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PRACTICAL DIRECTIONS

FOR

PRESERVING THE TEETH,

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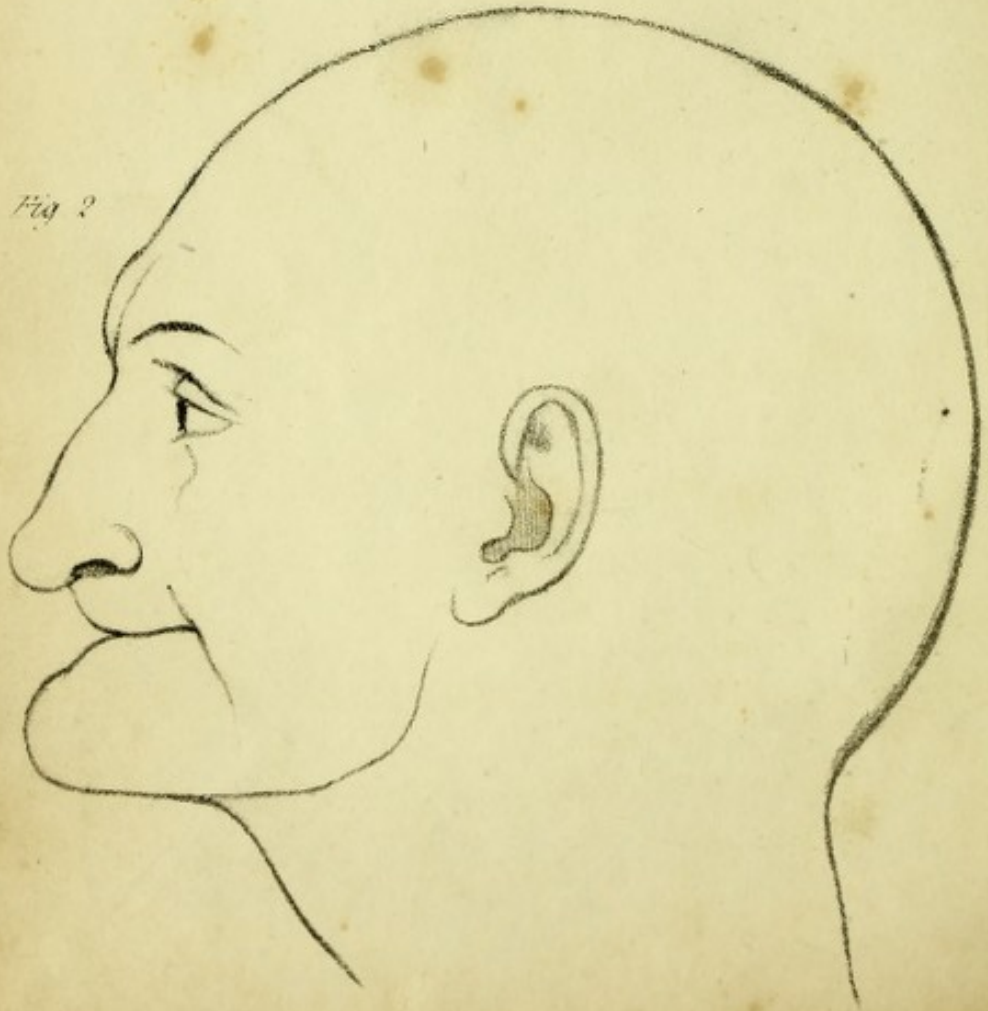

For Mr Clark's Work on the Teeth

PRACTICAL DIRECTIONS

FOR

PRESERVING THE TEETH;

WITH AN ACCOUNT

OF THE MOST MODERN AND IMPROVED METHODS

OF

SUPPLYING THEIR LOSS;

AND

A NOTICE OF

AN IMPROVED ARTIFICIAL PALATE,

INVENTED BY THE AUTHOR.

ILLUSTRATED BY PLATES.

BY ANDREW CLARK, DENTIST.

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NOTICE.

THE object which the author had in view in the composition and compilation of the following pages,—for they are partly composed and partly compiled,—was not to teach the public how they may contrive to dispense either with the preventive or restorative operations of the dentist, but merely to put them in possession of as much simple and practical information as may assist them in judging whether these operations are or are not performed in the best manner.

It need not be concealed that, in every profession, prescription and operation, which relates to disease, disorganization, or decay of the body, people are more exposed to the impositions of quacks and the bunglings of the ignorant than in any other matters whatever. Whether this arises from the nature of the

subjects themselves, from the fashion of not making them matters of popular study, or a disposition to proceed by stealth and concealment, the author shall not enquire. It is enough for him,—knowing, as he does, from his own experience, that people are often improperly served, and the pretended cure made an aggravation of the disease, in all the branches of his profession,—to contribute his mite to the general information, in the hope that it may be instrumental in removing the evil.

In what he has stated, he feels none of the ambition, and knows that he possesses none of the attractions of a mere author; but, as everything that he states is the result of long and careful experience, he hopes it will not be the worse received in consequence of the plain manner in which it is delivered.

While he has endeavoured to afford information to the public, he feels convinced that no dentist, who is worthy of the name, can take offence at anything he has advanced. The in-

terests of the truly respectable part of every profession are identified with those of the public; so that he who attempts to make the public better able to judge between the right and the wrong, necessarily renders a service to those who are disposed and able to do rightly.

With these views the author submits his little book, to the public and to the profession, without forwardness and without fear.

76, *Lower Grosvenor-street,*
May 1, 1825.

CONTENTS OF PART FIRST.

INTRODUCTION. ..... Page 1

CHAPTER I.

SECT. I.—OF THE JAW-BONES.—Description of their position and uses. 4

SECT. II.—DISEASES OF THE JAW-BONES.—Of the deep-seated abscesses in the jaws.—Prevention and cure.—Dangerous diseases in the bones under the eyes.—Causes, methods of preventing them, and the cure. 5

CHAPTER II.

SECT. I.—OF THE ALVEOLAR PROCESSES, OR SOCKETS OF THE TEETH. 10

SECT. II.—DISEASES OF THE ALVEOLI.—Connexion of the alveoli with the teeth.—Wasting of the alveoli.—Causes of decay.—When the disease spreads over the roof of the mouth, the loss of the palate is occasioned. 11

CHAPTER III.

SECT. I.—OF THE GUMS.—Their properties and uses treated of. 13

SECT. II.—DISEASES OF THE GUMS.—Gum-boil.—Cause of, and cure.—Teething in infancy, considered as being the cause of many sufferings, and even death.—Treatment of.—Excrescences of the gums. ..... ib.

CHAPTER IV.

SECT. I.—OF THE TEETH.—Number and names of the shedding and permanent teeth.—Description.—Complement sometimes defective and sometimes redundant.—Singular case of defective teeth.—Irregularity, cause of, prevention and cure.—Teeth of various animals compared.—Their uses, &c. 17
SECT. II.—DISEASES OF THE TEETH. 25

CHAPTER V.

OF EXTRACTING TEETH.—The instruments used for this purpose.—The accidents which sometimes occur in performing the operation. 40

CHAPTER VI.

OF A PROJECTING CHIN. 44

CONTENTS OF PART SECOND.

INTRODUCTORY REMARKS. 47
—Modes of supplying the loss of teeth by artificial means.—Loss of the teeth always the most frequent in civilized society.—The probable causes.—Effect of the loss of the teeth on the constitution.—Effect on the personal appearance.—Loss of the teeth now comparatively of little importance, in consequence of the great improvement made on artificial ones.—The profession of the dentist brought into disrepute by the awkward attempts of ignorant persons.—The public ought to be aware of every method known for the supply of artificial teeth, in order to prevent being imposed on.—Anecdote of a portrait-painter turned dentist.—Prejudices against the use of artificial teeth, and the causes of the same.—Curious customs of foreign nations with respect to the teeth. ..... ib.

CHAPTER VII.

OF NATURAL TEETH, AND BONE, FORMED INTO TEETH AND GUMS.—Early methods of supplying artificial teeth.—Fastening natural teeth to the adjoining teeth by silk or wire ligatures.—Teeth made of bone.—Natural teeth rivetted to artificial gums.—Quotations from other writers.—Instance of the loss of teeth through the use of ligatures.—Strange methods of affording relief to persons suffering from the use of badly-constructed artificial teeth —Of the Ossimeter, an instrument for fitting bone more accurately to the mouth, invented and used by the author.—Method of adapting bone to the gums. 59

CHAPTER VIII.

OF COMPOSITION, OR PORCELAIN TEETH.—Nature and appearance of.—Method of making.—Difficulties attending the fitting of them to the gums.—Disadvantages of.—Opinions of others respecting them 69

CHAPTER IX.

OF GRAFTING OR RIVETTING TEETH.—Excellence of.—Method of doing it. 73

CHAPTER X.

OF GOLD PLATES USED IN SUPPLYING ARTIFICIAL TEETH.—At once the best and most difficult method of supplying artificial teeth.—Method of making them.—Many of the first dentists never attempt this method.—Danger of wanting the back teeth.—Materials to be used.—When this mode ought to be adopted and when avoided.—This method successful where every other must fail. 76

CHAPTER XI.

OF CLEANING THE TEETH.—Admits of a great variety of methods of performing.—Much depends on the method in which this operation is performed.—Appearance of healthy

and of diseased gums considered.—Stopping decayed teeth.—Effect on the teeth.—Tooth-powders, &c. 82

CHAPTER XII.

Of Artificial Palates.—Various attempts made for supplying.—Description of the human palate and its diseases.—Improved Palate invented by the author, description of.—The disadvantages to the public arises from the ignorance of medical gentlemen on mechanical subjects. 86

Extracts from medical journals in favour of the author's improved metallic palate. 95

PRACTICAL DIRECTIONS

FOR

PRESERVING THE TEETH.

PART FIRST.

INTRODUCTION.

THE mouth, whether we regard its beauty or its utility, is one of the principal portions of the human subject. Around it the smiles are collected; and it is to its appendages that are connected the muscles which give to man those peculiar expressions and movements of feature that distinguish him from all other animals. Upon its form are stamped no uncertain indications of the fixed character of the individual; and the variations of it tell the changes and intensities of every passion. It is also the seat of the voice,—man's chosen and peculiar exercise,—that which enables him to combine with, to instruct, or to command his fellows, and of which the proper and perfect exercise has ever been regarded as the most noble

and most powerful of his endowments. The mouth is also the receptacle for the nourishment of the body, and the apparatus from which that nourishment receives the first stage of its preparation: it is in fact the part, from the diseases or decays of which man feels the severest privations; and the only seat of the senses which is indispensible to existence. Consisting of more parts than any of the others, it is more liable to derangement and disease; and having some of those parts in more severe and frequent exercise, it is more liable to partial mutilation, and the mutilations to which it is most generally subjected—the discoloration or loss of the teeth, and the wasting away of the gums—occasion not only an inconvenience, but a deformity, exceedingly vexatious to the patient. The ears may become deaf without any change of their external structure; the eyes may become dim, or even sightless, and lose little of their external lustre; but if the teeth are discoloured, a diseased appearance is given to the whole face; and, if the teeth are gone, the whole expression of the countenance is changed—it seems a ruin—the wreck, the mockery, the caricature of its former self.

It is with a view of calling attention to this important part of the body, of preventing disease and decay, where they can be prevented, of rectifying natural defects and derangements, and of pointing out how positive dilapidations of the teeth and the palate (the parts most liable to be

destroyed) can best be replaced, that the following pages have been written. The object of the writer is not to obtain the praise of authorship for himself, but to confer substantial benefit upon his readers, and therefore he has made his little book as unostentatious and simple as it is possible for language to make it. In the first part he has explained the structure of the parts, and noticed their diseases and the remedies; and, in the second, he has made such observations on artificial teeth and artificial palates as he thought would be most useful.

The subjects which require to be described in this part are four,—the maxillary, or jaw-bones; the alveoli, or sockets of the teeth; the gums, or soft sheathing, for the protection of those sockets against hard substances; and the teeth themselves. To each of these a chapter is devoted,—one section consisting of a description of the parts, and another of the diseases to which they are subject.

CHAPTER I.

DESCRIPTION OF THE BONES WHICH SUPPORT THE TEETH AND THEIR SOCKETS; WITH THE DISEASES TO WHICH THEY ARE SUBJECT.

SECTION I.

DESCRIPTION.—Each jaw is originally composed of two bones, united by a suture at the front of the mouth. In the upper jaw this suture remains visible through life; but in the under jaw it, in course of time, forms so nice an adhesion as that the whole not only seems, but becomes, a single bone. In the infant subject, the bones of both jaws have cavities, in which are contained the rudiments of the future teeth. The jaw-bones, different from all other bones in the subject, (the teeth excepted,) cease to grow in breadth, in front, after the first twelve months; and thus, though they afterwards continue to extend, in length, at their posterior extremities, the fore parts never form segments of a larger circle. This circumstance frequently occasions an irregular formation of the second or permanent set of teeth; as these often, if not always, come larger than the first ones, without any corresponding increase of the bones in which they are

set; and so the fore teeth are often forced into oblique directions, and occasionally (in the case of very narrow and confined jaws) protruded out of the mouth altogether. It is almost unnecessary to observe, that the bones of the upper jaw are connected with those of the head and face, and remain immoveable; and that thus all motion, whether for masticating, for speech, or for any other purpose, is confined to the lower. Its articulation is very free, admitting of lateral as well as verticle motion, though not to the same extent, and, from the insertion and structure of the muscles, shutting with very considerable power.

In the most general, and also the most regular, beautiful, and convenient conformation of the jaws, the teeth of the lower jaw, which is a segment of a smaller circle, fall within those of the upper. When this is not the case, the result is an unpleasing projection of the chin, and also a slight affection both of the voice and of the operation of masticating. As this conformation is both a deformity and an inconvenience, it should be remedied at as early a period as possible; and if it be taken in time, its correction is neither dangerous nor difficult.

SECTION II.

Diseases.—Those diseases, if attended to in time, may in general be cured by the dentist; but if they

be neglected, the aid of the surgeon is required, and even with that they prove exceedingly troublesome, and sometimes fatal. For instance, when a tooth, having a very large fang, becomes diseased, it is apt to communicate the disease to the bone, and a deep-seated abscess is thereby formed in the jaw. An abscess of this kind frequently discharges matter through the cheek, and when it heals, which is always tedious, it leaves an unsightly scar, and often a cavity of considerable depth, which never afterwards fills up. This external and disfiguring abscess may be prevented from breaking outwards, by an artificial opening internally; but this opening is troublesome, both in the original making and the subsequent treatment; and, therefore, the safe plan is to remove the diseased tooth before the abscess begins to be formed.

In cases of pain seated in the jaw-bones, it is of importance to know whether it proceeds from tooth-ache, properly so called;—namely, disease or decay of one or more of the teeth; or be merely a nervous affection of the bone or periosteum of the jaw. If proper tooth-ache, and the disease can be traced in the tooth itself, extracting will give immediate and effectual relief; but if nervous, extraction will be of no use; and, if under such circumstances, a sound tooth be extracted, it should immediately be replaced, where it will soon become as firm as ever. Even a diseased tooth,

which is not too far gone, may have the diseased part filed off, or the perforation cleaned, and carefully stopped up; and then, if it be immediately returned into the jaw, it will fasten, and become serviceable; while, in all probability, the bleeding occasioned by the operation will remove, or at any rate mitigate, the pain. In purely nervous tooth-ache, the corresponding side of the tongue is apt to be affected, which circumstance may be of use in directing to the best method of affording relief. Sometimes this sort of tooth-ache is only symptomatic of other complaints,—it often proceeds from an improper state of the stomach, or bowels, and when these are attended to, the tooth-ache generally subsides. This is frequently the case with females, during the early stage of pregnancy.

