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BURDELL
ON
TEETH.
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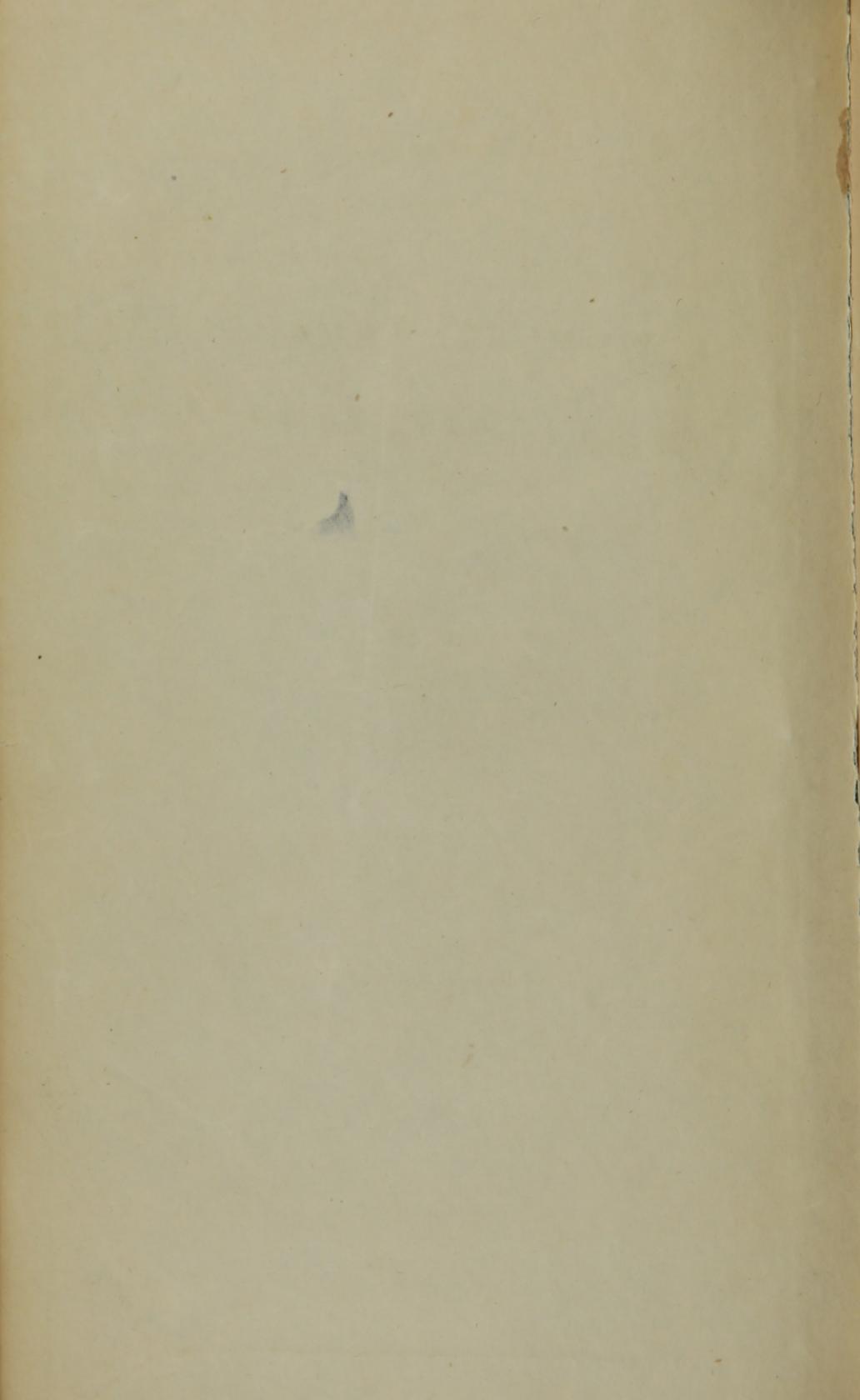
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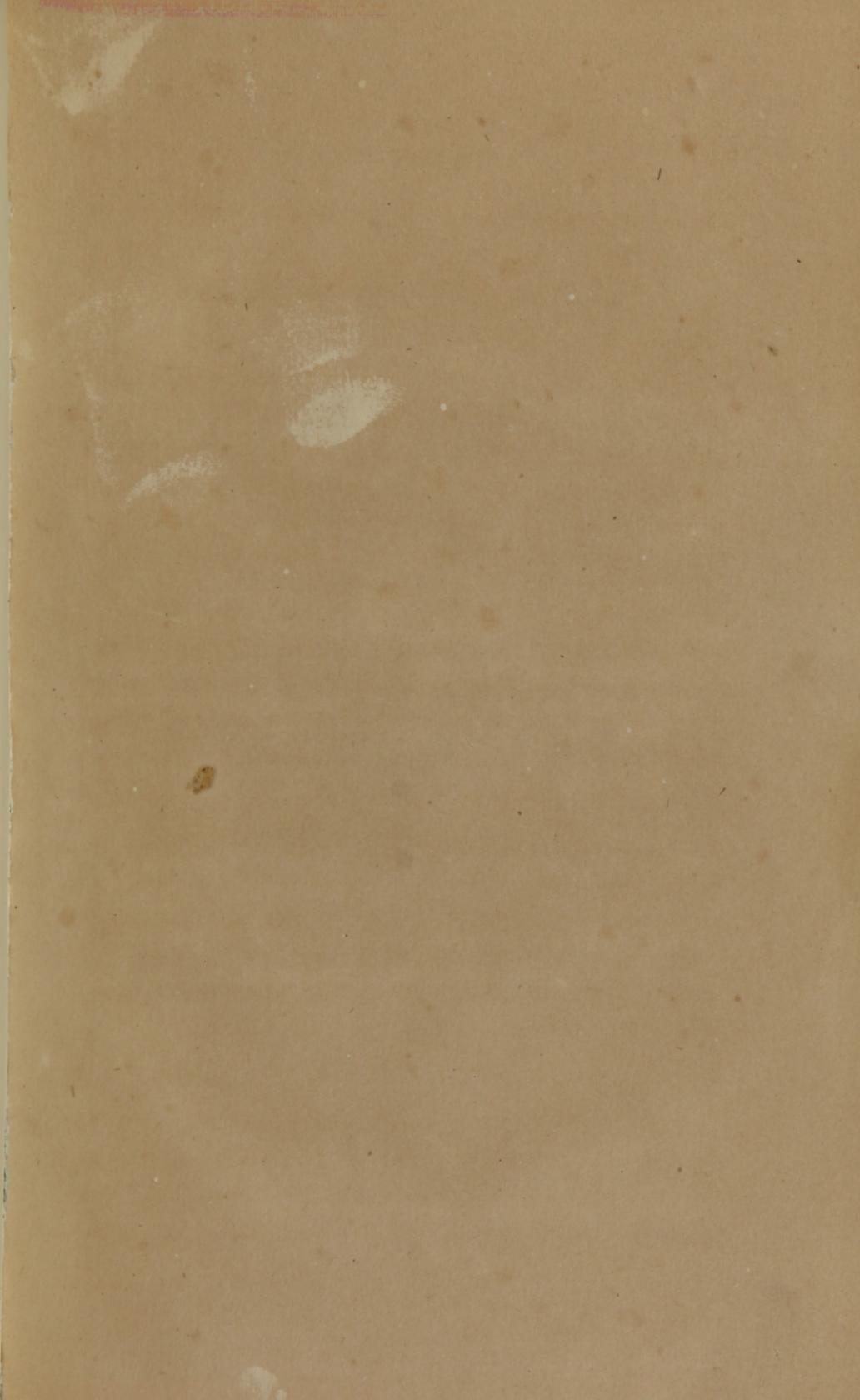
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OBSERVATIONS

ON THE

STRUCTURE, PHYSIOLOGY, ANATOMY

AND

DISEASES OF THE TEETH;

IN TWO PARTS.

PART FIRST,

BY HARVEY BURDELL, M. D.

HONORARY MEMBER OF THE PHILADELPHIA MEDICAL SOCIETY, AND MEMBER
OF THE MEDICAL SOCIETY OF THE CITY AND COUNTY
OF NEW-YORK.

PART SECOND,

BY JOHN BURDELL, Dentist.

WITH DRAWINGS AND ILLUSTRATIONS.

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✍ Several errors in this work escaped notice until after the sheets were printed, but as they do not change the sense materially, it is considered unnecessary to point them out.

INTRODUCTION.

THE author of the following pages intended to have treated fully and in detail, of the anatomy, physiology, and diseases of the teeth; and likewise to have prescribed the mode of treating such diseases, and to have given rules for the preservation of these important organs of the human economy; but his professional engagements and other circumstances have prevented. He hopes, however, at a future period, to accomplish his original undertaking.

The brief treatise which is here presented to the reader, is not designed for the instruction of the profession, but is intended for the perusal of the author's friends and patrons; and he will feel highly gratified and amply repaid for his trouble if they derive from it any useful information.

The profession of dentistry has obtained a degree of importance and respectability within the last

twenty years, more particularly in our large cities which enables its qualified and accomplished professors to rank with the educated physician or surgeon.

Quacks and ignorant pretenders in this, as well as in the other branches of the healing art, are numerous. It is a fact, universally admitted, that a majority of those who assume to themselves the title of "surgeon dentists," and who palm themselves off by means of recommendations, advertisements, &c., are persons who have devoted the earlier part of their life to pursuits widely different. Barbers, butchers, tailors, blacksmiths, carpenters, and in fact those engaged in almost every other capacity, (not that these occupations are less respectable,) without the least preparatory education, quit their shops, issue their placards, and commence *sans ceremonie*, to gain an experimental knowledge, at the expense of those who may be so unfortunate as to fall into their hands.

It cannot be supposed that the former pursuits of such individuals could have contributed much to their surgical knowledge; yet in almost every newspaper we see them pushing themselves forward into notice, with an impudence and boldness equalled only by the brazen-faced medical charlatan.

Such men, however, render themselves liable at common law for any damage which may be sustained from their swindling and culpable practices.

But this is not sufficient ; if laws were enacted for the protection of the dentist, as there are for that of the physician, those only could pursue the profession of dentistry who had been regularly educated to it.

In Germany, Prussia, and several other countries, it is required by law that the dentist shall possess a regular medical education, as a preparatory step, previous to being admitted to practise the dental art. In Paris, in the year 1700, a law was enacted, that those only should practise dentistry who were licensed physicians or surgeons ; and a few years after, this law was amended, prohibiting dentistry to be practised except by those who had served three years with credit and fidelity as licensed surgeons.

How much more creditable would it be to those engaged in the dental profession, if laws similar to these existed in our own country ; and then the educated dentist would not hesitate or be ashamed to acknowledge himself to be a member of the profession while associating with strangers.

In many parts of the United States, particularly in small towns and villages, where the inhabitants have been so often duped and swindled by " surgeon dentists," all those who practise dentistry are looked upon with ridicule and contempt, and are considered to be accomplished knaves or genteel impostors.

Information on the subject of the preservation of the teeth should be more extensively diffused throughout the community; but in this country, where the treatment of the diseases of the teeth are confined principally to unprofessional persons, the licensed practitioner considers it out of his province to interfere, or even to study the subject, so as to impart to others useful knowledge.

H. B.

New-York, May, 1838.

PART I.

STRUCTURE AND COMPOSITION OF THE TEETH.

TEETH are the organs designed by Nature for dividing and masticating the different substances required for the support of life; they are admirably adapted for this purpose, being the hardest and densest structures of the body. They also contribute materially to the beauty and expression of the face, to the articulation of language, and to other important purposes.

The teeth, in their chemical and physical properties, in their composition and general organization, resemble the bones. They are formed on the same general plan, by the union of gelatine with earthy particles. They, however, possess less vitality, are developed in a different manner, and are united with the body in a mode different from that of the bones.

The teeth have not the power of recovering their substance, as the other bones have; thus, if a portion of a tooth be broken off, it never grows again; if a bone, however, be fractured, the broken parts join, and in many cases become stronger than before. The teeth differ from the bones also in their mode of development, and in the energy with which they re-

sist the action of chemical agents and of decomposition after death.

Each tooth is divided into three sections—the root, the neck, and the crown; the root is that portion inserted in the jaw-bone; the neck is that part between the socket and crown, and is surrounded with the gum; the crown or external body is that part which projects into the cavity of the mouth. The tissue of the teeth is very hard and solid; they are composed of two substances—the bony portion and the enamel. The bony portion forms most of the tooth,—its root, its neck, and much of the crown.

In the following tables may be seen the chemical analysis of a bone, and also of the bony part of a tooth, as furnished by that distinguished chemist, Berzelius. The proportions are contained in a hundred parts:—

BONES.

Animal matter,	33.3
Phosphate of lime,	51.04
Carbonate of lime,	11.30
Fluate of lime,	2
Phosphate of magnesia,	1.16
Soda, Muriate of soda and water,	1.20
	<hr/>
	100

BONY PART OF A TOOTH.

Animal matter,	28
Phosphate of lime,	62
Carbonate of lime,	5.5

Fluate of lime,	2
Phosphate of magnesia,	1
Soda and muriate of soda,	1.5
	<hr/>
	100

The enamel is a semi-transparent, shining, and milk-white substance. It is firmer and harder than the bony portion, and covers all that part of the tooth which projects from the gum. Its structure is crystalline; and it is composed, according to Berzelius, as follows:—

ENAMEL.

