A practical treatise on teething, and the management of the teeth, from infancy to the completion of the second dentition, at about twenty-four years of age : in four chapters, each descriptive of an era in the developement of the teeth and jaws / by J. Paterson Clark.

A PRACTICAL TREATISE

ON

TEETHING,

AND

THE MANAGEMENT OF THE TEETH,

FROM INFANCY

TO THE

COMPLETION OF THE SECOND DENTITION,

AT ABOUT TWENTY-FOUR YEARS OF AGE:

IN FOUR CHAPTERS,

EACH DESCRIPTIVE OF

AN ERA IN THE DEVELOPEMENT OF THE TEETH AND JAWS.

By J. PATERSON CLARK, M.A.

"Just as the twig is bent, the tree 's inclined."—Pope.

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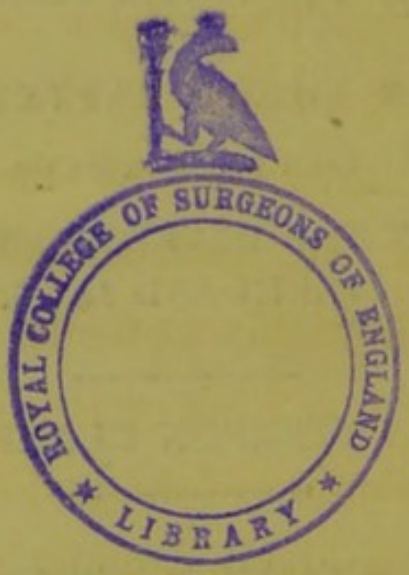

PREFACE.

THE object of the following Treatise is familiarly to explain the nature and progress of Teething, from infancy to the completion of the second dentition, at about twenty-four years of age. The arrangement of the Work, in its present form, was suggested by the explanations the Author was professionally called upon daily to afford his Patients. The idea of more than two Eras in teething originated in a consideration of the periods and manner in which the teeth usually cut the gums, and the difference of treatment required at the various stages of their developement.

The primary teeth remain, as an entire

set, until a child is six years old, and no longer, when they begin to be shed. On their management during this period depends more than is usually imagined of the comfort of a child, not only at the time, but for the ensuing six years.

Shedding the twenty primary teeth, and filling up their identical places with an equal number of successors, occupies about six years. From the commencement of ossification upon the pulps, within the jaw, until the complete developement of a permanent tooth, of which there are always four formed at a time, requires a space of six years. A similar period is required for the jaws to expand sufficiently in order to receive these additional teeth. At six years of age, before the breaking up of the first set of teeth, four new grinders, one at each

end of both jaws that never change, cut the gums; which circumstance, rather more pointedly than the commencement of shedding, distinguishes the second Era in teething. During this period all the primary teeth are shed, and their identical places supplied with successors.

At twelve years of age four additional teeth, that never change, cut the gums, one at each newly formed extremity of both jaws, intimating a third Era in teething.

At eighteen the four wisdom-teeth begin to cut the gums in the same manner, marking a fourth — the last Era in teething.

To an Era, of six years, a chapter of the Work is devoted; and, for additional facility (professional works being proverbially dry reading), the chapters are subdivided into paragraphs, with references at

the head of each; so that the reader, by knowing the age of the young person for whose sake he is making inquiry, may not only refer to the chapter, but to the very paragraph in which the desired information will be found.

This arrangement, however, has the disadvantage of occasioning a few repetitions of the same ideas; sometimes of the very words, as in the commencing paragraph of each chapter.

The leading features of the Work are,— that early extraction of the primary teeth leads, more frequently than any other cause, to irregularity of the permanent ones,— that caries may be altogether prevented, and, up to a certain point, remedied after it has taken place: the Author believing that the teeth were intended to last for life.

Part the Second, being a corrected Edition of his former Treatise, should a favourable reception of the present Volume encourage its publication, will contain the following articles.

PRESERVING THE TEETH.

I.—By cleaning, scaling, and polishing; processes equally applicable at every period of life.

II.—By filing, cutting, and stopping.

III.—By curing toothach and sensibility in teeth, previous to the introduction of permanent stopping.

IV.—By artificial teeth; applicable to certain cases of deficiency and irregularity, without reference to age.

Sackville Street, London,
June, 1835.

CONTENTS.

CHAPTER I.

FROM BIRTH TO SIX YEARS OF AGE.

CHAPTER II.

SECOND ERA IN TEETHING FROM SIX TO TWELVE YEARS OF AGE.

CHAPTER III.

FROM TWELVE TO EIGHTEEN YEARS OF AGE.

CHAPTER IV.

FROM EIGHTEEN TO TWENTY-FOUR YEARS OF AGE.

FOUR ERAS IN TEETHING.

FIRST ERA,

FROM BIRTH TO SIX YEARS OF AGE.

CONTENTS OF CHAPTER I.

THERE are four natural eras, of six years each, in completing the human teeth, commencing about the first, seventh, thirteenth, and nineteenth years of age. After the completion of the first set of

teeth, the commencement of each of the other three eras in teething, is recognised by the cutting of four additional double teeth, one at each extremity of both jaws as they exist at the time; a jaw always requiring six years more to elongate sufficiently for the reception of these new teeth.

2. *First era of teething.*—The first era of teething, extending from birth to six years of age, is distinguished by the cutting, and complete developement about the end of the second year, of the twenty shedding or first set of teeth; and by their permanency, as an entire set, until the seventh year, when they begin to be shed.

3. *The two sets of teeth.*—Mankind is usually furnished with two successive sets of teeth; the first called deciduous, shedding, temporary, and milk-teeth, from their short duration in the mouth; the second, adult and permanent, from their lasting, under favourable circumstances, for the remainder of life.

4. *Number of the teeth.*—The proper comple-

ment of the shedding teeth is twenty; that of the permanent set is thirty-two.

5. *Process and periods of shedding first teeth.*—By a process of nature, the twenty shedding teeth usually loosen of themselves, in consequence of the absorption and actual disappearance of their roots; they accordingly drop out, one by one, between the seventh and thirteenth years of age (the second era in teething), during which period they are regularly succeeded by an equal number of permanent teeth, having the same denominations and characteristics, only differing from their predecessors in size. These twenty new teeth of the second set, together with twelve additional ones that never change, constitute the usual complement of thirty-two adult teeth.

6. *Classification and description of the teeth.*—Waving the common classification of the human teeth, we shall here consider them as consisting of two classes only, single and double teeth (incisors and grinders). For, although "man possesses, indeed, teeth called canine (eye-teeth), they do

not, as in other creatures, exceed the level of the others, and are obviously unsuited to the purposes which the corresponding teeth execute in carnivorous animals."*

Of the twenty shedding teeth, twelve are single, and eight double. The single teeth are placed in front of the mouth, six in each jaw; and, from their employment there, simply dividing the food, they are called incisors. The eight double teeth are placed two in each side of a jaw, the fourth and fifth from the centre of the mouth, farther back than the incisors; and from the nature of their employment, that of millstones, they are called grinders.

Incisors have each but one root; the grinders of the first set have three roots in the upper, and only two each in the under jaw.

That part of a tooth which is visible on looking into a mouth, is called its crown, or body; the part concealed in the jaw its root; and the in-

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* Lawrence.

termediate part, which is encircled by the gum, is called its neck. The body of a tooth is covered with a thin coating of enamel much harder than the bone of which the tooth itself is formed, although the hardest of all bones. The enamel of teeth is, indeed, the hardest of all animal productions; but, on that very account, like flint, it is the more easily splintered, and readily resolves itself to its elements when touched with acids. The bone is of a more stubborn character; and when devoid of enamel as in the lines, indentations, and inequalities of the double teeth that are inaccessible to the tooth-brush, or to the sweeping influence of the tongue and food during mastication, it softens and rots.

Decay is produced chemically by the united action of the atmospheric air and moisture of the mouth on the bone and enamel of teeth. When the state of the saliva is such as to produce rapid decay, the enamel is reduced to something very like chalk. It has been called the "white decay." When caries is slow, the enamel only turns dark.

When the bone is in a state of rapid decay it may easily be cut away in soft adhesive flakes; when slow, it becomes impalpable mud.

