting that it should stand a little for-

wards opposite the irregular tooth. It should be so long as to extend just beyond the first bicuspis in each side; two small holes are drilled through it at the part corresponding to each of those teeth, to the irregular one, and, if necessary, to any other to which it may be thought desirable to fasten it for greater security. *Ligatures*, consisting of strong silk twist, are passed through these holes, the ends of each being brought in front, and the bar is thus fastened, first of all to the bicuspides, and then to the irregular tooth. It is necessary that the ligatures should be applied quite up to the necks of the teeth, or they will slip off. The closing of the jaws is to be prevented by a method less complicated, and less liable to derangement, as well as firmer and more comfortable to the patient than the one formerly in use. It consists of a simple *cap* of gold, made to fit very accurately to a molar tooth, either of the upper or lower jaw; I have usually found the former the most eligible. The thickness of its surface must be sufficient to prevent the lower front teeth from interfering with the operation of bringing the

irregular upper one forwards by means of the bar."

"The ligature should be replaced about every other day, and the bar should be wholly removed whenever this is done, in order to *cleanse* it, as it otherwise becomes *offensive*, and *irritates* the edge of the gum."

The author presumes that, upon a re-perusal of the means used in the case at page 44, it will be sufficiently obvious that the simplicity of the method there made use of, and which so easily effected a cure, is a much less complex and inconvenient instrument than the improved one of Mr. Bell. In his, there is a band of gold to be fastened to the teeth by *three ligatures*, and gold *caps* made to fit other teeth, so as to prevent the lower front teeth coming in contact with the irregular upper ones, which they had done heretofore; the ligatures also required *changing* every other day, to prevent unpleasant consequences.

Now the instrument used by the author was a piece of block-tin, cast in a mould of the lower teeth, which fitted with accuracy. Neither pain nor inconvenience was produced; that portion

which projected above the lower teeth was filed so as to resemble a wedge (hence its name), with its plane inclining inwards; and when the jaws were closed, the inner edge of the irregular teeth touched the wedge, and were thus gradually pressed forwards to the line occupied by the other front teeth.

A great improvement may, however, be effected on the instrument described by Mr. Bell, so as to render two out of three ligatures unnecessary. This may be accomplished by attaching *caps* to the *extremities of the gold band*, and placing them on those teeth to which the two end ligatures were fastened. The caps may vary in number, in order to give a more extensive grinding surface for mastication; then, the only ligature to be used is the one which surrounds the tooth requiring to be drawn into the dental line.

The following case will readily illustrate the difficulties in the management of children's teeth, with which a dentist has frequently to contend, and which may be successfully overcome, provided the parent or guardian is reason-

ably patient and persevering. The mere removal of a tooth, may be easily performed by any operator; but to remove a tooth or teeth, which shall lead to a happy and natural appearance, requires both discrimination and decision on the part of the dentist, and a confiding perseverance on the part of the parent. As, for example, to obtain sufficient room for an eye-tooth (they usually come late) to correspond exactly with the eye-tooth in the opposite side of the jaw, if an incisor (one of the four front teeth) be extracted, to make way for a permanent eye-tooth, there will then be an eye-tooth on one side, awkwardly corresponding with a lateral incisor on the other side. It frequently happens that when a small grinder is removed, the late-coming eye-tooth will naturally and easily take its place, and appear to a superficial observer to be quite natural. This is the proper treatment of such a case. If, however, the eye-tooth present itself more to the front of the mouth, the removal of an incisor will permit the new eye-tooth to slip quietly into its place, and produce

the deformity hinted at above. These cases are common; they are readily performed, and the parents are easily satisfied, because informed there is no better way.

If the operator should propose any thing that would require time, (some months,) the parent will probably leave him for another and another dentist, and that too after a step has been taken by the first, which could only by *him* be carried to a successful issue; and thus the young person becomes the permanent victim of the unreasonable impatience or niggardliness of the parent.

Case.—Without adverting here to the want of development of the jaw, it will be sufficient to state that the Hon. Miss G— had arrived at an age when the shedding of the first teeth was complete, and permanent successors had supplied their places. The upper jaw was as full of teeth as it could contain, and yet only one of the eye-teeth had made its appearance. At a periodical examination of the young lady's mouth, the point of a tooth was seen protruding from the roof in the rear of the left lateral in-

cisor. This was the deficient eye-tooth. The appearance in such a place was unusual, and, as it gradually descended, it pushed out the adjacent incisor. Had the incisor been extracted, the new tooth would readily have fallen into its place, only meeting the under jaw within the teeth, while all the others closed outside in the usual way. This state of affairs is easily remedied by the use of the wedge (described at page 44). Had this course been pursued, the young lady's mouth would have been so far deformed that an eye-tooth would have to correspond with a small lateral incisor on the other side of the two handsome central front teeth. It was determined to extract the first small grinder instead, and, with much trouble on the part of the patient and operator, the new eye-tooth was trained to attain its proper place. The process of cure occupied several months, during which period the young lady visited the dentist about half a dozen times, to have the little apparatus that was employed altered. The teeth are fully worthy of the trouble, and the fair patient has now as uniform and beautiful a set of

teeth as can reasonably be desired. None but those who try the experiment can appreciate the difficulties of this case.

The eye-teeth are also frequently seen occupying situations more or less removed from the natural; these teeth, equally with the incisors, are much larger than their predecessors. The eye-teeth seldom appear before those on either side have obtained fixed positions in the jaw; so that in all cases wherein there exists a disproportion between the teeth and the jaw, the eye-teeth, from their lateness of appearance, must deviate from the dental circle, shooting inwards or outwards, or lapping over the lateral incisors. The following case is in exemplification.

CASE.—Master H—, aged fourteen, had the eye teeth on either side in both jaws projecting and forcing the lips outwards; the whole of the teeth appeared crowded, and no space existed for their falling into natural positions; the first small grinders were removed in both jaws, and in a short time the eye-teeth gradually fell into the dental line occupied by the others.

This treatment may originate the annexed

question. Why was one tooth removed to make room for another? or for what reason is a small grinder to be extracted to preserve an eye-tooth? The loss of an eye-tooth will detract more from the beauty of the teeth; the small grinders will much sooner decay, while the former are in every way stronger and more valuable when artificial teeth are required to supply the place of natural ones.

When the jaw bones are too narrow from side to side near their anterior parts which support the front teeth, then the following irregularities are produced:—the incisors in the lower jaw generally slide past each other, while those in the upper jaw more commonly project outwards; this, however, occurs generally in the upper central incisors, and materially affects the expression of the face. The following is an instance.