Animal matter and water,	1
Phosphate of lime,	85.3
Carbonate of lime,	8
Fluate of lime,	3.2
Phosphate of magnesia,	1.5
Soda and muriate of soda,	1
	<hr/>
	100

Moricini asserts that the enamel contains 0.33 of lime; 0.09 of magnesia; 0.05 of alumina; 0.22 of fluoric and phosphoric acid; 0.01 of carbonic acid; 0.30 of animal substance. Pepy, in his analysis of the enamel, was unable to detect the least trace of animal matter. Bell, however, concludes, and very justly, from the circumstance that the enamel becomes blackened when exposed to a considerable

degree of heat, that it contains a small proportion of animal matter.

It has been stated by a few writers, that the enamel cannot be colored artificially; but such is not the fact. In those parts of China and the East Indies where the betel nut is chewed, the teeth are darkened by its use. The natives of the Pelew Islands color their teeth black with the juice of certain plants. Chewing that noxious and poisonous weed, tobacco, causes the teeth to assume an unnatural yellowish hue.

ORGANIZATION OF THE TEETH.

“That the teeth possess vitality,” says Dr. Bell, “that they are connected by their organization with the general system, having nerves, blood-vessels, and absorbents, and are analogous in this respect to other bones, is a truth so strongly attested by all the phenomena they present, whether in a healthy or diseased state, that it is difficult to imagine upon what grounds it can have been controverted, or even doubted, by any one whose opinions are deduced from observation or experiment.”

The blood circulates through the teeth in the same manner as it does through the bones. The late distinguished anatomist and physiologist, Dr. John Hunter, asserts, that so far as the circulation is concerned, the teeth are extraneous or foreign bodies; and he then attempts to prove that they possess a living principle, which renders his position fallacious by his own reasoning. Hunter was led to doubt the

vascularity of the teeth, by the result of his experiments, which were very ingenious.

The opinions and doctrines of Hunter, on the vitality and vascularity of the teeth, are now generally considered as erroneous, although some few authors still advocate his views on the subject. Thus they are followed and adopted by the celebrated Baron Cuvier; and De Blainville has gone beyond both, for he not only denies that the teeth have a vascular structure, but even asserts that they have no living principle. Yet the best writers maintain that the teeth are organized, but do not possess so much vitality as the bones.

One of the experiments on which Hunter founded his opinion was, the impossibility of injecting the teeth; but the external and internal layer of the dental germ have been injected by Mr. Fox.

The absorbents of the teeth are so minute that anatomists have not been able to trace them, but physiological observation prove that they exist.

TEETHING, OR FIRST DENTITION.

No period of life is so critical as that of the child during the first dentition. The bills of mortality prove that about one half of the deaths of children under two years of age are caused by the effects of teething, or by diseases thereby induced.

The highly susceptible and delicate organization of the body seems to be peculiarly sensitive when

the teeth are about effecting their passage through the gums.

At whatever period the teeth are formed and may appear, the process is often so gradual that but little pain is experienced. But at other times, various and even alarming forms of disease prevail.

The first active stage of teething occurs generally about the fourth, fifth, or sixth month of infancy; at this time the bone forms from the pulp of the tooth, which has long been enveloped in the gums. The first symptoms are manifested by frequent moanings and turning of the head, and by fretfulness and crying; at this time the saliva flows from the mouth very freely; next, the uneasiness of the child is found to be relieved by pressure against the gums with a hard substance. For this purpose a ring of ivory, or coral, or gold, is employed; the latest invention is a ring of gum elastic, or India rubber, which answers a very good purpose.

If the irritation be very great, the gums swell and become painful; the child starts in its sleep, and is feverish; the bowels are frequently affected, and a red eruption appears, which is called *red gum*. In about ten days or a fortnight these symptoms subside, but the child may continue with slight symptoms of uneasiness until the period when the teeth are about coming through the gum.

At other times the symptoms are so violent that the whole system is in the highest degree of excitement. "The difficulty of breathing often increases

to an alarming degree, with painful inspiration, cough, and, in short, every symptom of pneumonia. The brain, too, is frequently affected; the pupils of the eyes are frequently expanded. Spasms of the voluntary muscles permanently succeed; and convulsions at length recur, at intervals, with increasing violence, which, unless immediate relief be obtained, too often terminate at once the little patient's sufferings and existence." When any of these symptoms prevail, no time should be lost in consulting a physician.

To assist the efforts of nature, is a consideration deserving attention during the progress of dentition; and I therefore particularly recommend the operation of scarifying or dividing the gums whenever symptoms indicate the least inflammatory action in these parts.

SECOND DENTITION.

The permanent, or second dentition, is not attended with any of the painful or dangerous symptoms of the first. All of the second set appear successively with but slight sensation or inconvenience, except, however, the *dentes sapientiae*, or *wisdom* teeth, which are retained within the jaw until about the sixteenth or twentieth year; when they appear, they often produce irritation, and sometimes painful sensations, and require the inclosing parts to be freely divided by the scarificator or gum lancet, after which the pain ceases. Sometimes, however, there

is not sufficient room in the jaw for these teeth, and in such instances they should be extracted. The number of thirty-two includes all the teeth of the second dentition.

ON ANOMALIES OF THE TEETH.

I have mentioned the usual time at which the teeth appear. Anomalies, however, sometimes occur. First, in the number of the teeth; there existing sometimes an excess, and sometimes a deficiency of teeth in the jaw. It is more common to find a deficiency than an excess.

Mr. Fox mentions several cases in which the teeth were entirely deficient. Borelli saw a woman who lived to the age of sixty without having a single tooth.

Meckel, (whose works have been translated by A. Sidney Doane, M. D., of New-York,) states a case where there were only four permanent teeth in each jaw. In another there was only one incisor in the upper jaw. Sabatier also mentions cases in which the teeth have not appeared at all.

Pliny has mentioned a curious case, which was that of Pyrrhus, king of Epirus, in whom all the crowns or bodies of the teeth were united. Soemering has, in his cabinet, two teeth united in this manner. Lemaire states one instance in which there were three accessory teeth engrafted, as it were, on the root of an eye-tooth.

The period at which the teeth appear varies con-

siderably. In fact, many instances are recorded where children have been born with teeth. On the other hand, instances have been known where the appearance of the teeth has been delayed for many years. Duges saw a case where the teeth were not cut till the age of eleven. Smellie mentions many instances where they did not appear till much later in life.

Camerarius mentions the case of a Bengalese, who cut teeth at the uncommon age of 335 years; (this, however, is very doubtful.) Cases are recorded in the German Ephemerides, of teeth appearing in the jaws of an old man 122 years of age, and many others of a similar character. Dr. Bessot had a patient, a female, in her 98th year, who cut twelve double teeth, mostly in the lower jaw. Dr. Hunter knew a case where a complete set of teeth in each jaw was reproduced, and the sockets also were apparently renewed.

Dr. Good once attended a lady who cut several straggling teeth at the age of 74; and another remarkable feature attending this case, was, that she at the same time recovered her sight to such a degree that she was able to dispense with the use of spectacles. In another case which fell under his notice, Mrs. Hughes, the patient, cut two double teeth, and at the same time completely recovered her hearing, after having been for some years so deaf as to be obliged to feel the clapper of a small bell, which was always kept by her, to know whether it rung or not.

One of the most singular instances of the kind,

however, is given by Dr. Slade in the Philosophical Transactions for 1713. The patient was his father. When 75 years old, he cut an incisor tooth, which he had lost 25 years before; and at 77, another incisor was replaced in the same way; thus at 80, he had a complete row of teeth. When he was 82, they all dropped out successively, and when 84, they all successively re-appeared; so that at 85, he had still a perfect set of teeth. At the same time his hair changed from a white to a dark hue, and his constitution seemed more vigorous and healthy.

In the Edinburgh Medical commentaries, a case is mentioned of an individual who, when 60 years old, was entirely toothless; at this period the gums and jaw-bone became very painful, and in the space of twenty-one days both jaws were furnished with a complete set of teeth.

The teeth sometimes appear in other parts than where they properly belong. They have been seen in the roof of the mouth, in the palate, and even in the gullet. Barnes found one in the orbit of the eye.

The teeth often present unusual forms, their roots often being hooked and peculiarly fixed in the jaw; in which case their extraction should never be attempted, except by the dentist who has a knowledge of the anatomy of the parts.

Dr. Mayo, in his Outlines of Physiology, records a case of the irregularity of teeth, several of which grew from the jaw with the roots reversed, occupying, in natural cases, the places of the crown. The

skeleton of this subject is preserved in the anatomical museum of the celebrated Albinus.

In Europe, many years since, boys were carried round the country as a show, it being pretended that they had an iron or a golden tooth. This exhibition caused much astonishment among all classes of people, and even many men of science were deceived.

Several physiological authors have firmly denied that a third set of teeth does ever appear. This is unfair, for many modern authors give testimony to the reverse. Dr. Bell, of the University of London, and a highly esteemed surgeon and anatomist, saw an instance in which four front teeth appeared at the age of 80. I have myself witnessed occurrences in which teeth have appeared at an advanced age. In one case I had inserted several teeth upon a plate for a lady aged 35 or 40; after she had worn them a few weeks, the gums became much inflamed, and she was unable to retain them in her mouth; at the expiration of six months from that time, three teeth appeared through the gums in different parts of the upper jaw.

NERVES COMMUNICATING WITH THE TEETH.

A brief outline of the branches of the fifth pair of nerves is given to explain the sympathy between the teeth and other parts of the head and face. The branches of the fifth pair are,

1st. The *Ophthalmic*, extending to the eye and glandula lachrymalis; some of these branches com-

municate with the Portio Dura of the seventh pair, &c.

2d. The *Superior Maxillary*, or nerve of the upper jaw; this forms the communication between the nerves of the head, face, eye, ear, and the great Sympathetic Nerve. The subdivisions of this branch furnish small twigs, extending to each of the roots of the teeth of the upper jaw.

3d. The *Inferior Maxillary*, or nerve of the lower jaw; this is the largest branch of the fifth pair; its course is very deep, after passing from the skull through the foramen. This branch is subdivided, and forms two important nerves, one of which is distributed to the tongue, to impart the sense of taste. The other branch is termed the proper Maxillary Nerve; this branch enters the lower jaw-bone, extends along the canal in its centre, and is then subdivided, giving off, in succession, minute twigs to the roots of the teeth, and to the integuments of the lips, chin, and some of the upper portion of the neck. [See drawings in Part Second, by J. Burdell.]

NEURALGIA FACIALIS, OR TIC DOULOUREUX.

This is a disease of the nerves; it is a painful sensation, usually seated in the branches of the fifth pair of nerves.

The primary causes predisposing to this disease or affection, originate in many cases from diseased teeth; and it is therefore necessary that the dentist

should possess a pathological knowledge of this singular disease.

Tic Douloureux is a disease that is now, and ever has been, involved in mysterious obscurity. This formidable disorder has a tendency to "rivet itself into the habit, and to terminate only with the life of the patient."

Sir Astley Cooper and several other distinguished surgeons recommend the division of the excited nerve, and others advise counter-irritation. Doctor Gregory, however, is of the opinion that narcotics, such as opium, hemlock, nightshade, &c., are most to be depended upon.

The treatment of local neuralgia, which arises more particularly from diseased or painful teeth, is directly comprehended in the practice of dental surgery; and the dentist can in all cases, if he is well qualified as such, cure and entirely eradicate the disease. It is not only necessary to remove one or more of the offending teeth, but other treatment is required, dependent entirely upon the peculiar circumstances of the case. How essential is it, then, that the dentist should possess a regular medical education, or at least a knowledge of anatomy and surgery.

ON DISEASES OF THE TEETH GENERALLY.

Those who have written on the subject of the diseases of the teeth for the last century, disagree with each other, more particularly as to the *origin* as

well as the *treatment* of such diseases ; but as I have not time or space to enter fully upon the subject, I shall give my own views, founded on experience and practical observation.

In the first place, much depends upon hereditary predisposition, for it is generally observed, that when the parents of a family have decayed teeth, the teeth of their children are likewise affected. Much also depends on the proportions of bony and earthy matter in the teeth ; those teeth in which the earthy material predominates, are uncommonly soft, very liable to decay, and easily broken.

Another cause is, irritation produced on the general fibre of the constitution by ill health during childhood, which, undoubtedly, impairs the rudimentary pulps of the second set, rendering their secretory organs feeble and inactive.

Diseases of the child in which it is sometimes necessary to administer mercury, the action of which exerts a powerful stimulus on the absorbent vessels of the jaw and periosteum, are also very exciting causes of decay.

There are numerous other causes ; such as external injuries from biting hard substances ; not keeping them clean ; particles of food collecting between them, producing irritation of the gums and of the periosteum, or external membranes of the teeth ; tartar, or calcareous filth remaining upon them producing inflammation of the gums and membranes ; taking fluids into the mouth of a very high or low temperature, such as hot tea or coffee, or ice water,

when the system is relaxed from heat ; the use of improper tooth powders, acting as chemical agents, for *whitening* the teeth, &c. &c.

Whenever there is a disposition to decay in these organs, it will be more speedily induced from any of the foregoing exciting causes.

Several learned and experienced physiologists give it as their opinion, that when teeth are decayed or diseased, they are incapable of acting contagiously upon the sound ones ; but this is not the case, for it is observed, that if a decayed tooth continues at the side of a sound one for any length of time, the sound one will commence decaying also, and directly opposite to the diseased portion of the one first decayed, against which the diseased part is in contact.