The saliva becomes putrid wherever it is stagnant; and while it decomposes the bone of the teeth, it occasions an offensive breath; when acid, as saliva is ascertained sometimes to be from a disordered state of the stomach, it decomposes even the enamel itself.

A tooth is not a solid body, but has an internal cavity, filled with nerves and blood-vessels. This cavity is large in the body of the tooth, and diminishes gradually towards the termination of its root or roots, where the internal membranes, consisting of nerves, &c. communicate with others of a larger description ramifying along, and within, the jaw-bones, and hence with the whole nervous system of the body.

7. *Sockets and lining membranes of teeth.*— Each tooth stands in a socket, or alveolar process, of bone, formed expressly for its support. This socket is absorbed, and disappears after the ex-

traction of a tooth; although, on looking at a skull, the alveolar processes seem to be an integral portion of the jaw-bones. The gums, unthinkingly supposed by many to be the supports of teeth, have but little to do with the matter, as, on their removal, the teeth remain as firmly fixed as before. The socket of a tooth is lined with a membrane, that answers the purpose of a pad, placed between it and the root of the tooth of which it is only the sheath: for if a tooth were to clink against the naked bone of its socket in mastication, the clatter would be intolerable; besides the danger it would constantly be subjected to of being broken when used. This lining membrane of a tooth's socket, and its internal blood-vessels, seem to unite in supplying a tooth with vitality; for on the obliteration of the one, or the receding from the tooth of the other, it begins to darken as if no longer supplied with blood. Even in this condition a tooth may remain permanently useful, although called dead. Such is always the

state of roots that remain in the jaws after the destruction of the crown or body of a tooth.

8. *Inflammatory diseases of the gums and lining membranes.*—These membranes however, necessary as they are to the beauty and health of the teeth, have disadvantages peculiar to themselves. The membrane within a tooth, being confined in hard bony cells, when excited and inflamed, has no room to dilate as in the soft parts of the body; it therefore occasions toothach: while the lining membrane of the socket, on being inflamed, swells, and to a certain extent ejects the tooth, which then feels longer than the others; and is, consequently, compelled to sustain the whole shock of the opposing jaws in mastication. This also occasions toothach.

Continued inflammations of either, produce suppuration; and the matter, when formed at the root of a tooth, can only find an exit by perforating the bony socket. This process is slow and very painful: it may be stimulated and urged

forward, or if applied early, prevented by poultices: it may be retarded or reduced by leeching, cooling medicines, blisters, &c. The channel, by which the matter thus formed finds an exit, is denominated an abscess. The gum, participating in the disorder, becomes inflamed and suppurates, thus producing what is termed a gumboil.

A gumboil, if only kept open and clean for a short time, will exhaust the disease by the partial or total destruction of the membranes, and thereby permit the tooth to remain; which, in young persons, from reasons to be given in the proper place, is of the utmost consequence for the proper developement of the second set of teeth.

These remarks are, in reality, more suited to another chapter of the treatise; but, owing to their importance in regulating the teeth of young persons, they have been inserted here.

9. *Ossification of teeth, cutting the first set.*—On examining the skull of a new-born infant, it would be found that ossification of all the shedding teeth had taken place already to a considerable extent,

and a commencement made even of the four "six years old" permanent grinders. Instances occur where, previous to birth, one or more teeth have already cut the gum; although the usual time is from five to eight months of age. The cutting of the first teeth generally begins in front of the under jaw, followed by the corresponding ones in the upper. The set is completed in the second or third year. Differences of months or even years are to be met with, both in the coming and disappearing of the first teeth. These differences, however, can only be regarded as exceptions from a general law of nature, and can have no reference to the constitutional condition of the child.

The following is pretty nearly the order, as to time and situation, in which the twenty shedding teeth cut the gums.

About five to eight months,—four incisors, the two front teeth in each jaw.

From seven to ten months,—four lateral incisors, the second tooth from the centre, in each side, of both jaws.

From twelve to sixteen months,—four grinders, the fourth tooth every where from the centre of the mouth.

From fourteen to twenty months,—the four eye teeth, the third tooth, in each side, from the centre.

From eighteen to thirty-six months,—the four furthest grinders, the fifth tooth, in each side, of both jaws.

10. *Teething, its dangers, and treatment.*—The teeth are said to be a greater source of suffering, at every stage of life, than any other part of the body. In infancy, the protrusion of a tooth from the gum, is as frequent a source of danger to the child, as its own birth was to the mother. "Teething is productive of local and constitutional complaints with local sympathy. The local symptoms are inflammation, heat, and swellings of the gums, and an increased flow of saliva. The constitutional, or general consequential symptoms, are fever, and universal convulsion, attended by diarrhœa, costiveness, loss of appetite, erup-

tions on the skin, especially on the face and scalp; cough, shortness of breath, with a kind of convulsed respiration; spasms of particular parts; an increased secretion of urine, and sometimes a diminution of that secretion with a discharge of matter."* As it is in the power of art to prevent, or greatly to mitigate the evils of teething, nurses ought to make themselves acquainted with the symptoms of their approach. For some time before the protrusion of a tooth, that part of the gum which lies immediately over it, is observed to swell into something like the shape of the approaching tooth. The front teeth are shaped like wedges, sharp at their cutting points, and thicker towards their roots: they therefore cut their way through the gum with comparative ease, and their coming is proportionably free from danger to the child; but the grinders, of which there are eight belonging to the first set of teeth, are formed with flat grinding surfaces, that cannot cut, but

* Hunter.

only distend the gum, occasioning great local irritation. The inflammation always attendant on this tension of the gums, produces absorption of the part, to make way for the obtuse forms of the double teeth. The prevention of ill consequences from bad teething is easy at first, being simply to lance the gum as often as it may be required. One must cut fearlessly down to the tooth, as harm cannot be done even by many repetitions of the operation. The child cries because its mouth is forcibly opened by a stranger, but does not experience pain. "As far as my experience has taught me, to cut the gums down to the teeth appears to be the only method of cure. I have performed this operation above ten times upon the same teeth, where the disease had recurred so often, and every time with absolute removal of the symptoms."*

11. *Teeth never increase in size after their protrusion from the gums, the jaws continue to*

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* Hunter.

grow like the other bones.—About the end of the second, or beginning of the third year of age, when the first set of teeth is completely developed, perhaps no object in nature can look more beautiful than the mouth of a child when all the circumstances are favourable. The form of the jaws is semicircular; the gums are of one uniform healthy colour; the teeth are of beautifully shaped ivory, without the appearance of a flaw. Teeth once formed, and thus arranged, can never undergo any change but for the worse; the jaws, however, in which they are arranged, are subject to continuous change. Teeth attain the utmost size of which they are ever capable while within the jaws, but the jaw-bones continue to enlarge like other bones during the growth of the body. Soon after the completion of the first set, spaces begin to appear between them; which, in favourable circumstances, continue to enlarge until the succession of the second teeth.

This is sometimes a source of unreasonable anxiety to parents: without reflecting on the

changes necessarily taking place at an early age, they expect the mouth of a child to continue always equally beautiful, and hence his first fertile source of torture.

The most striking change in the structure of the jaws takes place at both their extremities, where four new permanent teeth make their appearance at six years of age, and in situations formed expressly for their reception, since the completion of the first teeth. They are placed the last tooth in each side of the upper and lower jaws,—the sixth tooth every where from the centre of the mouth.

All the additional teeth of the second set, without any reference to those that change, make their appearance four at a time, in the same manner, at intervals of six years; thus distinctly indicating periods that may be reckoned as natural eras in teething.

12. *State of primary teeth when shed; sometimes they do not shed, and must therefore be extracted.*—What is most remarkable in the economy of the

first set of teeth is the manner in which they are ejected from the jaws, to make room for the second; their roots are absorbed as their successors advance. Nothing analogous to this takes place in any other part of the body; not even in the permanent teeth themselves, however affected they may be with caries or other diseases. Sometimes it happens that no absorption of the roots ever takes place; in which case nothing remains but to extract them, tooth for tooth and no more, as their successors arrive, in order to prevent a double row.