Case.—Master D—, aged fifteen, had two central incisors in the upper jaw, projecting in a frightful degree, with their edges turned in oblique and contrary directions. As the two first permanent molars (or six-years-old teeth,) were

in this instance very much decayed, their removal was determined on. This operation relieved the teeth generally from *lateral pressure,* and room was thus procured for the two irregular teeth to obtain less objectionable situations, with the assistance of the mechanical contrivances about to be described. A model of the mouth was taken in the usual manner, and a plate was made to extend across the roof of the mouth to the small grinders on each side; these were covered with caps, fastened to the ends of the plate, so constructed as to press against the *inner* edges of the irregular front teeth; a band was formed and soldered to the outside of the caps, and, when applied, pressure was directed against the *outer* edges of the oblique teeth, and kept up by a ligature being passed through a hole in the plate, and tied over the band in front; this was renewed daily. In a few days it was found necessary (from the gradual receding and turning of the teeth into natural situations,) to have the band cut; a small piece was taken out, again soldered, and re-adjusted to the teeth, so as to maintain a considerable degree of pressure on

their projecting edges. Several small pieces of the band were from time to time removed, as often as the teeth inclined towards proper positions, which was accomplished in about three months,—the projection being diminished by one-fourth of an inch. This case gave great satisfaction to all concerned, having resisted the treatment of an eminent dentist, and being given up by him as incurable.

The subjoined case is one of slight irregularity.

Case.—Miss D—, aged sixteen, daughter of the Hon. Mr. D—, had several of the front teeth in both jaws slightly irregular, which could have been seemingly remedied by passing a thin *file* between them; but whenever the *wisdom-teeth* had protruded through the gums, the result was a close approximation of the front teeth, and ultimate destruction by lateral pressure, as already illustrated, (page 41.)

In this case the posterior bicuspides in each jaw were removed; the vacancies soon filled up, by the front teeth inclining backwards, and the molars coming forward.—There being ample

space in the jaws, the wisdom-teeth appeared in regular and upright positions.

Whenever the six-years-old teeth are affected with caries (as they frequently are) they should be extracted; care must also be taken to remove an equal number of teeth in both jaws, or the dental circle will be decreased in the one, while that of the other jaw would not be diminished in proportion.

In the foregoing cases are described the principal irregularities to which the teeth are liable. They are selected from a number of similar ones. The mechanical means also admit of alterations, and can be adapted to every variety of distortion.

CHAPTER IV.

OF CARIES, AND OTHER DISEASES OF THE TEETH—OF THEIR DEFECTIVE ORGANIZATION—EFFECT OF LATERAL PRESSURE, AND ACCIDENTAL CAUSES OF DECAY—OF THE TREATMENT—STOPPING AND SCALING OF TEETH.

WITHIN the last few years the subject of decay in the teeth has occupied a considerable share of public attention. It was at all times considered to be a *desideratum* among the profession to discover means whereby decay might be best prevented,* and when incurred, to be

* However useful the improvements in medical science have been to society, in the alleviation and cure of diseases incident to the mouth and teeth, the preventive means, which Mr. Fox termed "the delightful secret," will, if prosecuted and brought forward, supercede the necessity of every other; since the want of preventive means has been one great cause of human misery, and the only reason why mankind do no longer retain these important organs for masticating their food, and preserving a perfect voice, the functions of which apparatus constitute, in some degree, a main spring of life."—L. S. PARMLY.

able, by the application of suitable remedies, to arrest its progress, and thus preserve the teeth in the jaws to the latest period of life.

The extraction of *molar* teeth involves a principle of much greater importance to the community at large, than, from a superficial view of the subject, it would be likely to obtain.

The very construction of the teeth should make it manifest that they were originally designed by nature to last equally with the living body. By various causes incident to civilization and society, the operations of nature have been frustrated, and destruction of the teeth has resulted.

There are few teeth, when decay has once attacked them, that gradually moulder away without the patient being tormented with pain, in some instances of an aggravated nature; and from the great inclination existing in the human mind to free itself from every inconvenience and painful feeling, extraction is resorted to, as the most common and certain means of obtaining relief.

How few people arrive at the age of twenty

without experiencing the effects of extraction! But the infliction of pain is trifling in importance, when compared with the almost irremediable injury arising from the loss of large grinding teeth. A tooth perhaps but slightly affected with caries, which, if attended to in time, would answer every purpose of mastication to an indefinite period, is, whenever pain supervenes, subjected to the operation of extraction. Is the pain inflicted by the instrument used the only evil to be dreaded? Certainly not. When the mouth is filled with the proper complement of teeth, and the dental circles are perfect, it will be seen, as the jaws close with a slight force, that the back teeth come in contact on their grinding surfaces, and alone receive the shock; and moreover, that the front teeth of each jaw scarcely touch each other, (when the molar teeth are fairly brought together) as the front teeth of the upper pass outside those of the under jaw.

Now, whenever a large grinder is extracted, its opponent in the other jaw becomes, to a certain extent, useless. Mastication is performed

by bringing two opposite surfaces into contact, accompanied by the rotatory motion of the jaws; the extraction therefore of a tooth deprives its antagonist of its grinding property, and in the course of time this tooth advances higher or lower (in whichever jaw it is situated) than the neighbouring ones; this is an effort of nature to fill up the space left by the extracted tooth.

It has been already remarked, that the molar teeth generally decay in pairs, and it will also be found that the corresponding teeth in the other jaw are liable to similar affections produced by the same causes.

Whenever a certain number of molar teeth have been extracted, the remaining ones are deprived of their antagonists, and mastication must then be performed with the front teeth. Persons in this situation will discover, upon shutting the jaws with some force, that the shock is received by the front, instead of falling on the back teeth, as was the case heretofore. They may then prepare for very speedily being deprived of all the remaining teeth, which either decay rapidly, from having their posterior surfaces ground away

by the sharp edges of those in the lower jaw, or become loose in consequence of the sockets being absorbed by incessant irritation, and ultimately drop out. These are inevitable consequences, though sometimes effected in a very gradual manner, and by insidious means.* The

* The loss, however, of a tooth is of more serious importance than we may probably imagine; there is always a disposition in the anterior and posterior, as well as the lateral sides of the socket, to approximate, and the pressure which the extracted tooth bore is thrown upon those contiguous to it; they have consequently to support an additional pressure, and become much sooner weakened than if the mouth had remained in its original state. A regular pressure on all the teeth is necessary, however, to their economy, and we will again consider another reason why the extraction of a tooth should not be resorted to without it is indispensably requisite. There is in the sockets a disposition to fill up, and thus the pressure of the two jaws against each other tends to counteract."—G. WAITE.

"It will be readily understood how, in absence of double teeth, an unusual pressure falls on the front, or single ones, every time the mouth is shut, the front teeth of the under jaw rubbing forcibly against those of the upper, grind down by attrition, or loosen each other. The proper remedy for this state of affairs is to fill up by *artificial* means the ravages of time, of heedlessness, and *tooth-drawing*, thereby restoring in a great degree, and in the proper quarter, the usual powers of mastication."—PATTERSON CLARK.

cheeks fall in, the voice changes, the nose and chin approach each other, and the countenance strongly indicates and characterizes premature old age.

Such are the daily melancholy consequences arising from the too common practice of indiscriminately extracting molar teeth, however much or slightly decayed.

The author cannot conclude this part of the subject without directing the attention of the medical profession, their assistants, and pupils, who are engaged occasionally in extracting teeth, to the above remarks, and he trusts that they will ponder well before depriving even the most humble individual of a tooth, as (in nineteen cases out of twenty) it could have been relieved of pain, permanently plugged, and would have remained in the jaw answering all the purposes of its office to extreme old age.