EFFECT OF THE TEETH ON PERSONAL APPEARANCE.

The expression and general appearance of the face depend much upon the condition of the teeth. If they are perfect, regular, pure, and clean, they contribute more to beauty than any of the other features ; but if neglected, diseased, or incrustated with an offensive accumulation, they excite in the beholder both pity and disgust.

To illustrate this fact, the following picture is drawn by Mr. Pleasants, in a work written by him, and dedicated, with permission, to Dr. Valentine Mott.

“ If the sculptor, the painter, or the poet,” says Mr. Pleasants, “ would invest the production of his genius

with those forms of horror at which humanity shudders and recoils, he perfectly comprehends the art of giving to his allegorical personages an array of teeth, black with tartar, mutilated with gangrene, broken by violence, or wrested by distortion. Should Envy present herself in the group, her parted lips would disclose but a single fang. Should Malice approach to persecute his victim, his teeth would be turned away as if by the violence of his passion. Thus the wrinkled witch, the smoky gipsy, the fortune-telling hag, and the freebooter of the seas, would lose the proper expression of their distinctive characters if supplied with perfect, regular, and beautiful sets of teeth.

“On the other hand, the skilful artist, who would exhibit the amiable and worthy passions in all their loveliness and attraction, bestows untiring labor in the exhibition of perfect arches of teeth, white as monumental alabaster, and regular as the crystal columns in the palace of Odin, inhabited by the virgins of the Valhallah. If he exhibit beauty in her smiles, a colonnade of pearls contribute to the enchantment; if he show us Love, with music on her lips, the emblematic purity of her teeth must lend its tributary charm. Thus the ideal Venus of the polished Greeks, as well as the living Beauty in the hamlet of Circassia, would cease to please on the discovery of sensible defect in these important organs.”

A scientific medical writer of Paris, thus concludes, in describing the influence of the teeth over

the other attractions of the face. "The influence which the teeth exercise over beauty justifies the pre-eminence which I attribute to them over all the other attractions of the countenance. This ornament is equally attractive in both sexes: it distinguishes the elegant from the slovenly gentleman, and diffuses amiability over the countenance by softening the features. But it is more especially to woman that fine teeth are necessary, since it is her destiny first to gratify the eyes before she touches the soul, and captivates and enslaves the heart."

I assent most cordially to the preceding remarks. The dark black eye may be ever so piercing, the soft blue eye may melt with tenderness, the rose may blossom brightly upon a downy cheek, and the graceful form, even of the Venus de Medicis, may be found among the softer sex, yet all charms lose their power if the teeth are defective.

Let all fair readers remember Moore's lines :

"What pity, blooming girl,
That lips so ready for a lover
Should not beneath their ruby casket cover
One tooth of pearl !
But like a rose beside the church-yard stone,
Be doomed to blush o'er many a mouldering bone !"

FILLING OR PLUGGING DECAYED TEETH.

Plugging or filling the cavities in decayed teeth with fine gold, is an operation by which such teeth in most cases can be preserved as long as preserva-

tion is necessary. It would, however, be useless and in fact worse than useless, to plug many teeth that are decayed; such, for instance, as have given severe pain, and are diseased throughout their structure.

Teeth suitable for filling, and consequently capable of being thus preserved, are those that have not given much pain, and are not already so much decayed as to expose the internal nerve.

Fine gold, manufactured into thin sheets is incomparably the best substance ever made use of for this purpose, notwithstanding the *wonderful* discoveries made by empyrical pretenders and advertising impostors engaged in dentistry.

Unsuccessful results in plugging decayed teeth, unless it be under very disadvantageous circumstances, (of which the dentist should always inform the patient,) expose want of skill and actual mechanical ability on the part of the operator.

Dentists, too many of them, err more particularly in reference to the *preparation* of the cavity, which consists in not excavating and entirely removing all of the *minutest particles* of decay previous to the insertion of the plug. When a tooth is thus hurriedly plugged, and the decayed portions are not faithfully removed, the filling in a short time becomes loose or falls out, or the filling is rendered inadequate to the preservation of the tooth, which still continues to decay around the surfaces of the cavity between the plug and the tooth.

Dental quacks and impostors succeed better in filling decayed teeth than in the other branches of

the profession. The reason of this is obvious from the fact, that almost any substance will remain, for a short time at least, in the orifice of a decayed tooth; and previous to the discovery of the deception, and the non-utility of their pastes and succedaneums, they pocket the reward of their vile deception, and walk away.

The notorious advertising and puffing impostors—“the *celebrated* Messrs. Crawcour of London and Paris,” succeeded a few years since, in New-York and Philadelphia, in realizing a small fortune, during a practice of six or eight months, by filling the cavities in teeth with a preparation of *mercury* or quick-silver, which they denominated “the Royal Mineral Succedaneum,” asserting its qualities to be that of “*making a stump into a sound tooth, at once as if by magic!*” So delighted were many of our most respectable citizens with their manipulations, that they favored them with their patronage to such an extent, that the Messrs. C. were compelled at one time to enlarge their apartments for the accommodation of their customers. The imposition was however, as a matter of course, subsequently discovered; and these *royal* empyrics were compelled to leave the country, whose citizens they had so successfully plundered. They returned to Europe, laughing in their sleeves at the gullibility of the Americans.

ON DESTROYING THE NERVES, OR NERVOUS SENSIBILITY
OF THE TEETH.

Teeth, in some cases, after having decayed until the nerve is exposed, can be operated upon so as to destroy or allay their susceptibility, and then they can be plugged with advantage. Various means are employed to accomplish this object. The safe and most approved agents to effect this purpose are caustics, (among the best of which is kreosote,) or the actual cautery, or the extraction of the nerve mechanically. The success of these remedies, however, depends upon the seat or locality of the pain.

I will here mention the very dangerous treatment resorted to by a few New-York dentists, which consists in applying ARSENIC, or rat's bane, to the excited nerve. Notwithstanding this most atrocious practice, a dentist of this city, in a late publication of his, recommends this *remedy*, (the most deadly and corrosive poison,) to be applied to the teeth. It was supposed, when the Crawcours left this country, that *valuable* discoveries of this kind were at an end; but this *modest* man, in reference to arsenic, thus observes: "we *claim* for our brother, Dr. ———, of Montreal, the credit of this *invaluable discovery*, and for ourselves no small share of *credit* for thus *frankly* laying it before the *dental profession* and the public."

A case in which this vile and dangerous substance was applied recently came under my care. The patient was a lady; the arsenic was applied by a dentist to the bare nerve of one of her double teeth,

and in a few days after her face became much swollen, accompanied with the most violent forms of *neuralgia facialis*; she was assured by the operator that she had only "taken a slight cold," and that the pain and swelling would soon subside; but this was not the fact. On investigating her case, I found it necessary to extract the tooth immediately, as well as to remove a portion of the alveolus; and I have every reason to believe if the source of all this difficulty had not been removed, the lady's life would, in all probability, have fallen a sacrifice to this corrosive, poisonous application.

SEPARATING THE TEETH.

This operation consists in making an interspace, where the teeth require it, or exhibit symptoms of decay. Separating the teeth, with much care, under such circumstances, is one of the most beneficial operations in dental surgery. The front teeth would seldom or ever require plugging, if timely and judiciously separated.

Pressure by the teeth upon each other; particles collecting between them, causing irritation and sometimes pain; livid or blueish appearances between them, &c. are indications or predisposing causes of decay, and as a general rule, (to which, however, there are some exceptions,) such teeth should be separated.

CLEANSING THE TEETH WITH INSTRUMENTS.

Tartar or foreign concretions adhering to the surfaces of the teeth, excite an unhealthy action in the gums and surrounding periosteum, and in time loosen or uproot them entirely. These substances can be safely and effectually removed from them without the least injury.

Malpractice, to a considerable extent, has prevailed in cleaning the teeth with instruments. This injurious practice consists in *scraping away* or wounding the enamel, while removing from it the concretions of blackish matter or tartar.

When this operation is judiciously performed, it is attended with no injury, but with material benefit. The tartar or foreign matter is not united with the enamel, and to remove or injure the latter while taking off the former, would be committing an unpardonable error, and would likewise evince the grossest ignorance.

After the tartar has been removed from the teeth, the gums and adjacent parts usually feel tender. In a few days, however, this uneasiness subsides, but may be more speedily alleviated by washing the gums with either of the following lotions :

<p>℞</p> <p>Aluminis ℥ ii</p> <p>Mist. Camphoræ ℥ iv</p> <p>Tinct. Myrrhæ ℥ ss</p> <p>Aquæ Font. ℥ i</p> <p style="text-align: right;">Misce.</p>		<p>℞</p> <p>Tinct. Cinchonæ ℥ i</p> <p>Vini Rubri</p> <p>Aquæ Dist. āā ℥ iv</p> <p style="text-align: right;">Misce.</p>
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TOOTH POWDERS.

It is proper and judicious at times to employ tooth powders to assist the brush, in removing *mechanically*, matter temporarily deposited upon the teeth. Tooth powders or tooth washes containing acids or chemical agents of any kind are decidedly deleterious and hurtful to the teeth and gums, having a tendency to dissolve or decompose their substance.

Many sets of teeth have been destroyed by the use of washes and powders vended by advertising quacks; such preparations contain chemical agents, which prove successful in "whitening and beautifying the teeth," but the result is, that this whitening process destroys the agglutinating principle by which the earthy particles are held together, and decomposition eventually ensues.

The formula which I observe in preparing tooth powders, is contained in twelve ounces as follows:

℞	Cretæ Præparatæ	$\frac{3}{4}$ iv	
	Bol. Armeniæ	$\frac{3}{4}$ v	
	Pulv. Myrrhæ		
	“ Iridis Florentinæ		
	“ Cort. Cinchonæ	offi. āā $\frac{3}{4}$ i	
			Misce.

The above compound ought to be rendered as fine as possible, and then all coarse and useless particles sifted therefrom. The dentist or druggist is the most proper person to prepare tooth powders.

BRUSHING THE TEETH.

The brush ought to be applied to the teeth in the morning and after eating. A stiff brush is preferable if the teeth and gums are in a healthy condition. Use water with the brush about the temperature of the blood. Apply the brush perpendicularly as well as otherwise, so as to clean the spaces between the teeth. The brush should be applied faithfully on the internal as well as external surfaces of the teeth. If tooth powders are used, rinse the refuse or waste particles from the mouth after brushing, after which rub the surfaces of the teeth with a linen or silk cloth.

EXTRACTING THE TEETH.

Extracting teeth requires as much care, skill, and ability, for its judicious and safe performance, as do those operations in surgery to which is attached a much higher degree of importance. The pain of the operation is much diminished by a judicious and proper application of the instrument.

The use of the *turnkey*, among scientific dentists of the present day, is superseded by the forceps, and, except among physicians and "old-fashioned" dentists the turnkey instrument is seldom employed.

It has been stated that fatal consequences have resulted from removing, or attempting to remove, decayed teeth with the turnkey. It is impossible, however, for any danger to arise, even under the

most disadvantageous circumstances, in using the forceps. The awkward and careless manner in which not a few "pullers" take hold of the tooth, and *wrench* it from the jaw, reckless of consequences and the sensibilities of the patient, deserves execration.

ARTIFICIAL TEETH.

Substitutes for the original teeth, from a single tooth to an entire set, can be inserted in the mouth so as not to be distinguished from those formed by nature, even by the closest observer.

It is only within a few years that this branch of dentistry has arrived at such a degree of perfection. Ten or fifteen years ago, the materials used in preparing artificial teeth were bone, ivory, and the tusks of the Hippopotamus. These substances are acted upon by the juices of the mouth, and render the breath disagreeable; they likewise change color, and decompose.

The incorruptible mineral teeth, when inserted, are not attended with these disadvantages. They never change color in the least, or decompose, and are not affected by the most powerful chemical agents or fire. These teeth are now generally used by all scientific dentists, and their manufacture is one of the greatest improvements heretofore made in dentistry.

Teeth, artificially inserted, if much care and attention be not observed in *matching* the natural ones as to color and shape, exhibit an unnatural appear-

ance ; therefore, the dentist in this respect should be very particular. It is much to the discredit of many dentists, who are skilful in other respects, that they do not strictly and practically carry out this rule. The mechanical part may be performed with the utmost nicety and perfection, while the color presents a glaring proof of an ill imitation of nature.

SURGICAL AND MECHANICAL DENTISTRY.

The practical science of dentistry is divided into two branches,—surgical and mechanical; the former includes operations upon or appertaining to the natural living teeth, and the latter such services as are necessary for the insertion of artificial ones. One individual, however, often attends to both of these branches; yet it is proper and judicious to divide the labor between two persons. This arrangement in extensive practice is desirable, not only to arrive at a higher degree of perfection, but “by concentrating the energies of individual intellect to a single point, the intensity of its action, like the focus of the solar lens, is multiplied a thousand fold in the valuable result.”

INCORRUPTIBLE MINERAL TEETH.

Mineral incorruptible teeth are formed principally of felspar, quartz, and kayolin; the coloring materials used are titanium, cobalt, oxide of gold, &c. These substances are pulverized, mixed with water, and then formed into a soft mass similar to moist clay,

from which the teeth are shaped; they are then baked, or the different mineraletic particles are melted together, forming a dense compound, as hard or harder than glass.

Billard of Paris was one of the first who manufactured these teeth, and he subsequently introduced them into this country; but within a few years several American dentists have engaged in their manufacture.