There is a still worse disease of the jaw-bones, which has its seat in the cavity, in each side of the upper jaw: the *Antra of Highmore*, large cavities in the middle of each superior maxillary bone, between the eye and the roof of the mouth, and lined by the mucous membrane of the nose, are liable to several morbid affections. Sometimes their membraneous lining inflames and secretes pus. At other times, in consequence of inflammation, or other causes, various excrescences and fungi are produced in them. Their long parietes are occasionally affected with exostosis, or caries. Extraneous bodies may also be lodged, and, as has

been asserted, insects may be generated within them, and cause afflicting pains for many years. Abscesses in the antra are by far the most common. Violent blows on the cheek, inflammatory affections of the adjacent parts, and especially of the pituitary membrane, lining the nostrils, exposure to cold and damp, and, above all things, bad teeth, may produce inflammation and suppuration in the antra. The first symptom is a pain, at first supposed to be tooth-ache, particularly if there should be a carious tooth at this part of the jaw. This pain, however, extends more into the nose than that usually does, which arises from a decayed tooth; it also affects, more or less, the eye, the orbit, and the situation of the frontal sinuses. But even such symptoms are insufficient to characterise the disease, the nature of which is not unequivocally evinced, till a much later period. This complaint is, in general, of much longer duration than one entirely dependant on a caries of the tooth, and its violence increases more and more, until at last a hard tumour becomes perceptible below the cheek bone. The swelling by degrees extends over the whole cheek: but it afterwards rises to a point, and forms a very circumscribed hardness, which may be felt above the back grinders. This symptom is accompanied by redness, and sometimes by inflammation and suppuration of the external parts. It is not uncommon, also, for the outward abscess to commu-

nicate with that within the antrum. The circumscribed elevation of the tumour, however, does not occur in all cases. There are instances in which the matter makes its way towards the palate, causing the bones of the part to swell, and at length rendering them carious, unless timely assistance be given. In some cases the matter escapes between the fangs and sockets of the teeth; and there are others in which it makes its exit at the nostril of the same side,—especially when the patient is lying with his head on the opposite one, in a lower position. If this last mode of evacuation should be frequently repeated, it prevents the tumour, both from pointing externally and bursting, as it would do, if the purulent matter could find no other vent. This discharge of the pus from the nostril is, however, not very common.

The method of cure consists in extracting one of the *dentes molares*, or grinding teeth, on the side affected; and then perforating through the socket into the bony cavity. After which, a mild injection may be occasionally employed, to cleanse the sinus.

CHAPTER II.

OF THE ALVEOLAR PROCESSES, OR SOCKETS OF THE TEETH.

SECTION I.

DESCRIPTION.—The second substance to be described, is the *alveolar processes.* These *alveoli* consist of a bony substance, which covers the grinding edges of the jaw to a considerable depth, and forms the sockets for the teeth. The existence of the alveoli seems to depend entirely on the teeth, since they begin to be formed with the teeth, accompany them in their growth, and disappear, when, from any cause, the teeth are lost, as may be seen by examining the mouth of any person who has sustained that casualty.

In every case where, by accident, by disease, or in the course of nature, the teeth are lost, the alveoli are received by absorption into the system; in consequence of which, the jaws become greatly diminished in depth. This occasions that approach of the nose and chin, so observable in old age.

In artificial teeth, the place of the alveoli is supplied by bone, on which natural teeth are artificially fixed; and by this means the face is restored to its former shape.

The alveoli of the upper jaw, shooting off from the teeth, across the mouth, in thin horizontal lamellæ, form the arch of separation between the mouth and nose.

SECTION II.

Diseases.—The alveoli are so much connected with the teeth, that whatever injures the one affects the other. At the birth there are no alveoli, because there are no teeth to require their support. The principal disease, therefore, to which they are subject is, a wasting away, by absorption, in after life. In early life, this must be regarded as a disease; although, in old age, after the teeth have fallen, and when the secretions become scanty and languid, it is quite natural.

At earlier stages, a wasting of the alveoli takes place, in consequence of constitutional diseases, or of accidents; such as long-continued inflammation, scurvy, salivation, &c. It usually commences at the upper thin edge, causing the gum to recede, and exposing the neck and fangs of the tooth, until, deprived of its natural support, it drops out.

When the disease spreads across the roof of the mouth, and attacks the arch of separation between it and the nose, the loss of the palate ensues.

Another alveolar disease is, a filling up of the sockets, commencing at the bottom, and gradually ejecting the teeth. The same causes seem to be

productive of both diseases, although the latter is, occasionally, found to commence at the ends of the fangs, which sometimes swell and unite with the sockets; but, as the disease can exist only in the thin membrane, or periosteum, which covers the fang of a tooth and connects it with the socket, copious bleeding of the gums will sometimes effect a cure. Where a tooth appears to be ejected gradually, the disease may be checked by extracting it, and, having filed down the fang, to the size of the diminished socket, it may be successfully replaced. A case may occur, too, where mere filing of the projecting edges of the tooth will have the desired effect. This operation requires great care in the performance, as the jarring of the file will be apt to loosen the tooth and cause it to fall out; nor must the cavity of the tooth be exposed, as, in that case, tooth-ache would be induced.

Such, however, is the connexion between the teeth and alveolar processes, that it is difficult to describe the one without anticipating the description of the other; and, therefore, whatever of importance, connected with them, has been omitted here, shall be noticed when the teeth come to be treated of.

CHAPTER III.

OF THE GUMS.

SECTION I.

DESCRIPTION.—The gums are that very vascular and elastic substance which covers the alveolar arches, and has as many perforations as there are teeth. It is attached to the necks of the teeth, and covers the alveoli; and, being of almost cartilaginous hardness and having very little sensibility, it cannot suffer much either of pain or injury, when wounded by a sharp instrument. This consideration ought to do away with the too prevalent but vulgar objections against lancing the gums, and thereby affording relief to suffering infancy.

SECTION II.

DISEASES.—The gums are very subject to disease, arising from various causes. Of these, the *gum-boil* is the most common. Gum-boils are generally produced by diseased teeth that are neglected, or by accidental or constitutional diseases in the mouth and its vicinity. To prevent the recurrence of this disease, after an abscess has been

formed, it is only necessary to keep the abscess open until a healthy skin is formed on its internal surface. This is usually done by the application of lime-water, caustic, and lapis septicus. This last is the best, but most dangerous, from the vicinity of the lips and other parts of the mouth. Let it not be forgot that a little attention to the teeth would probably, if taken in time, prevent the disease altogether.

The shedding teeth, in cutting the gum, give pain, and produce many other symptoms, which sometimes prove fatal to children. They produce both local diseases and constitutional diseases with local sympathy. The local affections, arising from the pressure of the teeth against the inside of the gums, in endeavouring to extricate themselves, occasion heat of the parts, with swelling, redness, and the other symptoms of inflammation and an increased flow of saliva. The irritation, thus occasioned, causes a wasting of the gum at this part; on which account it is highly proper to open the way before the coming teeth; especially, since, as has been mentioned, the operation is never attended with danger.

The constitutional symptoms which attend the cutting of the gums are, fever and universal convulsion. The fever is sometimes slight and sometimes violent. It is remarkable for its sudden accession and declension; so that, in the first hour of this illness, the child may be perfectly cool; in

the second, flushed and burning hot; and, in the third, cool again.

The local symptoms which attend the cutting of the gums are, diarrhœa, costiveness, loss of appetite, eruptions on the skin, especially on the face and scalp; cough, shortness of breath, with a kind of convulsed respiration, similar to that observable in the hooping cough; spasms of particular parts, either by intervals or continued, and an increase and diminution of the ordinary secretions. The lymphatic glands of the neck are also apt to swell, and if the child has a strong tendency to scrofula, this irritation will bring on that disease. At other times, the gums are apt to swell, to become tender and bleed on the slightest touch; and this symptom is not unfrequently mistaken for scurvy. Now, although persons of scrofulous habits are more liable than others to swellings of the gums, yet they appear frequently in persons who are in all other respects perfectly healthy.

The part of the gum between two teeth is very apt to swell, and often pushes out a fungous appearance, which is frequently very tender.

Ulceration of the gums is often produced by inflammation, whether it originate in the teeth, alveoli, or gum itself; and, in any way, the teeth become denuded. Sometimes also the gums become spongy, and hang loose from the teeth.

Scarification and cleanliness will in general be sufficient for the removal of these diseases; but

when there are reasons for supposing them to arise from a peculiarity in the constitution, the treatment should be such as will remove this peculiarity, as local treatment, by wounding the parts, may in some cases do harm. Sea-bathing and washing the mouth frequently with sea-water, may be useful in most cases, and can do harm in none.

There is another species of disease which sometimes attacks the gum, the origin of which is in the gum itself:—excrescences, which, at times, assume a cancerous appearance. This appearance is apt to deter the surgeon from operating, for fear of real cancer, which ought not to be the case, as mere bleeding will frequently remove those alarming symptoms. The bleeding which follows a proper incision is generally so considerable, that it is necessary to cauterize. If the swellings should return repeatedly, the presence of cancer may be suspected. But, in such cases, the skill of the surgeon, rather than the art of the dentist, will be required.

CHAPTER IV.

OF THE TEETH.

SECTION I.

DESCRIPTION.—In the preceding chapters it has been attempted briefly to describe the various substances out of which the teeth arise. It remains now to treat of the teeth themselves. In describing the teeth, it is usual to begin with their first formation; but, as these pages are designed rather for the general reader than the medical student or the dentist, it has been thought most advisable to begin at the period of their first appearing out of the gum. The first set of teeth are divided into three classes,—incisores, cuspidati, and molares; they are called shedding teeth, from their falling between the seventh and fourteenth year, at which period they give place to the permanent or adult teeth. Of the adult teeth there is a fourth class,—the bicuspides, so called from their double points; and also a fifth, the dentes sapientiæ, or wisdom teeth.

The regular complement of permanent teeth is thirty-two, although they sometimes exceed that number, and at others come short of it.

It may not be uninteresting to mention that, while the shedding teeth appear in their places, and are full grown, their successors, the permanent teeth, are also in their separate cells, ready to succeed them. Plate II. represents the appearance of the shedding teeth in a child under seven years of age; behind them, the permanent ones being also seen, in their proper cells. The front parts of these cells are represented as cut away, for the purpose of exposing the permanent teeth.

The order and number of the shedding teeth, in each jaw, are as follow:

4 Incisores, incisors, fore-teeth, or butter-teeth.
2 Cuspidati, canine-teeth, or eye-teeth.
4 Molares, or grinders.

Those of the permanent teeth, in each jaw,

4 Incisores.
2 Cuspidati.
4 Bicuspides.
6 Molares, of which two are dentes sapientiæ.

The incisors are the four teeth in the fore part of each jaw; they derive their name from their use in dividing and cutting the food, in the manner of a wedge, and have, each of them, two surfaces, which meet in a sharp edge. In the upper jaw they are usually broader and thicker, especially the two middle ones, than those of the under jaw, over which they generally fall, by forming a portion of a larger circle. The cuspidati are the

longest of all the teeth. There is one of them on each side of the incisors, so that there are two in each jaw. Their fangs differ from those of the incisors only in being much larger. The grinders, of which, including the bicuspides and wisdom teeth, there are ten in each jaw, are so called, because they are used for bruising the food. The eye-teeth and incisors have each only one fang, but the last three grinders, in the under jaw, have always two fangs, and the same teeth, in the upper jaw, have three. Sometimes these fangs are divided into two points, near their base, and each of these points has, perhaps, been sometimes considered as a distinct fang. The bicuspides, or first two grinders, on each side, have in general only one fang.

This complement of teeth is, however, sometimes deficient; and of the various cases of this description which have, in the course of his practice, come under the author's notice, plate VI, figs. 1, 2, and 3, represent the most extraordinary—that of a gentleman, of about twenty years of age, where there never appeared more than thirteen permanent teeth in both jaws, although his shedding teeth had amounted to the usual number. Fig. 4 represents the same case, after the gentleman had been supplied with artificial teeth.

The last grinder, in each side, is that called the wisdom tooth. The grinders usually, although not always, come between the twentieth and thirtieth

year. Sometimes they never come at all, or but partially. In some rare cases, old people receive a third set of teeth, but, from their fewness and irregularity, they are productive of little or no utility.

A more common irregularity of the teeth is, when they do not come properly arranged in the dental circle. This irregularity, in some persons, is so great as to present the appearance of a second row, is always unseemly, and frequently attended with inconvenience. It may proceed from the disproportion existing between the teeth and jaws; or from want of attention to the teeth in early life. It occurs solely in the incisors and eye-teeth, they being the only ones which are larger than their predecessors of the first set. The bicuspides generally make their first appearance before the eye-teeth, and fill up the space intended for both; in consequence of which, the latter, from want of room, are obliged to shoot over the former. It also happens from the temporary eye-teeth standing firm. That irregularity of the teeth is occasioned by the want of room in the jaw, and not from any effect that the first set produce upon them, is evident; first, because in all cases of irregularity, we find that there is really not room to admit of placing all the teeth properly; so that some are necessarily on the outside of the circle, others within it, while others are turned with their edges obliquely; and, secondly, because the bi-

cuspides are not out of the circle, although they are as much influenced by the first set as any of the others.

In cases of irregularity arising from the want of room, it may be proper to remove the teeth which are out of their place; but as any tooth of the first set can form no obstruction to the growth of its successor of the second set, it will, in general, be unnecessary to assist nature by extracting it. It may, however, be necessary to extract an adjacent tooth, if it is in the way of a coming one; for the fangs of the first set are absorbed only in proportion as the corresponding teeth, of the second set, come to supply their places. The teeth can be trained toward any part of the jaw that may be required, especially in early life; but they incline backwards, rather than forewards, in the mouth.

So great a disproportion frequently occurs between the teeth and the jaws as to occasion much inconvenience. In such cases, the last grinder never becomes totally extricated from its socket; while the gum, continuing to cover it over, is subjected to the action of the teeth in mastication.

It has been thought by some, that the shedding teeth are forced out by the mechanical pressure of their successors; while others assert that this is impossible, from the circumstance of every tooth, of each set, having its own proper cell. A little reflection will show that both these opinions

are compatible with the real cause. Any part of the body, being subjected to mechanical pressure, may be absorbed, and no part more readily than the sockets of the teeth. This absorption is not the immediate result of the pressure, which only irritates the parts and superinduces inflammation, as in the case of the milk-teeth pressing against the gums. The pressure of the permanent teeth does not mechanically expel the shedding teeth; but, when they become too large for their cells, they act mechanically against the sides of the cells, and thus occasion the new action. This new action extends itself over all the neighbouring parts, and the fangs of the shedding teeth participate in the general irritation, and are soon absorbed, so that the teeth themselves, thus loosened, fall out. It must be admitted, however, that this absorption of the fangs of the shedding teeth takes place even in cases where permanent teeth never grow to succeed them. The gentleman mentioned above, informed the author that he lost his milk-teeth in the usual way and with the usual symptoms attending their falling out. On the other hand, several of his thirteen teeth are of the first set.

