The Story of the Teeth

AND HOW TO SAVE THEM

BY


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DEDICATED
TO MY WIFE
To whom I owe everything
The Story of the Teeth

PART I

The purpose of this little book is to convey to people in a simple and interesting way the leading facts concerning the nature, growth, and development of the teeth, and to show how they can be safeguarded.

The history of the teeth is one of the most wonderful and beautiful scientific unfoldings and revelations of our time—a story worth telling from any point of view—where and how the teeth originate, how they are born, what they are fed on, how they may be poisoned, how they should grow from their infancy to full maturity, what their rights are, what treatment they are entitled to, what friends they have, what foes they may meet, and how they may be cut off prematurely in early life or live to a good old age.

All these are matters of surpassing interest in themselves, but it is not from the point of view of mere interest and entertainment that we are now making this appeal for general enlightenment as regards the teeth. We appeal from the higher standpoint of Justice to the Children and Duty to the Community and the State—the duty of establishing Health and National Efficiency.

In the middle of last century Herbert Spencer wrote as follows, with prophetic insight:

To be a nation of "good animals" is the first condition to National prosperity. Not only is it that the event of a war often turns on the strength and hardiness of soldiers, but it is that the contests of commerce are in part determined by the bodily endurance of producers. Thus far we have found
no reason to fear trials of strength with other races
in either of these fields. But there are not wanting
signs that our powers will presently be taxed to
the uttermost.

And this was written half a century before George V.
became King.

Fifteen years ago the late Major-General Sir Frederick
Maurice, writing on National Health in the *Contem-
porary Review*, warned the nation of the tendency to
National Deterioration, which was forced on his
attention by the failure of the young manhood of
England to come up to the standard required for
ordinary military home service, even in time of peace.

He showed that at the end of two years from the
time at which they had applied to serve in the army,
only two out of every five had been accepted and
proved strong enough to remain in the service—that
is to say, that "primary rejects," plus failures during
the first two years of service, amounted to 60 per
cent. of all applicants. Adding to these figures those
of youths who would not apply on account of obvious
unfitness, the inevitable conclusion was that nearly
three out of every four young men were being reared
below a reasonable standard of health and fitness.

Further, it was pointed out that "primary rejects"
and "proved unfits" were on the whole poorly qualified
for ordinary civil life and citizenship. It might have
been added that, if the nation was doing so badly for
the stamina of its boys, the physical health and fitness
of girls, was, for the most part, on a still lower plane.

Investigation revealed that the leading causes of this
grave falling-off of the rising generation were *unpre-
paredness for motherhood, and lack of essential know-
ledge on the part of parents*—leading to bottle-feeding
in early infancy, defective hygiene (not enough open
air, sunlight, exercise, etc.), and too much pap-feeding
of the children. The gravest of all consequences was
found to be the universal prevalence of feeble jaws and
decayed teeth, poor development of nose and throat,
adenoilds, weak chests, indigestion, etc.—these con-
ditions undermining the constitution, dwarfing the body, and predisposing it to all other maladies, such as Rickets, Consumption, and even Cancer.

In the face of these facts, and the evidences of advancing physical deterioration, Sir Frederick Maurice contended that to fold our hands, and say that continued decline was inevitable would be "to proclaim ourselves guilty of the greatest of all civic crimes, viz., 'to despair of the State.'"

In New Zealand it was felt that there was every ground for perfect confidence that the tendency to decay of the teeth could be prevented if the matter were only set about early enough and in the right way. The Maoris were noted for their physical perfection, and nowhere was this more strikingly manifested than in the jaws and teeth.

Writing in the N.Z. Society's book for mothers, *Feeding and Care of Baby*, many years ago, I said—pointing to the contrast between the perfect native jaws and teeth and the feeble jaws and decayed teeth typical of our own race:

To us white intruders the contrast shown ought to appeal as "the writing on the wall." No race or family can remain great or even perpetuate itself, if it fails to develop properly and give due exercise to jaws and teeth. The whole organism, and every function of body and mind, is ultimately dependent not only on what the mouth delivers to the stomach, but on the complete grinding and mixing with saliva of every morsel of food before it is swallowed.

Look at the illustration on page 6, count the thirty-two well-worn teeth, perfect in advanced age, without a speck or sign of decay, set in their perfectly arched jaws, and contrast these with the feeble remains of teeth, which jostle one another in the shrunken jaw of the degenerate European.