This feature in the mode of shedding first teeth ought to be impressed on the minds of all those who would permit the teeth of children to decay, "because they are to be shed at any rate." "The shedding teeth are as subject to caries, if not more so, than those intended to last through life."* It will be recollected that caries of the first teeth does not necessarily favour their ejection from the jaws, while it frequently occasions much annoyance

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* Hunter.

to the little patient, even to the endangering his health.

13. *Management of shedding teeth; objections to their premature extraction.*—Since the decay of children's teeth does not favour the process of shedding them, and since it occasions exposure of their nerves, with consequent torture, is it not reasonable to expect that the same attention should be paid to them as to their permanent successors? The whole art of this care lies in cleanliness. Were every part of a tooth kept perfectly clean, there would be no decay of its substance: decay, when it does occur, invariably commences in a part that is not or that cannot be kept clean with the tooth-brush or the tongue, or that is not polished by the friction of mastication. Let children, therefore, be taught the free use of a tooth-brush as soon as they are old enough to use one.

It frequently happens that the double teeth are formed with deep lines and indentations on their surfaces, in which the relics of food unavoidably remain and stagnate; and, owing to the imper-

fection of the enamel in these lines, they reach and affect the bone with cariosity. This is the principal cause of an offensive breath. For this the remedy is simple: where the double teeth have deep indentations, let them be artificially filled up and their surfaces made level, as is the practice with respect to permanent teeth. This operation, to be sure, cannot be performed so well in the mouth of a child as of an adult, but still sufficiently so for a temporary purpose: the stopping ought to be revised from time to time. By these means young persons may retain the perfect use of their first teeth to the last day of their duration: at about twelve years of age.

The greenish thin tartar that collects on the outside of first teeth ought to be rubbed off with a wooden tooth-pick. Cuttlefish bone, or, should that fail, pounded pumice-stone, or fine sand, may be used as a tooth-powder with impunity.

We have spoken only of the decay of double-teeth, ascribing it to their shape; but all teeth when much crowded together are liable to decay,

from lateral pressure: no cleansing process can then reach between teeth in very close contact with one another. The remedy for this, should symptoms of decay appear, is fairly to open a space between them with a file or other cutting instrument. Let the newly cut surfaces be made as even and smooth as possible, and kept clean, and teeth so treated will last and be useful as long as their services may be required.

There are other reasons for preserving first teeth to the proper time. "The rudiments of the permanent teeth, instead of being original and independent, like those of the temporary, are in fact derived from them, and remain for a considerable time attached to, and intimately connected with them."* "I am led, by this consideration, the more decidedly to deprecate their too early extraction, with whatever object it may be proposed. We must not, however, disregard the injury which the extension of severe inflam-

* Bell.

mations to the permanent rudiments may produce in the formation of the permanent teeth. As soon as pain is produced, any of the applications useful for toothach should be applied."* The best, perhaps, is diluted spirits of wine, or gum mastich dissolved in spirits, and applied in wool. If these remedies fail to have the desired effect, the dentist may probably be able to hit on some remedy more suited to the case. "Should the plan for the reduction of the inflammation have failed, and especially should suppuration have taken place, the immediate removal of the teeth is imperatively called for."†

14. *Projecting chin and other irregularities of the mouth*.—In concluding this part of our subject it may be proper to remark on the force of habit in establishing the style of the future mouth. "It is about the time of the completion of the first teeth that the projecting under-jaw gradually begins to shew itself, and shortly before the

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* Bell. † Ib.

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

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* Sigmond.

FOUR ERAS IN TEETHING.

SECOND ERA,

FROM SIX TO TWELVE YEARS OF AGE.

CONTENTS OF CHAPTER II.

THERE are four natural eras, of six years each, in completing the human teeth; commencing about the first, seventh, thirteenth, and nineteenth years of age. After the completion of the first set of teeth, the commencement of each of the three

other eras in teething is recognised by the cutting of four additional teeth, one at each end of both jaws; the jaws always requiring six years more to elongate sufficiently for the reception of these new teeth.

15. *Second era in cutting the human teeth.*— The second era in teething, commencing about six years of age (four years after the completion of the first set), is distinguished by the cutting of four new teeth, in addition to the twenty shedding ones. They are called the "six years old" permanent grinders, as they never change. Their place is the sixth tooth every where from the centre of the mouth. By them the complement of twenty teeth, at this age, is increased to twenty-four; which number, notwithstanding the important changes that take place in the mouth during the ensuing six years, is not exceeded before twelve years of age, when four more grinders intimate a new era, being the third, in teething.

The second is by far the most important era in cutting the human teeth. During this period

four new permanent grinders make their appearance in the mouth, in parts of the jaws formed expressly for their reception, since the completion of the first set. During this period the twenty teeth of the first set are, or ought to be shed, and their identical places supplied with an equal number of successors—teeth having the same characteristics and denominations, but differing greatly from their predecessors in size and strength: during this period also the jaws become, or ought to become, sufficiently enlarged for the proper developement of the twenty teeth that come a second time.

On the treatment during this period must depend the future appearance and comfort of the mouth. In order to understand the treatment here proposed, a most important feature in the economy of the teeth must ever be present to the mind: teeth once formed, which happens while yet within the jaws, are completely formed, and do not continue to grow afterwards, while the jaws that contain them do. Were it not so, one set of

teeth would be sufficient: like other parts of the body they would enlarge, and seem at every period of life in keeping with the surrounding features of the countenance. But the nature of their enamel forbids this; like glass, it cannot be expanded without cracking. The teeth are in fact unlike any other part of the body, and in describing them, can only be compared with teeth. They form a system within a system; bones, with a part of them exposed to external influences, and a part to internal ones only. Other bones may be broken, and they will heal again; they may be diseased, and recover by exfoliating the diseased part; but the teeth, once formed, are formed for ever. They never undergo any change but that of deterioration. Nature has not provided a renovating power for injuries of the teeth; they were doubtlessly intended to be as permanent as life. The nails and hair are thrown off, and still there is a new supply of their substance. But with respect to the teeth, if the smallest flaw exist in their surface, if but the smallest chip be re-

moved at the time of their first appearance in the mouth, the deficiency remains unrepaired by nature for the remainder of life. Touch but a point of enamel with strong acid, and it remains a blemish for ever. "Another circumstance in which the teeth seem different from bone is, that they never change by age; and seem never to undergo any alteration, when completely formed, but by abrasion: they do not grow softer like other bones, as we find in some cases, where the whole earthy matter of the bones has been taken into the constitution."*

16. *Remarks on teething, addressed to professional men.*—A knowledge of these facts ought to have its due influence on the minds of all those who would advise others respecting the treatment of their teeth. Much of our happiness or misery in this world depends on the teeth. The diseases to which they give rise when cutting the gums, at the commencement of each of the four eras in teething,

* Hunter.

have not been so well ascertained by medical men as their importance deserves; and yet the observant dentist has traced, in imperfectly formed teeth, the very periods of life at which their possessors were afflicted with illness. On the health of the mother, during pregnancy, depends the quality of the first teeth. On the health of the child, at the time the various teeth of the second set are ossifying, a period extending to twelve years, depends the supply of healthy material for their formation. Even layers of sound and unsound enamel, as when honey-combed, can be traced on the same teeth in many persons, according to their varying shades of health and illness during the time of its first deposition within the jaws. Are the teeth, then, not of sufficient importance to require an equal knowledge of their diseases and treatment, on the part of medical men, as other parts of the body? The author begs respectfully to say that they are; and, more especially, of those various diseases which arise from external influences, as relics of food, acid saliva, tartar, abrasion, &c.;

for to the medical faculty the public generally appeal in such matters. Is it too much to expect that they who regard it as more glorious to restore than to amputate a limb, should know something of the teeth beyond mere extraction? Has professional bias, or an exclusive education, any thing to do with this neglect? Mr. Bell, a competent judge, observes, that "In addition to the neglect of the study of the anatomy and diseases of the teeth by medical students, and the dearth of information on a subject confessedly of no trifling interest, another is to be found in the unprofessional character of those persons to whom the treatment of the teeth has been too generally restricted; and the unmerited neglect which the subject has consequently received from the regular practitioners, to whose care, from their education and experience, the treatment of those organs would be more legitimately confided."*

* Since the above was written, a treatise on Teething, of deep research, has been published by Dr. Ashburner, which ought to be in the hands of every medical practitioner.