The teeth are small bones, fixed in the alveoli of the upper and lower jaws; and they are the hardest and whitest bones in the subject. Each tooth may be divided into two parts; viz. its body, or that part which appears above the gums; and

its fangs, or root, which is fixed in the socket. The boundary between these two, close to the edge of the gum, where there is usually a small circular depression, is called the neck of the tooth. Every tooth is composed of enamel and internal bony matter. The enamel is a very hard and compact substance, of a white colour, and peculiar to the teeth. It is found only on the body of the tooth, covering the outside of the bony or internal structure. This enamel is thickest on the grinding surface, and on the cutting edges, or points of the teeth, becoming gradually thinner as it approaches the neck, where it insensibly terminates. The bony part of a tooth resembles the other bones in its structure, only it is much harder than the most compact part of bones in general. It composes the inner part of the body and neck, and the whole of the root of the tooth. Each tooth has an inner cavity, which, beginning by a small opening at the point of the fang, becomes larger, and terminates in the body of the tooth. This cavity is supplied with blood-vessels and nerves, which pass through the small hole in the root. In old people, this hole sometimes closes, and the tooth then becomes insensible. The teeth are invested with a thin membrane, called the periosteum, from their fangs to a little beyond their bony sockets, where it is attached to the gums. This membrane seems to be common to the teeth which it incloses, and to the sockets which it lines.

In all animals the teeth of different classes differ in size and length, often very considerably; and they are separated by intervals more or less wide. This is particularly the case with the teeth called canine, which are long, prominent, and distinct from the neighbouring teeth; their not projecting beyond the rest, nor being separated from them by any interval, is, therefore, a very characteristic circumstance in the human structure. The teeth of man are distinguished by being all of one length, and by the circumstance of their being arranged in a uniform, unbroken series. The eye-teeth are a little longer than the others at first, but their sharp points are soon worn down to a level with the rest. Even in the ape, whose masticatory apparatus most nearly resembles that of man, the eye-teeth are longer, often very considerably longer, than the other teeth; and there are intervals in the series of each jaw to receive the eye-teeth of the other. The inferior incisors are perpendicular; the teeth, indeed, and the front of the jaw, are placed in the same vertical line. In most animals, these teeth slant backwards, and the jaw slopes backwards directly from the alveoli; so that the full prominent chin, so remarkable a feature in the face of our species, is found in no animal, not even in the ourang-outang, where it appears as if the part were cut off.

The obtuse tubercles of the grinders are again very peculiar and characteristic; they are worthy

of particular remark, because, being the great instruments of bruising the food, they correspond with the kind of nourishment which the animal naturally takes. Their surfaces do not resemble the flat crowns, with rising ridges of intermixed enamel, belonging to the common herbivorous animals; nor are they like the cutting and tearing grinders of the carnivora; but they are well adapted to that mixed diet, prepared by the arts of cookery, which man has always resorted to, when he could get it, and when his natural inclinations have not been thwarted by the interference of religious scruples or prohibitions, nor opposed by his own whims or fancies.

The lower jaw of man is distinguished by the prominence of the chin, a necessary consequence of the inferior incisors being perpendicular; by its shortness, and by the oblong convexity and obliquity of the condyles.

Having thus described the formation, structure, and growth of the teeth, it remains to notice their uses; the chief of which we know to be mastication; and, the secondary one, assisting in the articulation of the voice.

SECTION II.

Diseases of the Teeth.—In descriptions of diseases to which the teeth are subject, a circumstance, of considerable importance, seems to have been little, or not at all, attended to; namely,

their shape. It is well known how long a peculiarity of countenance sometimes belongs to a family, and how often the features of a distant ancestry revive in the faces of their descendants. Various diseases, in like manner, descend, in families, to posterity. The same thing holds with respect to the diseases of the teeth, and particularly when occasioned by their shape. There are many instances on record, where the teeth were known to contain constitutional distempers; and, which upon being transplanted, have conveyed the same to their new possessors, in whom the disease has burst out with redoubled violence. An instance of this occurred, some years ago, in London. A young lady had her teeth extracted and their places supplied with others, still alive, from the mouth of a healthy-looking girl. The teeth took root, and with them a disease which miserably terminated the existence of the unhappy young lady. But such unseemly practices are now abandoned by every respectable practitioner.

In cases where disease of the teeth proceeds from their shape, it commences on the grinding surfaces of the back teeth. Whole families frequently suffer most of the evils arising from decayed teeth, while others never experience the least degree of tooth-ache. Even, in the same family, individuals sometimes may be found who lose all their teeth, while those of the rest are exempted from disease. This may arise from the

teeth of some being like those of one parent, and of others, like that of the other. Where both parents have had their teeth affected, the children rarely escape. In families not subject to the attacks of tooth-ache, the grinding surfaces of the back teeth will be found to be even, and free from furrowed depressions; while, on the other hand, in families that are subject to tooth-ache, the grinding surfaces are deeply furrowed, and rise in irregular and sharp points, to such a degree as to defy every effort to keep them perfectly free from the particles of food, which they retain in mastication. The particles, thus retained, decay and give an offensive odour to the breath, often attributed to internal diseases, and they also corrode the enamel, at the bottom of the furrows. A disease, thus planted, will soon take its course, unless it is checked by the hand of the dentist. This is easily effected, if attended to before the nerve comes to be exposed; and even then it should not be considered too late to attempt the cure. A tooth ought never to be thrown away upon slight grounds. One who, with indifference, permits the inroads of disease to gain upon the back teeth, and then gets them extracted, to be free from pain, will in a few years lose them all, and the fore teeth of the upper jaw will soon follow. All this can be avoided, although disease may have commenced, by scooping out the black speck and enlarging the opening within, so as to

retain the stopping materials. When well stopped with gold leaf, in this way, such teeth may be made to last until they drop out in the ordinary course of nature. Families ought to ascertain whether their teeth bear the marks just described, by which means much inconvenience and suffering may be prevented

An unfortunate circumstance, connected with the diseases of the teeth, which cannot be sufficiently attended to, is, that the commencement and progress of decay are so insensible, that disease may exist many years, and even the person himself not be aware of it till it has penetrated to the very centre of the tooth; but having once reached the cavity, it there commands attention, on account of the severe tooth-ache which it occasions.

One of the most common diseases to which the teeth are exposed is, mortification. It commonly appears, at first, as an opaque, white spot, on that side of the tooth which is not exposed to friction. The cause of this has never been satisfactorily explained. But as caries frequently commences between two teeth, and almost always in some part which is not subject to friction in mastication, may not the same cause produce it, as in deeply-furrowed back teeth? or, may not the practice of picking the teeth with a pin, which many, particularly young persons have, prove injurious to the teeth, by scratching the enamel, which may thus retain particles of food, as in the case of

furrowed teeth? The smallest scratch will retain matter enough to lay the foundation of disease in the enamel. A fall, a blow, and many other causes, will occasion injury to the teeth, which, at the time, appearing to be of small importance, is neglected and forgotten. Not so the effect; but the fact, that the effect does not always lead to a knowledge of the cause producing it, occasions, in all probability, the uncertainty which generally attends diseases of the teeth. Diseased teeth may sometimes arise from constitutional maladies; although certainly not so often as is generally imagined. Diseases of this description are indeed often occasioned by medicines. Mercury, under various modifications, is frequently administered to children, and it often affects the teeth, although given even before they appear out of the gums. The effect of mercury on the adult is well known, as producing blackness and decay of the internal substance of the teeth, and the consequent destruction of the enamel, together with debility of the gums, partial or total destruction of the sockets, and final falling out of the teeth. The bones composing the roof of the mouth being a continuation of the sockets of the teeth, are also soon affected by mercury, and not unfrequently disappear altogether.

When the gums, weakened by the influence of disease thus excited, forsake the teeth, their appearance is sometimes mistaken for scurvy, and

treated accordingly. This is erroneous, however, as scurvy cannot exist in the gums without exhibiting itself in the rest of the system.

In some persons the enamel of the teeth is so thin or porous, as to be very susceptible of injury. This must arise from constitutional causes. When the enamel is thin, care must be taken not to bite, or bruise any very hard substances with the teeth; when it is full of pores, they ought to be stopped, which will save the teeth for years. When the teeth have not sufficient room to expand during their growth, their substance seems to be so much injured as to decay early. This is frequently the case with the dentes sapientiæ which, though they come last, are generally the first to decay. The want of them is often an advantage; especially when the jaw is too small for the teeth. Sometimes the enamel disappears from the external surface of the incisors, as if filed across. For this disease, which cannot be accounted for, there is neither preventive nor cure known; fortunately, however, it seldom is to be met with.

Although caries of the teeth is the most general cause of tooth-ache, yet pain in the teeth may be produced by other causes, and particularly by sudden changes of heat and cold; for, from the compact structure of the teeth, they are good conductors of the changes of temperature; and being, from their situation, much exposed to the extremes of heat and cold, they convey those sen-

sations suddenly to the vessels in the central cavity. Cold water, cold air, &c. produce what is commonly termed a jarring of the teeth, which generally soon ceases; but should peculiar irritability, or other circumstances concur, inflammation and pain may be induced, which will extend to the membrane that lines the socket; and thus, although the tooth itself is perfectly sound, the most diffusive kind of tooth-ache will be experienced; to relieve this, the gums should be lanced in the early stage, which will generally remove the symptoms; but, should this be neglected, an abscess may be formed, at the root of the tooth, which will destroy the socket, and loosen the tooth itself, so that extracting it will then be the only remedy; but it is one which never fails, as the offending matter is thus discharged, and the part speedily heals.

In some persons a tooth often becomes diseased, and wears totally away, without giving the slightest pain: this may happen from the previous destruction of the nerve, or it may arise from its becoming ossified, as in old age.

The first symptom of disease in the teeth is, soreness, when touched, or when exposed to any external influence. This hint ought always to be attended to, as the removal of extraneous matter, scarification of the gums, or some equally simple operation, if performed early, will generally remove the painful symptom.

In early stages of tooth-ache, before the nerve is much exposed, the pain subsides and recurs frequently; but, after inflammation has made considerable progress, no cessation of pain is experienced until the inflammation has been reduced, or the tooth has been extracted. In the incisors and other teeth, having only one fang, the nerve is easily destroyed, to a certain depth, so as to admit of stopping in such a way as will render it both useful and durable. Sometimes, without touching the nerve, the cavity in the affected tooth may be stopped. This is done by pressing gold leaf tightly into the sides of the cavity, and preventing it from touching the nerve, over which it may lie loosely at the time. If the stopping, thus put in, can be borne for a day or two, the inflammation will subside, and the nerve shrink back into its cavity; so that the operation may be repeated with success, and without giving pain. The same method may also be adopted with the grinders, although, with them, it is more troublesome. The impatience of the sufferer frequently occasions the removal of a tooth, which might be successfully treated in this way; and the dentist, to save his own labour, may possibly occasionally advise the removal of a tooth. Careful treatment might, in the author's opinion, save eight out of ten teeth condemned by the rash and unskilful.

In many cases where a considerable cavity exists, and where the sensibility of the nerve ren-

ders stopping completely intolerable, a soft substance, such as wax, may be introduced a little way, to protect the nerve until the inflammation has subsided, and then the diseased tooth may be stopped without further inconvenience.

When neither of these methods will answer, the tooth must be extracted; but if found, upon subsequent examination, to be deserving of it, it ought to be properly stopped, and restored to its place. When it is intended to destroy a portion of the nerve of a decayed tooth, it is usual to introduce a hot wire, which is both a painful and a tedious operation, from the frequent repetitions required to produce the desired effect. A much better way, where it can be done, is to introduce a fine steel point into the canal of the tooth, and, by turning it quickly round, between the forefinger and thumb, it will produce the wished effect in less than a second. This operation gives no greater pain than any other, while it possesses the advantage of being sooner over. The other methods of destroying the nerves of the teeth are, by using concentrated acids, which will frequently answer the purpose, while they do not terrify the patient; they, however, require a more skilful operator. The acids used for this purpose, are the sulphuric, the nitric, and muriatic. Caustic alkali will also produce the same effect. In the upper jaw, where fluids cannot easily be made to

ascend against their own gravity, common caustic may be tried.

Another great cause of the diseases of the teeth, and which no person altogether escapes, is the collection of what is called tartarous matter. The teeth, in their natural state, and when perfectly clean and free from extraneous substances, are as clear and beautiful as polished ivory. Those who value their teeth should always have them kept in this state. The tartar is secreted from the juices of the mouth, and incrusts the teeth, as stalactites do caves. It first attaches itself to the parts of the teeth not exposed to friction, in masticating the food, and, gradually gaining ground, it covers them, in some instances, all over. But this can only take place when a person, in long-continued illness, has been unable to masticate solids. From which it appears, that much of the appearance and soundness of the teeth may proceed from the sort of food we use.

And as bodily health is preserved by proper exercise in the open air, so the teeth, by being acted on by proper food, are kept in a wholesome state. Every part of a tooth, that has lost its clear, bright polish, may be regarded as covered with some extraneous matter, which ought to be removed. When this is not attended to, it continues to increase, and, descending between the teeth and the gums, attaches itself to the

sockets; and there it accumulates to so great an extent as to separate the gums from the teeth, while it frequently presses so much upon the sockets as to induce absorption of their substance, and, acting as a lever, raises the teeth and expels them altogether. Thus the bad effects ascribed to natural causes, may proceed from carelessness, which, a little attention would easily have prevented. The pressure of the tartar may also bring on a disposition in the sockets to fill up; and, in either way, the teeth are equally expelled. Whole sets of teeth may become loose in this way, and even drop out, leaving their astonished possessors under the alarm of some more serious calamity. It must be recollected, however, that in old age the teeth naturally fall, through the decay of the sockets; although there is but little reason to doubt that such a crisis is accelerated by inattention, or inexperience.

The tartar sometimes increases so much as to occasion gum-boils, swelling of the fangs, what is termed scurvy of the gums, callous thickenings of the gums, excrescences, and even cancer.

In cleaning teeth, great caution is necessary, least splinters of the enamel should follow the masses of tartar, in cases where it has been long accumulating; especially as it is often difficult to distinguish the one from the other. Tartar accumulates most on the internal surface of the incisors of the lower jaw; and in many persons, whose

teeth are kept carefully clean everywhere besides, but who are ignorant of this circumstance, large masses of this concretion are often found upon examination. Every one, who is duly careful of the teeth, ought to be possessed of a dental mirror, for examining the inside of the mouth,—see plate v. In the country too, where the assistance of a dentist cannot always be had, it might be proper for families, and more especially for medical practitioners, to be possessed of small cases of instruments, for the purpose of scaling and stopping the teeth.

In stopping a diseased tooth, it is only necessary to clean out the disease well, and with the proper instruments to make such enlargements as shall retain gold-leaf, or any other stopping, to prevent a recurrence of the disease. This being done, the cavity must be thoroughly dried with lint, and the stopping, immediately after, fixed in the best possible manner. With the aid of a dental mirror, all parts of the inside of the mouth may be seen with the greatest ease, and thus the internal surfaces of the teeth may be as easily kept clean as the external.

It is an important fact, respecting the teeth, which no person ought ever to lose sight of, that ninety-nine cases in a hundred of bad teeth are the result of ignorance, or carelessness; and that an incredible number of the sufferings of infants, during dentition, are owing to the same causes.