We Europeans have become content merely to chop our food, by moving our jaws up and down, hence the crowns are not worn—the teeth do no really hard work—they do no grinding. Our pre-
decessor, the old-time Maori, on the other hand, chewed and ground tough fern-root between his molars, as millstones grind corn, until his jaws were tired with the healthy exertion—an excellent check on over-eating. He reaped the reward of honest work; he developed perfect jaws and teeth, which turn us almost green with envy as we see them in museums, side by side with the jaws of our own race—the jaws of physical idleness......This contrast does not represent inevitable destiny, so far as concerns our children that are to be.

The choice and decision lie with ourselves. Nature is kinder than we are. Starting with the unborn babe—making the mother healthy and
letting her understand how and why it is that the jaws and teeth of our own race have been failing to grow properly—starting with this simple knowledge, parents prepared to do justice to their children, need have no anxiety that Nature will fail them. "Accuse not Nature; she will do her part, do thou but thine."

By adopting our vices—corsets, heavy constricting clothing, tight boots, living indoors, lack of daily exercise, irregular habits, the use of alcohol, soft foods for themselves and bottle-feeding for their babies, many Maori mothers of the present generation have already brought the jaws and teeth of their progeny nearly down to the level of those of the average European (see recent reports of Dentists as to the prevalence of decay among the rising generation of Maoris).

Describing the Maori and his food half a century ago, Colenso wrote: "Teeth beautifully regular and white...... The common fern-root was generally used as food. It had to be repeatedly beaten with a small club—its use was tiresome both to the eater and the beater, to the master and the slave."

Our children need not eat fern-root, but they must be trained and habituated to feed from birth onwards in such a way and on such foods as will ensure thorough exercise and proper development of the mouth, jaws, and teeth. Self-interest and patriotism both lie this way.

To ensure success in this fight we must appeal specially to parents, nurses, and teachers. I believe that the best way to make matters clear and simple is to employ to some extent the Socratic method of question and answer. (See Part II, page 14.)

**Decay of the teeth is not a mere chance unfortunate disability of the day—it is the most urgent and gravest of all diseases of our time**—a more serious national scourge than Cancer or Consumption: indeed, these and other diseases would be best attacked by establishing the strength and resistiveness of the whole human
organism of which the mouth, jaws, teeth, and nose are the gateways—the gateways to health or disease according to our choice.

The remedy lies in our own hands. We can have good health if we will, but we must work for it in the right way and in the light of sound knowledge.

In regard to the teeth, perhaps more obviously than in the case of any other structures, the question of whether civilized humanity is going to advance, or undergo further physical deterioration, depends almost entirely on the parents. As we shall see, the first teeth are handed over to the baby at the time of birth, practically ready-made—built by the mother herself out of her own blood and tissues.

Therefore, the mother’s health and habits during pregnancy practically determine whether her baby’s first set of teeth are to be strong and resistive or weak and subject to decay.

In the next stage the main question (in addition to fresh air, exercise, etc.) is whether the baby is suckled or bottle-fed; and in the third stage whether he is brought up luxuriously, or with Spartan simplicity and regularity—fed on food needing vigorous mastication—not coddled, spoiled, or pap-fed. Thus is the building and destiny of the permanent teeth also an intimate domestic and family question. Granted sensible upbringing, on the lines indicated, there would be no grounds for any anxiety as regards the future.

It may be asked, what would the Dental Profession say to such a proposition? The reply is simple. For the last ten years and more the dentists, with admirable public spirit, have been doing their utmost to sheet home the very thing we are aiming at—to show that prevention in the home and through the parents, and prevention only, can solve the problem.

The dentists have let slip no opportunity to gain the co-operation of the medical profession in influencing mothers in the right direction, and they have been
untiring in their efforts to bring us and the public to appreciate fully the transcendently important rôle that dental deficiencies and dental diseases play in causing and aggravating disease in general.

The war has interrupted world conferences of any kind, but at the great International Medical Conference, held in London just before the war, the work and proceedings of our dental confrères demonstrated in the most convincing way the natural unity of work and aims of the two professions—especially from the Public Health point of view.