The principle involved in extraction is the following, that when the jaws are closed and the teeth are perfect, the molares of each jaw touch at the grinding surfaces, and the front upper ones pass over those in the lower jaw;

but, when the back teeth are extracted or worn down, the pressure in mastication is thrown upon the front ones, which not being intended by nature for masticating or grinding down hard substances, (as is apparent from their shape and situation) loosen by attrition, and one after another become ejected from the sockets.

There is certainly very little knowledge extant concerning the causes of decay, and also of the means by which the teeth, especially the front ones, are lost; a deprivation always to be regretted, but the more so when it occurs prematurely, or about the middle period of life.

SECTION I.

CAUSES OF DECAY.

I.—It has been shown that incipient decay was in some instances perceived in the primary teeth a few days after emerging from the gums, caused by defective organization, or by a superficial covering of enamel, which in many instances was altogether wanting in the centre of

the masticating surfaces. The same defects frequently exist in the permanent teeth. In some instances, several cracks are visible in the enamel, indicating imperfect union.

It is, during the formation and growth of the teeth, and previous to their appearance in the mouth, that the imperfect covering of enamel is produced; the "*six-years-old*" teeth appear to suffer more from this cause than any of the others. If particles of food are allowed to remain upon the surface of a tooth having a pitted enamel, they will in time insinuate themselves between the cracks, and decomposition rapidly follows. Before this event can take place, there must necessarily exist defective enamel favourable for the development of caries, and likewise the constant or occasional presence of extraneous and adventitious matter."*

* "Were it possible to keep every part of a tooth at all times perfectly clean, it is presumed that decay would be as slow to commence in the hollow as in the prominent parts. The reason why this species of decay seldom appears in front teeth, is, that they have but single pointed wedge-like shapes, on whose surfaces few indentations exist, as in the double teeth, for the lodgment and decomposition of food and moisture."—PATTERSON CLARK.

The enamel of the front teeth is sometimes pitted or honey-combed, and when moisture gains admittance, they become discolored, and decay ensues; this, however, is not so frequent as in the grinders.*

II.—Another and very common cause of decay, applicable alike to temporary and permanent teeth, is an over-crowded state of the mouth, described as "*lateral pressure.*"

Even in the young subject the injurious tendency of a crowded state of the teeth is as perceptible as in the adult. As a general rule it may be remarked, that in all cases where the teeth touch one another at the sides decay may be expected.

* "Though this disease attacks all the teeth without distinction, yet it may be considered as a general rule, that the grinding teeth more frequently suffer from this malady than the incisors and cuspidati; and that the bicuspides or small grinders, incisors, and cuspidati of the upper, are generally much more subject to caries than the same teeth in the under jaw. The large grinders are affected with this disease, most commonly on the grinding surfaces, whereas the small grinders, and front teeth generally, suffer from it on those sides which are in contact with the adjoining teeth."—LEONARD KOECKER.

The evils arising from premature extraction of the temporary teeth have been shown to retard the growth of the jaw and arrest its development; these defects will, however, be more apparent where the permanent set are only with great difficulty able to attain upright positions. The lateral pressure against each other is increased, while the unyielding substance composing enamel becomes injured; and upon the admission of moisture and lodgment of impurities, a black speck will be manifest, indicative of decay having commenced. Continued pressure is attended with precisely the same effects on the teeth as in every other part of the human frame, producing either absorption, or deprivation of vitality. This latter affection, when it occurs in the teeth, assumes the primary appearance of a dark speck,* and upon the admission

* "This speck gradually enlarges as the enamel becomes decomposed by the agency of the impure matter which constantly lodges there: it also makes its way to the bone, which from exposure to air and moisture, soon becomes soft and spongy, and is consequently well adapted for retaining the noxious principle that destroys teeth."—PATTERSON CLARK.

of moisture becomes more discoloured and ultimately decayed.

Nature occasionally obviates this disposition to decay from lateral pressure, when the jaws are contracted, by causing the front teeth to slide past each other; thus preferring irregularity to painful decay and ultimate destruction. However, if particles of food are allowed to decompose between these teeth, decay will often be the result.

The same rule that is applicable to molar teeth wherein decay commences by affecting them by pairs, from defective organization, is equally so from lateral pressure; for, as the same tooth in both sides of each jaw is formed at the same time, so the causes of decay, (whatever they may be,) will operate in an equal degree, and in a similar manner.

III.—The following causes may be said to be accidental and of an indirect character. They have influence only upon a single tooth, such as is evinced by an accident, fracture by external violence, or a tooth coming in contact with a stone mixed with particles of food.

The injurious tendency of *acids* to combine with and ultimately destroy the enamel, more particularly when it is not of the usual characteristic hardness, has the effect of denuding the teeth, and facilitates the wasting away of the bony substance or internal texture. This description of decay commences at the neck of the tooth, close to the edge of the gum; the former is, therefore, extremely tender when touched with any hard substance. Hence arises the necessity of avoiding the frequent use of liquids possessing acid qualities; and, in those instances where the enamel is known to be of a preternatural softness this circumstance cannot be too rigorously attended to. Ripe fruit, however, should not be avoided, as a moderate use of it rids the teeth of incipient depositions of tartar, which is the reason why they are whiter in the fruit season than in any other; when, however, it produces unpleasant sensations it may naturally be concluded that a defective state of the enamel exists.

There are some persons whose saliva appears

of a contrary nature to that generally secreted.* It is known by being of a thick, viscid, and stringy appearance, flowing into the mouth in small quantities, and producing an odour of its own kind; it is in these persons that a denuded

* "*Acid saliva.*—The case is that of a patient. On visiting him to-day he complained of having pain in all his joints; he has also an ulcerating sore on the posterior and upper part of the right thigh. Mr. Brodie tested his saliva and found it *acid.* 'It ought to have been *alkaline.*' Mr. Brodie also observed, 'It is a very singular fact, but Dr. Prout informed me that he has met with a great many persons who have *acid saliva*, and since he has named it to me, I have remarked the same circumstance myself in several of my own private patients. Now this is a very extraordinary fact, and should only be met with in cases where there is very great disorder of the system.'"—*Report of Hospital Cases.*—LANCET, 1832, VOL. II.

"The fluid of a salivary gland has never been directly analysed; it is always the fluid found in the mouth, which, in fact, is invariably found to be entirely composed of saliva. It has been found limpid, viscous, without colour or smell, of a sweet taste and a little heavier than water.

"M. Berzelius states it to be formed in the following manner:—water 992·9; a peculiar animal matter 2·9; mucus 1·4; muriate of potash and soda 0·7; tartrate of soda and animal matter 0·9; soda 0·2. It is probable that this composition of the *saliva* varies, for under certain circumstances it possesses a sensibly acid taste."—MAJENDIE'S ELEMENTS OF PHYSIOLOGY.

state of the teeth is so frequently detected, from its attacking them indiscrimately.

How far the use of a variety of *tooth-powders, tinctures, lotions, &c.* may injure the teeth, it is impossible to state. All person should be mindful of the quackery connected with advertisements, and should also confine themselves to substances recommended only by respectable dentists.