Stockton of Philadelphia, however, has far surpassed, in point of beauty and utility, any teeth of the kind heretofore made, either in Paris or any other country; and to this gentleman much credit is due. Doctor Spooner of New-York recently published a work containing various receipts and observations on the manufacture of incorruptible teeth; but the teeth made by this gentleman, or in fact by any other person in New-York or Philadelphia, when compared with those manufactured by Stockton, are a complete failure. Stockton's mineral teeth are generally used by all scientific dentists throughout the United States; which fact alone, is a sufficient recommendation of this gentleman's qualifications in the art.

NOTE.—Not a little imposition has been practised in New-York by dentists claiming to be the sole and only manufacturers of incorruptible mineral teeth, when in truth they have never even attempted to make them, and are entirely ignorant of the science. Not many years since, one or two dentists, calling themselves doctors, carried their impositions so far, that they obtained a premium, and a gold medal at the Fair of the American Institute, for teeth which, as I have been credibly informed, were manufactured by Mr. Billard of Paris. Base and unprincipled, indeed, must those persons be, who could resort to such vile subterfuges.

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PART II.
INTRODUCTORY REMARKS.
PART SECOND,

BY

JOHN BURDELL, DENTIST,

WITH

DRAWINGS AND ILLUSTRATIONS.

PART SECOND

JOHN RUSSELL BENTLEY

DRAWINGS AND ILLUSTRATIONS

PART II.

INTRODUCTORY REMARKS.

IN the preceding part, Dr. H. Burdell has stated, very briefly, his views in regard to the teeth; but much, however, remains to be said in reference to these organs, more particularly in a physiological point of view, and many important facts may be deduced from a close inquiry into the laws of the formation and preservation of these necessary organs of the animal structure.

It will be my object, in the following pages, to present some additional views, which have been the result of much study and close observation during the many years I have devoted to the subject of Dentistry. And, although my opinions may differ in some respects from those generally held, yet I would ask a candid attention to what I may offer; and if, in weighing the arguments for and against

the positions I take, they should be regarded as sound and philosophical, I shall be truly gratified in being the humble instrument of benefitting in any degree my fellow-creatures.

I propose in this part also to illustrate, by drawings and explanations, what has been presented in Part I., as well as the statements which I shall make in relation to the physical condition of the living teeth.

There are two modes of illustrating an obscure subject—by drawings addressed to the eye, and by written descriptions. Things which we see are understood much more clearly than those of which we merely read. They are also remembered with much more distinctness. Clear and correct illustrations are, moreover, one great means of arresting the progress of quackery in the dental profession. By enabling the public generally to understand the delicate structure, the beautiful anatomy of the human teeth, they will become extremely careful not to trust the management of them to any but scientific and experienced dentists. For these reasons, the reader is furnished, in the following pages,

with a number of anatomical drawings, executed, in part, from preparations in my cabinet, all of which, it is believed, will contribute to the proper understanding of an important subject.

JOHN BURDELL.

69 Chambers Street,
New-York. }
May, 1838.

with a number of astronomical figures, and which
but, their projections in any kind of which
this subject will contribute to the public under-
standing of an important subject.

JOHN BARNARD

of Cambridge
in the year 1751
A second edition of the
with a number of astronomical figures
but, their projections in any kind of which
this subject will contribute to the public under-
standing of an important subject.

PHYSIOLOGICAL REMARKS.

It was undoubtedly intended by our wise and beneficent Creator, that all the constituent parts of the human body should harmonize fully and perfectly with each other in a natural and healthy manner. And we observe this principle even in the lower orders of creation, especially in the animals termed wild, which may be said to exist in a state of nature.

The camel is admirably adapted, by the numerous cells in his stomach, which act as so many cisterns or reservoirs, for travelling many days without drinking, and his foot is peculiarly constructed for passing with rapidity over sandy deserts. The hollowness of the bones of birds, and the air-cells which they contain, adapt those feathered warblers of the woods for flying; as, formed in this manner, the bones have strength, but are not heavy. The smellers of those animals which prowl about at night, as lions, tigers, &c., answer the purpose of so many organs of touch. The anatomy of fishes proves that they were intended to reside in a fluid different from that of air; while tortoises, crocodiles, &c., have special organs, adapt-

ing them to either of the last-mentioned elements, by which they can dwell either in the air or the water.

The teeth constitute as essential a part in the formation of the animal as the hands or feet; and they are governed by the same physical laws. All intelligent physiologists admit that the teeth are organised, that they possess a living principle, and depend upon other parts of the system, the blood-vessels, &c., for their vitality and support.

Many entertain the erroneous opinion that the organs of the human body suffer only from such affections as operate locally and directly upon these organs. Every scientific physiologist, however, will admit, that organs which appear to suffer directly from a violation of natural laws, inflict the attending penalty, as it were, upon some remote organ; for so great is the sympathy throughout the structure of the animal economy generally. This fact is known to all who have investigated the subject, and hence farther explanation is unnecessary.

If the laws which regulate digestion be violated, by introducing into the stomach an excessive quantity of food or drink, or articles which are unfit, from their quality, to be digested, headache ensues, the brain sympathizes, and the circulation of the blood is much more hurried than it should be; and this, too, although the stomach itself is not painful. Nor are the effects of improper food confined to the parts mentioned; for it is obviously through the medium of the stomach and digestive organs that the teeth

receive the most injury; or the causes of decay in the teeth are to be sought for, not in the teeth themselves, but they depend very much upon what is taken into the stomach.

The gums also are directly affected by a violation of the laws of diet, and they exert a great influence on the teeth. Whenever the stomach is overloaded, particularly with animal food, the gums become very irritable and debilitated, and in some cases bleed without apparent cause.

The membranes which surround the roots of the teeth likewise become extremely irritated when the functions of the stomach are thus abused. I have witnessed many cases of the kind in my practice. All the parts mentioned above, exert a direct influence on the organization of the teeth, and if themselves morbidly affected, predispose the teeth to disease. It is very evident that if the gums are in an inflamed and irritated state, they tend to produce decay in the teeth; and as it has already been seen that this state of the gums may be produced by overloading the stomach with animal food, the decay of teeth from this latter cause is evident.

Hot and very cold substances when taken into the mouth likewise injure the teeth. This is confirmed by the fact, that some persons can chew substances of a blood heat without inconvenience, when a piece of ice or a mouthful of hot tea will cause excessive pain in the teeth. Is it then remarkable that they decay, when we consider how many hot and cold substances are placed in contact with them? The most

common fluids in constant use are hot tea and coffee; these affect the teeth in two ways; first, the heat which they contain acts locally and directly upon the teeth; and, secondly, they stimulate the nervous system, and thus remotely affect the absorbent vessels of the teeth. Ice-cream, ice-water, iced lemonade, or ice itself unmixed, is frequently taken into the mouth; but such practices cannot be too much condemned. It is undoubtedly true that fluids of a higher temperature than the blood, or those, on the other hand, which are very cold, are either primary or remote causes of decay in the teeth.

The injudicious use of such articles, too, is aggravated by the employment of them alternately, as it is no uncommon thing for a lady first to sip a cup of hot tea, next to indulge in an ice-cream, and then make use of some other article of food quite as noxious. This alternate use of hot and cold articles is peculiarly injurious. The limits of this work do not allow me to examine in detail the effect which different articles of food have on the teeth, nor to point out those which are or are not injurious. I would simply remark, that any thing which tends to injure, to debilitate or to prostrate the vital energies of the human frame in any manner, exerts a similar effect on the organization and structure of the teeth and gums.

THE NATURAL FOOD OF MAN.

Comparative anatomy and physiological research prove conclusively that man is a frugivorous animal, and was intended by his Creator to subsist upon fruit and vegetables, the natural productions of the earth. When he departs from this great first principle, he violates the law of nature; and hence the diseases of the teeth, as well as other maladies which "flesh is heir to." In support of this position, many arguments can be adduced.

Thomas Bell of London, in his valuable work on the teeth, makes the following remarks in reference to the natural food of man, as deduced from the character of his teeth:—"With this view of the subject, it is not, I think, going too far too say, that every fact connected with the human organization goes to prove that man was originally formed a frugivorous animal."

On a careful examination of the organization of such of the lower order of animals as most resemble the human species, of those which in a state of nature subsist entirely on vegetables, we readily observe the complete physical analogy that exists between them and mankind. "The opinion which I venture to give," continues Mr. Bell, "has not been hastily formed, nor without what appeared to me sufficient grounds; it is principally derived from the formation of his teeth and digestive apparatus, as well as from the character of his skin, and the gene-

ral structure of his limbs. If analogy be allowed to have any weight in the argument, it is wholly on that side of the question I have just taken. Those animals, whose teeth and digestive organs most nearly resemble our own, namely, the apes and monkeys, are undoubtedly frugivorous."

As I wish most sincerely to remove all doubts as to the injurious effects of animal food on the system generally, and thence to deduce conclusions more particularly in regard to the teeth, I subjoin the following testimony from ancient writers on this subject, showing the happy effects produced by a mild vegetable diet, both on the passions and body, and therefore on the longevity of man. If we go back to the times of king Nebuchadnezzar, spoken of in Scripture, we shall find there a triumph over the flesh-eating Babylonians, by the experiment made in the case of the four children of Judah, who refused the king's meat and drink, and confined themselves simply to their pulse and water; and yet for wisdom and fairness of face and proportion, none was found like them in all the king's realm. I refer next to the Greek historians; when they describe the primitive ages of the world, they relate that the first men lived upon every mild and wholesome herb they could discover, and on such fruits as the trees spontaneously produced. The food of the primeval generations, however, differed according to the respective productions of various countries:—the ancient Arcadians subsisted on acorns, the Argives on pears, the Athenians on figs.

Next of the Romans. They were so fully convinced of the superior effects of a vegetable diet, that besides the private examples of many of their great men, they publicly countenanced this mode of diet in their laws concerning food. Among these may be mentioned the *Lex Fannia* and the *Lex Licinia*, which, allowing but very little flesh, permitted without limitation whatever was gathered from the earth, from shrubs and from trees.

Lycurgus, the distinguished lawgiver of Lacedemon, who was considered as a model by Diogenes, Plato, and Zeno, forbade his subjects the use of fatted animals, and even the assistance of either butchers or cooks; and gave as his reason, that the use of fat animals not only tended to corrupt their natures, but likewise to disorder their bodies.

The celebrated Porphyry of Tyre, the Platonist, who flourished about the middle of the third century, in his book concerning abstinence from animal food, addressed to Firmus Castricius, who had relinquished the Pythagorean system, tells him as follows:—“ You admitted, when you lived among us, that a vegetable diet was better than animal food, both for preserving health and for facilitating the study of Philosophy; and now, since you have eaten flesh, your own experience must convince you, that what you then confessed, was true. It was not from among those who have lived on vegetables that robbers or murderers, sycophants or tyrants, proceeded; but from *flesh eaters*. The necessaries of life are few and easily acquired, without any violation of justice,

liberty, health, or peace of mind: whereas luxury obliges those vulgar souls who take delight in it, to covet riches, to give up their liberty, to sell justice, to misspend their time, to ruin their health, and to renounce the joy of an upright conscience."

He attempts to convince men of the two following propositions.

1st. "That a conquest over the appetites and passions will greatly contribute to preserve health and to remove disease.

2d. "That simple vegetable food, being easily procured and easily digested, assists very much in obtaining this conquest over ourselves.

"Give me a man who considers seriously what he is, whence he came, and whither he must go, and from these considerations resolves not to be led astray nor governed by his passions, and let such a man tell me whether a rich animal diet is more easily procured, or incites less to irregular passions and appetites, than a light vegetable diet! But if neither he, nor a physician, nor, indeed, any reasonable man whatsoever, dares to affirm this; why do we oppress ourselves with animal food; and why do we not, together with luxury and flesh meat, throw off the incumbrances and snares which attend them?"

"The ancient Greeks," says Porphyry, "lived entirely on the fruits of the earth. The ancient Syrians abstained from every species of animal food. By the laws of Triptolemus, the Athenians were strictly commanded to abstain from all living creatures. Even so late as the days of Draco, the At-

tic oblations consisted only of the fruits of the earth."

Strabo states, that regularity, temperance and a choice of food, in ancient times, were the chief medicines of the Indians.

The learned and accomplished Plutarch remarks, that "it is best to accustom ourselves to eat no flesh at all, for the earth affords plenty of things, not only fit for nourishment, but for enjoyment and delight: some of which may be eaten without much preparation, and others may be made pleasant by adding divers other things to them."

"You ask me," continues Plutarch, "why Pythagoras abstained from eating the flesh of brutes? For my part, I am astonished to think, on the contrary, what appetite first induced man to taste of a dead carcass; or what motive could suggest the notion of nourishing himself with the flesh of animals which he saw, the moment before, bleating, bellowing, walking, and looking about them. How could he bear to see an impotent and defenceless creature slaughtered, skinned, and cut up for food? We should therefore rather wonder at the conduct of those who first indulged themselves in this horrible repast, than at such as have humanely abstained from it."