17. *Origin of diseases of the teeth.*—The same writer has, in his clever treatise, carried down to the present time the stream of information, according to commonly received opinions, respecting the Physiology and Pathology of the human teeth, in the completest manner; but his work is addressed to the medical student only: perhaps it is on that account he endeavours to trace all the diseases of the teeth to an internal and hidden origin, which require only internally applied remedies for their correction. The author of these pages, however, feels himself reluctantly compelled to differ from him altogether as to the origin of diseases of the teeth, believing it to be entirely the result of external influences. He begs, therefore, with the greatest deference for so respectable an authority, to state his conviction that no useful information can ever be conveyed to medical students, or through them to the public, respecting the management of the teeth, without assuming, as first principles:—That all diseases of the teeth have their origin

on their external surfaces, in lines, and indentations, &c., which are natural, but more especially to double teeth; and in the sides of all teeth that press severely against each other, from want of room in the jaws; and at the necks of teeth when foulness is permitted to remain stagnant and putrid between them and the gums. Also, that these diseases are incapable of being prevented or remedied by any other than external agency; and that art alone can do all that is desirable for preserving teeth, without extraction or medicine.

18. *Examination of a mouth at six years of age.*—It has already been stated that the second era is the most important in teething: 1st, Because it commences with the cutting of four new permanent grinders in newly formed parts of the jaws, that required six years for their developement, being formed expressly for the reception of new teeth, since completing the first set;—2d, Because, during these six years, all the teeth of the first set either are, or ought to be shed, and their identical places supplied with an equal

number of successors having the same denominations and characteristics, and only differing from their predecessors in size;—and, 3d, Because it is not the nature of teeth to grow larger in the least degree after they have once cut the gums; while the jaw bones, regulated by the same laws as other bones, continue to enlarge gradually with the body, for the reception and developement of the teeth.

In order the more readily to understand the inferences to be deduced from these facts, let us look into the mouth of a child about six years old. We shall there see twenty-four teeth, twelve in each jaw; four of them permanent, and that come but once; the others shedding teeth. Reckoning from the centre of the mouth, the sixth tooth every where is the permanent one; and, as it has made its appearance at so early a period, it is frequently mistaken for a shedding tooth, and, like one, too often permitted to decay.

19. *Reasons against extraction, &c.*—I know that I am here treading on delicate ground,

when, in candidly stating my own opinions, I observe and follow nature. The fashionable practice has been to remove these "six years old" grinders to make room in the jaws. I would ask the advocates of this treatment, whether, if one or two teeth be extracted from any part of the mouth, between six and twelve years of age, the space does not become obliterated by the approach of the adjoining teeth, and not by an increase of their numbers? and whether they do not find decay afterwards attacking teeth thus approaching, although room was supposed to be made for them? Nature endeavours to repair the injury inflicted by extraction, by stopping the growth, or rather by diminishing the jaw at this part; and by permitting the easy approach of the others to one another: mindful, without doubt, of original intention as to beauty of form as well as utility. "Premature extraction often produces an effect quite contrary to that intended; as, in such cases, the gums and alveolar processes shrink back to the permanent teeth, which have not

come forward; so that the space, instead of being enlarged, becomes contracted."* In humble life we seldom meet with irregular teeth at an early age, however much they may be injured and lost through ignorance of their management afterwards. Had nature intended that those four teeth should be shed, she would assuredly have provided for their expulsion. The first teeth, where neither an accident nor weakness of constitution interferes, drop out of themselves, their roots being as completely absorbed as if they had not at one time possessed any: this never happens except to the twenty primary teeth. Again, with what instrument could animals (which also shed the first teeth) or uncivilised man remove the permanent teeth of their offspring? "No dentist of respectability would extract shedding teeth before the permanent ones appeared ready to occupy their place; at least not without strongly protesting against such an operation. Nor should chil-

* Murphy.

dren's teeth be prematurely extracted on account of toothach; and until the proper time of removing the tooth we would recommend the usual palliatives."*

There are other and powerful reasons for preserving these "six years old" grinders even in the worst of cases: they have a peculiar duty to perform. Still looking into the mouth of the child before us, we shall see that in closing the teeth the sixth in each side meets an antagonist in the other jaw; the flat, wide surface of the one opposing that of the other, quite unlike the sharp, wedge-shaped front teeth. The form of the grinding surfaces of double teeth is such, that no pressure can bring the jaws nearer to one another than where they first meet; while in front of the mouth, after the loss of the double teeth, the incisors of one jaw overlap those of the other, in such a manner that the one row or other would be displaced by continuous pressure.

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* Fuller.

At this age too, perhaps, the child's primary grinders are broken down with disease, and no longer capable of warding off the pressure which, but for the intervention of the "six years old" grinders, must necessarily fall on the front teeth, which office they had hitherto to perform; for in perfectly organised mouths, the front teeth, although they touch front teeth in the other jaw, never press severely against them. You could at any time draw a slip of paper away without tearing, however much a person wished to retain it. This, you must see, is owing to the manner in which the jaws are propped by the meeting of the flat, grinding surfaces of double teeth. This, then, is the reason why these permanent molares come into the mouth at so early an age. The shedding grinders are generally in a condition to sustain the pressure of the jaws until the "six years old" can attain their proper station above the gums; for you must know, that by pressure they could be made to stick midway, or even kept on a level with the gums, for life. Does it

not appear, then, that if the shedding grinders be prematurely lost, through disease or extraction, before their permanent neighbours have attained their proper stations in the mouth, the pressure would inevitably fall on the front teeth, and push them about in every direction except the right one; and that a mouth meant to be beautiful, would thus be blemished for life? Should the necessity ever arise for extracting any of these teeth, it is better, perhaps, for uniformity's sake, to extract the whole four; not, however, before twelve years of age, when four additional grinders, the seventh every where from the front of the mouth, will advance into their places. The operation is now comparatively a safe one, in consequence of eight other new double teeth, nearer the front of the mouth, having succeeded to the primary grinders, to support the jaws, and ward off undue pressure of the front teeth of one jaw from those of the other.

20. *The dissected jaws of a child.*—Looking

still into the child's mouth, let us now suppose the jaws dissected; and we shall there find the astonishing number of forty-eight teeth in his mouth at the same time, viz. the twenty shedding ones and four permanent grinders in sight; and twenty-four others, at the various stages of ossification, concealed within the gums and jaw-bones. Some of the shedding teeth are without roots, or nearly so, preparatory to their dropping out, by the beautiful and wonderful process of absorption of their roots; the teeth of the second set are as yet without any, excepting those which have cut through the gums; for the roots are gradually added as the teeth advance into view. But the principal fact to be regarded at this stage of teething is the size of the new teeth, they being equally large, as far as the ossification has proceeded, as ever they can become; for on that part of a tooth which is usually covered with enamel, and that is seen above the gum, it is as large in the child of six as in the parent of fifty; "whatever part of the tooth is formed, it is

always completely formed; which is not the case with other bones."* See, or fancy it, how the second teeth lie huddled together—those of a man in the small jaws of a child. Crowd your fingers into the glove of a child, and you will have some idea of the case. Remember, too, for now the new teeth are cutting the gums in spaces not sufficiently ample to contain them, that the jaw-bones continue to enlarge for at least six years more; when, if their arrangement be left to nature, the second teeth are likely to find sufficient accommodation for themselves. At least, the rule ought to be, that only one tooth may be removed, to make room for its own identical and proper successor; and not two, as is too commonly the case. The only other thing to be particularly attended to during the changing of the teeth, is, that they be not permitted to take a wrong direction; as, for example, when one upper incisor shuts inside, and another outside,

* Hunter.

the under teeth. This may be effected by training the erring tooth with the finger, or by the help of a lever, say the point of a silver or ivory knife; or should these means fail, by a bridge of metal worn for a time on the under teeth, to convey the offender in the upper jaw outside the under one.