Considerable injury is inflicted on the teeth by the vicissitudes of cold and heat. The chemical changes produced by these causes deserve mention. The teeth of savage nations, as has been remarked, who partake of food and liquids only in a cold state, are generally exempt from the effects of decay.

Certain organic diseases appear to affect the teeth in various ways; for instance, those of consumptive people are frequently of a pearly whiteness, indicative of a want of vascularity, or debility of the circulating system.

There are other causes of decay which have their origin primarily in the alveolar processes, diseases of the roots of teeth, gumboils, affec-

tions of the lining membrance of the sockets or of the fangs, and many other maladies, some of which owe their origin to a want of cleanliness.

SECTION II.

TREATMENT OF DECAY, &c.

Necessity of early Attention—Remedies to relieve Pain and Inflammation—Utility of Plugs—Of Chalky Teeth.

When decay has commenced, either in a temporary or a permanent tooth just protruded through the gum, it is remarkable in how short a period a large cavity is formed; so rapid indeed is the process of decomposition, that in some instances a few months will be sufficient to form a larger decayed cavity than can be effected in old teeth after many years have elapsed from the first appearance of disease. The six years old molar teeth are frequently attacked with disease, and become the victims of extensive and rapid decay, in consequence of their being frequently mistaken for shedding teeth.

To understand how such extensive caries can be so speedily produced, attention must be directed to the difference of structure existing between the teeth of young persons and those of mature age. A young tooth has a large cavity, and its vascular, or living principle, is abundantly furnished. This very active condition of the vascular portion of a tooth is strictly in unison with other parts of the body of a child. The bony structure is not of the usual denseness, nor is its substance so compact as in an old tooth; the absorption of moisture is therefore facilitated, and decomposition quickly induced.

On the contrary, an aged tooth has very frequently its cavity obliterated by depositions of ossific particles, while its structure becomes hard; so much so, that when accident has removed the enamel, the bone assumes an appearance resembling the primitive covering. If the mouth of an old person be examined, wherein teeth have resisted decay, they will be found to possess qualities hard and brittle, as a piece of rock or crystal.

Incipient decay of the teeth may be detected

by a speck or line of a dark brown colour, in one or more of the depressions on their grinding surfaces; at other times it appears on the side of a tooth. This discoloured speck, sooner or later, breaks down, from an extension of the caries, and the bone becoming soft and spongy, an opening is made into the cavity, and by exposure to air and the admission of foreign substances, pain is induced.

It is always a duty on the part of the parent, therefore, to have the teeth inspected at short intervals, in order to discover decay, and to have the disease early eradicated. The places of such portions as are taken away should be filled up with a stopping of gold or tin leaf, introduced in an efficient manner. This operation is frequently performed at one sitting, and if decay be thus arrested in due time, with proper attention paid to cleansing the tooth, and no unforeseen accident occurs, it will endure to extreme old age.

Should a tooth wherein decay, from various circumstances, has been permitted to continue until it is extremely tender and painful, and

the cavity be exposed, the inflammatory symptoms must be relieved, and the tooth brought into a state fit for the reception of a plug; to answer this purpose, a piece of cotton-wool, dipped in mastic varnish, and gently introduced into the cavity, so as effectually to prevent the admission of air and moisture, will, in almost all cases, be attended with relief from pain, and a subsidence of other inflammatory symptoms.

Relief will be more certain, if precaution be taken to cleanse out the cavity of adventitious matter, and if a small quantity of camphorated-spirit on cotton be applied previously to using the mastic.

The cessation of inflammatory action is indicated, not only by the absence of pain, but it allows of the diseased portions being cleared out, and afterwards permanently stopped in the usual way. In some cases, several applications of the mastic are necessary, at intervals of a week each. It should, however, be recollected that in no instance can a tooth be preserved, or decay arrested, unless the cavity is hermeti-

cally sealed by the plug, to the utter and complete exclusion of air and moisture, which are the principal causes of decay.

Whenever a plug is prematurely introduced into a decayed cavity, or before the tooth is brought to a healthy condition, pain is liable to return, and on removing the stopping, matter and blood will sometimes flow.

A tooth wherein decay has made considerable havoc, and reduced it to a mere shell, is not unlike a worm-eaten nut, having a tiny hole only visible. This will break down by its inability to bear pressure of the opposite tooth, when hard substances are to be encountered. Many persons suppose (from the absence of pain and uneasiness), that the breaking in of a tooth was entirely the effect of accident at the time, and are not aware that decay of an insidious nature had existed some time previously. Now, although a tooth so situated may be permanently plugged, yet it is of little use for the purposes of mastication, if its grinding surface be lower than the neighbouring teeth. If there already exist a deficiency of molar

teeth (the result of extraction or neglect), so as to threaten the safety of the front ones by frequent collision in mastication, it often becomes necessary to lengthen the grinding surface of the decayed, and worn-down tooth to its original level, that it may come in contact with the opponent tooth, when the jaws meet each other, and thus be enabled to take its share in performing the office of mastication; the treatment for remedying this and similar defects are mentioned in the chapter on artificial teeth, Section II.

When a front tooth is slightly decayed, or when only a dark spot is to be seen, it may be eradicated by appropriate instruments; and, if kept perfectly clean, decay will make no further progress. If the disease have advanced to the interior of the tooth, the treatment must be the same as that recommended for the molares. The cause of decay in the front teeth arises from a crowded state of the mouth and neglect of cleanliness, as has been already indicated.

In considering the treatment of temporary teeth it was mentioned that the best stopping

is tin-foil; this substance corrodes by the action of air and moisture. The process, however, is the work of several years, and by the time this is accomplished, the permanent teeth protrude through the gums and supply the places of the first set; should the stopping be within the range of the tooth brush it will remain unoxidized. In some peculiar cases of decay, it is advisable first to use a certain quantity of tin-foil, and to fill up the remainder of the cavity with a layer of gold leaf.

Great attention must be paid that the stopping does not rest upon the gum, especially in cases where decay is situated at the side of the tooth.

When a portion of enamel has become detached close to the edge of the gum, decay spreads very rapidly to the centre of the tooth; when touched with a hard substance a thrilling pain is experienced. On removing the disease, the tooth will be found to be of a character denominated "chalky," and in a short period it crumbles away to the stumps, unless the cavity be discovered in due time, and prompt measures are used for preservation.

The application of camphorated-spirit appears to retard, in some measure, the progress of decay in these teeth, and prepares them for receiving a permanent stopping. It is a custom with many persons to wash the mouth after using the spirit, which should never be done, as its beneficial effects are thereby frustrated.

The structure of the wisdom-teeth is occasionally detected as being of a soft and chalky nature; they are the last that appear in the jaws, and are frequently the first affected by decay; their defective construction always predisposes to disease, which generally proceeds with great rapidity; it is also a common occurrence to find teeth similarly organized in various parts of the mouth.

For a tooth very much decayed and reduced to a mere shell, so that no stopping can be retained on account of pain or tenderness, and which is necessary to be preserved for purposes of mastication, a gold cap, as is mentioned in the fifth chapter, should be so constructed as to fulfil this intention.