Long before the teeth are ready to leave the gum, a small ridge may be perceivable over the part, if this ridge be pressed by the finger, a dark mark, of the shape of a tooth's edge, will remain. Whenever a child betrays symptoms of uneasiness from pain in the gums, the dark mark, described above, should be laid open down to the tooth. If the child should indicate, by a favourable change of spirits, that relief has been thus afforded, it will surely be allowed that the operation ought to be repeated as often as there shall be occasion, until the tooth makes its appearance. The wound soon closes over the tooth, unless it be very near the surface; but not, however, before the tooth has made some progress outwards. If there appear in the gum two equal prominences, cut one only; repeat the operation a dozen times, should it be required, and the tooth, attended to thus, will come long before the other. It is only necessary to watch, as far as possible, the feelings of infants during dentition, to be quite satisfied that very few persons attach sufficient importance to this subject.

In guarding against diseases of the teeth, considerable attention ought to be paid to the temperature, as well as the nature of the food we eat.

Acids of all descriptions act upon the teeth, in consequence of which, they may be observed to look whiter during the fruit season than in winter; but acids at the same time waste the enamel, and weaken the gums. When liquids

are taken too much heated, they injure the teeth. The sensation produced by extreme cold is, in itself, a sufficient admonition against the use of any thing too cold for the teeth.

In general, due attention to the teeth, by not exposing them either to extreme heat or cold, cleansing them of the particles of food which they retain after eating, watching the first appearances of disease, and applying the proper remedies, will, with few exceptions, preserve them, sound and beautiful, during most lives. The gums also participate in the benefits arising from attention to the teeth; nor ought they to be spared, while there is any inclination in them to bleed, upon being rubbed with a hard brush. The gums, in a healthy state, have a pale appearance, and they adhere firmly to the necks of the teeth. This state of them is easily preserved by the regular use of the brush. Various methods, some of them very whimsical, have been found to relieve tooth-ache. The sight of the surgical instruments has frequently been known to drive it away. Burning the ear with hot irons has also produced the same effect. Spirit of lavender drawn up the nose has also produced the same effect. Strong vinous spirits, kept to the affected part for a considerable time, or a little lint soaked in laudanum, is also useful as an anodyne. Inflammation may be reduced in the usual way, by poultices. In desperate cases, diluted acids, hot brandy, spices, essential

oils, &c. may be used for mitigating the pain. If, in spite of these precautions, the disease continue its attacks, the best advice should instantly be procured. It is in the early stages only that a cure can be confidently anticipated. But too often, from the slight degree of pain and almost imperceptible change in the appearance of the disease, the malady runs on, and is permanently established in the tooth before any means for its removal be adopted.

CHAPTER V.

OF EXTRACTING TEETH.

The extracting of a tooth is often an operation of nicety, if not of difficulty. This arises from various causes, and from none more frequently than the unfitness of the instruments used and the inexperience of the operators. Of all the instruments, at present in use, for extracting teeth, the dentiducum, or key instrument, is the safest for the back teeth; although it is highly desirable that some instrument should be found for extracting teeth perpendicularly from their sockets. Accidents more frequently happen in the hands of persons professing to use the forceps only, for every purpose. In extracting the front teeth, the forceps is the proper instrument; but the man who uses it for the back teeth will inflict great torture on the patient, and almost inevitably splinter, or dislocate his jaws, or, at least, break the teeth, by making them serve as a fulcrum to the forceps. The dentiducum, if a proper one and judiciously used, is, in almost every case, perfectly safe.

The accidents to which extracting a tooth subjects a person are, the breaking of the tooth, the tearing of the socket, and the splintering the jaw.

The last of these accidents can never occur in the hands of a steady operator, who is able to judge when he is going too far, or when to desist from further attempts. The two first accidents may happen in any hands. Laceration of the sockets is a matter of little importance, as it only accelerates the decay of them, which must naturally take place when a tooth has been extracted. Fracture of the teeth is unpleasant, only, as it subjects the patient to the disagreeable operation of punching out the fangs. This, however, is attended with no danger. From its texture, a tooth may, in some constitutions, break in any hands; this, however, is no justification of a careless and pretending operator. Much depends on the manner of adjusting the instrument, and much on the size of the hook used upon it. If the hook be too small, it will come in contact with the tooth, while scarcely moved, and so fracture it, or even the jaw, if sufficient force be applied; but, if the hook selected for the purpose be large enough to admit the free play of the tooth, as it yields to the instrument, all will be safe, provided the instrument has been placed properly. This is done, after scarifying the gum round the diseased tooth, if it should require it, forcing the point of the hook as low as possible on the neck and fang of the tooth, and bringing the nut of the instrument, at the same time, fairly opposite to it, on the other side of the tooth. The tooth is generally extracted

on the outside, where the socket is supposed to be weakest; but, in most cases, the direction in which the tooth lies will be sufficient for the guidance of the operator. A sudden jerk, in extracting a tooth, is to be avoided. However much such a mode of operating may show the expertness of the operator, it ought to be considered as an act of inexperience and imprudence. At one time he was considered the most skilful extractor of teeth who pulled the quickest; but this practice is, fortunately, exploded by respectable dentists. In extracting a front tooth, after a firm hold of it has been got in the forceps, the tooth may be twisted a very little backwards and forwards to loosen it, when it will come with greater ease. The patient ought to recollect, that the unpleasant jar of the adjacent bones is the worst part of this operation.

It has been thought proper, by many persons, not to extract a tooth while the parts affected are inflamed; but as no bad consequences are ever found to ensue from the operation in such circumstances, it appears the best practice to extract a condemned tooth at once, while the ardour of the patient is sufficiently in force to allow it.

Although the circumstances under which teeth ought to be extracted have been already mentioned, it may not be amiss to remark, that when a tooth is loose, from the decay of the gum and sockets, it ought to be removed, as its action on the surrounding parts, in mastication, will tend to excite

inflammation and induce absorption of the adjacent alveoli and the loss of the teeth, with other diseases to which the gums are liable. When moderate bleeding follows the extraction of a tooth, it will prove of great service; but should it continue longer than may be desirable, the socket ought to be filled with lint dipped in spirits or oil of turpentine. A piece of cork, of the size of the tooth, is a simple remedy, and will frequently be found to answer the same purpose. In extreme cases, where hemorrhage continues, the extracted tooth, upon being restored, will be found effectually to stop it.

CHAPTER VI.

OF A PROJECTING CHIN.

If the under jaw project beyond the upper, the teeth of the upper, when the mouth is shut, and in its usual position, will fall within the under. This conformation is sometimes natural, but, in most instances, it, as a deformity, admits of being corrected. It is sometimes occasioned by negligence, or imitation; at other times, it is occasioned by unusually large teeth in the lower jaw. It is also occasioned by the tendency of the teeth of the under jaw to point outwards, which will naturally cause the corresponding ones, in the upper jaw, to point inwards. The modes usually adopted for remedying projecting chins, are the extraction, from the lower jaw, of superfluous or useless teeth, at an early period of life; while, by an instrument constructed for the purpose, the teeth of the second, or permanent set, are trained to shut in any way that may be wished for. If the person, thus in training, can succeed so far as to catch the points of the under teeth, within the upper set, the thing may be said to be accomplished, as a very little practice of the operation daily, will soon render the change natural.

PRACTICAL DIRECTIONS,

&c. &c.

PART II.

PART SECOND.

OF ARTIFICIAL TEETH AND PALATES.

INTRODUCTORY REMARKS.

HAVING, in the preceding part, given some account of the structure and growth of the teeth, the means of mitigating the pain which their first appearance occasions, the methods of preventing them from becoming irregular, and of correcting irregularities which have occurred, the diseases to which they are subject and the methods of cure,—and having pointed out the most approved means of preserving them from decay, as well as of arresting that decay, in the early stages of its progress,—it now remains to point out how, when, from incurable disease, or from casualty, actual loss of the natural teeth, so as to occasion inconvenience or deformity, or both, has taken place, that loss may be supplied by artificial means; and as the loss of the palate, though it is by no means necessarily connected with the loss of the teeth, or a consequence of those diseases or casualties, by which that loss is occasioned, yet, as the bony substance, to which

loss of the palate is generally owing, is a continuation of the alveolar substance, and as the artificial repair belongs more properly to the province of the dentist than to that of any other artist, it forms a necessary, as well as an important, branch of this part.

The loss of the teeth, at whatever period of life, other than that of the natural shedding of the infantine set, it may happen, is one of the most disfiguring and inconvenient privations to which human nature is subject; and whether it be from a want of care, from man taking his food hotter than the other animals, or from any other cause, it is a decay almost peculiar to the human subject. It is exceedingly general, too, and different from many other diseases: it increases with the increase of civilization and refinement. Indeed, it seems of itself to point at the possibility of an artificial restoration; for it is matter of common observation, that the loss of the teeth occurs most frequently, as well as earliest in life, among those who can best afford to have them replaced. Among men, in their rude and savage state, the teeth are scarcely less durable than they are among the inferior animals; and, in civilized society, it may be observed, that the farther any class of persons are removed from the simplicity of savage life, the more are they subjected to this casualty, although, in other respects, they may be less frequently or severely the victims of disease.

Such being the case, it is impossible to attribute the whole of the decay to carelessness, and especially to want of cleanliness on the part of the owner; and hence one would be led to conclude, that it is connected, in some way which has never yet been explained, and which, perhaps, is inexplicable, with the more luxurious and stimulating food to which those classes of persons are accustomed. The investigation of that cause, which would be, in all probability, a futile waste of words, forms no part of the plan of these pages, and especially of this part, the object of which is, to point out how the evil, when it cannot be prevented at its commencement, or arrested in its progress, may be corrected, after it has taken place.

Whatever be the cause,—whether it arise from something which human ingenuity cannot discover, and, consequently, which human caution cannot prevent,—or whether it arise from indulgences, of which the present pleasure is too strong for the future consequence,—the effects of it are precisely the same, and it is just as pleasant to know that there is a remedy, whether the loss springs from one cause or from another.

A total loss of the teeth produces ruinous effects, both with respect to appearance and comfort. When they are gone, the patient cannot articulate with that precision and force which are desirable; the whole expression of the lower part of the face is deteriorated; and the food, which is

never so altered in quality—and, indeed, cannot be conveniently so altered—as to accommodate itself to the decay, is sent to the stomach without that preparation which is essential to the process of digestion,—at the same time that that organ would require it to have undergone even a more thorough preparation. Whether, therefore, we regard personal appearance—which always is, and always ought to be, a matter of primary importance, or the power of delivering our thoughts in a clear, intelligent, and agreeable manner, or the due preparation of that food, upon which our comfort and our existence depend, the total loss of the teeth is a severe calamity. Even the partial loss is vexatious. The want of a single front tooth affects both the appearance and the voice, and the want of a grinder not only occasions a falling in of the cheek, and consequent premature appearance of old age, but a deficiency in the necessary and even vital process of mastication. Nor are these all; for the absorption of the lost sockets gradually extends to those of the neighbouring teeth; the pressure, which ought to be distributed over the whole, is confined to a few points; and thus even a partial dilapidation paves the way for a general decay,—so that those who neglect to replace, in due time, one or two lost teeth, must soon either replace a number, or submit to the deformity and inconvenience, of being wholly without them.

But if the loss of the teeth be attended with so

many disagreeable consequences, the replacing of them, when done in such a manner as to approach closely to the natural appearance and the natural usefulness, must be regarded as holding no mean rank among those operations which afford pleasure, by contributing alike to elegance and utility. Upon this part of the subject, it is pleasing to reflect that the labours of the dentist have, at least in the case of some of the more skilful and respectable practitioners, been so improved, that the loss of the natural teeth becomes a matter of not very much more consequence than the pecuniary cost of artificial ones. These may be constructed so neatly, as that a very close inspection shall not be able to find out that they are artificial; they may be so formed as to restore the voice to its proper tone, and so adapted to the gums, as not only to be worn without pain, but to serve for the purposes of mastication nearly as well as the natural ones; while they may be removed and replaced by the wearer, at pleasure, with the greatest ease and safety.

As is the case, in all professions, where a considerable degree of skill and great mechanical nicety are required, the productions of the dentist are very frequently brought into disrepute by the abortive attempts of the unskilful; and it is with a view to convince the public, if words can produce such a conviction, that those imperfections and failures belong not to the art itself, but to

those who practise it and should not, that the following chapter has been written. The author has no desire of becoming an egotist, far less would he wish to advance that which is not true; but still, as he feels conscious of having been useful in this profession himself, and knows that others also have been useful, he is anxious that neither himself nor any other who has made the art a subject of long study and labour, and found the advantages of these in the practice of it, should suffer either injury or reproach in consequence of the ignorance or the blundering of those who will practise that for which they are not qualified. With this view, he shall state, frankly and candidly, the results of his own experience, without scrupling to adopt both the views and the language of others, when they are in accordance with his own; and though, for this, there should be some who may blame him, he will have the satisfaction of knowing that his statements are as well founded as his intentions are open and honourable.

From all that the author of these pages has discovered, and he thinks he has read the most of what has been written upon the subject, it does not appear to him that the printed accounts of the methods of supplying teeth come at all up to the recent improvements of the art itself. But, that they should do so, or as nearly so as possible, is essential, in order to enable those who require the aid of the dentist to judge whether they be

properly served or not; and to ascertain whether the plans which the particular artist, whom they consult, be calculated as well to give support and permanence to the remaining natural teeth, as convenience, utility, and neatness to the artificial ones.

The circumstance which, together with a strong predilection for the nicer mechanical arts, first directed the author's attention toward his present profession, will show how, in provincial districts at least, the business of the dentist often is, or at least was, managed; and, if such was the case, there is no reason to hope that it has yet become better, because the profession of the dentist is open to every adventurer, whether he possesses the requisite degree of scientific knowledge and mechanical expertness or not, and if, as has been said, the writings on the subject are not such as to enable the public to form for themselves that judgment, which, in the analogous case of surgery, is, in a great measure, formed for them by the licensing schools and colleges, then it is plain that the public have no defence whatever against quackery upon the teeth—a species of quackery as ruinous to personal appearance and as destructive of comfort as any that can well be imagined. The circumstance alluded to was as follows:

An itinerant portrait painter, who, finding that the representing of faces in the state in which he found them, either did not afford him sufficient

employment, or sufficient pay, added to it the repair of teeth. A young lady had lost one of her fore teeth, by an accident, and as the remaining teeth were healthy, and her appearance and voice materially injured by the loss, herself and her friends were anxious to have it repaired. They applied to the peripatetic, who undertook, and instantly set about, the business, preparing the tooth, and fixing it, by drilling holes in the adjoining teeth, into which he inserted iron wires for the purpose of making all fast. It need hardly be added, that the cure was a good deal worse than the disease. The perforated teeth were almost immediately attacked by a violent tooth-ache; and, so rapid was its progress, that, before ten days were over, the lady had to submit to the deformity of losing three teeth, instead of one. This is only one instance, out of many; but it may serve as a specimen, and shows that every pretender is not to be trusted with operations on the teeth.

If Nature has denied teeth to our early infancy, she has also wisely provided food not requiring their use; while, for old age, when equally deprived of them, she has made no corresponding provision. But, as Nature, when rightly understood, is uniformly found to have perfected her works, it may reasonably be inferred, that this apparent imperfection in the human teeth is greatly owing to man himself. It appears to have been intended that, in old age, man should recur to

the food proper for infancy; or that the teeth should continue to perform their functions to the end of life. It will serve the purpose here to state, that whatever was intended, man does not do all in his power to save his teeth; nor, when they fall, does he recur to such food as his stomach, without their aid, can digest. If teeth had never been bestowed on man, then, doubtlessly the stomach would have been rendered capable of performing its functions without them, under every circumstance to which mankind are exposed. This is not the case, however, and hence it is that we hear of the frequent complaints of people who have passed a certain age, as the want of appetite, head-ache, &c. the never-failing concomitants of unoccupied senility.