To come, however, to modern times, we will present Sir William Temple's ideas on this subject. He states:—

"Of what passed before the flood, we know little from Scripture itself, besides the length of their lives; so, as I shall only observe upon that period of time

that men are thought neither to have eaten flesh nor drunk wine before it ended. For to Noah, first, seems to have been given the liberty of feeding upon living creatures, and the prerogative of planting the vine. Since that time we meet with but little mention of very long lives in any stories, either sacred or profane, besides the patriarchs of the Hebrews, the Brachmans among the old Indians, and the Brazilians, at the time that country was discovered by Europeans. Many of those were said then to have lived two hundred, and some three hundred years. The same terms of life are attributed to the old Brachmans; and how long those of the patriarchs were, is recorded in Scripture. Upon all these I shall observe, that the patriarchs' abodes were not in cities, but in open countries and fields: that their lives were pastoral, and employed in some sorts of agriculture: that they were of the same race to what their marriages were generally confined: that their diet was simple as that of the ancients is generally represented; among whom flesh and wine were seldom used but at sacrifices or solemn feasts. The Brachmans were all of the same races, lived in fields and in woods after the course of their studies was ended, and fed only upon rice, milk, and herbs. The Brazilians, when first discovered, lived the most natural, original lives of mankind, so frequently described in ancient countries, before laws, or property, or arts made entrance among them; and so their customs may be concluded to have been yet more simple than either of the

other two. They lived without business or labor further than for their necessary food, by gathering fruits, herbs, and plants. They knew no drink but water : were not tempted to eat or drink beyond common appetite and thirst : were not troubled with either public or domestic cares, nor knew any pleasures but the most simple and natural.

“From all these examples and customs it may probably be concluded that the common ingredients of health and long life are great temperance, open air, easy labor, little care, simplicity of diet, rather fruits and plants than flesh, which easier corrupts, and water, which preserves the radical moisture without too much increasing the radical heat. Whereas sickness, decay, and death, proceed commonly from the one preying too fast upon the other, and at length wholly extinguish it.”

Cullen, who still retains an enviable position among the professors of the healing art, remarks, in his *Lectures on the Materia Medica*, that vegetable aliment, inasmuch as it never over-distends the vessels nor loads the system, never interrupts the stronger motions of the mind ; while the heat, fulness, and weight of animal food, is an enemy to its vigorous efforts. Temperance, then, does not so much consist in the quantity, for that always will be regulated by our appetite, as in the quality, viz : a large proportion of vegetable aliment.

Lord Bacon, in his treatise on Life and Death, says :
“It seems to be approved by experience that a spare and almost Pythagorean diet, such as is either pre-

scribed by the strictest monastic life, or practised by hermits, is most favorable to long life."

Cheyne, who is known extensively as a sound writer and an accomplished physician, remarks, "There is no chronical distemper whatsoever, more universal, more obstinate, and more fatal in Britain than the scurvy, taken in its general extent. Scarce any one chronical distemper but owes its origin to a scorbutic cachexie, or is so complicated with it, that it furnishes the most cruel and most obstinate symptoms. To it we owe all the dropsies that happen after the meridian of life; all diabetes, asthmas, consumptions of several kinds; many sorts of colic diarrhœas; some kinds of gout and rheumatisms; all palsies, various kinds of ulcers, and possibly the cancer itself; and most cutaneous foulnesses, weakly constitutions, and bad digestions; vapours, melancholy, and almost all nervous distempers whatsoever. And what a plentiful source of miseries the last are, the afflicted best can tell. And scarce any one chronical distemper whatever, but has some degree of this evil faithfully attending it. The reason why the scurvy is peculiar to this country and so fruitful of miseries is, that it is produced by causes mostly special and particular to this island: to wit, the indulging so much in animal food and strong fermented liquors, sedentary and confined employments, &c.

"Though the inhabitants of Britain live, for the most part, as long as those of a warmer climate, and probably rather longer, yet scarce any one, especially those of the better sort, but becomes crazy,

and suffers under some chronical distemper or other before he arrives at old age.

“The choleric disposition of the English is almost proverbial. Were I to assign a cause, it would be, their living so much on animal food. There is no doubt but this induces a ferocity of temper, unknown to men whose food is taken chiefly from the vegetable kingdom.”

Cheyne then proceeds to remark on the longevity of the early Christians and others. He says, “It is surprising to what a great age the Eastern Christians, who retired from the persecutions into the deserts of Egypt and Arabia, lived healthful on a very little food. We are informed by Cassian, that the common measure for twenty-four hours was about twelve ounces, with only pure water for drink. St. Anthony lived to 105 years on mere bread and water, adding only a few herbs at last. On a similar diet James the hermit lived to 104. Arsenius, the tutor of the emperor Arcadius, to 120; sixty-five years in society and fifty-five in the desert. St. Epiphanius to 115; St. Jerome to about 100; Simeon Stylites to 109; and Romualdus to 120.

“And it is wonderful in what sprightliness, strength, activity and freedom of spirits, a low diet, even here in England, will preserve those who have habituated themselves to it. Buchanan informs us of one Laurence, who preserved himself to 140 by the mere force of temperance and labor. Spotswood mentions one Kentigern, (afterwards called St. Mongah, or Mungo, from whom the famous well in Wales is

named) who lived to 185 years : and who, after he came to years of understanding, never tasted wine nor strong drink, and slept on the ground. My worthy friend, Mr. Webb, is still alive. He, by the quickness of the faculties of the mind, and the activity of the organs of his body, shows the great benefit of a low diet ; living altogether on vegetable food and pure water. Henry Jenkins lived to 169 years on a low, coarse, and simple diet. Thomas Parr died at the age of 152 years and 9 months. His diet was coarse bread, milk, cheese, whey and small beer ; and his historian tells us that he might have lived a good while longer if he had not changed his diet and air ; coming out of a clear thin air into the thick air of London, and being taken into a splendid family, where he fed high, and drank plentifully of the best wines, and, as a necessary consequence, died in a short time. Dr. Lister mentions eight persons in the north of England, the youngest of whom was above 100 years and the oldest was 140. He says, it is to be observed that the food of all this mountainous country is exceedingly coarse."

We might fill many pages with similar quotations. In fact, volumes upon volumes have been written on the subject. A single extract from a writer in the Philadelphia Journal of Health is so appropriate, that we cannot refrain from giving it to our readers. This writer remarks, "For the information of all such misguided persons, [as think that they cannot preserve their strength without eating freely of some kind of flesh-meat, and who believe their children would suf-

fer without it,] we beg leave to state, that the large majority of mankind do not eat any animal food, or so sparingly and at such long intervals, that it cannot be said to form their nourishment. Millions in Asia are sustained by rice alone, with perhaps a little vegetable oil for seasoning. In Italy, and southern Europe generally, bread made of the flour of wheat or Indian corn, with the lettuce and the like mixed with oil, constitute the food of the most robust part of its population. The Lazzaroni of Naples, with forms so active and finely proportioned, cannot even calculate on this much, coarse bread and potatoes are their chief reliance: their drink of luxury is a glass of iced-water slightly acidulated. Hundreds of thousands, we might say millions, of Irish, do not see flesh meat or fish from one week's end to the other. Potatoes and oatmeal are their articles of food; if milk can be added, it is thought a luxury: yet where shall we find a more healthy and robust population, or one more enduring of bodily fatigue, and exhibiting more mental vivacity? What a contrast between these people and the inhabitants of the extreme north, the timid Laplanders, Esquimaux, Samoideans, whose food is almost entirely animal!"

In fact, in those countries where the inhabitants live on animal food exclusively, the population would in time become extinct, were not the immigration kept up from other places. Dr. Lambe, an eminent physician of London, states, as a remarkable fact, that in Heimaey, the only one of the Westmann Islands which is inhabited, scarcely a single instance

has been known, during the last twenty years, where a child survived the period of infancy. In consequence of this, the population, which does not exceed two hundred souls, is maintained entirely by immigration from the main land of Iceland. These people live principally upon sea-birds, fulmars, and puffins. The fulmars they procure in great abundance; they use the eggs and flesh of these birds, and salt the latter for winter food. There are a few cows and sheep on the island, but the inhabitants are said to eat no vegetable food.

We have also the testimony of Dr. Lambe as to the efficacy of a vegetable diet in cases of scrofula, cancer, and other obstinate chronic diseases. He is now over seventy years of age, and has subsisted exclusively on a vegetable diet for the last thirty-five years.

The same opinion in favor of a vegetable diet is expressed both by the celebrated Hufeland and Dr. Abernethy.

Dr. Adam Clarke, the learned commentator, states it as his opinion that the scurvy, so prevalent throughout the British nation, is attributable to the use of swine's flesh, which in a warmer climate, would produce leprosy.

The widely different dispositions of the frugivorous and carnivorous animals show satisfactorily the effect produced by their food on the temper; the former are mild, and delight in society, the latter shun even the light of day, and at times seek to gratify their blood-thirsty appetites by destroying their own

species. In man the same difference may be remarked by contrasting the peaceful vegetable-eating Asiatics with their carnivorous neighbors, the Europeans. The Asiatics, as I have already observed, live principally on rice and vegetables; and perhaps no stronger proof of their quiet disposition can be mentioned, than their passiveness under the yoke which European governments have imposed on them.

Mr. Eleazer Parmly, a respectable dentist of this city, in his Notes to Brown's *Dentologia*, states that he had suffered much in former years from debility and other forms of indisposition, induced, as he thinks, by improper diet. For the last year, he says that he has refrained from all exciting drinks—has relinquished the use of tea and coffee—has abstained from animal food of every kind, and by this course has found his health to be so much benefitted, that he feels it to be a duty as well as a pleasure to endeavor to impress upon the reader the necessity of living thus temperately if he wishes to enjoy that health of body and that tranquillity of mind which none can enjoy, for any great length of time, but such as live in accordance with the rules prescribed by all profound philosophers, both of ancient and modern times. I can also add to the foregoing testimony my own experience. I have been from childhood afflicted with nervous headache and general debility; and, as I advanced in life, with a general derangement of the secretory organs. This I attribute to the free use of animal food, tea, coffee, &c.; and I do it with confidence, inasmuch as I

have been free from these evils since I have abstained from the use of these articles of food, which I have done for the seven years past. I can undergo much more labor with less fatigue than formerly, when my diet consisted in part of animal food.

Much valuable information may be obtained from the writers on diet since the time of Moses, but I think that any one who will carefully examine for himself the code of dietetics, which has been laid down by him, and then judge of it by experience, cannot fail to be convinced of the utility and wisdom of such a code, although we are told by some, of the beneficial effects of some articles there proscribed, as, for instance, swine's flesh.

A learned writer of extensive observation, however, remarks, that he had never seen a case of lepra vulgaris, but he could trace it to the use of pork. Fifty years since, in Scotland, scrofula and lepra were hardly known, owing to their veneration for the commands of their Creator to abstain from this unhealthy article of diet.

Scripture will sustain us also in asserting that vegetable food is the proper diet for man; for we read, "Behold I have given you every herb bearing seed which is upon the face of all the earth, and every tree in which is the fruit of a tree yielding seed; to you it shall be for meat." Nor was it until after the flood that permission was given to taste of animal food; and yet where do we read of the greatest longevity? Is it not when man lived as his Maker originally intended he should? Since the time of Noah it is rare

to meet with an instance of merely *natural* bodily decay.

When we state, as the reason of this permission to eat animal food, the determination of the Almighty to shorten the days of man, we are told that we are more favored than the antediluvians; for if the *duration* of our life is not so great, we *live better*. This is a practical interpretation of the phrase—"While we live, let us live;" but if those who make this assertion would take into account the diseases and pains from which the antediluvians were free, (for we do not read of the curse of sickness before the flood,) and which have been brought on us by this permission, I think they would not be so ready to call it a special favor. For if being devoted to the gratification of a depraved appetite—to the injury of both body and mind—be a favored state, rather than that purity and simplicity of habits and manners, and that freedom from disease and unnatural decay which might be the result of regular living, then I grant that we are in a highly favored condition.

We have the authority of eminent philosophers and physiologists, from Pythagoras down to the present time, as to the pernicious effects of animal food, not only on the health, but on the character and disposition; and if we contrast the difference in this respect existing between the Tartars, who live on animal food, and the Hindoos, whose diet is entirely vegetable, our own reflection must convince us that

their diet must have some effect in producing this difference.

In the Mosaic law there is no provision made for either physicians or dentists; while here, in the 19th century, we could not do without their assistance; so necessary do we find it to be constantly repairing our shattered and decaying tenements, even from infancy. In the city of New-York there are no less than 100 dentists, and physicians innumerable. Is not this sufficient to show that our habits must be very far from the original intentions of our Creator?

I have already stated as my opinion, that whatever is deleterious to the general welfare of the system, affects the teeth as a part of that system. I have shown, and I trust satisfactorily, that man, in his best estate, was intended by his Creator to live, not upon animal food, but upon the fruits of the earth. This we have illustrated by reference to Scripture; and the good effects of such a diet have been demonstrated by referring to those ancient philosophers who have contented themselves with vegetable food, and also by quotations from the most celebrated modern authors, who have devoted the energies of their minds to the investigation of this important subject.

I come now to another part of my argument, viz., to show that the teeth suffer, particularly, in consequence of departure from the natural diet. Are not the teeth subject to wear? Certainly. The animal

machine is transitory. All flesh is grass ; the child is born, he grows up, becomes a man, and then dies. This is natural ; and of course it is to be expected that the teeth, although extremely hard, although resisting powerful chemical agents, should yet take part in this general decay. In what then does the *natural* decay of the teeth consist ? Not in being affected with caries or covered with tartar. No, far from it. But in the gradual wearing off of their grinding surfaces ; the teeth insensibly and uniformly become shorter, and this, too, without any pain ; at the same time the alveolar processes become firmer ; and finally, when the crown of the teeth is worn off, these alveolar processes, which, in the mean time, have assumed a good degree of solidity, discharge all the duties of the teeth. At the same time the relative position of the nerve varies ; it contracts, as it were ; and, as life advances, becomes smaller, until it entirely disappears.