21. *Periods of cutting the second teeth.*—The second teeth cut the gums in nearly the following order as to time; the first deposition of the bone upon their pulps, having preceded their protrusion from the gums, by six years or upwards. One or more month's difference in cutting the corresponding teeth in different individuals is not considered a matter of any consequence. Varieties of even two or three years may sometimes be met with; but unattended with any remarkable circumstance. The teeth of the under-jaw usually precede the coming of the corresponding ones in the upper-jaw. The teeth about to be shed are the twenty primary ones of the first set; twelve of them single, and eight double. The teeth about to cut the gums consist of thirty-two, being the

usual complement of adult teeth, of which six in each jaw are single, as with first teeth, and ten double, instead of four, as in the first set. Of the thirty-two new teeth, no more than twenty can come a second time; the other twelve come but once and for ever.

All the teeth of the second set are much larger than those of the first, except the grinders; double teeth of the first set being actually larger than their successors. These latter, the fourth and fifth from the centre of the mouth, are called small grinders, being indeed small, compared with the large grinders placed beyond them, which come but once.

At about six years of age four permanent grinders cut the gums; one at each end of both jaws being the sixth tooth, in each side, from the centre of the mouth.

About seven,—four incisors; the two centre teeth in each jaw.

About eight,—four lateral incisors; the second tooth every way from the centre.

About nine,—four small grinders; the fourth tooth every where from the centre.

About ten,—four more small grinders; the fifth tooth in each side of both jaws.

About eleven,—four eye teeth; the third tooth every where from the centre of the mouth.

About twelve,—four large additional grinders in newly formed parts of the jaws, which, after an interval of six years without cutting additional teeth, mark a third era in teething; they are placed the seventh tooth, in each side, from the centre.

About eighteen,—four more grinders, the wisdom teeth, begin to appear, which, after another interval of six years, mark the fourth era in teething; their place is the eighth tooth from the centre of both jaws.

22. *John Hunter mistaken as to the periods of cutting adult teeth.*—It has been unfortunate for many persons that Hunter, in his celebrated Treatise, has wrongly stated that the first permanent grinders do not cut the gums before

twelve years of age; whereas in reality they appear at six; those four teeth that come at twelve being the second of three series of double teeth. "The first adult molaris comes to perfection and cuts the gum about the twelfth year of age; the second about the eighteenth; the third, or dens sapientiæ, from the twentieth to the thirtieth."* Perhaps his accidental mistake has led many of his admirers to practise on their patients accordingly. The dreadful operation of transplanting living teeth originated with him; but was soon discontinued, in consequence of the diseases which transplanted teeth communicated to their new possessors. There are persons yet living who recollect seeing crowds loitering near the doors of dentists, ready, when a wealthy purchaser could be found, to dispose of their masticators for money.

23. *The various systems of regulating the teeth.*—It has already been stated above, that

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* Hunter.

the jaws are at this age in a state of continuous growth, while the size of the teeth themselves remains stationary; for, "whatever part of a tooth is formed it is always completely formed," and does not enlarge, "as is the case with other bones."*

It has also been stated that four permanent grinders have already appeared in the mouth; which, from the early age at which they make their appearance, are frequently mistaken for shedding ones, and like them often permitted to decay. As it is the firm conviction of the author, that these "six years old" grinders were intended to last for the remainder of life, and that it is within the reach of art to effect this even where counteracting circumstances interfere, he hopes to carry home the same conviction to the minds of others, in order, if possible, to restrain the cruel practice of extracting.

As each of the shedding teeth is to have a

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* Hunter.

successor in the identical spot it hitherto occupied,—and as the second teeth are of larger dimensions than the first;—as the jaws, too, continue to enlarge during the six years required by nature for changing the teeth, themselves not enlarging during the while, which is the cause of their temporary irregularity in the dental circle;—does it not seem reasonable to expect more room for them at last without early extraction, which only causes contraction of the part, by leaving the care of them to nature, at least until she has done her best with the case?

That the reader may have a better opportunity of judging for himself, he may peruse the arguments adduced by the advocates of both methods.

"The temporary teeth are seldom shed fast enough; and the consequence is, that the permanent teeth, not finding their natural opening, shoot out in a false direction. As a general rule, the safest practice is to extract the four temporary incisors. A few months subsequent to this, it becomes of the utmost importance to attend to the forth-

coming lateral incisors. To make room for the lateral incisors (the second from the centre), it is requisite to remove the temporary eye teeth (the third from the centre of the mouth,) in each jaw; when the child, as far as the four front teeth are concerned, may be considered in a perfect state of safety. We have now arrived at a period when twelve of the temporary teeth, six in each jaw, have been removed; and when eight of the permanent set, four in each jaw, have taken their proper places; leaving eight more temporary teeth to be shed. It is advisable to remove the primary grinders (the fourth and fifth from the centre of the mouth), and as they occupy a much greater space in the circle than their successors, their extraction will also make room for the eye teeth (the third from the centre). Without considerable attention, deformity is apt to take place on the advancement of the upper eye teeth. Room, in such cases, must of course be made for them at whatever expense; and as there are no longer any temporary teeth to be removed, it becomes a matter of serious

consideration what teeth ought next to be extracted*." The concluding sentence speaks volumes against the premature extraction of the shedding teeth.

Those who think with the author argue as follows: "There is no subject connected with the management of the teeth, which has given rise to so much gratuitous cruelty, as that which regards the treatment or prevention of irregularity in the permanent teeth. It were well if the intentions of nature were more attended to in the regulation of the teeth, than has generally been the case. In this, as in every other circumstance in which surgical treatment is required, it should be recollected, that the legitimate object of the surgeon is confined to the application of remedies in a disease, or the regulation of the natural functions when they are deranged; and it is not to be supposed that a process of so much consequence to the comfort and health, and essentially connected with a

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* A cotemporary.

function so important as that of digestion, should be so imperfectly provided for, as to be constantly in need of such harsh and unnatural intemperance. I have known no less than eight, and even ten, firm teeth forcibly removed from the jaws of a child at once. I will not employ the terms of indignation and disgust which such barbarous quackery deserves; but surely the unnecessary infliction of pain, upon the plea of preventing an evil, which in the majority of instances there is not the slightest reason to apprehend, and which even where it might occur, can always be detected in time to obviate it, is of sufficient importance to deserve reprobation, even were this the only injury which could result from the treatment recommended in the foregoing passage. But there are other and more important reasons for avoiding the early removal of the deciduous teeth: the connexion between the temporary tooth and the succeeding permanent one. If the temporary teeth be removed before the permanent ones are so far advanced as to be ready to occupy their

situation, the support of the alveolar processes (sockets of the teeth) being thus lost, the arch of the jaw (dental circle) contracts; and when, subsequently, the permanent teeth are fully formed, there is not room for them to range in their proper situation. I have seldom or never found any ultimate injury to result from leaving the first teeth even until the permanent ones had acquired considerable size, unless when the jaw itself has been ill formed.

"The simple and uniform principle is to leave the temporary teeth as long as may be, without risking the permanent irregularity of their successors. I have often had reason to congratulate myself upon the result of having refrained from extracting permanent teeth until the age of fourteen or fifteen years should have decided whether they would be ultimately necessary. I have successfully treated a case of this description as late as between nineteen and twenty years of age."*

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* A cotemporary.

24. *Of the diseases and irregularities of the teeth; with appropriate treatment of the same.*— "Probably a tooth might, by slow degrees, be moved to any part of the mouth."*

Having once decided on the course to be pursued with a mouth; whether it be that of extraction to make room for the new teeth, or leaving their arrangement to nature, it must not be forgotten that instances occur in which the roots of first teeth are not absorbed, nor consequently shed. In cases of this kind it will be necessary to remove a first tooth on the approach of its successor, to prevent the awkward and inconvenient appearance of a double row. In either case, the same necessity exists for preventing the decay and premature loss of first teeth.

First, then, with a view to this, let us carefully examine the "six years old" permanent grinders, the sixth every where from the centre of the mouth; and, if for the first time, let us

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* Hunter.

inform ourselves, if possible, of the fate of the corresponding teeth in the parents of young persons; for, like those of the one or other of them, the teeth of children are sure to be formed, and consequently liable to the same affections, other circumstances being the same.