SECTION III.

OF TARTAR.

How produced—Symptoms of—Effects of Uncleanliness—Treatment required—Causes of Scurvy.

THE gums and sockets of the teeth are subject to a variety of diseases. It is, however, not improbable, that peculiarity of constitution may be, to a certain extent, considered a cause. The saliva of many persons has been shown to be marked by qualities differing from those possessed by mankind in general. Earthy particles are more abundantly deposited around the necks of the teeth of such persons, and concretions are formed, resembling in every respect, those produced by tartar, and attended by similar consequences.

These concretions increase rapidly when friction with a tooth-brush is sparingly used.

Some authors have imagined, that tartar and other accretions collect principally in those parts of the mouth where the tongue is less frequently applied to the teeth. But it will be found that these substances are generally attached in

greater quantities to the outside of the molar teeth in the upper, and on the inside of the front ones in the lower jaw. To account for this, it must be mentioned that the *ducts* of the salivary glands, through which the saliva flows into the mouth, are opposite these situations; and therefore it is that tartar collects about the teeth nearest the terminations of these ducts.

The presence of tartar is always known by the gums being red, painful, swollen, and bleeding freely whenever a tooth-brush is applied, attended with a state of the breath exceeding the odour arising from the most putrescent substances, and contaminating the air around. The shock given to persons who unfortunately come near a mouth so situated, is better imagined than described; but so it is, that tartar has been suffered to remain for years unbroken, while particles of food which lodge about the teeth after every meal, pass into putrefaction, until the whole line of gums become diseased and detached from the teeth; the sockets are at length involved in the diseased action, become slowly, but surely, absorbed; the teeth appear

to have elongated, are found chattering and unsupported in the jaws, and are finally ejected from their positions at irregular and distant intervals. The mouth is thus left a complete wreck, and the constitution participates in the consequences.*

It is proper here to remark, although it will increase the chagrin of persons concerned, that

* "When it has increased so much as to touch the gums, (which very soon happens, especially in the angle between the teeth), it produces *ulceration* of that part, and a train of bad consequences. Often the gums receding from this matter, become very tender and subject to hœmorrhage.

"The disposition of the juices of the mouth to abound so much with earth, seems to be peculiar to some people, perhaps to some constitutions; but I have not been able to ascertain what these are. We find persons who seem to have nothing particular either in constitution or way of life, so subject to this accumulation, that the common methods of prevention, such as washing and brushing the teeth, have not the desired effect.

"It is very apt to accumulate on a tooth, the opposite of which is lost.

"I once saw a case of this kind, where the accumulation, which was on a grinder, appeared like a *tumour* on the inside of the mouth, and made a rising in the cheek, which was supposed by every one that felt it, to be a scirrhous tumour forming on the cheek; but it broke off, and discovered what it was."—JOHN HUNTER.

teeth so lost, are generally of the densest texture, and free from decay.

Such are tbe deplorable effects arising from the presence of tartar and other concretions.

Whenever the gums put on an appearance of redness, and bleed when touched, tartar will be found under their edges, (although the teeth look tolerably clean to a casual observer) and if removed by appropriate instruments, little more requires to be done; the gums return to a healthy state, and by the frequent application of a brush, and friction with a towel, the collection of tartar will be retarded.

It must, however, be remembered, that the removal of these incrustations can only be safely effected by the dentist's instruments, and persons should be careful of the bad effects attending the use of various tooth-powders advertised to remove tartar and whiten the teeth; that they do so, is true enough; but at the same time they injure the enamel, when decay, with its train of distressing symptoms, is an inevitable result.

The author wishes to direct the attention of

the medical profession to the condition of the gums, as described above, and recommends them to institute an inquiry into the state of the teeth, and to examine minutely the gums, in order to detect the cause of "*scurvy*," as it has hitherto been erroneously called, in preference to prescribing various useless lotions.

When the teeth are surrounded by tartar in considerable quantities, it appears improper to remove it completely at the first operation; some days should be allowed to intervene between the removal of certain portions. In aggravated cases, wherein some of the teeth were loose in both jaws, the above method had the effect of restoring them to their natural firmness, and quickly eradicating the fanciful disease ascribed to "*scurvy*."

SECTION IV.

INSTRUCTIONS FOR PRESERVING TEETH.

Necessity of Brushing—Hard Brushes—Prevention of Tartar—Of Tooth-powders, and of Tooth-picks.

A FEW general directions for preventing decay of the teeth, and preserving the gums in a healthy state appear to be necessary, and, it is presumed, will be found useful.

Care should be taken to keep the teeth free of all adventitious and extraneous substances. The grinding surfaces of molar teeth are the parts most favorable for the development of *caries*, while in the interstices between the front ones *tartar* is abundantly deposited. The teeth ought, therefore, to be well brushed night and morning, effectually removing all particles of food, which are so apt to insinuate themselves into irregular surfaces.

Teeth with defective enamel, especially those where dark coloured spots are visible, require to be indefatigably attended, and kept free of

substances already enumerated as likely to induce decay.

In the generality of cases *hard* brushes should be preferred. The great secret, however, lies in keeping every part of a tooth at all times perfectly clean. After the use of a brush, friction should be freely applied to the gums with a towel, when (if they be relaxed) a whitish matter will be pressed out, which, if allowed to remain, would probably become a foundation for tartar.

Vicissitudes of *cold* and *heat* are injurious to the teeth, therefore water used for cleansing the mouth should be only tepid; in summer it is sufficiently so, in winter it requires to be made warm.

Prepared Chalk is, of all substances, the safest as a tooth-powder, and it may be applied at pleasure. Its use is particularly indicated when the saliva possesses acid qualities, or after partaking of sub-acid fruits; it also effects the neutralization of particles of food lodged in cavities in and about the teeth, thus in a great measure rendering them harmless.

Tooth-picks are of service in removing extraneous matter, dislodging and preventing the formation of tartar between the teeth. The most useful are made of steel; a piece of watch-spring answers every purpose. It should be about an inch in length, pointed, and fixed in a neat ivory handle; the great elasticity of this substance is much in its favour. The author has observed that the teeth of persons who use tooth-picks as above described, are remarkably free of tartar, and are not much afflicted with decay.

SECTION V.

OBSERVATIONS UPON THE DESTRUCTIVE EFFECTS OF AMALGAMS, SPURIOUS CEMENTS, &c.

THE word "cement," as applied to the teeth, was first introduced by Mr. Patterson Clark, some time in the year 1825. He also affixed to it the term "anodyne," from its well-known efficacy in relieving the most aggravated cases of tooth-ache.

The "anodyne cement" is applied in a soft

state to a decayed tooth; air and other causes of pain are excluded; but it never becomes so hard as to supply the place of a permanent stopping, nor was it ever intended to do so; for when the inflammatory symptoms have subsided, which they generally do after one or more applications, it is removed, and the tooth, formerly so painful that the touch of an instrument could not be endured, now admits of the decay being cleared out, and the cavity permanently plugged.