If these remarks be just, it follows, that every method, which has for its object the increase of the enjoyments of that age, to which we all look forward with the hope of happiness, must be considered laudable and deserving of encouragement. If the use of artificial teeth has come in late among the benefits conferred on mankind, that circumstance ought to be ascribed less to their real importance and utility, than to the difficulty of doing them justice. The prejudices existing against artificial teeth are as astonishing as they are unreasonable, and are more extensive than will readily be credited; for the feeling not only pervades the lower and middle classes, but even such of the higher ranks as are of the old school. Although

this prejudice is now fast giving place to more enlightened views, a slight consideration of the matter will show, that the objection to artificial teeth was at first well founded, and owed its existence more to the artist than the art. The remedy has generally been worse than the disease; and, in too many instances, this is still the case. The power of custom and fashion is everything. Our forefathers, like the Jews, would have considered it disgraceful to be deprived of their beard; while we would feel an equal shame to wear one. A corresponding change of opinion, with respect to artificial teeth, is taking, or rather has taken, place, as in artificial hair, limbs, eyes, &c., and with greater reason than some of these. That the teeth have been a source of anxious concern, among all nations and in all ages, may easily be collected from history and from the songs of the poets; while, in modern times, travellers inform us, that the Guzerats and some American tribes paint their teeth black, to distinguish them from those of the brute creation. The ladies of Japan gild their teeth; and those of the Indies paint them red. Other tribes make the care of their teeth a religious ceremony, and even offer them, in sacrifice, to the gods. Some tribes do not rest satisfied with one set of teeth only, but, cutting a new mouth, in their chins, parallel to the natural one, plant there a second set of teeth, made of shells. These usages, although barbarous, are honest, in-

asmuch as they are openly avowed; not so with polished society, for while the desire of ornamenting the person is equally strong, the candour to avow it is very generally wanting. It is astonishing that, while no person is ashamed to lose a tooth, almost every one is unwilling to allow that he wears an artificial one in its stead. This is discouraging to the artist, hostile to the art, and consequently injurious to the public in general.

The love of a pleasing personal appearance is a principle implanted in the human heart, to which nothing contributes more than a beautiful set of teeth. The effect is the same whether these be natural or artificial; too much stress, therefore, cannot be laid on every argument in favour of preserving the teeth in a sound state, as long as possible, and, when they fall, to have their places properly supplied with artificial ones.

The loss of the palate, already alluded to, another evil of the mouth, to which mankind are liable, is more afflicting in its nature than the loss of the teeth, but, fortunately, of rarer occurrence. The use of language is not only the first of human enjoyments, but the grand characteristic of man; and therefore any disorganization, resulting either from nature or misfortune, that deprives man of the faculty of speech, is about the severest privation under which he can labour. The extremely delicate structure of the human palate renders it liable to organical defects, and also to partial or total de-

struction, in consequence of various diseases; and many attempts have been made, by metals, by India rubber, and by other substances, to supply the defect. But of these a particular description shall be given in the proper place.

CHAPTER VII.

OF NATURAL TEETH, AND BONE FORMED INTO TEETH AND GUMS.

The earliest method of artificially supplying the loss of the teeth, with which we are acquainted, was by inserting natural ones. As the assistance of art was seldom thought of, in this particular, except so far as it concerned personal appearance, the back teeth were never taken into account. The greatest improvement of the art of the dentist is, a right understanding of the uses of the back teeth; and yet it is astonishing to find how very few of its professors have emerged from the ignorance of the first dentists. Their method consisted in fastening the tooth, to be inserted, to the adjacent teeth, by silk or wire ligatures, after having cut it to the proper length. The tooth, thus inserted, looked ill and was felt worse. It looked ill from its extreme length, there being no artificial gum to receive it, and from the ligatures, which could not be concealed; and it gave pain, if accidently touched, in masticating food, from the want of a socket or bed to rest on. The first improvement on this method was, to form the artificial teeth of the hardest bone, so as to resemble nature,

with the addition of leaving part of it, having the resemblance of gums; while, at the same time, when well adapted to the jaw, it gave no pain in wearing. The teeth, thus formed, soon became discoloured, and looked unnatural, in consequence of which, natural teeth began to be artificially rivetted to artificial gums and sockets; and this method, variously modified, continues still to be practised by almost all dentists. In particular cases, the sockets are formed of gold, adapted to the shape of the gums, on which are fastened natural teeth in front, and bone substitutes for the back teeth. The great inconvenience arising from the use of ligatures is, the difficulty with which teeth, so fastened, can be removed, for the purposes of cleanliness. As the late and present modes of supplying teeth will be best understood by quotations from the latest and ablest writers on the subject, most of the following descriptions are taken from those sources, and they are accompanied with such remarks as have been deemed necessary for their due illustration.

"When a few artificial teeth are to be supplied, they must either be pivotted to stumps, or attached to the adjoining teeth, by means of gold claws, or springs, or by means of ligature*." The same writer well observes, that "the construction and adaptation of artificial teeth is an art in which some professors greatly excel others. Some teeth are so ill made and unskilfully adapted, that they

* Murphy—1811.

are troublesome to the wearer, 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 and useful."

Another writer*, on the same subject, observes that "it is certainly desirable, as much as possible, to avoid the use of silk ligatures, as strings, in the fastening of artificial teeth, it must, notwithstanding, be observed, that the exaggerated statements of interested persons should always be received with great caution."

This is prudent advice and gravely given, but it seems to savour of Chinese improvement. From the above quotations, it appears, that the latest writers on artificial teeth were not acquainted with any mode of supplying them superior to *ligatures* and *claws*.

Hence the justly-founded prejudices of the public against the use of artificial teeth. But such are the late improvements of the art, that teeth, properly adapted, in this way, will remain in their place and perform all the functions of natural ones, without inconvenience, and without *claws*, or *ligatures* of any description; although, in some few instances, where the wearer has not the complete and easy command of his mouth, a fine gold spring, of about the thickness of a hair, may be contrived to go half round the adjacent teeth; and that, to prevent any sudden or awkward accident,

* Fuller, edited by Downing—1815.

rather than any necessity there is for springs. A spring, of this description, will have the desired effect, and, on account of its extreme fineness, can do no injury to the other teeth; while the claw, or spring, generally used, will, by its friction on them, soon loosen the adjoining teeth, and subject the wearers to many of the evils arising from decayed teeth. Instances of this sort are daily to be met with, where the unfortunate wearer of artificial teeth is subjected to the annual loss of one or more of those which Nature gave him.

The author of these pages has, in his practice, met with several cases of this sort, and has supplied whole sets of artificial teeth, where the wearers had lost their own, in the manner described above; and that, in some instances where the original defect was no more than the loss of a single tooth. A gentleman became his patient, under the following circumstances: In the upper jaw there remained only one grinder and two stumps of the fore teeth. He was reduced to this state, in the course of a very few years, from the use of ligatures in fastening artificial teeth, originally not more than two, which he had been in the practice of wearing; while, in the lower jaw, he had never lost more than a single tooth. It became necessary to make an unusually large piece for the upper jaw, which was to require spiral springs, to keep it in its place. In order to effect this, his dentist declared, that three teeth must

be extracted from the lower jaw, there being one out already, in order to make room for a new piece, on each side of it, for fastening the spiral springs. Unwilling to submit to such an operation, if it could be avoided, the gentleman consulted the author whether he considered it necessary to remove any sound teeth, in supplying artificial ones.

The gentleman then had a set made by him, and is still in possession of all the natural teeth he had at the time of his first application—about four years ago; although he has, ever since, worn a set of beautiful artificial teeth, without springs, claws, or ligatures of any description. This is one of the many instances of a similar nature, which might be adduced; nor is it necessary that a sound tooth, or fang, should ever be removed, or in the least injured by operations on the teeth.

It is far from being intended here to depreciate the merits of other people, or to endeavour to diminish their usefulness to themselves and the public; but justice to the public and to the respectability of the profession demands the disclosure. The public, once aware of what ought to be, and what can be, done, will bring about the general improvement of the professors of any art; and it is high time for them to be aware of this, with respect to that of the dentist. When this shall be the case, neither party will have much reason to complain.

The following observations, from the same authors, are illiberal, and only prove that they had not sufficiently understood the making of artificial teeth.

"Notwithstanding the excellence to which dentists have arrived in constructing the useful articles, *teeth*, candour obliges us to say, that they do not answer the extravagant descriptions of them, too frequently obtruded on the public, and which can only be done with a view to puff them off*." Fortunately this reproach no longer adheres to the profession, as there are several dentists in London whose work not only exceeds all expectation, but affords the most entire satisfaction.

"When the roots of the natural teeth are unfortunately lost, or so unsound as not to permit teeth to be fixed to them, the number required are constructed in one solid piece, (or which is still more elegant, *natural* teeth, to the number required, may be artificially fixed to a false gum, or bed of bone, and if necessary to be particularly thin and delicate, the bed may be of gold or silver,) so as completely to fill the vacancy between any two contiguous teeth, which are firm in their places, and to these it is attached by *fine silk*, or gold springs, as circumstances may render proper. Much has been said against this mode of fixing teeth, on account of loosening those to which they are tied; the fault, however, generally is in the artificial piece not being accu-

* Murphy.

rately fitted to the part, for, if it is too large, it presses the teeth out of their natural situation, and if too small, by tying them, they are made to approximate towards each other; in either case, looseness of such teeth will be produced; but, when they are very nicely adapted, such inconveniences will not occur,—at least for many years; but this must depend on the abilities of the dentist, combined with the after attention of the wearer to strict cleanliness. It would, indeed, be a desirable attainment, if there were any other method of retaining artificial teeth superior to that of attaching them to the contiguous natural ones—but there is not; and, from the nature of circumstances, it appears there never can be; so that however the public may be alarmed with the mischief of tying in the teeth, in order to induce them to adopt some improved method, such improvement is only substituting springs for strings."

The desponding tone of the preceding remarks is accounted for by the recommendations, which follow from the same quarter: the author having failed in pointing out how to make his work like an artist, goes on to prescribe for the evils which it produces. When the bone has been fitted to the gums and the natural or artificial teeth applied in the best attainable manner,—" by persisting in their use, relieving them when they appear to press too hard, and using cooling and emollient applications to the gums, such as roasted figs,

and rinsing the mouth, &c. the inconveniences gradually vanish, the gums become hard, compact, and insensible; and they are at length perfectly pleasant and satisfactory, so that a person who, a few months before, could scarcely bear their use, cannot now do without them." This is but a sorry consolation for those who have been tortured by the hands of the practitioner.

From the foregoing extracts, it seems that the method of accurately adapting and fitting bone to the gums was not understood by those writers at least. The *Ossimeter*, an instrument invented and constructed by the author, has enabled him to arrive at a very considerable degree of perfection in this branch of art; because, by its assistance, he can supply artificial teeth, which keep in their places without any sort of ligature, and where, in the ordinary way, they could by no means be retained in the mouth.

When the method by which it is accomplished is known, it may appear astonishing how accurately bone is fitted by a few of the best dentists. The bone is worked to a model of the parts, by wetting the model with any liquid pigment, pressing the bone upon it, and then cutting away the places marked, till it be an exact reverse of the model. It is not possible to apply the model with the hand, without considerable shake, and the touching of wrong places with the colour; and hence it is not possible to fit the bone so as wholly to exclude

air from between it and the gums, and to prevent giving pain to the wearer. By the use of the ossimeter, a mere beginner can shape bone, to a model, with a degree of accuracy which the oldest practitioner, without it, would in vain attempt to imitate.

It only requires further to be added, on the subject of fitting bone to the mouth, that, in order to ensure success, it is necessary to adopt the same process with the real gums, after the model has been laid aside, that had previously been pursued with the model, until the new mouth-piece can be worn without occasioning the slightest pain, at any point, and to continue working, from time to time, till complete success be obtained. If this method be adopted, and the dentist understand his business, we shall no longer hear of its being necessary to apply emollients, such as roasted figs, &c. to the gums, for "*months*," before the artificial teeth can be worn with comfort. This is one of the best parts of the profession, and will prove equally useful to the dentist and the public. The practice too generally prevailing among dentists is, to attempt to force the gums to adapt themselves to the artificial bone, and not nicely to fit the bone to the natural gums, as ought to be the case. The consequences of such methods must appear so obvious to every person, as not to require any further observations.

There is one other circumstance to be attended

to, in fitting bone to the gums, which may offend the delicacy of some operators, and be thought unworthy of notice here; while, in reality, it is of great importance, that is, working with gloves on, and similar practices. This trifling must be dispensed with by every person who would seriously wish that his work, rather than himself, should please, were he to operate on the mouth even of a king.

CHAPTER VIII.

OF COMPOSITION TEETH.

Among the various modes, now in use, for supplying artificial teeth, that of composition or porcelain, lately offered to public notice, holds a conspicuous place. Whether this be an ancient or a modern discovery, it would be somewhat difficult to determine. If it be ancient, its simplicity did not perpetuate the use of this composition; nor is even its present cheapness likely to afford any great proof of its usefulness, by recommending it to general use. The teeth to be seen in the mouths of figures on a porcelain jar, will afford a tolerably correct idea of this composition, and the clatter of a china-woman's basket, that of their effect in one's mouth. The method of making composition teeth is so simple, that to describe it may occasion some risk of making the bakers turn dentists, and so deprive us of our daily bread; or, at least, to render them as common as hot muffins. When one or more porcelain teeth are to be supplied, a model of the parts is taken, in the usual manner, and the porcelain, while yet in a state of soft clay, is pressed into the model until the reverse,

or shape of the parts appears. On this piece, and of the same materials, the number of teeth required are formed, and afterwards sent to the porcelain manufactory, to be baked, which process renders it ready for use. The teeth, thus manufactured, are fastened in their place by ligatures, and are productive of all the evils arising from that source; while, from the impossibility of rendering them steady in the mouth, they produce an unpleasant jarring noise as often as they come in contact, in mastication. A serious inconvenience, already described, is felt with peculiar severity by those who have the misfortune to wear crockery teeth—the impossibility of fitting them properly to the gums; and the consequent necessity the gums are put to, of adapting themselves to the new teeth. It may be here remarked, what has, perhaps, already occurred to the reader, that composition teeth undergo some little change of their shape and size, while in the furnace; this circumstance, added to the well-known fact that, in most cases, a model of the mouth cannot be taken in wax, or any other substance, with absolute perfection, renders it necessary that the substance of artificial teeth should admit of such further alterations, after the model has been laid aside, as to fit it to be worn without pain or inconvenience. Of this the composition teeth do not admit; so that it becomes a matter of astonishment how they ever should have come into use. Of taking models, too, the author can

speak from experience, for he has found that, with the advantage of an improved instrument, constructed for the purpose, few mouth-pieces, made of bone or gold, can be formed so well upon the model, as not to require some slight alterations, before they can be worn with absolute ease. One of the writers, already so often quoted*, describes those teeth in the following words:

"The great improvement which, of late years, has been made in the supplying of artificial teeth, is in the use of porcelain composition, instead of the sea-horse bone; and, where expense is not an object, the superior cleanliness and incorruptibility of such artificial teeth will always entitle them to the preference." The preceding remarks are easily explained by the following: "Those persons, who require such aids, will always find themselves better served by a practitioner of established repute, than by those whose cupidity permits them to set truth, and even common sense, at defiance, and as the editor possesses the opportunity and means of suiting every exigency, he seeks for public favour and confidence, on just principles, free from all illusory pretensions."