These grinders are shaped as if four or five of the front teeth were bundled together when soft. The points and lines of junction are perceptible in the double teeth of all mankind; in some, faintly, in most, very strongly marked. When the tips of the component parts are high, ridgy, or pointed, the lines and depressions in the surfaces are proportionably deep. Indeed, in many instances no perfect junction has ever taken place; as is proved by the fact, that the influences of sweets, salts, and acids, are felt by them immediately after emerging from the gum. This imperfection, like the honeycombed enamel, is evidently occasioned by the want of health or vigour of the general system at the time of the first deposition of ossific matter on the pulps; being about six years before their cutting

the gums. In these lines and imperfections, which may be traced across the grinding surfaces and down the sides of the grinders, a deposit of food and moisture takes place. This lodgement, lying beyond the reach of a tooth-brush or the tongue, soon becomes offensive there, and rots the bone underneath the enamel, for it is the enamel that is imperfect and cracked. The bone within gradually softens and decays away; so that at last the enamel, no longer supported from within, breaks down during mastication, and exposes the full extent of the calamity, when, perhaps, too late to be remedied. The very same thing happens to teeth artificially applied, whether they be natural or of the sea-horse tusk.

You will perceive that the front teeth are quite differently formed from the back teeth; like wedges they are sharp in their cutting edges, and have no lines there to retain moisture: they consequently never decay from their shape, except in accidental cases where a line or hollow, peculiar to the individual, may mark it for decay. Any

dentist of experience will inform you that double teeth, marked as described above, are frequently to be met with in a state of excellent preservation, from being stopped (their lines and indentations hermetically shut) with gold or tin leaf, twenty, thirty, or even forty years before. Perhaps a corresponding tooth has been extracted at the time in consequence of pain, and which circumstance it was that first called attention to the case.

In addition to this source of decay inherent in the double teeth of most persons, all the teeth in a mouth are liable to become diseased from too great a pressure against each other. This happens when the teeth and jaws are not in just proportion to themselves. The point of junction between two teeth is as impervious to the tooth-brush as the natural line in the centre of a grinder, and it is there that decay usually commences; in some constitutions more readily than in others, just as the saliva happens to be abundant, and cleansing; or sluggish, acrid, and destructive.

Perfect cleanliness, were it attainable, would

prevent decay in teeth under any circumstances whatever; but as this is impracticable, owing to their shape, when deep lines and indentations exist in their grinding surfaces; or from too close contact, which early extraction does not quite prevent, other methods must be had recourse to in furtherance of so desirable an object. Room must be made, by filing or cutting, between two teeth that are threatened with decay, the approach of which is discovered by their changing colour. An even flat surface, lateral or horizontal, when kept clean and polished, never decays further, even after the enamel has been removed by the operation. It is in cases imperfectly operated on, or when the new surfaces are afterwards neglected, that this process fails to have the desired effect. Should the lateral decay, after cutting away enough to permit the operation, prove too deep for the file, the remaining cavity may be successfully stopped with gold or tin, as the case may require. For a more complete description of these matters, see second part of this treatise.

FOUR ERAS IN TEETHING.

THIRD ERA,

FROM TWELVE TO EIGHTEEN YEARS OF AGE.

CONTENTS OF CHAPTER III.

THERE are four natural eras, of six years each, in completing the human teeth, commencing about the first, seventh, thirteenth, and nineteenth years of age. After the completion of the first set of teeth, the commencement of each of the other three eras in teething, is recognised by the cutting of four additional teeth, one at each end of both jaws; the jaws always requiring six years more to elongate sufficiently for the reception of these new teeth.

25. *Third era of teething.*—The third era in cutting the teeth, commencing about twelve years of age, is distinguished by the coming of four additional teeth, the "twelve years old" grinders. They are placed the seventh tooth from the centre, one in each side of both jaws; and, after an interval of six years in cutting additional teeth, increase the complement at this age to twenty-eight; which number is not exceeded in the mouth before eighteen years of age, when the fourth and last era of teething commences.

After twelve years of age, we are not to expect much, if any, enlargement of the jaws, except at their extremities, where room must be found for the wisdom teeth, and in spaces that require six additional years for their growth.

26. *Form and condition of the mouth and teeth.*—Keeping these facts in view, when we would regulate a mouth at or after twelve years of age, there are two principal features in the economy of the teeth that require our most serious consideration,—the form of the mouth, and the ac-

tual condition of the teeth. "The teeth of the upper jaw, when they are in the most natural state of contact, project a little beyond the lower teeth, even at the sides of the jaws; but still more remarkably at the fore part, where, in most people, the upper teeth lie before those of the lower jaw."* There are three conditions of a mouth that may be considered regular, because seemingly natural; any deviation from which is considered a deformity. The slightest deformity of a mouth unconsciously excites less or more dissatisfaction in the mind of the beholder, which he finds it difficult to account for from ignorance of the cause; and yet it is easily explained. Fortunately much, if not all that could reasonably be wished, can be done for a mouth, however unpromising, at this early age; for, "in youth the jaws have an adapting disposition. On the loss of a tooth at fifteen years of age, the two neighbouring teeth approach one another, in every part alike, till

* Fuller.

they close."* The same adapting disposition brings it greatly within the reach of art to produce, in the most unfavourable circumstances, one or other of the forms here alluded to. The forms of the mouth that may be considered regular are;—1st. When all the upper front teeth shut outside those which are opposed to them in the under jaw.—2d. When the front teeth of both jaws meet in the same vertical line, edge to edge. —3d. When the teeth of the upper jaw shut inside the under teeth. The first of these forms is the most common, and it is considered to be the handsomest; the second is scarcely perceptible; while the third is considered all but deformed; and yet it is rarely to be seen but in a countenance otherwise pleasing. Each of these forms of the mouth has its peculiar advantages and disadvantages. In the first, while the double teeth remain entire, receiving the shock of the jaws in mastication, the severe and always injurious collision of

* Hunter.

the front teeth is prevented; but after the loss of any, or all the grinders, the front teeth meet their opponents with a severe lateral (not direct) touch, that by frequent repetition loosens and ultimately expels them, however sound, from one jaw or the other. The reason is, that front teeth are shaped like wedges, thickening towards the gums; on which account, when the jaws approach nearer than formerly, the thicker parts of the teeth meet, aiding as with a lever the process of their expulsion. This state of affairs is a frequent occurrence in the mouths of aged persons; it may however be equally the result of tartar, at any age.

In the second form of a mouth, when front teeth meet front teeth, cutting-edge to cutting-edge, after the loss of the grinders,—the process of mastication frequently wears down front teeth to the very gums. This, perhaps, is better than that they should be expelled altogether, as in the first case. The process of their wasting by attrition is so slow, that the parties concerned scarcely

ever perceive the change that is taking place. The way to prevent these unpleasant consequences is to preserve, as long as possible, the back teeth, which are so constructed as to resist injury from (fair play) mastication for a century, should their services be so long required; or to supply their places with artificial grinders.

In the third form, the advantages and disadvantages are much the same, or nearly so, as in the first. Deviations from all and any of these forms of the mouth must be regarded as irregularities, if not decided deformities.

Irregularity of the teeth may be the result of accident, or it may appear to be owing to natural causes. Of accident, as when one or more teeth have been knocked out by a fall or blow, and when, from the adapting nature of the jaws, the adjoining teeth have so approximated as to leave it doubtful whether the proper teeth belonging to that situation had ever existed there; or as when the front teeth of one jaw meet their opponents of the other, stragglingly, some shutting outside and

some inside of them. An irregularity may seem natural when the teeth are out of proportion to the jaws that contain them, being either too large or too small; by which the appearance of a double row is produced. This state may indeed be natural in a particular case; but as we find no such irregularity in animals, or persons in a state of nature, it is not unreasonable to infer that nature's intention has only been thwarted in the present instance; as with rickety bones. Do we not constantly meet with cases of deformity and irregularity of other parts of the body, arising from ill health, or confinement, &c., as in factories. With respect to the teeth, let it always be kept in mind that they are originally formed of the largest dimensions they can ever attain to—long before their protrusion from the gums,—and while the jaws were yet, and for years after, in a state of growth, which growth and perfect developement may have been interfered with. May not a refined state of society have something to do with the matter, as we find less irregularity in the

mouths of rustics who crawl, creep, or walk about from the earliest infancy, in the open air, under every aspect of the heavens, than in the mouths of their superiors, who are often nursed into a delicate state of health; but who afterwards retain their teeth, whether good, bad, or indifferent, for a longer period, from their superior care and cleanliness.