This I say is the *natural* mode of decay in the teeth ; and let it be remembered that this natural decay is attended with no pain, no suffering, no caries.

This state of things, however, is seldom seen, I grant. A dentist may not observe a case of the kind in his lifetime ; but it is owing chiefly to the unnatural manner in which people live. I have stated in a preceding page the change I made in my plan of diet ; since that time I have not been troubled, as before, by tartar collecting on my teeth. And I

have observed a similar result in others who have adopted the same mode of living.

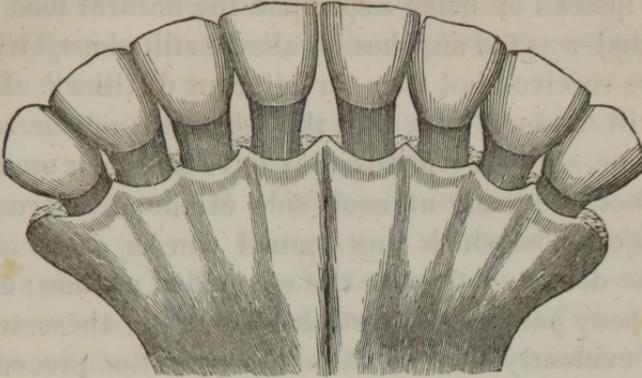
How is it generally with those who come nearest to the natural diet of man? The North American Indians, who are constantly in the habit of intercourse with the whites, suffer occasionally from carious teeth; but those who live more nearly in a state of nature, are less subject to these evils. While those who subsist on corn, fruits, and, above all, who do not abuse themselves by taking hot drinks, have remarkably fine teeth.

The Southern negroes, also, whose diet is much more vegetable than that of the whites, are remarkable for the whiteness and regularity of their teeth, which, generally speaking, are free from tartar and decay. But if one of these negroes comes to the North, and enters into the service of some of our wealthy families, and indulges in all the luxurious living of the present age, the healthy and natural condition of his teeth is soon changed.

During a short residence in the West Indies, my attention was particularly directed to this subject; and the condition of the teeth of slaves in those islands confirmed my previous opinions.

But perhaps one of the most striking proofs of the position I take is to be drawn from the effects which a deviation from the natural food has upon the lower orders of animals.

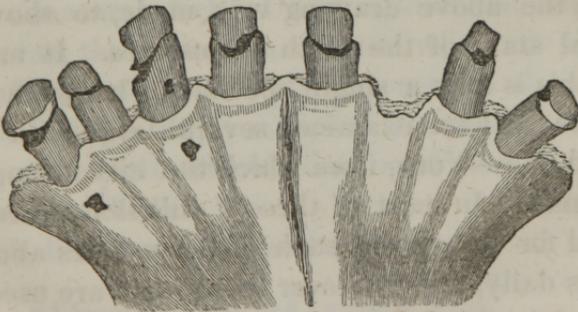
No. I.



[Teeth of a Cow fed on natural diet.]

The above drawing exhibits a portion of the jaw of a cow which has fed upon natural food. It will be observed that the teeth are perfectly healthy, and the enamel sound—the alveolar processes are not diseased; there is no accumulation of tartar between these teeth, but they are firm and white. I next present a specimen from my cabinet of a different character.

No. II.



[Teeth of a Cow fed on artificial diet.]

The animal from which this latter drawing is

taken, is of about the same age as the preceding; but instead of being kept upon the natural food, the animal was fed on what is called "still slops," which were received hot from an adjacent distillery. Here it will be seen, first, that the whiteness of the teeth is gone,—in other words, they have lost their enamel. In fact, the teeth at each side of the jaw are the only ones on which any enamel can be seen. Nor is the decay confined to the enamelled portion; even the bony part of the teeth has suffered; these teeth are evidently smaller than those in the preceding plate, although the jaw is of the same size. Caries also has affected them, as can be easily seen by observing the black spots in the teeth. The alveolar processes likewise have taken part in the disease; ulcers have formed at the roots of these teeth, the portion of bone opposite these roots has become affected and has broken off, and one of the teeth is also gone.

In the specimen last presented, many of the interstices were filled with tartar, which was removed before the above drawing was made, to show the natural state of the teeth themselves. It may be said this is only a single specimen; but such is not the fact. I have examined several large milk farms around New-York, from which the city is supplied with milk. In most of these, "still slops" are used as food for the cows; each cow consumes about 30 gallons daily, and wherever these slops are used, the teeth of these animals are more or less affected.

Those kept near a distillery, and where the food

is furnished to them hot, exhibit more marks of decay than those kept at a greater distance, where the still slops are of course cooler before the animal is fed on them.

I might extend these remarks much farther, but my limits do not permit. I will conclude this portion of my physiological remarks, by saying—1st, that I consider it proved that man is naturally a frugivorous animal; 2nd, that the teeth suffer in a peculiar manner from the indiscriminate use of different articles of food, and particularly from taking these articles while they are hot. In fact, that while caries and tartar affect the teeth of those who live in an artificial manner, we have every reason for supposing that the teeth of those who would content themselves to live on natural food, would escape these evils. If this be true, the use of the tooth-brush, and of all tooth powders, might readily be dispensed with, as there would be no formation of tartar on the teeth. Hence it will be seen, that the use of tooth powders is merely to counteract the effect of an unnatural diet. Under a different mode of living, too, the numerous dentists who now live on the public could be readily dispensed with; one or two would be amply sufficient to repair the accidents of the teeth which would occur in a city of the size of New-York.

Such, however, will not be the case;

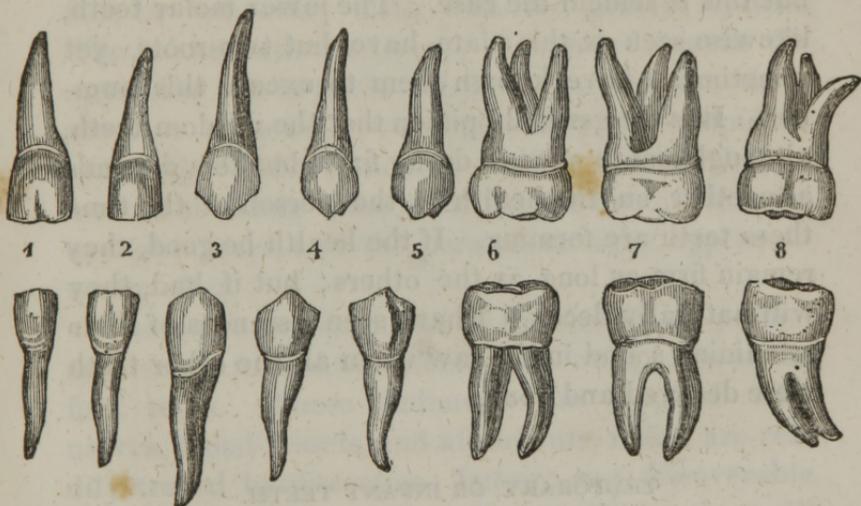
“I know the right, and I approve it too,
I know the wrong, and yet the wrong pursue.”

Such is the common course of action in this world. The depraved appetites of mankind do not allow them to abandon their habits of luxurious living; they will continue, (as has been their former practice,) to violate the laws of nature; and dentists and physicians will continue to find ample employment until the practice of mankind accord with reason unperverted, and an enlightened judgment; then, and not till then, may we expect that day will dawn when "there shall be no more an infant of days, nor an old man that hath not filled his days, but the child shall die an hundred years old."

ANATOMY OF THE HUMAN TEETH.

In the jaw of an adult, perfectly developed, the whole number of teeth is thirty-two, sixteen of which are placed in each jaw. These are divided into four classes—the incisors, the cuspids, the bicuspids, and the molares; and last of all, appear what are commonly called the wisdom teeth, but which are of the last mentioned class.

No. III.



The incisors, or cutting teeth, numbered in the plate, fig. 1—2, occupy the centre of the jaw in front of the mouth. They are thus termed from a Latin word, which means to *incise*, or cut, because they cut the food. Next come the cuspids, fig. 3; these are the longest of all the teeth, and are commonly called the

eye teeth; these, with the bicuspid, fig. 4—5, which stand next to them, form a regular gradation between the incisor and molar teeth. Next are the molares, or grinding teeth, three on each side, above and below, having five prominences with corresponding depressions, perfectly adapted to those opposite them, like mill-stones in miniature, for our convenience in grinding our food.

It will be seen in this plate, that the upper grinders, fig. 6—7—8, have three roots; in some cases I have extracted them having four, and sometimes five; but this is seldom the case. The lower molar teeth, likewise seen in this plate, have but two roots, yet sometimes I have known them to exceed this number. It is the general opinion that the wisdom teeth, although last to appear, decay first; but this depends altogether on the health of the person at the time these teeth are forming. If the health be good, they remain firm as long as the others; but if bad, they will naturally decay. I have seen instances of their remaining sound in the jaw when all the other teeth were decayed and gone.

TEMPORARY, OR INFANT TEETH.

During childhood temporary teeth make their appearance from the jaw, which are designed to masticate such food as is requisite during this period. The absence of teeth for the first six or seven months after birth, clearly shows the importance of giving infants no solid food during that period; those

who regard nature as their guide, will consider this sufficient to induce them to confine infants to that food which has been so bountifully provided by Providence for them, and which alone is adapted to the delicate state of the digestive organs.

When the child is from five to eight months old, the infant teeth begin to protrude through the gums, and the whole set is completed at the age of about two years.

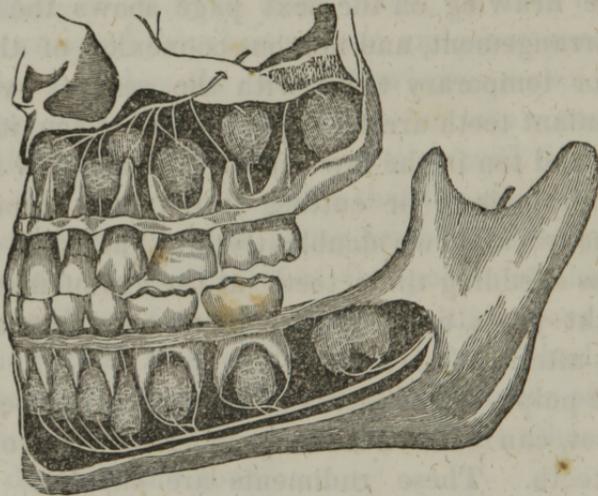
The drawing on the next page shows the number, arrangement, and nervous connexion of the infant or temporary teeth with the general system. The infant teeth are twenty in number, ten in the upper and ten in the lower jaw. In each jaw there are four incisors or cutting teeth; two cuspid or eye teeth; and two double teeth. The child commences shedding these teeth at the age of from six to eight years, and the permanent ones appear directly after.

The pulps or rudiments of the second or permanent set, can be seen directly under the roots of the first teeth. These rudiments are supplied with nerves, blood-vessels, and absorbents, which are readily traced by dissection; but are not discoverable after they are formed into bone. When the rudiments commence growing or ossifying, they crowd against the absorbents of the infant teeth, and it is supposed, stimulate these absorbent vessels to such a degree that absorption progresses with the advance of the permanent or adult teeth. Some authors say that the permanent teeth, when they advance, press

against the roots of the infant teeth. Such a doctrine is founded only on hypothesis, although it is evident that the roots of the first set are not commonly absorbed when the permanent ones, which are to take their places, appear at a little distance from them.

The following drawing shows the upper and under jaws, with the external alveolar processes cut away.

No. IV.



[This plate exhibits the jaws of a child at the age of 4 years.]

The nerves in the above plate, represented by white or thread-like filaments, which supply the teeth, are important branches of the fifth pair, which has its origin in the brain.

In reference to the progress and formation of the teeth, Mr. Thomas Bell says: "The mode in which the teeth are produced, so different from that of the formation of any other part of the body,

although a subject which has engaged the attention of physiologists ever since physiology became a science, has not, until within comparatively few years, been perfectly understood." Anatomists, however, subsequently have thrown much light on this subject.

The rudiments of the first or infant set, when the jaws are examined with care, show a soft gelatinous substance, along the edge of the maxillary arch. These are the first discoverable evidences of the existence of the rudiments of the infant teeth. These rudiments have the same form that the crowns of the teeth afterwards assume, and the bony deposition commences on as many points as the teeth have eminences on their external surface. When the shell or ossific matter has advanced so as to cover the forms of the pulp, it then elongates, and forms the root, and after this the teeth gradually protrude from the jaws.

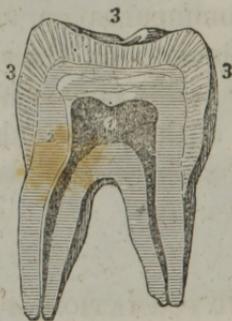
DEPOSITION AND FORMATION OF THE ENAMEL.

The formation of the external covering, or enamel of the teeth, differs from that of the bony portion. The deposition of the enamel, in the infant and in the permanent set, is carried on similarly. Provision having been made for the organization of the inner parts of teeth, and for the support of their vitality and connexion with the living system, there is then spread over all that portion above the gums, a dense, hard, insensible, and almost indestructible

substance termed enamel. This substance is composed principally of phosphate of lime. The peculiar manner in which this matter is arranged about the body or crown of the tooth, is worthy of notice. In fact, it assumes a crystalline character.