Another writer on artificial teeth†, gives the following excellent account of the subject: he seems, however, to think a little too well of them. "The artificial teeth, called mineral, are composed of baked earth, covered with an enamel flux, and coloured to imitate nature. Many of them, how-

* Fuller, by Downing. † Murphy.

ever, have but little resemblance to nature, their opaque, livid appearance, very much resembling earthenware. I am, however, of opinion that the art of making mineral, or enamel teeth, is still capable of great improvement."

CHAPTER IX.

OF GRAFTING OR RIVETTING TEETH.

ANOTHER method of supplying artificial teeth is, by grafting natural ones, reduced to a proper size, upon the old stumps. This mode, where it can, with propriety, be applied, is excellent, and is practised by every dentist, being, perhaps, the most pleasant operation he has to perform upon the teeth, while, at the same time, it looks so natural as to defy the minutest scrutiny. It has been described thus. "When either, or all, of the six front teeth are decayed and painful, or so unsightly as to render their presence disagreeable, they should by no means be extracted, for, by filing them off close to the gums, artificial, or, which is far preferable, natural teeth may be fixed to the roots.—In doing this, the natural canal in the root is enlarged, and the nerve, of course, destroyed, so that after the teeth are properly settled, no tooth-ache can ever occur, nor is the operation itself attended with the pain generally supposed; frequently it does not occasion any at all; for we observe, that the bony substance of the teeth has no nerves, consequently no feeling; therefore,

filing it gives no real pain, only a trifling kind of jar, which soon passes off. Whenever, therefore, this method of affixing teeth can be adopted, it is far preferable to any other, and should always be recommended; for, as long as the roots remain firm, which is often many years, we can renew them at any time, without the least inconvenience, as they are independent of any other teeth; they may likewise be fitted to such a nicety as it is impossible to detect them, even on a minute examination; add to this their firmness, for if the root is sound, they will answer every purpose, almost equally well as the former natural teeth, whose place they occupy; and, indeed, so superior, in every respect, are teeth placed in this manner to any other, that it can be only from the impossibility of adapting them properly, that any other are recommended, where it is possible to apply these*."

Nothing can be better than the practice here recommended, with the exception of filing the decayed tooth, however long it may be. It will give much less annoyance to the patient to have the decayed tooth first sawed across, quite close to the gum, and afterwards filed down as much as possible: the bleeding will give to the gums a healthy tone, and the joining will be concealed, while the gum, if sound, will regain its usual position on the grafted tooth.

Some persons chip the decayed teeth, in the

* Fuller.

operation of preparing them for grafting on, which frequently has the effect of splintering them. A splintered fang will soon be attacked by disease, and thus render the operation useless. The state of the others, particularly of the back teeth, is a matter of the first consideration to the success of grafting teeth. When the mouth is shut, if the back teeth are remaining, the front ones of the one jaw do not come in contact with those of the other; but, on the contrary, if the back teeth are gone, the friction of the lower front teeth upon the upper ones soon loosens them, which causes them to fall out also. It must readily appear, then, that to be supplied with front teeth only, after the grinders are all gone, is, to throw away labour uselessly. In supplying artificial teeth of all kinds, therefore, this circumstance ought always to be kept in view, where durability is intended; otherwise the operation, however, profitable, can never prove honourable to the dentist. Artificial teeth, from one to a full set, possessing the advantage of being rivetted even to a single fang, will remain in their place more firmly than by any other method of fastening.

CHAPTER X.

OF GOLD PLATES.

THE fixing of artificial teeth, upon gold plates, properly adapted to the gums, is, from its universal applicability, one of the best modes, if not the very best, now in use. It is, however, the most difficult of execution, while it is the least understood of them all; and it certainly has occasioned more mischief to the wearers of artificial teeth than any other method. "As many teeth as are wanting are strongly rivetted on a plate of gold, made hollow, and fitted for the gum to rest in; the plate, containing the teeth, is attached to the adjoining teeth, by means of elastic gold *claws*, or *springs*, placed so as to embrace them*." From what has already been observed on the subject of ligatures, this practice must appear truly alarming; nor can there be the least reason to doubt that such claws, or springs, must, in a very short period, deprive their wearers of every natural tooth they possess. "Made hollow for the gums to rest in;" not fitted to the gums, as it ought to be, with the same care as has been advised with respect to the fitting of bone. That

* Murphy.

the universal applicability of gold plates has not hitherto been understood, at least by those dentists who have written on the subject, will appear from what follows:

"This last mode, gold plates, though more preferable, and generally useful, cannot be indiscriminately applied to every case; as the shape, situation, or state of the teeth, to which artificial teeth are to be attached, sometimes precludes the possibility of applying claws, or springs, to them, either with ease or security to the wearer."

Such, however, are the late improvements on this mode, introduced by the few who are able to accomplish it, that in cases where every other method would fail, even in their hands, they can succeed with ease and certainty in this. It has, in fact, given a new tone to the art, and raised it above the imperfection so generally ascribed to it. Such is the fondness with which ligatures have been clung to, although formed, like bruin's embrace, to destroy the object to which they are attached, that they are still very generally used.

"Ligature is injurious, by its misapplication alone; it is, and must ever continue to be, most useful to the dentist, for many purposes. When a few artificial teeth are to be supplied, they must either be pivotted to stumps, or attached to the adjoining teeth, by means of gold claws, or by means of ligature*."

A common method of making these plates of

* Downing.

gold was, to form them into something like the shape of the parts to be supplied with teeth, by merely bending them with a pair of pliers, and forcing them into their intended place, which naturally forced out the teeth with which the plate came in contact; or if claws or springs were added, the same injurious result was produced. Those who improved this method had brass models, cast for the purpose, on which the plate was moulded, in the usual way that dies are worked upon. But still almost all the former disadvantages of this method of making artificial teeth remained. So sensible of this are many of the best dentists, that they never attempt it at all. The last improvement on this method was, to make caps for such of the back teeth, or their fangs, as remained, when partially worn down by decay or attrition, and the whole formed out of one piece. That such caps may, even to many of the dentists themselves, appear to be useless, is not surprising, when it is known that they supply front teeth without thinking it necessary, at the same time, to insist upon back ones being given also. In order to understand the right use of these caps, it is only necessary to suppose any person's front teeth, at least as many of them as remain, to be sound, while the back teeth are so far wasted, by decay or attrition, as to allow the front teeth of the one jaw to act laterally on those of the other. The result, as has formerly been observed, would be, that,

from such friction, the fore teeth would soon fall out of their sockets. The advantage gained by the caps, therefore, will be to keep the jaws asunder, at their former distance, in mastication; by which means, the front teeth will remain in their former security. The fore teeth of many persons may thus be seen to project out of the mouth at all angles, or be worn down to mere stumps, while perfectly sound, without the owners being in the least aware of the cause: as this casualty may take place without any pain, or caries, for, as we advance in life, the canal in the teeth fills up, or becomes ossified.

A dentist, who worked only in bone, would, when such a case occurred to him, require either to extract the irregular teeth, although sound, to make room for his operations, to make his new mouth-piece so low as to allow the front teeth to act on each other as already mentioned; or to make the covering of bone so very fine as to yield and readily break in pieces during mastication. The hardest bone, when it has been in the mouth for a very short time, becomes soft and yielding, if thin. The chief use of gold, therefore, is to supply all these deficiencies. No person need be alarmed at the appearance which gold would make in the mouth; for it would only be necessary to cover such of the back teeth, as are easily concealed, while in front all appearance of it is easily hid by the new teeth and the gums.

The sheet gold, used for the purpose, is also an object of consideration; if too thick, it can never be moulded into proper shapes; nor, if it could, would it be either pleasant or safe to use it. The circumstances in which it would be advisable to use bone, or gold, or both united, when to employ natural teeth, and when bone, shaped into the form of teeth, will always remain a matter of much nicety, and must depend entirely on the judgement of the dentist. One thing is certain, that he should be able to work equally well in them all.

It has been remarked, in another part of this work, that the proper use of bone is to supply the place of the sockets of the teeth and of the gums, as, upon the loss of teeth, their sockets become absorbed. In such a case as this, gold alone would be of little use, since it would go but a very little way, in separating the jaws to the proper distance, for relieving the fore teeth. At the same time the case might be such as to require bone in one part of the mouth, and gold only in another; unless the patient would be inclined to submit to the extraction of teeth perhaps sound. Where this happens to be the case, the proper way is, to make a plate, fitted to the whole jaw, and upon it, in the proper place, to fasten, by rivets, natural teeth, where they ought to appear, and bone, formed into back teeth and gums, where these are wanting. By these means a mouth, however, irregular, suppose even such a case as

every second tooth wanting, could be properly organized, without injuring a sound tooth or fang; and the work, if well executed, would rival natural teeth in every particular, except the reality; and, instead of loosening them by its friction, the mouth-piece, thus formed, would give security to the natural teeth, and would remain firmly in its place without springs, or claws, with the additional advantage of being taken out and replaced by the wearer at pleasure.

On this principle are formed all the instruments in use for correcting disorganizations of the mouth and teeth of young persons, and he who best understands the one, will be best able to execute the other.

CHAPTER XI.

OF CLEANING THE TEETH.

Although scaling the teeth is an operation easily performed by any dentist, it still may not be amiss to observe, that there is no operation on the teeth which admits of greater variety, in the manner in which it may be done. The intention of cleaning the teeth is, simply to keep them free from the accumulation of extraneous matter, and, whenever this is accomplished, they assume the appearance of finely-polished ivory.

The various shades of colour, to be met with in the teeth of different persons, can only be accounted for, from constitutional, or accidental causes, as, in general, where such causes do not operate, they are found, at least when they first appear, perfectly pure and white. It has often been observed, although perhaps not accounted for, that one artist can scale teeth so effectually as to prevent any speedy accumulation of extraneous matter upon them; while with another, operating on the same individual, quite a contrary effect will take place. As the cause of this often depends on the patient himself, it may not be improper to caution him against impatience under the

operation; as that might induce him to admit that the teeth feel smooth, long before the stony particles have been completely removed from them. The consequence of which will be, that the particles thus left shall serve as collecting points for new matter, and until this be accomplished, subject the tongue to irritation, and even to become inflamed. This is also the proper time for the dentist to watch and give warning of the first approaches of disease, as, by so doing, much general suffering and misery will be prevented, and many a good tooth saved. By due attention to the teeth, the gums also are more likely to preserve a healthy tone; and many appearances, which are mistaken for scurvy, and other diseases, may be prevented altogether. Healthy gums have a pale, clear, hardy appearance, and they adhere firmly to the necks of the teeth, while they do not easily bleed; unhealthy gums, on the contrary, forsake the teeth, bleed readily on every occasion, have the sensation of tooth-ache, whenever they are exposed to any vicissitude, either in the temperature of the solids, or liquids, subjected to them, or even of the air. When it is known that scaling and stopping the teeth, scarifying the gums, and ordinary attention to cleanliness will, in general, prevent these evils, the dentist will be in greater requisition, and the public will experience less pain.

Another important advantage is gained, by pre-

serving the teeth and gums clean and sound, a wholesome breath, than which nothing can be more conducive to comfort The removal of the adventitious matter from the teeth is a part in which the dentist ought to be very cautious: he should know perfectly the difference between the natural, or original tooth, and the adventitious matter, carefully avoiding even the possibility of hurting the former, and sparing no pains to remove the latter; because many persons have had their teeth wholly spoiled by injudicious treatment of them, in this respect. As the cause of this incrustation is not either a known disease of the constitution, or of the parts, but depends on a property of the matter secreted, simply as inanimate matter, the remedy of course becomes either mechanical or chemical. The mechanical remedies are friction, filing, and picking. The chemical means are solvents; these are either alkalies or acids. Acids of all descriptions ought to be studiously avoided; they will beautify the teeth for a short time, but will, at the same time, waste the enamel and weaken the gums. Every person must have observed that, although the teeth appear cleaner after eating fruit, a tenderness and pain are often experienced in consequence. When the accumulation has been considerable, the teeth and gums will feel tender on the removal of the matter, and even be affected by cold air; but this will not be of long duration. A little

warm water applied to them will at any time remove such pain. With respect to the tooth-powders to be used, those ought to be avoided which have gritty particles, and in general those may be recommended, as the safest, which are of vegetable composition only, as they do not injure the teeth. In using the tooth-brush, although it may sometimes be necessary to rub it across, it will in general answer the purpose, equally well, to rub up and down in a perpendicular direction, as this method, being in the line of the enamel, will not injure it so much as the other. The teeth of every person ought to be cleaned by a dentist, at least once in twelve months, although a predisposition in the teeth of many persons to collect extraneous matter, may require more frequent repetitions of the operation.

CHAPTER XII.

OF ARTIFICIAL PALATES.

The loss of the human palate has been, at all times, considered one of the greatest misfortunes to which it is the lot of mankind to be subject. In some persons this defect is the result of accident, or imprudence; in many it is a natural conformation. In either case, the space within the mouth, which lies between the mouth and nose, is laid open, in consequence of which the unfortunate sufferer is nearly deprived of the power of speech; while the act of swallowing produces an unnatural and unpleasant noise, and liquids are as likely to pass out of the nose as into the stomach. As no human art can restore a lost palate, more than an amputated limb, it may be important to know every method which has been contrived to supply the defect, by artificial means. Various have been the attempts made for this purpose, but with varied success, until the appearance of the Improved Artificial Palate, invented, some years ago, by the author; nor is he aware of any other person having ever attempted to remedy defects of the palate, which were of natural and not of accidental growth. In order to understand

the nature of the Improved Artificial Palate, it will be necessary for the reader to peruse the following descriptions, from the best medical authorities :

"Children are frequently born with malformation of the lips. Every species of this deformity is called hare-lip. The fissure commonly affects only the lip itself. In many cases, however, it extends along the bones of the palate, even as far as the uvula. Sometimes these bones are totally wanting; sometimes they are only divided by a fissure. Such a malformation is always peculiarly afflicting. In its least degree, it constantly occasions considerable deformity; and, when it is more marked, it frequently hinders infants from sucking, and makes it indispensible to nourish them by other means. When the lower lip alone is affected, which is more rarely the case, the child can neither retain its saliva, nor learn to speak, except with the greatest impediment. But when the fissure pervades the palate, the patient not only never articulates perfectly, but cannot masticate or swallow, except with great difficulty, on account of the food readily getting up into the nose*."

In cases where the palate is lost through disease, "the ulcers, in the mouth and throat, being likewise suffered to spread, and to occasion a caries of the bones of the palate, an opening will be made from the mouth to the nose, and the cartilages

* Dr. Hooper.

and bones of the nose, being at length corroded away, this will sink on a level with the face."