From the success which attended this discovery, many imitators of the above method appeared, and the public prints teemed with their advertisements. Unfortunately for them and the public, the *modus operandi* of the "anodyne cement" was not understood sufficiently; the greater number supposed that it was simply inserted into a decayed tooth, there to remain permanently, and thus effect a cure by arresting the progress of decay, in the same way as a permanent gold stopping; others had the sagacity and honesty to clear away the decay (when it would admit it) previously to its application; the cements, therefore, were various in their compo-

sition, and in their effect. Some were to become instantaneously equal in hardness and durability to the original enamel—others were to fill up the decayed portion with so much precision, that the tooth would be restored to its primitive state; and in all cases the relief afforded was to be unbounded and permanent.

A little reflection upon the nature of decay and the causes, would very soon convince even the most quackish and credulous of the impossibility of preserving teeth from decay by any composition, which does not in the completest manner effectually keep out air and moisture.

In cases treated by the introduction of amalgams of mercury, &c. pain generally re-commences a few days afterwards; they are inserted into hollow teeth in a soft state, and the metal adapts itself to all the cracks and crannies of the decayed surfaces with great nicety; air and moisture are thus deprived of admission for a time, while the patient, relieved of pain, expresses considerable satisfaction. But, alas! a few days scarcely elapse before pain of an aggravated nature occurs, and if a sharp-pointed

instrument be applied, the stopping will be discovered to be loose, and to admit of being moved in various directions: the amalgam, in hardening, had contracted, according to its nature, while air, moisture, &c. had free ingress in the space left between the metal and the sides of the carious cavity.

In other instances pain does not occur, but the composition of amalgams being like the refuse, or cineritious part of melted metals, the particles break down piece by piece, and are washed out of the cavity by the liquid part of our food.

In particular cases wherein the pulpy portion of the nerve has, by a process of nature, become destroyed, and the tooth rendered insensible, these metals appear to a superficial observer to answer exceedingly well; no pain is experienced and the tooth performs its office. Sooner or later it invariably happens that when an extra pressure, or increased force is necessary to be used in breaking a substance more than usually hard, to the very great surprise and suffering of the unfortunate patient, the tooth also breaks

away, the metal drops out, and pain of an aggravated character ensues; this is a certain result arising from the decay not having been previously cleared away; or, if removed, the metal is very unfit to arrest the progress of decay by its inaptitude to hermetically seal up the cavity; such a result should have been anticipated, as caries was proceeding in an insidious and insensible manner.

A tooth thus loaded, even in favorable cases, quickly loses its natural and beautifully transparent colour, acquires a blackish hue, very like the dark teeth of incorrigible smokers and chewers of tobacco. So destructive are amalgams, that if introduced in a cavity made in a a *healthy* tooth, blackness and decay speedily ensue. Teeth thus treated are rendered very *brittle,* and are not able to resist even a common degree of pressure.

The author has had many opportunities of witnessing the direful effects of these amalgams, having to remove them frequently from the mouths of suffering individuals in consequence of a recurrence of *pain,* or the formation of

gum-boils, abscesses, &c. Such are only a few of the evils arising from the use of *spurious* cements; and it is hoped that sufficient has been said to deter persons from submitting to such practices in future.

CHAPTER V.

OF ARTIFICIAL TEETH.

INTRODUCTORY REMARKS.

It would be superfluous to give a lengthened account of the causes which lead to the necessity of constructing artificial teeth, or to enlarge upon their utility; the beneficial influence they have on the digestive organs, the general effect on the constitution, and the improvement and expression given to the face, are advantages which, at the present time, are very properly appreciated by society in general.

It is to be regretted that there is no work upon the construction of artificial teeth, containing a complete system for the guidance and information of those who are anxious to attain some degree of respectability in their profession.

Many and able are the publications treating of the natural history of the teeth, among which the celebrated work of John Hunter will ever

remain one of reference and study to experienced dentists, and if perused more frequently by gentlemen of the medical profession, the pain and sufferings inflicted by carious teeth would be mitigated. A correct knowledge of the physiology and diseases of the teeth would enable them to advise their patients respecting the best means of remedying defects in the mouth, which from time to time appear; not to mention that practitioners of medicine are the proper media between the public and the dentists. A knowledge of this branch of the animal economy enables them to give the necessary information to persons having defects in the mouth, or diseases in the teeth (perhaps unknown to the patient); such intelligence offered, even by an intimate friend, might be construed into officiousness, or a want of politeness. This objection could not be raised against the medical profession.

Other circumstances tend to circumscribe the utility of dentists, especially when artificial teeth are required; one is the secrecy with which

they are worn, and the manifest attempts made by patients to conceal from their most intimate friends and even from their family, that they possess such teeth. This prevents the beneficial comparison between teeth properly and improperly constructed; the public consequently suffer, while the unskilful escape detection. If communications were oftener made, they who suffer from wearing teeth badly constructed, and improperly secured, would discover they had not that in the mouth which adds to their comfort or affords pleasure.

It is a custom with some dentists to supply patients with front teeth only, and with these mastication must be performed; with front teeth the important office of mastication can be but imperfectly executed, and large masses of food are swallowed in a half-broken state; irritation of the stomach ensues, or, more frequently, spasms of that organ, and obstinate or habitual constipation. Now, all these evils are to be remedied by having artificial grinders fitted accurately, so that every part of the gums

receive equal pressure and the teeth feel like part and parcel of the jaw-bones.

There is another remark applicable to those who are compelled to wear artificial teeth: the *extraction* of the few remaining natural ones is an operation which some dentists deem it expe dient to perform previously to the model being taken on which the artificial set is to be constructed. The public should be informed that by the present improved methods, teeth are adapted with so much accuracy and precision, that where persons fortunately possess one tooth or more in a jaw, or even a few healthy stumps, they are of the most essential service in assisting to steady the plates, and are of advantage in other respects; therefore they should never be extracted.

When all the teeth in one or both jaws are lost, the alveolar processes or sockets become absorbed, and a change takes place in the contour of the face which is familiar to every one. The features are shortened, the nose and chin approach each other, the cavity of the mouth

is reduced, and articulation becomes difficult and imperfect.*

* "The too great extent of the lips, which, as soon as the *incisors* are lost, are longer than is necessary to go from one jaw to the other, and which touching each other internally, instead of meeting at the edges, are no longer capable of retaining the *saliva*. The want of teeth reduces them to the necessity of chewing with the lips constantly in contact, which again gives a peculiar character to mastication.

"The *saliva* is one of the most useful of the fluids concerned in the process of digestion; it favours the trituration and division of the food; it assists in its deglutition and transformation into chime; it also renders the motion of the *tongue*, in speaking and singing, more easy. The greater part of the fluid is carried into the stomach by the motions of deglutition; another part flies off in the form of vapour, and escapes with the air expired as it passes through the mouth."—MAJENDIE'S ELEMENTS OF PHYSIOLOGY.

SECTION I.

OF GRAFTING, OR PIVOTING.

When young persons require artificial teeth they are generally confined to the front of the mouth, and in the upper jaw.

The front upper teeth are liable to decay principally from lateral pressure, and occasionally from their shape, and they are more subject to decay than those of the lower jaw.