The following drawing (No. V., fig. 3,) shows the crystals disposed in radii, springing from the centre of the tooth, so that the extremities of the crystals form the external surface of the tooth, while the internal extremities are in contact with the bony substance, (fig. 2.)

No. V.



This plate shows a magnified section of a tooth, to illustrate the arrangement of the fibrous crystals composing the enamel. 1. Cavity of the tooth. 2. Bony substance. 3. Enamel, showing the crystals disposed in radii.

The enamel is much more slowly worn away by friction, and is less liable to be fractured than the bony part of the tooth.

In this manner an instrument is constructed possessing requisite hardness, durability, and insensibility; yet organized, and as truly a living part of the general system as the eye or heart.

PERMANENT, OR ADULT TEETH.

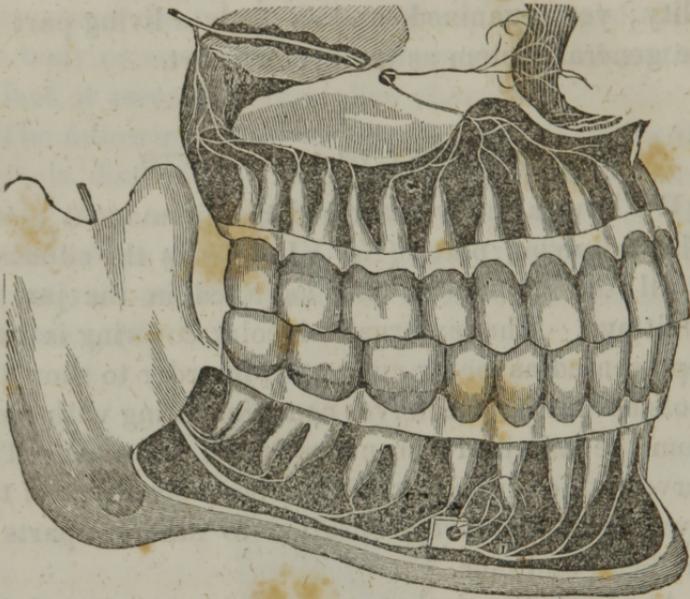
We have already described the permanent teeth. The following plate, (No. VI.,) shows the situation of all the permanent set, as fixed in the jaw at adult age. The external alveolar covering is here represented as being cut away, in order to show the roots as well as the nerves communicating with them from the maxillary branches of the fifth pair. The nerves which pass through the bony structure of the jaws, serve to convey sensation to different parts of the head and face.

At about the sixth year, the permanent teeth begin to appear; those first seen are the first large double teeth, one on each side, in the lower jaw; after which the places of the infant set are supplied with the second or permanent teeth.

PERIODS AT WHICH THE PERMANENT TEETH APPEAR.

First molares at the age of 6	years.	Second bicuspidæ,	- 10½	years.
Central incisors,	- - - 7	Cuspids, or eye teeth,	- 12½	"
Lateral incisors,	- - - 7½	Second molares,	- - - 13-14	"
First bicuspidæ,	- - - 8	Wisdom teeth,	- - - 19-21	"

No. VI.



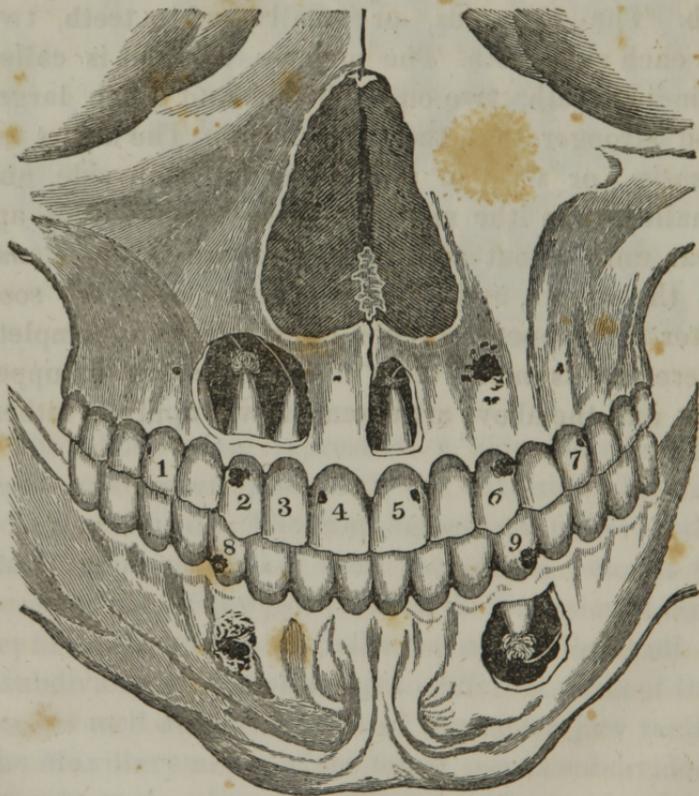
The above plate represents a side view of the upper and under jaw, with the external alveolar sockets removed. The front, upper and under tooth, which appears darker than the others, belongs to the other side of the jaws. After the Superior Maxillary branch passes through the foramen of the skull, it is subdivided, giving off twigs to different parts of the face, as well as to each root of the upper jaw teeth. The Maxillary nerve of the lower jaw is subdivided, not only at the place where it enters the inside of the jaw near the ear, but at about half its length, where it is seen passing out of the foramen of the external

alveolar plate; these twigs are distributed to the lips and integuments of the lower part of the face.

The permanent teeth are arranged in the following manner: 1st. The two central incisors, or the two most prominent teeth in front of the mouth. 2nd. The two lateral incisors, one on each side of the central, which are smaller and not as wide. 3d. The cuspid, or eye teeth, being pointed, one on each side. 4th. The bicuspid, or small double teeth, two on each side. 5th. The molares, or what is called grinding teeth, two on each side, and much larger and stronger than the others. 6th. The *dentes sapientiæ*, or wisdom teeth, one on each side, and smaller than the molares; these teeth do not appear until about adult age, and are not as dense as the others, and often commence decaying soon after they appear. When the whole set is complete there are as many teeth in the under as the upper jaw, and the above arrangement will apply to either.

DISEASED TEETH.

The following drawing exhibits the jaws, with several of the teeth in a diseased state, as they are situated in the maxillary bones,—the fleshy covering, or soft parts, being removed to show more accurately the parts affected.



The teeth numbered in the above plate are all affected with caries, which has penetrated to the

nerve, with the exception of fig. 3, which is in a natural and healthy condition. Fig. 1, 4, and 7, show the jaw and teeth in an incipient stage of disease, the ulcer, or abscess having just commenced, and not yet progressed as far as the others.

Fig. 6 and 9 are equally affected at the roots; Fig. 6 shows the effect of the ulcer on the jaw after a long continuance of the disease. Fig. 9 shows part of the bone, or alveoli removed, to expose the ulcer which has formed at the root. Fig. 8 and 2 are similarly affected. The bone is removed from fig. 5, to show the ulcer when first commencing.

The white lines from the roots of these teeth are twigs or branches of the subdivisions of the fifth pair of nerves, as I have heretofore explained.

The general cause of these ulcers is found to exist in dead teeth or roots, acting as foreign bodies in the alveolar sockets; but from whatever cause they may arise, the progress and effects are invariably the same; which are, inflammation of the surrounding parts; swelling of the face and glands of the neck; pain in the jaw and nerves of the face, extending to the ear; and finally exfoliation of the alveolar processes, where the disease commences. These painful symptoms are produced by the efforts of nature to separate the dead from the living parts. And in extracting from the jaw these decayed and useless members, we are merely endeavoring to assist nature in accomplishing the necessary work which is already begun.

The first obvious effect of the irritation arising

from this source, is a swelling or thickening of the membrane that lines the socket, which raises the tooth from its natural position, and causes it to appear much longer than before ; in which state it is more easily extracted than at other times, although, from the tenderness of the surrounding parts, it may not appear so to the patient.

As all the nerves are intimately connected, the effects on the whole system from this cause, must be obvious, and it becomes a question of high importance to us, in what manner evils may be avoided. Neglected caries in the teeth, penetrating to the nerve, and thus exposing it to the atmosphere, may cause inflammation and lead to the many dreaded evils just described, and therefore claims our serious attention.

Caries, or decay, is a mortification of the bone of the tooth, generally commencing on the outside of the bone, but under the enamel, diffusing itself throughout the entire tooth unless removed ; but if it is suffered to penetrate the nerve, the tooth becomes dead, and is thus the means or cause of the ulcers, or alveolar abscesses, which I have exhibited in the foregoing plate.

This should be sufficient to convince those who are not already past conviction, of the importance of adopting a proper diet to secure a healthy condition of the teeth ; and, if already diseased, of removing the offending parts before it be too late to correct the evil, as the tooth in that case would be in a condition precisely analagous to a dead limb—an

arm or hand, which must be separated from the living part before a healthy condition can be restored.

Nor is this all ; we likewise, by delay, subject ourselves to the possibility of an extended inflammation, or disease of the contiguous teeth and membranes ; for in some cases, a neglect of this kind has caused the whole side of the jaw to become affected.

I could refer to many cases of this kind in my practice. In one instance, a young lady about 16 years of age came to me for advice, whose tooth had been affected for two years previous. When I first saw her she was obliged to keep her face bandaged, as there was a constant discharge of matter through a fistulous opening in the side of her cheek, near the mouth. The tooth affected was the first molaris in the lower jaw, and at the time I extracted it, the cheek around the orifice had become entirely callous, and had grown fast to the integuments of the jaw, which caused great distortion of the countenance whenever she attempted to open her mouth. Any liquid substance taken into the mouth would also discharge itself through the orifice in the cheek.

Mr. Joseph Fox, in speaking of the distressing consequences attending violations, through ignorance, of the laws of nature on this point, illustrates his meaning by a case very similar to the one I have just described. The gentleman of whose case he speaks, had suffered from the tooth-ache for some days previous to applying for advice. His gums and upper lip had become much swollen, and while in

this state, he continued to foment and poultice, instead of informing himself as to the cause of the inflammation. A large quantity of matter had collected and discharged itself under the lip; and at the time he applied for advice, not only was the diseased tooth loose; but also those on each side of it. He extracted the tooth, but expected, of course, the socket would exfoliate, and this proved to be the result, for on examining the other teeth soon after, he found, through the extent of the three teeth, the bone had become quite loose; so much so, that in a short time the whole came away. The parts then healed, but left an immense cavity in the jaw.

There is one fact, however, I have not yet stated, which should be known in order to have a perfect understanding of this case. The extent of the disease depends very much on the predisposition or constitution of the person affected, and therefore the disease may be divided into two classes. Those occasioned by local affections, and those by general constitutional causes.

This is proved by the knowledge we have of the effects of all disease on persons of scrofulous habits, as in such cases the ulcerous affection assumes a more decided and obstinate character, and is a much longer time in healing.

Thomas Bell says:—

“ Caries, and exfoliations of considerable portions of the alveolar processes, and of the body of the jaw-bone, are not uncommon results of the formation of alveolar abscess. Two cases are figured in Mr. Fox’s

work, in one of which a portion of the upper maxillary bone containing the central and lateral incisors, and the cuspidatus of the left side, exfoliated; and in the other a large portion of the substance of the lower jaw, with the two bicuspides and the first molaris, which latter tooth had, by the irritation produced by the exposure of the membrane, occasioned the mischief. I have known many similar cases, though not in general to such an extent. Those given by Mr. Fox appear to have been occasioned by the obstinate determination of the patients, not to consent to the extraction of the decayed teeth which had produced the abscess, and the consequent burrowing of the pus. The same dread of the operation appears now to be very rare, whether from the advance of education in general, or more probably from the prevalence of an opinion, that the extraction of the teeth is greatly facilitated, by late improvements in the application of the instruments.

“ Another consequence frequently arises from alveolar abscess; namely, the formation of a small tumour around the fistulous passage through which the pus passes. When the opening of the abscess has taken place in the gum, these tumours are generally small and depressed; but in the cheek they occasionally assume an elongated conical form, extending sometimes to half an inch in length. I have seen many cases of this kind, in which, from not being acquainted with the cause or nature of the disease, surgeons have removed the fungus with the knife, and afterwards endeavored to repress its re-

production with caustic and even the actual cautery, but without the least permanent benefit. The removal of the tooth is the only effectual remedy, and is always followed by the spontaneous disappearance of the tumour: it is however succeeded by a depression in the integuments similar to that which I have just described.

“ A distinct, permanent, unchanging patch of redness on the cheek, unaccompanied by pain, is an occasional consequence of the irritation produced by the causes now under consideration. Various appearances of this kind, differing in character and importance, according to constitutional influence, and other causes, are continually occurring. The following is however too curious an example to be omitted; though I regret that my notes of the case are too imperfect to allow of so minute a detail as I could have wished.

“ S. M., a servant in a gentleman's family, about thirty years of age, was affected with a superficial sore on the cheek, immediately beneath the left orbit, of a very remarkable character. It was about the size of a shilling, of a black color, having very much the appearance of a portion of integument suddenly and recently destroyed by actual cautery. It was uniformly though slightly depressed, and distinctly circumscribed; and the edges of the surrounding skin were somewhat inflamed, though there was but little pain. Various applications had been employed, with but little success, for the removal of the slough; poultices had been persevered in, alternately with

ung. hydrargyri nitrico-oxydi, and arsenical ointment. Once or twice the slough had been removed, but it immediately re-appeared. At length the surgeon who attended her, sent her to me to ascertain whether any thing in the state of the mouth could have occasioned this singular disease. I found the second molaris of the upper jaw, on the left side, much diseased, and an enlargement immediately over the socket passing upwards towards the orbit, and thus indicating that there had existed some irritation extending in that direction. The tooth was therefore removed, and with the best effect. The part was again poulticed, but finding the adhesions of the slough very strong, I removed them with the knife, and it never re-appeared; the part healed in the usual way, though somewhat tardily.