The following extracts, from the publications already quoted, will inform the reader of all that the dentists have been able to do in the matter. "The palate bones are sometimes naturally imperfect. When the palate is perforated, either by nature, or from disease, the speech is rendered inarticulate, and the tone of voice is lost in nasal sound. To remedy this defect, and to prevent the inconvenience arising from food getting through the aperture, artificial palates were constructed. The usual mode of making artificial palates is, by a thin plate of gold or silver, made convex, and so fitted as to cover the orifice. This plate is secured in its place by means of a sponge. The best way of remedying a defective palate is, by a double plate, one of which covers the internal and the other the external surface of the orifice. The internal plate is formed of two sides, or flaps, which, by means of a hinge, or joint, are raised, and so let into the aperture, when the flaps are let down, they are confined by a cross bar, contrived to turn on them by a pivot from the opposite side. Palates are also fixed in, by gold bands, to the natural teeth. In either of the last mentioned modes, the sponge is dispensed with, which is certainly a great advantage; for, by imbibing the mucus narium, it becomes foul and taints the breath. The wearer of a false palate with a sponge

should be careful to keep it clean, and to renew the sponge, when necessary."

The human palate consists of two parts; one of bone, being a continuation of the sockets of the teeth; the other a soft fleshy substance, situated near the uvula. When the loss of the palate is occasioned by disease, the bones only are affected, before the progress of the disease can be stopped. Plate III. fig. 1, represents a case of accidental loss of palate. But when the defect is a natural malformation, the fissure sometimes extends from the lips and teeth to the uvula. For this no complete remedy has ever before been attempted. It has been common, in such cases, to make a plate to cover only one half of the natural fissure. Besides the methods of supplying artificial palates, here noticed, others might also have been added. Bone, India rubber, &c., have been used for this purpose. As persons, whose means would enable them to have the best articles, are known to make use of India rubber, or sponge, for artificial palates, it is reasonable to infer, that the other modes attempted have either failed of affording the advantages proposed by them; or, that those dentists, who operated, did not understand the nature of the work to be done. The palate, made of a thin plate of gold or silver, with a sponge attached, and intended to be forced into the wound, is in the hands of every dentist, and of easy accomplishment. Some of the disadvan-

tages arising from the use of these are, the enlargement of the orifice of the wound which it occasions, and the unpleasant breath, inevitably proceeding from the collection of the mucous matter constantly in contact with it. It may be recommended, however, for its cheapness and the facility it affords to a poor man, who may be so unfortunate as to require one, to have the enjoyment of an artificial palate.

The India rubber palate is still cheaper and simpler, but, from its hardness, it also has a greater tendency to enlarge the orifice in the palate. The use of India rubber, as an artificial palate, is known frequently to enlarge the wound so much as to render it incapable of any longer retaining one of any sort. The method of adapting India rubber, for the purpose, is, to cut a piece of the hardest sort into the shape of the fissure to be fitted, only made a little larger, and a groove formed round the edge of it. The piece is then forced into its place, where the edge of the wound, catching the groove, will retain it firmly.

Bone is also used for the purpose of supplying artificial palates, but it is never used, except by persons who do not understand the working in metals. When "artificial palates have been fixed in, by gold bands, to the natural teeth, the sponge is dispensed with;" but the teeth suffer and fall out; nor is the palate, thus formed, air tight. The other method mentioned, of using two plates, one

for the internal side and the other for the external, is almost theoretical, as a case would not occur, among a thousand, where it could be made to apply. The author has tried all these modes, and particularly the last; and he has found that no two cases of the disease are ever alike. He has found it necessary, in every new case, to contrive something new. In every instance the benefit has been but partial—the metals have not fitted closely, and have given pain, while the teeth, to which they were attached, becoming loose from the friction of the metals, soon dropped out of their sockets,—and the India rubber, or other flexible substances, have, by their pressure upon the parts, aggravated the disease. In general, too, the substitute palate could not be removed, even to be cleaned, or replaced, without the aid of a surgeon; and this, often a matter of expense, and always one of delicacy, subjected the wearer to unpleasant consequences, from the infrequency with which cleaning could be performed. This last circumstance, together with its own peculiar scent, made the India rubber particularly offensive. It is, therefore, with much satisfaction the author has to state, that he has invented a palate, which may be made of gold or silver, and so constructed, that the principle of it can be universally applied. It requires no connexion with the teeth, nor does it hurt any other part of the mouth; while the wearer can take it out, clean, and replace it, with-

out any assistance, in the short space of two or three minutes. At the same time, it fits perfectly air-tight; and, as it exerts its pressure equally on all the parts, it never tends to increase the deficiency. He is enabled further to state, that it has given uniform satisfaction to the wearers, as well on account of the complete restoration of the voice, which it produces, as of the ease with which it is worn, and the facility with which it may be cleaned. As the improved artificial palate in some measure suggested the publication of this little work, it was at the same time intended to give drawings and descriptions of it in detail; but, from a consideration of the difficulty of conveying any correct idea of it from a single case, and from the great variety of shapes it has assumed according to the nature of the cases where it was required, this plan has been abandoned. Another consideration has added weight to this resolution, the opinion of some medical gentlemen, who, from their ignorance of the mechanical arts, supposed that the principle of the improved palate could apply in no case where the form of the fissure differed from the particular case submitted to their inspection. For the information of the public, it will be sufficient to state, that the principle of the improved palate applies in every possible case of perforation of that organ—and, for the information of dentists, all that can be stated is, that a thin plate is formed, to cover the fissure, whatever may be its

shape; that it is kept air-tight in its place, by means of wings, contrived to act in such a manner as to adapt themselves to the inside of the wound, whatever may be its shape. The machinery occupies but a very small space and is concealed within the fissure in the natural palate. The wings are moveable, and in such a way as not only to take firm hold of the parts, at any angle required, but they possess the advantage of a perpendicular movement, and rise or fall so as to fit equally well whatever may be the thickness of the parts between them and the external plate. In some cases two wings will be sufficient, in others, half a dozen may be required; and the whole may be taken out and replaced by the wearer with the same facility that he winds his watch. It ought to be observed here that, when an artificial palate is made in the best manner described by others, that is, when formed of two plates, fastened by a hinge in the centre, any of these advantages cannot be obtained; neither can it ever be made air-tight. When the fissure extends from the lips to the uvula, a plate must be made, as before, having artificial teeth on it in the usual way, in front, if required, and having the part of the plate which covers the soft palate made elastic by means of springs and hinges, so as to render it moveable with those parts, while at the same time it continues air-tight, by means of the wings, as readily as where it covers the bony palate. If the fissure extend from the inside of

the teeth only, leaving them quite regular and sound, a plate, fitting the part, is to be made as before, only sometimes with this addition, that it has caps for the back teeth, as described at page 78; as, in that case, no accident can befal the teeth from springs or claws, for none will be required; although wings are indispensable in this as well as in every possible case of artificial palates, that are wholly metallic, and therefore cleanly and comfortable.

EXTRACTS FROM MEDICAL JOURNALS IN FAVOUR OF THE IMPROVED ARTIFICIAL PALATE.

From a number of favourable testimonials, respecting the improved artificial palate, the following are selected from two medical journals of the greatest respectability:

L'Indicateur Medical, printed at Paris, treating of the loss of the palate, takes the following notice of it. "M. Clark, dentiste fort ingénieux, qui demeure Grosvenor-street, à Londres, en fait, auxquels on ne trouve point ces inconvéniens: les siens s'adaptent aux parties avec la dernière précision sans presser le moins du monde contre les bords de l'ouverture. On peut les enlever, les nettoyer et les remettre en deux ou trois minutes."

The London Medical and Physical Journal, for October, 1823, has the following observations:

"Artificial Palate.—The natural want, or the casual destruction, of that delicate organ, the human palate, is attended with the most unpleasant of all effects—the loss of voice; and, of the many substitutes which we have, very few have those advantages which could be wished. The common metallic palate seldom fits well, and always gives pain; while those of gum cautchouc, and other elastic substances, are offensive, and also, by pressing asunder the parts, increase the deficiency. The removal of them all, for the purpose of cleaning, is a work of some trouble. We have seen a silver palate, constructed by Mr. Clark, of Grosvenor-street, a very ingenious dentist, which obviates many of the objections to the old construction. It fits the parts with the utmost nicety, and, as it does not at all press upon the edges of the deficiency, it allows the parts to contract, or even to be to a certain extent reproduced; while the wearer can take it out, clean it, and replace it, in two or three minutes. When it is to be removed or put in, the wings which fasten it to the upper side are made to collapse into a very small space; and, after it is put in its place, they are made to expand and embrace the edges of the bone, with any degree of tightness that may be necessary. The whole of the machinery (which is very neat) is worked by a small button in the

centre of the palate, so flat as to give no uneasiness to the tongue, and yet which can be moved with the greatest ease. Besides the facility with which this palate can be removed and replaced, the great advantage of it consists in the accuracy with which it fits the parts."

In addition to these and other equally favourable notices in the journals, the author is in possession of testimonials, of the value and complete and permanent success of his invention, from surgeons of the first eminence; but, as these relate to the cures and contain the names of individuals, he cannot, with propriety, lay them before the public.

THE END.

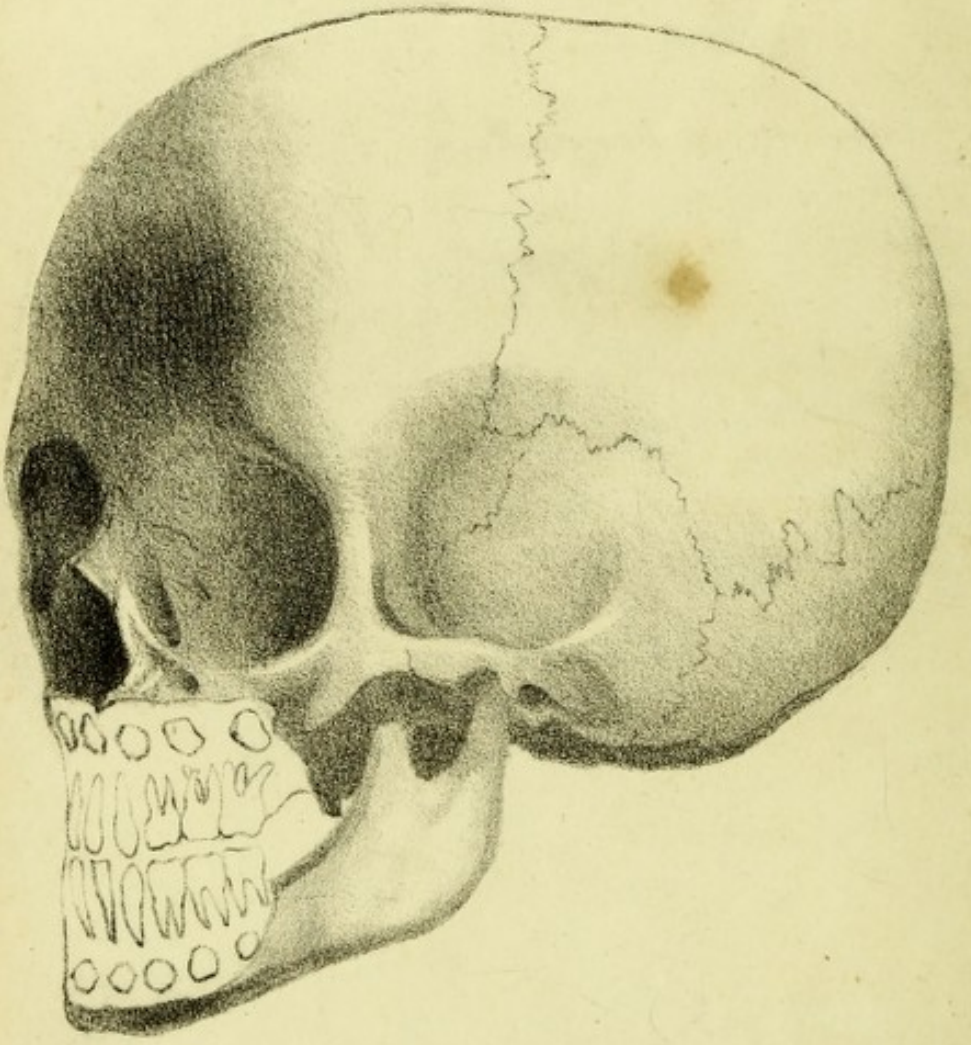
LONDON:
Printed by James Swan, 76, Fleet-street.

PLATE I.

FIG. 1.—Head of an old gentleman after being supplied with artificial teeth.

FIG. 2.—The same without his teeth, as may be seen by the dotted lines.

Plate 2nd



For Mr. Clark's Work on the Teeth

PLATE II.

SKULL of a young person under seven years of age.

This plate has been sketched from a skull in which the full complement of shedding teeth was perfect, and the permanent teeth forming in their separate cells, the fore part removed for the purpose of exposing these.

Plate 5th

Fig 1

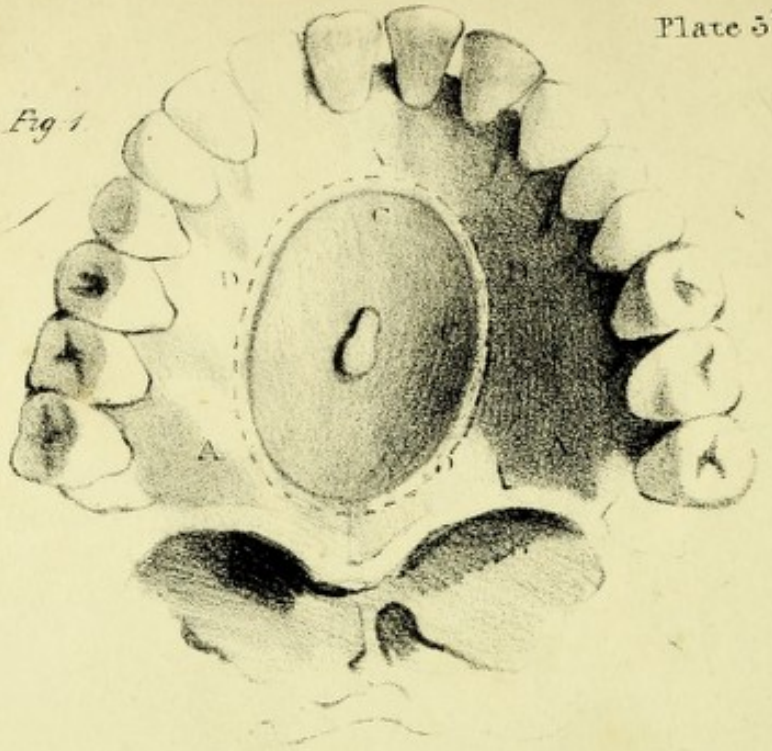
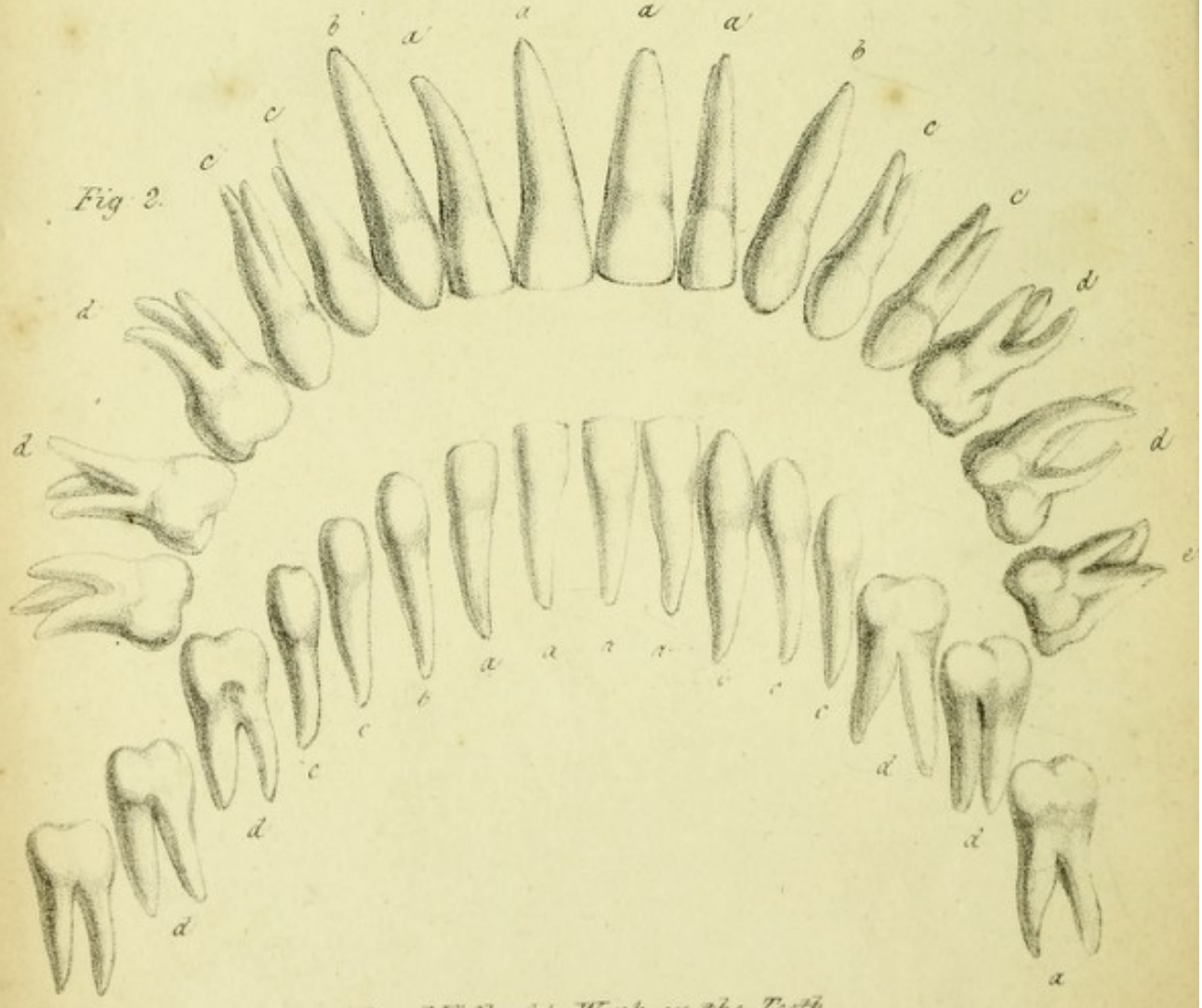