27. *Cases of irregularity.*—A remarkable instance of irregularity, the result of accident, came under the notice of the author in the case of one of two brothers, twins, who were strikingly like each other until you looked at their mouths. One had his two central incisors struck out by a cricket ball, when a boy,—the lateral incisors approached each other and filled up the vacancy; but as lateral incisors in the upper jaw are considerably smaller than the central ones, a species of rabbit mouth was the result, which greatly injured the appearance of a very fine countenance.

Another instance of irregularity occurred in a family consisting of three sisters, who had each

a small grinder extracted, at Bath, under the impression of its being a duplicate of an eye tooth, in the right side of the mouth in the upper jaw. There was an evident falling in of the mouth at the part, which was the more vexatious as there was not an unsound tooth in any of their heads; while the space remained, the operation having been performed after the jaws had ceased growing.

In regulating a mouth, then, we are to consider, first, whether there be room enough in the jaws for the full complement at this age, of twenty-eight teeth; and whether all the teeth are sound and worthy of preservation. If there is room enough, we are to consider whether the teeth of both jaws meet properly in shutting, according to either of the three forms of the mouth described above; taking care that all the teeth of the upper jaw shall form an unbroken semicircular figure; shutting within or without an equally regular figure of the under jaw, or meet them in the same vertical line.

It is desirable to produce the first form, if possible. This may be effected in some cases by extracting two small grinders, one from each side of the under jaw, in order to diminish its circumference, if too large; or if less space be required, by extracting one only of the four front teeth, which in the under jaw are so nearly alike that its absence would not be noticed.

We are next to observe the state of preservation of the teeth; for if some be weakened by disease and so shattered that they are likely to be lost at any rate, it is better to extract them; permitting the others to bend to this necessity, and, if necessary, to force them by art into stations now more desirable, although not originally intended for them. This can be effected to an incredible extent, owing to the accommodating nature of the jaw-bones. "In the case of a young lady, at an age when the shedding of the first set was complete, and permanent successors had supplied their places, the upper jaw was as full of teeth as it could contain, and yet only one

of the eye-teeth had made its appearance. At a periodical examination of the young lady's mouth, the point of a tooth was seen protruding from the roof in the rear of the left lateral incisor: this was the deficient eye-tooth: the appearance in such a place was unusual, and as it gradually descended, it pushed out the adjacent incisor. Had the incisor been extracted, the new tooth would readily have fallen into its place, only meeting the under-jaw within the teeth, while the others closed outside in the usual way. Had this course been pursued, the young lady's mouth would have been so far deformed, that an eye-tooth would have to correspond with a small lateral incisor on the other side of the two handsome central front teeth. It was determined to extract the first small grinder instead; and, with much trouble on the part of the patient and operator, the new eye-tooth was trained to attain its proper place. The process of cure occupied several months, during which period the young lady visited the dentist about half-a-dozen

times, to have the little apparatus that was employed altered. The teeth are fully worthy of the trouble; and the fair patient has now as uniform and beautiful a set of teeth as can reasonably be desired. None but those who try the experiment, can appreciate the difficulties of this case."*

28. *Causes of caries of the teeth; Treatment—Popular prejudices against operations on the teeth.*—Under all possible circumstances, we ought now to look to the safety and preservation of the teeth. In order to understand how this is to be done, let us recall the form and nature of the teeth. At this age all the teeth of a set, if much crowded, and not kept highly polished in every part, and quite clean, are liable to decay laterally where they touch each other; but the double teeth are liable to a twofold decay, the one from contact—the other from their shape. There are additional causes for decay later in life: but of them in the proper place.

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* Imrie.

If you now examine a mouth, you will find the six single, or front teeth, in each jaw, so formed as to be incapable of retaining matter for decomposition any where on their surfaces, except at their points of contact with each other; and where a drop may be retained so long, by capillary attraction, as to become acrid and injurious. They accordingly decay only at those points. Exceptions to this rule are sometimes to be met with, in which accidental depressions of the surface occasion decay, as in double teeth. Similar effects and appearances are produced in a sound tooth, by an artificial depression, or in a natural or artificial tooth (unless it be mineral) artificially fixed in the mouth.

The small grinders, the fourth and fifth from the centre, are formed by the junction of two single teeth, or something very like this. Look, for an example, at the tips of your forefinger and thumb when in contact. The small grinders thus formed, are liable to decay in the deep line of demarcation. These lines are deepest in families where the teeth

have an early tendency to decay,—in others, they are so faint as to be scarcely perceptible, which renders them proportionably safe. Beyond them the two large grinders on each side are formed, as it were, of four or five single teeth united. Take the tips of your four fingers united, as an example; and, for the wisdom-teeth, you may add the thumb to the picture, and you will discern all the points and lines in which these teeth necessarily decay,—in addition to the injury arising from their contact with one another.

The teeth decay in pairs (by pairs are meant a corresponding tooth in each side, counting from the centre of the mouth), because they cut the gums in pairs. They are shaped as much alike as the right hand and the left. They are consequently liable to the same diseases, whether arising from their shape or from lateral pressure; and at about the same periods, owing to their being of the same standing.

The remedies for each and all of these cases, are easy and safe. If the lines be sufficiently deep—

dry them well, and plug them up with gold or tin, so as to keep out moisture, which, being acted on by the atmospheric air, is the true and only cause of caries in teeth. If the lines be not deep enough, make them so, previous to filling up. The operation, when well performed, prevents all further decay. From one to sixteen teeth may, at this age, require to be treated in this way.

If the tooth be too much decayed, and so tender to the touch as not to admit of being stopped without pain, let it be previously cured with anodynes, so as to prepare it for being ultimately plugged without inconvenience.

All the teeth, single and double, are liable to disease from lateral pressure. Its approach is perceptible to the practised eye, in most cases, for years before the patient can know any thing of the matter. If these symptoms be perceived at an early stage of their decay, before decomposition has entered deeply into the substance of the teeth, the remedy is extremely simple. It consists in filing or cutting open a clear space between two

teeth. This is precisely the stage, in managing teeth, at which the dentist usually experiences the greatest obstruction from his patients or their guardians. The everlastingly repeated interrogatories of—does not filing destroy the enamel—do not the teeth always decay after this operation? are showered upon his ears in so many forms, and with a perseverance so determined (together with the resistance, perhaps on account of pain, of the parties most concerned), as almost to deter him from this—the most valuable of operations; or he is compelled to stop short half way. Many instances of failure are to be met with, but which, if fairly traced, would, in most cases, be found to be owing to the obstructions thrown in the way of the operator. Successful cases are frequently to be met with of twenty, thirty,—yes, even of forty years' standing. In order to be successful, the operation must be performed well. Let it not be lost sight of that the lateral surfaces of a tooth never can decay, if kept perfectly clean and polished. Considerable skill, founded on experience,

is required on the part of the operator, and determined resolution on the part of the patient. If the decay be between two front teeth, care ought to be taken not to injure their appearance. By cutting open at an early stage, with a very thin file, a space to admit the free play of a piece of tape, enough shall have been done for safety, if the space be kept daily clean by the use of it; but if the disease has penetrated too far into the teeth to be removed by the thin file, the posterior sides of the holes may be cut away slantingly inside the mouth, always leaving such a surface as can be rubbed in every part of it by the piece of tape. The tooth-brush also may be successfully employed inside the mouth to aid in the operation of cleaning. The operator may with safety approach to very nearly the seat of the nerve itself in the centre of the tooth, should the case require his so doing. The tenderness occasioned by the operation will soon wear off, or it may speedily be cured by the use of anodynes. Should the caries have proceeded so far

into the substance of a tooth as to render it impossible to have it quite obliterated by rasping, the remaining hole must be cleaned out and plombed in the usual way with gold or tin. For a more particular account of this process, see Part II. of this treatise. In cutting between diseased back teeth, one need not be very particular; for the larger the space is, so much the better for the case. Cutting out is always preferable to stopping with metals, where it can be effected.