Whenever a front tooth has been injured by a blow or fall, or when decay has made such havoc as to deprive it of its transparent appearance; or, being deprived of enamel, it assumes a blackish hue and becomes a blemish, the remedy is safe and easy, and is obtained by performing the operation of *grafting*, about to be described.

The decayed tooth is taken between the finger and thumb of the left hand, and a very fine saw applied in the most gentle manner to its neck. By a succession of quick, light strokes of the saw, the decayed portion is cut away,

and the stump left in the socket; no uneasy sensation is produced. The decayed crown is sometimes cut off with a pair of excising forceps, but if the stump be brittle it may be splintered. The saw is therefore the safest instrument for this operation.

In the centre of every stump there is a little canal running to its extremity, which is occupied by the blood-vessels and nerves of the tooth. This canal sometimes requires to be enlarged, which is easily effected by a fine drill. A tooth of faultless shape and colour is now to be chosen, and, by the application of a file and other instruments, is made to fit with extreme nicety to the stump left in the jaw.

A piece of gold wire is used, one end of which is screwed into the body of the artificial tooth, while the other end is left of sufficient length to pass nearly to the termination of the canal in the stump. Much attention is required in regulating the length of the wire, for if too long it presses upon the nerve, thereby causing pain. The pivot requires a little fine silk passed a few times round it; it should then be dipt in mastic

varnish, and being introduced into the stump it becomes fixed. If this operation be properly performed, the edge of the gum will so cover the line of union as to defy detection by the keenest observer.

A tooth thus attached to a stump, will answer all the purposes for which it was intended, and will remain permanently fixed for many years. The following exemplifies mal-treatment.

Case.—Miss F— had her two front central upper teeth decayed, from mismanagement and neglect; a practitioner had fitted two artificial ones, by means of gold pivots, to their stumps, the decayed crowns being previously filed to a level with the gums. A short period only elapsed after this operation was performed, when the young lady became a great sufferer from pain in the stumps and front of the mouth: on applying to her dentist, "patience" was recommended. At length the pain became unbearable; her health suffered, and her friends resolved to take her to London for advice.

An experienced dentist was consulted, and after an examination, recommended extraction of the stumps as the only *remedy*. The friends

hesitated, and requested time for consideration. During this period, they consulted the author, who judged that the pain experienced for so many months, was caused by the pivots pressing upon the nerves. The removal of the pivots was attended with a discontinuance of pain; the gums were spongy and tumid; they were therefore scarified, and friction being applied for a few days, they assumed a healthy appearance.

The pivots were shortened, and again introduced into the stumps. The lady continued in town about a month, regained her former health, and, although three years have gone by, there has been no return of pain or uneasiness.

When the operation of "grafting" is performed on one or more of the front teeth, a careful examination should be made, so as to ascertain if any of the front lower touch the upper teeth, during mastication; should this be the case, the grafted teeth would soon loosen, and become a constant annoyance to the patient. The probable cause of this is, that the back teeth have been lost, either by caries or extraction, or

worn shorter by attrition.* This is a common occurrence, especially when the grinders are not of the usual and characteristic hardness.

SECTION II.

OF GOLD CAPS.

When the back teeth have become shortened, and do not touch their opponents in the opposite jaw, one or more of them on each side of either jaw, as may be found most suitable and convenient, should be covered with *gold caps*.†

* "Old people are often found to have very good sets of teeth, only pretty much worn down. The reason of this is, that such people never had any disorder in their teeth, or alveolar processes, sufficient to occasion the falling of one tooth. For, if by accident one tooth is lost, the rest will necessarily fail in some degree, even though they are sound, and likely to remain so, had not this accident happened; and this weakening cause is greater in proportion to the number that are lost. From this observation, we see that the teeth support one another."—John Hunter.

† "The proper remedy when an under pressure of the front teeth of one jaw is exerted against those of the other, is to cap the remaining teeth with gold."—Patterson Clark.

Indentations should be formed on the grinding surface of the caps, to correspond with those of the teeth; and for this purpose they require to be raised on a brass model of the grinders, a process well known to dentists of ability and skill.

From the same cause, namely, the shortening of molar teeth, the whole shock of the jaws, when brought into contact, is received by the front ones, which, by this incessant action, loosen, and one after another drop out of their sockets. When the front teeth become loose, they also appear elongated. It is a bad, though not an uncommon practice, to reduce them to the level of the neighbouring teeth with a file; this, however, affords but temporary relief; in a short period they again become lengthened, for inflammation had attacked the lining membrane of the sockets, and ejectment of the teeth from their cavity is a process set up by nature to relieve herself of the troublesome occupants.

When only a few molar teeth remain in the mouth, although they may be extensively decayed, it is essential to preserve them, for pur-

poses of mastication, and also to prevent the front ones falling a sacrifice to undue pressure; for this purpose the decayed molares should be plugged in the manner described in page 76, and afterwards restored to their original dimensions, by means of gold caps; this is an effectual way, and may be recommended to persons who have an antipathy to artificial teeth.

In some cases it is also necessary to lengthen the grinding surface of the back teeth, (although none have been extracted, but are worn away by a long course of attrition, through original defective organization,) or the front ones will be lost; and this is foretold by pain being occasionally experienced in front of the mouth, attended with other symptoms, indicating the commencement or presence of inflammation of the membrane lining their sockets.

The following case illustrates the utility and advantage of gold caps.

The Earl of D— had experienced considerable pain in the upper front-teeth; they were especially affected by whatever was taken into

the mouth, above or below a certain temperature.

The teeth were apparently perfect, none had ever been extracted, and, until of late years, he had never consulted a dentist, except to have them occasionally cleaned.

Upon examination, it was discovered that the inner surface of the upper front teeth were so worn away, as nearly to expose the nerves.

The above state of the teeth was occasioned by the grinding surfaces of the molares being worn down which allowed the points of the lower front teeth to come into too close contact with the inner surfaces of the upper front ones.

The remedy had recourse to was easy and simple; it consisted of covering with gold caps the whole of the double teeth on each side of the lower jaw. In some instances, the upper jaw is to be preferred, as the gold is not so readily observed.

The effect of this treatment is obvious; no further waste of the front teeth occurred, while the pain and other bad symptoms gradually subsided.

SECTION III.

OF THE ADAPTATION AND CONSTRUCTION OF ARTIFICIAL TEETH AND GOLD PLATES.

Much depends on the state of the gums in adapting artificial teeth. In some cases it is requisite to have a piece of sea-horse tusk fitted to the gums, into which teeth are to be inserted.* In other instances an advantage will be gained by using a gold plate.

When the front and some of the molar teeth are lost, the construction of artificial ones becomes more complicated and difficult than when the patient is deprived of the whole of the teeth.

* "A principal consideration with those who wear artificial teeth, is to have them appear perfectly *natural*, and no way of attaining this desirable object has yet been discovered, but by placing in human teeth of the same description as those whose places they are intended to supply. Teeth made of any other material are easily discovered to be artificial, especially when placed beside those formed by nature.

"No reasonable objection can be made to the wearing of human teeth in the manner they are now used, any more than the wearing of human hair in head-dresses."—Murphy.