Fig 2.



For Mr Clark's Work on the Teeth

PLATE III.

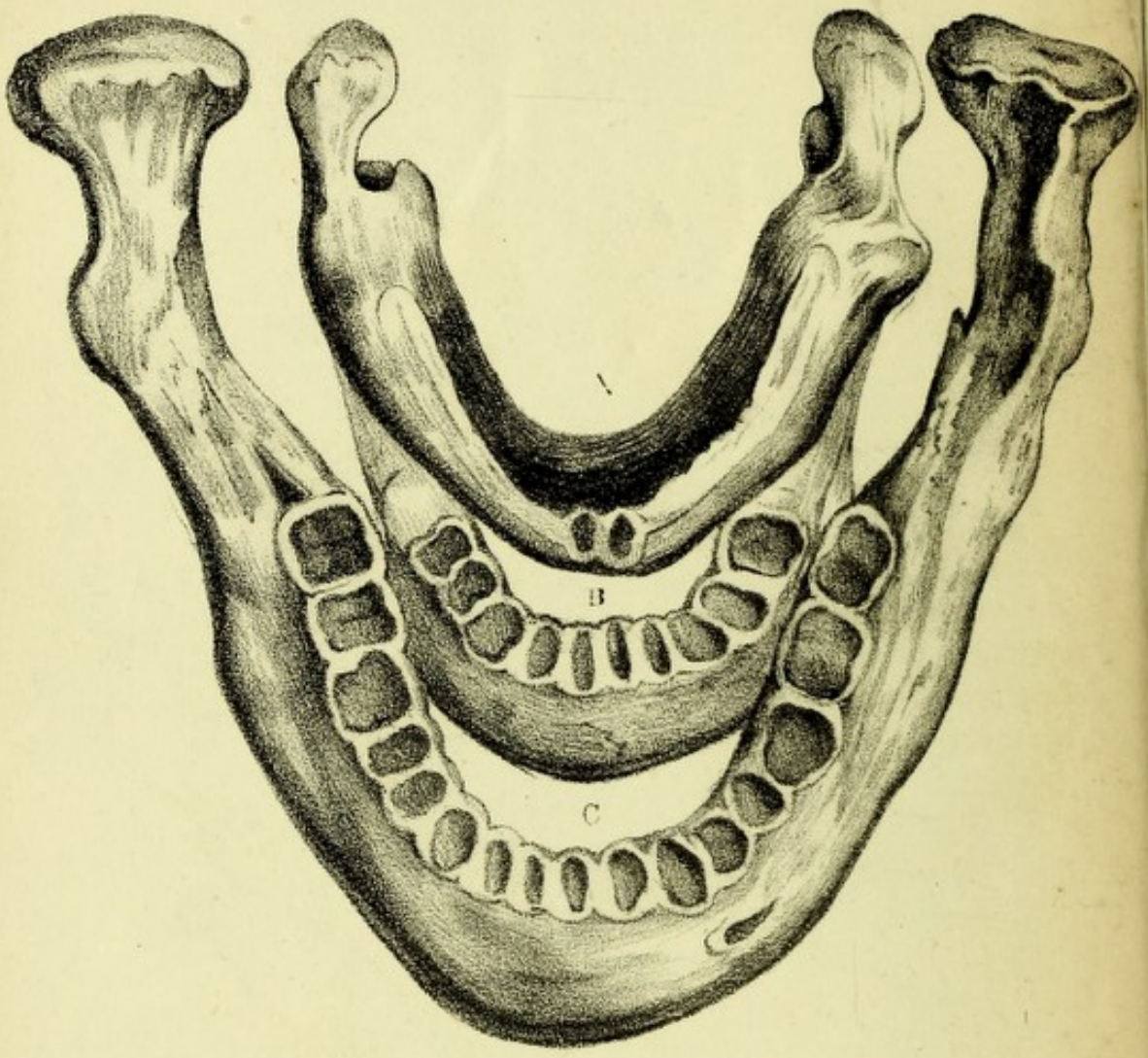
FIG. 1.—The human palate as far back as the uvula, with an inside view of the teeth of the upper jaw.

A.A.A. The bony palate.—B.B. The fleshy palate.—C.C.C. Accidental loss of the bony palate.—D.D.D. Gold plate of the Artificial Palate invented by the author.—E. The key used for adjusting the wings of the instrument, within the fissure.

FIG. 2.—Full complement of the human teeth, in both jaws, arranged in their proper order.

a.a. &c. Eight incisors.—b.b. &c. Four canine, or eye-teeth.—c.c. &c. Eight bicuspides, or small grinders.—d.d. &c. Eight grinders.—e.e. &c. Four wisdom-teeth.

Plate 4th.



For Mr Clark's Work on the Teeth

PLATE IV.

FIGS. A. B. C. represent the under jaws of a child of six months, a boy of six years, and a man of thirty years of age. From which it may be seen that the dental circle does not become larger in front of the mouth after the first year.

Fig. 1.

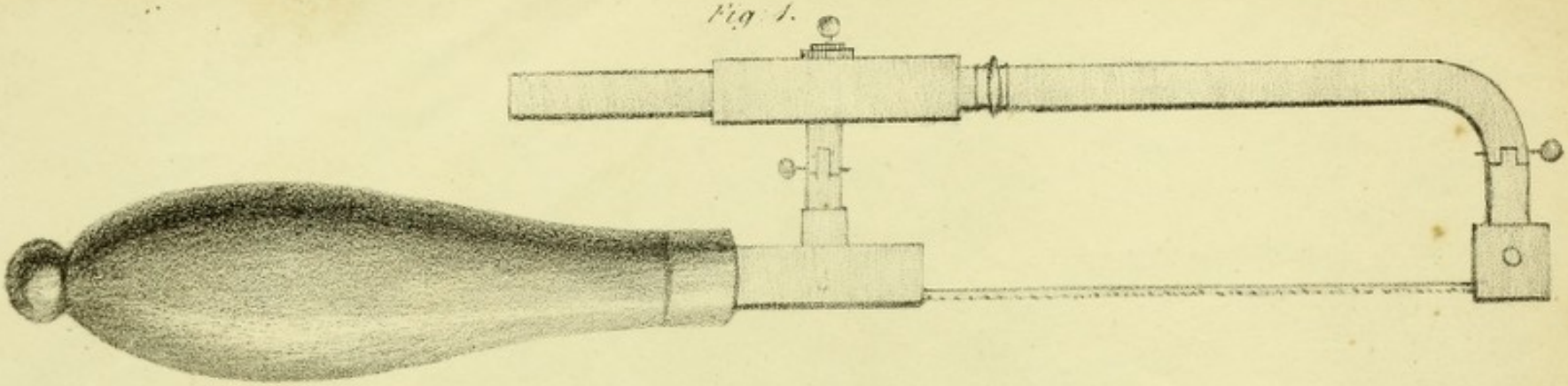


Fig. 2

For Mr Clark's Work on the Teeth.

PLATE V.

FIG. 1.—Saw, invented by the author, for cutting diseased teeth, in the operation of grafting.

FIG. 2—Dental Mirror, or a concave glass, for inspecting the inside of the mouth.

Plate 6th

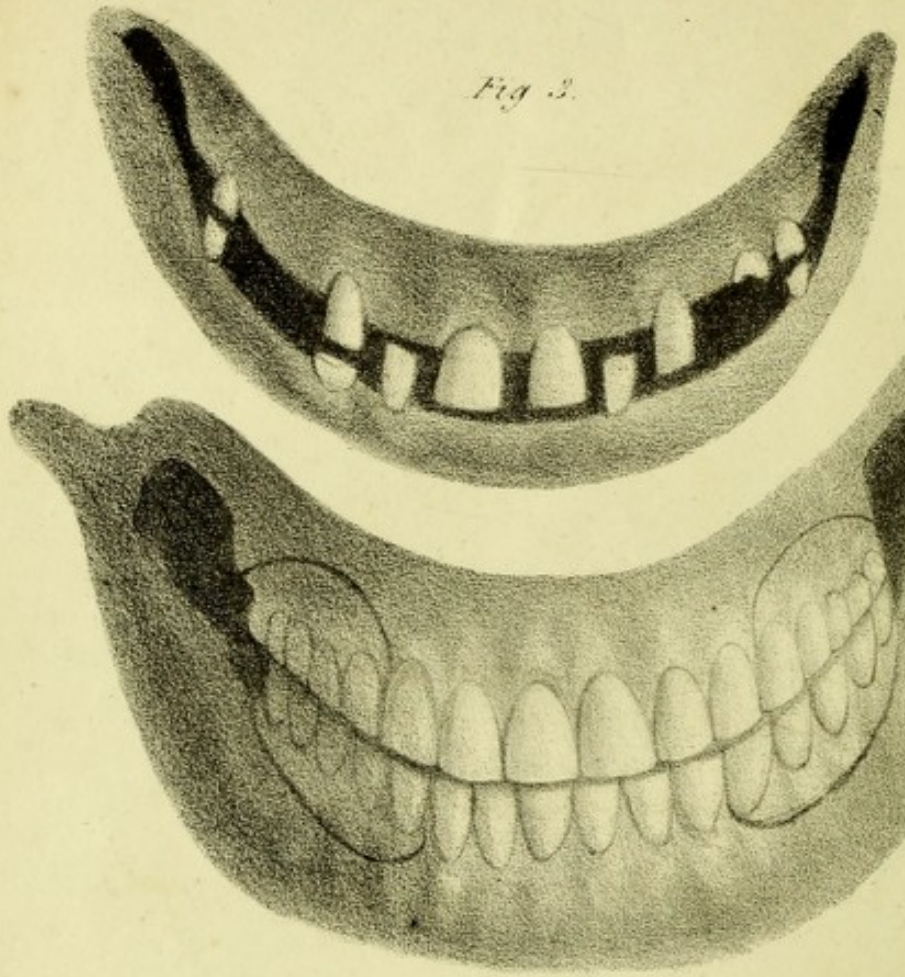


Fig 3.

Fig 4.

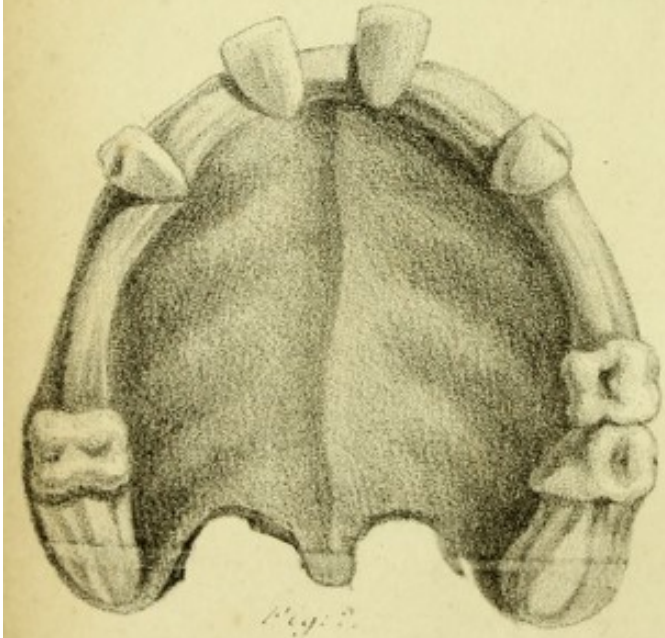


Fig 2.

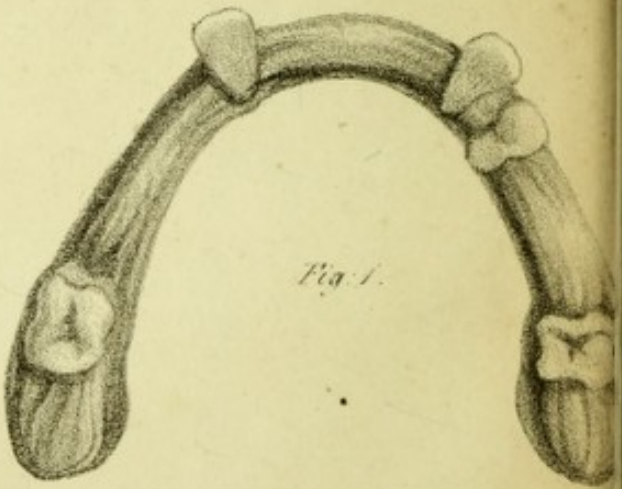


Fig 1.

For M^r Clark's Work on the Teeth.

PLATE VI.

FIGS. 1 and 2.—The lower and upper jaw of a gentleman who never had received more than thirteen permanent teeth.

FIG. 3.—The appearance of the gentleman's mouth when shut.

FIG. 4.—The same mouth after being supplied with artificial teeth.

1065