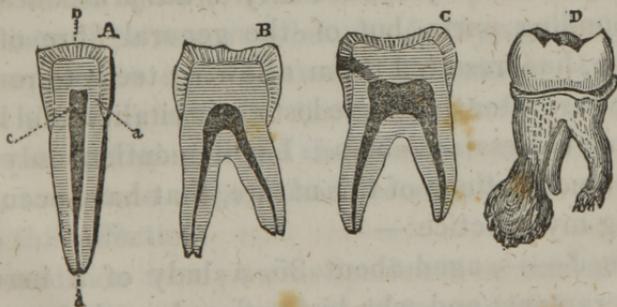
“ Arising from a similar cause, and possessing almost exactly the same characters as those of severe alveolar abscess, are those affections which arise from the irritation of a dens sapientiæ, when arising in the socket, where there is not sufficient room in the jaw for it to assume its natural situation. It often happens that the formation of this tooth is delayed, until the osseous system has become so entirely formed, and every part has so fully acquired its determinate size, that on the advance of the tooth, a corresponding elongation of the back part of the jaw does not take place, and the tooth is compressed by the surrounding bone and the molar tooth. Under these circumstances, it usually takes a direction out-

wards, towards the cheek; but its progress is not only accompanied with a high degree of inflammation, which is often succeeded by the formation of matter to a considerable extent, but the crown of the tooth is pressed so forcibly against the cheek as to produce thickening of the integuments, with inflammation and suppuration of the buccal glands, contraction and immobility of the muscles, and ulceration of a very unpleasant character, extending into the substance of the cheek.

“In the majority of cases, however, in which irritation is produced by the pressure of the dens sapientiæ in its advance, the symptoms are less severe, and are generally removed by the free liberation of the tooth, by making an incision through the gum that covers it. The cause of such affections, when they are not combined with actual deficiency of room in the jaw, is identical with that which has already been mentioned as producing the diseases of the first dentition. A similar indication is therefore to be fulfilled in the treatment of these cases, namely, the removal of that pressure upon the including parts from which the irritation has arisen. In effecting this in the present instance, a somewhat different method is required from that which has been mentioned in treating of the former. The gum, it will be observed, is strained, as it were, over the back part of the tooth, and is usually in a highly sensitive state from inflammation. The pressure of a gum-lancet, without effectually cutting the gum, produces severe pain; to obviate which, and to make a more free and efficacious inci-

sion, I prefer the introduction of a sharp bistoury, resembling a common phymosis knife, with the point upwards; and when this is carried back under the bridle of gum till the point is a little way beyond the tooth, the point is elevated, and, by the withdrawing of the instrument, a complete section is made of the gum, and of the integuments lying above it. The great advantage which this mode possesses over that usually employed, is sufficiently obvious. It is not, however, always sufficient to make a simple incision through the gum, as its immediate re-union often prevents the good effects from being permanent. It is necessary, in such cases, to remove a small portion of the gum from over the tooth." This operation, however, should be faithfully performed by an experienced person, so as not only to open a free passage for the advancing tooth, but likewise to promote or induce a partial bleeding, which serves to relieve the local irritation.

No. VIII.



In the above plate, *A* shows a central incisor split through the centre of its body; *a* the bony part;

b the enamel; *c* the internal nerve; *d* the medium of communication between the nerve of the jaw and of the tooth.

B shows a molar or double tooth of the lower jaw, of an individual aged about 50, split through the centre to show the comparative size of the nerve at this age; and that marked *C* exhibits a tooth of a person at the age of about 20, to show that this nerve is much larger than in a more advanced age, as I have stated in another part of this work; it can likewise be seen that this tooth has commenced decaying at the side, but has not so far advanced but that it could be preserved if carefully and properly plugged. *D* shows a diseased upper tooth, after the alveolar abscess or sac has formed at the extremity of the root, as I have exhibited in the drawing of diseased teeth, No. 7.

ADDITIONAL OBSERVATIONS ON DISEASED TEETH.

Very serious injury, not only of the jaw-bones and surrounding parts, but of the general fibre of the system, has resulted from allowing teeth to remain in the jaw after they have lost their vitality, and have become useless members. I will mention only one case, among others of this nature, that have occurred during my practice:—

Mrs. J——, aged about 35, a lady of a nervous temperament, and who had suffered much from previous disease. I was first called upon, about a year since, to examine and give my opinion in her case.

She stated, that for 18 months previous, at intervals, she had suffered much from a diseased tooth, which had occasioned swelling of the face and integuments of the jaw. I found her face and gums in a very irritable state, and much enflamed. The matter from the abscess discharged through the side of the face, and the appearance on the exterior of the cheek was like a bag or sack, with an opening on the top for the discharge of matter. This sack would contain about a gill, and when filled from the abscess, would run over from the opening on the top; likewise, any liquid substance would discharge through this orifice into the bag, and by pressing it with the hand, she could relieve herself from the pain or weight caused when full. After a careful examination I concluded to extract the tooth; which I accordingly did, after which she was considerably relieved from pain, and the swelling soon after subsided. I advised her, as the only remedy, to submit to an operation, which would consist in dividing the gums so as to allow the carious portion of the jaw-bone to be removed, but she firmly asserted, that such operation should never be performed. I called upon the lady again, a few weeks since, and found her still suffering from the diseased jaw, and in a very low state, which had been induced directly from this affection.

In addition to my own experience on this subject, I add the following case which occurred in Dr. Bell's practice. The lady he speaks of was of a decidedly strumous or scrofulous habit, and had been affected

with disease in the jaw for three months before he attended her. Soon after, he says, the glands began to enlarge, and her face became enormously swollen, and presented a most frightful appearance. The mouth was almost closed, so that it was impossible to introduce an instrument to extract the tooth. He then ordered local applications, to reduce the inflammation, and a wedge of soft wood to be placed between the teeth and gradually pressed further into the mouth, so as to depress the lower jaw. In three days he was enabled, with a small pair of forceps, to extract the tooth, which was followed by a discharge of pus and blood. Her system, while undergoing the operation, became very much reduced, and it was several weeks before she entirely recovered.

Mr. Fox gives an account of an extraordinary case of tumour, which occurred in 1812, in England, at Guy's Hospital. The patient was a girl of 13 years of age, and of a scrofulous constitution. She had suffered very much from tooth-ache for some months previous to the appearance of the disease in the two molares of the lower jaw, which teeth occasioned the tumour. When first received into the hospital, the jaws were separated nearly an inch from the projection of the tumour. Masticating was very difficult and painful from the pressure of the teeth on the tumour. She also complained of pain in the back part of the tumour. The ulceration and tumour continued to increase, and in six months it had become so large as to project considerably beyond the lips, and thus extended them

to an almost incredible degree, and her only mode of taking nourishment was through a tube. She became very much emaciated, and in eleven months after her admission into the hospital, death ensued.

TEETHING, AND DISEASES OF INFANTS.

How many children die during the progress of dentition! Does it not then become us, as responsible beings, to seek and obviate the causes of this useless expenditure of human life?

And where shall we find them? Surely not in any imperfection in the works of our wise Master Builder. All his works are perfect. We are therefore necessarily obliged to look within ourselves for the solution of this question; and if we come to the subject, with the honest intention of discovering the truth, we shall not long remain in ignorance.

We should call that physician deranged, or at least suppose him unpardonably ignorant, who, in an incipient stage of fever, should prescribe stimulants to increase the symptoms; and yet, in opposition to all the known laws of nature, we give our children exciting and stimulating food and drink, and then wonder why they thus suffer. During the period of what is commonly called cutting teeth, there is always more or less irritation; and particular attention should be given to the diet, both of the nurse and infant, as whatever affects the nurse will injure the child. And from this cause alone may proceed those violent bowel complaints which cause the lit-

tle sufferer so much pain, and very frequently result in death.

If parents would but awake to the importance of this subject, that so deeply concerns the welfare of those so dear to them, our newspapers would not so frequently have the mournful tale to tell, of children sent to an untimely grave.

Our Maker, undoubtedly in our creation, intended our comfort and happiness. He therefore never could have allowed one law so to infringe on another, as to cause suffering and death to innocence, on the developement of these useful organs. It becomes then an indispensable duty, on the part of parents, to examine the subject for themselves; and when their practice is in accordance with the laws of nature, their own happy experience will corroborate the truth of these remarks.

It is a fact well attested, that whatever is wrong in the mother's diet, injures the child, even when the mother does not feel the immediate effects. Among the lower animals this fact has been more particularly observed. It is known that calves have been poisoned through the medium of the milk received from the cow, while the effects on the cow were scarcely discernible.

The surest way to trace disease, says Whitlaw, to its original source, is to endeavour to point out cause and effect. Ignorance of the laws of nature, is the stumbling block that lies in the way of mankind; and when artificial regimen is allowed in the management of children, error is sure to follow; whereas

brutes, guided by instinct, never fail in rearing their progeny. It is true that domestic animals are exceptions to the general rules, and that they are equally susceptible of being diseased as erring man.

If mothers are willing to risk their own health to gratify their artificial appetites, indulging in exciting and stimulating food and drink, let them have some regard for the health and comfort of their offspring. It would be far better, in such circumstances, the child should be weaned, and fed on cow's milk, where the animal is kept on its natural food.

On a large plantation that I visited while in the West Indies in 1836, among the slaves, where the diet was principally vegetable, the overseer informed me, that for several generations previous, but two had died during childhood; and in many cases the teeth make their appearance without affecting the health of the child. Similar interesting facts might be added, but I forbear.

PLUGGING TEETH.

Plugging decayed teeth is of so much importance, that it is impossible to recommend this operation in higher terms than it actually deserves, as it is the only means of preserving them when beginning to decay. It is necessary the cavities be filled at as early a period as possible, as the sooner the decayed part is removed, the better, of course, for the health of the tooth. All that know the value of these essential organs must feel that as no artificial means

can fully supply the want of them. Not only in mastication, but likewise in appearance and in speaking are we reminded of their loss. An early and proper attention to them cannot fail of being amply repaid, in the comfort and convenience which must necessarily accrue.

Fine gold in general is the best article in use for filling teeth. As to the usefulness and durability of this operation, I have no hesitation in saying it is the most useful operation in dental surgery, if properly performed. Instances have been known of carious teeth, after being plugged, remaining firm for forty or fifty years. It is, however, an error to suppose that because the tooth is filled, it must therefore be in a safe condition without regard to the manner in which it is done. If the operation is not well performed, or any portion of the decayed part remains, the plugging will have no other effect than to keep the air from the nerve for a short time, while the carious portions remain covered up, causing the destruction of the tooth at some future time.

TARTAR, OR SALIVARY CALCULUS.

Tartar is that coating on the teeth formed by improper artificial living, which to the teeth is so general and destructive an evil. In its color and appearance it varies with the habits of the person; sometimes of a dingy white, in [other cases yellow, and sometimes of a dark color. It is composed of an earthy matter, and at first is of the consistence

of jelly or gelatin, but in time becomes hard, and is the cause of great injury and inconvenience.

I have already said so much respecting the primary cause of tartar accumulating on the teeth, from the use of animal food and other pernicious substances taken into the stomach, whose effects are ultimately to debilitate and cause a derangement of the secretory organs, producing impurity of the saliva, &c., that on this point I shall not enlarge.

Many persons, on observing this accumulation, will endeavor to remove it by the use of the brush, which, in such cases, only irritates the gums, and causes them to become more inflamed. The only proper manner to remove this substance from the teeth is to have it scaled off by a careful and skilful operator. In taking off the tartar, great care is requisite not to injure the enamel.

In concluding these observations on the teeth, I am fully aware much more might be said. It may however be proper, and not out of place, to present, at a glance, some of the considerations which have been offered.

I have attempted to show that the teeth are component and integral living parts of the human system, as much so as the eye, the ear, the heart, or the brain; that they are formed, and nourished, and kept alive like other parts of the body by the regular circulation through them of blood, &c.; a circulation which is constantly kept up by night and by

day—and which is always repairing the waste that is every moment occurring in the human economy. In fact, the human body is constantly changing, and the teeth participate in this universal law. It is but fair and reasonable to conclude, that whatever would tend to injure the body generally, would have the same effect on the teeth also; and this conclusion is obvious. Hence I was led to state my views in regard to the effect of hot and very cold substances on the teeth, and I endeavored to show, by reference to those nations where these were not used, as well as by reference to the lower animals, that their use was pernicious, and abstinence from them highly beneficial. I then proceeded to remark on the detrimental consequences of the common and general use of animal food, and to show that the fruits of the earth are the natural and proper food of man; that all departure from this simple, natural style of living is attended with bad consequences, and that one of the most striking of these is the deposit of tartar upon the teeth, and their decay.

I am well convinced that if mankind could be persuaded to abandon their present unnatural and artificial habits of living, and live according to unsophisticated nature, scripture, and reason, they would thus be enabled to dispense with what we now consider the necessary aid of Physicians and Dentists.