It was heretofore the practice, and by the unskilful is yet followed, to clear the mouth of the remaining teeth or stumps, whether sound or decayed; this error has already been pointed out at page 103. For, it is obviously the more correct method to fill up with artificial teeth the spaces between those remaining in the mouth, than have recourse to the destructive and unnatural measure of extraction. It is most undoubtedly the duty of the dentist to preserve and not to destroy.

It is the practice of some dentists to fasten artificial teeth by means of strong silk ligatures; there is, therefore, very little nicety required in fitting them,* consequently the teeth round which the ligatures are fastened will loosen and be dragged from their sockets, when a larger piece is required, and if secured as before will be followed by similar results, until the poor sufferer is deprived of every tooth.

* "Some teeth are so ill made and unskilfully adapted, that they are troublesome to the wearer, and an impediment to speech and mastication, and even a greater blemish to the countenance than the want of teeth; those that are well adapted are, on the contrary, easy, useful, and ornamental."—MURPHY.

The following illustrates the consequences of mal-practice, and is worthy of perusal.

Case.—A young lady had a front upper permanent tooth unfortunately removed by mistaking it for a shedding one; the dentist endeavoured to fill up the space by drawing the adjoining teeth together with silk ligatures, this was followed by the destruction of its fellow, and also a lateral incisor; the next step was to put in three artificial teeth, they were also fastened to the adjacent ones with silk ligatures, and the result was (as might have been anticipated), the loss of two more teeth. The young lady, before she was eighteen years of age, had thus been deprived of *five front* upper teeth, and had the same system been continued a few more years, not a tooth would have remained in the upper jaw.

Ligatures should never be used to fasten artificial teeth; they should be so constructed as to be removed as easily as a glove.

When the front teeth are destroyed, and the gums have not much receded, a thin gold-plate should be accurately fitted to the mouth, and

extend as far back inside as the small grinders; one or more of which being capped, is sufficient to make all secure. To the gold-plate natural front teeth should be fixed; much care and attention are required in their adjustment, so that the lower front ones do not come in contact with the upper when the jaws are closed.

When the alveolar processes are absorbed the features become shortened; the teeth must therefore be set in a bone-plate, so as to form an artificial gum. In all these cases, whether bone, or gold plates are required, they are to be accurately adapted to the mouth; fastenings with clasps or ligatures are thus rendered unnecessary.

It has been remarked, that the eye-teeth generally are the last remaining in the mouth. Persons so situated frequently suppose that *front* artificial teeth only are necessary. This is easily accomplished, by placing front ones on a plate of gold or ivory, and securing them with *claws* or ligatures embracing the eye-teeth; it should, however, be remembered, that they

will loosen, and be dragged from their sockets, and the artificial ones rendered useless.

To remedy the defects above enumerated, the following method may be advantageously adopted. Let it be supposed that the molar teeth on each side of the lower jaw are destroyed, the front ones alone remain. In such a case artificial grinders should be supplied, made of the tusk of the hippopotamus, formed on a model of the mouth taken in the usual way, and fitted to the gums with much precision, so as to bear equally at all points; or a gold plate might be used, raised with equal care and attention, on which back teeth are to be properly secured.

It is a bad practice to form the teeth of two pieces, (as is sometimes done,) which are connected by means of a gold bar passing behind the front ones; it is impossible to unite the two pieces by a band, so as to afford comfort to the wearer, or a feeling of security in the mouth, and generally while masticating on one side, the other will be raised from the gums.

Considerable care is requisite in forming the grinders of such a length as to come in contact with their opponents, and that without the front teeth touching; if they were in a loose state, as they generally are, previously to the application of artificial grinders, they will then be restored to their original firmness. Should the above circumstance be overlooked the loss of the remaining front teeth will follow.

CASE.—Lady L—, had lost all the grinders of the upper jaw, the two wisdom-teeth excepted; their opponents had been attacked with early decay, and were removed. The remaining lower grinders were therefore useless, and mastication was imperfectly performed with the front teeth, which had become loose by the points of the lower front ones constantly striking against their inner surface. The gums of the upper jaw were spongy and painful, and pus occasionally oozed from their sockets, indicating a dislodgment of the whole upper front teeth. The case was remedied in the following manner. A plate of gold was fitted inside the upper front

teeth, and extended as far as the wisdom ones, which were covered with caps connected with the plate. The vacant spaces were then filled up with artificial grinders adjusted to the bite of their opponents in the lower jaw, so as to prevent the front teeth touching during mastication. Thus the irritating cause was removed, the gums became healthy, and the teeth regained their former stability.

Whenever a partial loss of molar teeth has occurred, painful, or perhaps only uneasy sensations are experienced near the front teeth; these are warnings of the destruction about to ensue. The front teeth first separate, afterwards take irregular positions, projecting outwards or inclining inwards, and soon become loose.

By filling up the spaces left by the lost molar teeth with artificial ones, and lengthening the grinding surfaces of those remaining in the mouth, such defects are obviated. To ensure this, much labour and skill are required; and the dentist

who can accomplish a piece of work, which will bring a mouth thus affected to a state equal to the natural one, and render the patient easy and comfortable, ranks with the most eminent in this department of his profession.

Here are two objects to be attained: *First*, to supply artificial teeth where, perhaps, every second or third natural one has been extracted, and those that remain are decayed or worn to stumps. *Second*, To lengthen the grinding surface of the remaining back teeth by means of gold caps, and thus render these decayed teeth or stumps of essential service in supporting and steadying the apparently complicated structure of artificial ones.

Bone in these instances would be useless without the assistance of gold plates; unless, indeed, the remaining back teeth were extracted, a mode of proceeding always to be deprecated, and very properly met by the generality of persons with aversion, frequently deterring them from having artificial ones.

An impression of the mouth is taken with wax; from this a plaster model is made and

afterwards cast in brass. A plate of gold is raised on one or more of the brass casts, so as to be a perfect stamp, and is extended over the decayed teeth or stumps, forming caps. Then between these caps, and having the gold plate for a foundation, are fitted molar teeth, and secured to the plate by means of gold pivots. Much care is necessary in fitting gold plates, that they may bear equally at all points.

When one or more double teeth are slightly decayed, but very tender, they should be capped with gold and thus preserved, as they give great security to artificial ones; adventitious substances are thereby prevented coming in contact with the tender teeth; they quickly return to a healthy state, and decay makes no further progress.

This is illustrated by the following

Case.—A gentleman, a member of a learned profession, had lost nearly all the grinders in the lower jaw; one of those that remained was a wisdom-tooth, slightly affected with decay, tender at the neck, and very susceptible of atmospherical changes. The front teeth came in contact at the cutting edges, and were much

worn down; nearly all the upper double teeth had become useless for want of opponents. To remedy these evils a gold plate was accurately fitted to the gums, and extended so as to cover the remaining double teeth, including the tender wisdom one, and excluding air and all irritating substances. Thus protected it became easy and useful. The spaces were filled with artificial grinders, so adjusted as to prevent the front teeth touching, and consequently no further waste ensued by attrition.

FINIS.

Howlett and Brimmer, Printers, 10, Frith Street, Soho.