Another danger to which teeth are subject at this age arises from tartar, a deposit from the saliva, which is particularly abundant during illness.

After a severe fever, one continuous crust of tartar is frequently found to envelope the entire circles of teeth.

It collects with most persons; but principally on those parts of their teeth that are least disturbed by friction during mastication. The deficiency in this respect ought to be made up by the successful application of the tooth-brush. The

tartar collects most on front teeth, as they are comparatively but little used except in simply cutting the softer portions of our food. The refinements of polished life have greatly encroached on even this forlorn hope of cleaning front teeth in a natural way; since the knife and fork are considered indispensable for dividing every portion of our food before subjecting it to the operations of the grinders. The arts of cookery in France, exceeding ours, have left little even for the grinders themselves to perform; the state of our neighbours' teeth will, at any time, tell this tale of their gastronomic refinements. The effect of tartar is to inflame the gums, and to occasion absorption of the sockets of the teeth: hence the denuded, long-looking teeth, with exposed roots, that ultimately loosen and drop out. Follow the dictates of nature; masticate tough substances long and severely. In cleaning, pick your teeth with the tooth-brush as if your object and wish were to tear the gums from them: continue this practice night and morning, at least, until no bleeding ac-

companies the operation. Rinse your mouth with abundance of water at that temperature which you can use freely in every part of your mouth without inconvenience; the colder it is without inflicting pain, so much the more strengthening. A little spirit in the water, or say two or three drops on the wet tooth-brush, will assist the process of cleansing and leave a comfortable feeling in the mouth. See article, *Cleaning the teeth,* in Part 2d of this Treatise.

FOUR ERAS IN TEETHING.

FOURTH ERA,

FROM EIGHTEEN TO TWENTY-FOUR YEARS OF AGE.

CONTENTS OF CHAPTER IV.

THERE are four natural eras, of six years each, in completing the human teeth; commencing about the first, seventh, thirteenth, and nineteenth years of age. After the completion of the first set of teeth, the commencement of each of the other three eras in teething is recognised by the cutting of four additional teeth, one at each end of both jaws; the jaws always requiring six years more to elongate sufficiently for the reception of these new teeth.

29. *Fourth era of cutting the teeth.*—After a

cessation of six years in teething, the fourth era is distinguished by the cutting of four additional grinders (the " wisdom teeth"), about eighteen years of age. They are placed the eighth and last tooth from the centre, in each side of both jaws, and complete the full complement of thirty-two adult, or permanent teeth.

30. *Number, names, and classes, &c. of the second set of teeth.*—The set consists of twelve single, and twenty double teeth; the single teeth are the six in front of each jaw; the two next, on each side, are small grinders; the three beyond them every where, large grinders.

Reckoning from the centre of the mouth, the teeth of the second set are designated as follows; the two middle front teeth, in each jaw, central incisors; the second tooth in each side, a lateral incisor; the third tooth, an eye-tooth, (canine, cuspidatus, tusk;) the fourth and fifth teeth, small grinders, (bicuspides); the sixth, seventh, and eighth, large grinders (molares), the last

of which is also called the wisdom tooth (dens sapientiæ).

It will be recollected that before six years of age there was not room in the mouth for the development of more than twenty teeth, and that it always required a further period of six years for the jaws to expand sufficiently in order to receive an additional tooth at each end, until the completion of the second set; and all this without reference to the changes taking place in front of the mouth, where twenty teeth have been shed, and their places supplied with successors, during the second era in teething. It will likewise be necessary to bear in mind that, during all these years, the jaws have been, like the other bones, in a state of progressive growth, while the teeth themselves underwent no change whatever, from the time of their protrusion from the gums.

31. *Cutting the "wisdom teeth" with pain, &c.*— At this important era in teething, the cutting of the wisdom teeth is frequently attended with much

inconvenience; more so than at any other of the four periods of teething, except the first. But for the greater strength of the parties at this age, many would sink under the process of teething, and yet not be aware of the source of their uneasiness. The wisdom teeth sometimes occupy years in making their way into view: they have been known to cut the gums so late as at fifty years of age. The cause of pain in cutting these teeth is in general from want of room in the jaws; at times, it is no more than the pressure of the rising teeth against the gums. In this latter case, to cut down freely upon the new tooth, as often as may be required, will afford certain relief; but when there is not sufficient room for them, it may be advisable in bad cases to remove the "twelve years old" grinders, into whose places the new teeth will readily advance. What is best to be done must depend much on the previous treatment of the mouth; for if the "six years old" teeth have already been extracted, it would be injurious to remove any more, as in that case too much work

would thereby be thrown upon the front teeth. Front teeth in one jaw should never be permitted forcibly to touch those of the other; for that pressure will either waste or displace them.

32. *Regulating the teeth as an entire set.*—In regulating teeth at this age, we have to consider, first, their general appearance as to regularity in the dental circle; and, second, the state of preservation of each individual tooth.

Teeth are regular when as a row they form a perfect segment of some circular figure, generally that of a horse-shoe. The mouth is said to be regular when there is an equal number of teeth in each jaw, the teeth being likewise regular, and the upper row shutting outside the under jaw. Regular teeth are in actual contact with one another throughout the entire row. When not in contact they do not look so handsome, perhaps, but they are freer from the danger of becoming diseased; and the more closely they press against one another in the row, so much greater is their danger.

Irregularity in a row of teeth may sometimes be the natural effect of a jaw stinted in its growth; it is too commonly the effect of premature extraction of the primary teeth; and not unfrequently the effect of habit—as when a person musingly uses his tongue in a particular way, or twists his mouth, or grinds the teeth during sleep. Instances are to be met with, of jaws being dislocated under the influence of acute pain, so as not to meet evenly as before, without filing down the prominent points which now meet their opponents in unusual situations. By some trick or play of the mouth, some teeth are greatly ground down, while others are loosened and ejected. This state of affairs is first indicated by the chipping of the cutting edges, or by pain and abscess in the gum over the root of the irritated tooth. A little care, and in some cases a gag of peculiar construction, will obviate the evil, if had recourse to early.

Irregularity of the mouth is produced by the extraction of teeth from one side of a jaw, while the corresponding ones are permitted to remain in

the other; or by extraction from one jaw and not from the other; for be it always remembered, that teeth are formed in double pairs, two above and two below. By pairs, are meant the teeth that are equidistant from the centre of the mouth in both jaws. They always come into view about the same time, and are alike in form as well as the circumstances in which they are placed.

In cases where there is a predisposition to a projecting chin, the removal of a tooth from each side of the under jaw may still diminish the circle so much as to allow the upper teeth to meet on the outside of the under row; or, at all events, to improve the appearance. If the removal of one tooth should be thought sufficient, that one ought to be an under incisor. Its absence would not be perceived, owing to the similarity in shape, size, &c., of the lower incisors. One tooth from the upper jaw occasions a degree of irregularity that cannot be concealed.

Our next subject for consideration is the state of the individual teeth. If they be all quite sound,

and one or more is to be extracted, we have only to consider which would best answer the object in view according to the above rules. If, however, any of them be unsound, it is advisable to remove them in preference to others; and, however difficult it may prove, we ought to endeavour to force the remaining ones into the desired place in the row. It is quite incredible how much can be done in this way by art, owing to the very yielding nature of the jaw-bones.

It may happen that the teeth are honeycombed in front; if so, the time has now arrived when the file may, with impunity, be applied to beautify and improve them. It is high time to lay aside the idle delusion of danger accruing from filing teeth. No teeth, nor part of a tooth, whether bone or enamel, will ever decay if kept perfectly clean and polished. If the double teeth should now be found imperfect in structure, whether from ailment, accident, or family conformation, it is advisable to carve out incipient decay, and stop up the vacancy with gold or tin leaf,

according to the rules laid down in the previous chapters. Should the teeth be found to press greatly against each other in the dental circles, and that concealed decay is beginning to be indicated by the darkening appearance of the teeth at the points of lateral contact, it is better at once to rasp or cut out an opening, and in such form as shall render it easy to keep the part clean for the future. The reader who wishes to understand his own case thoroughly, will carefully peruse the preceding sections of this Treatise. It is now time to lead him to the Second Part of the Work, where he will find further information under proper heads.

END OF PART FIRST.

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