Though of profound importance, the most interesting exhibits were not in the microscopic preparations showing disease microbes at home in the cavities of decaying teeth, and equally at home in their next abiding and breeding places—the tonsils, pharynx, and internal organs—but rather the assembly of some sixty patients gathered in the Dental Hospital, Leicester Square, as living object lessons of the part played by decay of the teeth in the tragedy of disease. Here were human beings from babyhood to old age, drawn together on the common ground of dental disabilities. Adults who had suffered or were suffering from Indigestion, Appendicitis, Rheumatic Fever, Cancer, Tuberculosis, and even Syphilis, had been brought there to show the intimate relationship, either of cause and effect, or of aggravation, by dental disease, which obtains in such cases. The brighter side of the picture was afforded by the confident assurances given to people who had been martyrs, say, to dyspepsia or rheumatic fever, that, having had all trace of dental decay removed, they could now rely on remaining free from the other maladies if they would only keep their teeth clean and live reasonably, as to food and feeding, pure air, exercise, etc.

Even the subjects of cancer and syphilis, involving the mouth, were spoken to confidently and reassuringly as to continued mitigation of suffering, or future immunity, so long as their teeth were attended to from time to time and they kept them clean.
The real tragedy was the tragedy of the children—children with the prospects of long, ineffective, suffering lives ahead of them.

What honest consolation, or assurances regarding the future, could be given to the mother of an infant rendered absolutely toothless at three years of age, through the ignorance and mistakes of its parents! My special attention was drawn to a case of this kind by Dr. Colyer (the leading dental surgeon at the Dental College, and a world-wide authority on his speciality) as illustrating a point of contention between the American and English authorities at the Congress—the question as to what course ought to be pursued in such cases. The Americans were inclined to apply the term "ruthless extraction" to the clean sweep of the mouth which was being carried out in London; but the English authorities said:

"There is practically no difference of opinion between us: we all agree that no decaying teeth must be left. The Americans talk about conserving the remains of the teeth rather than extracting. Here again we are quite at one with them—if there is anything left worth conserving, or where it is possible to find time for patient, thorough stopping. Of course, the problem of stopping has got beyond us in London, and decaying teeth have sometimes to be extracted which could be saved if time were no consideration, but our aims could not be more conservative."

Turning then to the chart of the little child's case, Dr. Colyer pointed out how marked had been the improvement in nutrition and growth from the time when the whole of the teeth (which were all decaying) had been removed. It is bad enough to be entirely toothless at three years of age, but the record showed that it is worse to have mere stumps and decayed crowns, pouring pus, myriads of microbes, and foul, decomposing material into the mouth. But there is more than mere poisoning in such cases: The inflamed gums and exposed nerves of the teeth upset the whole
nervous system—the so-called “ruthless extraction” brings relief in all directions.

In concluding this section, I wish to convey grateful thanks to my friends and co-workers in connection with this little book. Special appreciation is due to the authorities of the Dental School at Otago University, for the generous way in which they have placed their library and other resources at my disposal, and to Mr. Charles W. Hay, for invaluable data and personal conclusions derived from his own long practical experience as a dental surgeon in Dunedin. I quote the following passage from a recent letter concerning the influence of “internal secretions,” etc., on the development and soundness of teeth:

“We all meet cases, and these are numerous, where children of poor bony development have poor teeth—not merely in the ordinary accepted sense of the term as ‘prone to decay,’ but also as to the actual, visible faultiness of their texture. The enamel is not the smooth, homogeneous substance we are accustomed to in the case of well-built normal teeth.

“In the cases I refer to the dental tissues are obviously poorly packed and deficient in lime salts, and we can predict their fate almost at a glance. On the other hand, those people who are fortunate in having teeth the enamel of which is glossy and vitreous both to touch and in appearance, and which can easily be pronounced as dense (verified by cutting it with burs, drills, etc.), seem fairly generally owners also of a good bony framework. The former class also show a strong tendency to calcareous deposits about their teeth, and in middle age they often suffer from pyorrhoea with characteristic lime nodules on the roots of their teeth...I certainly feel that intrinsic as well as extrinsic causes play an important rôle in decay of the teeth.”

If it were only for the sake of the teeth, there could be no stronger argument for exhorting parents to do
their utmost to ensure good, all-round healthy nutrition, growth, and development for their progeny, both before and after birth.

As a postscript to Mr. Hay's remarks, I may summarize a paper by Lenhardtson, of Stockholm, on prevention of decay of teeth:

"If calcification of the temporary teeth is influenced by the dietetic habits of the mother during pregnancy, calcification of the crowns of the permanent teeth depends mainly on the way in which the baby is fed during the first years after birth. Why are the customs of our civilization so utterly at variance with Nature in a matter of such vital importance for the development of the whole race? Suckling is the only rational means of feeding in the first year. Why is it that so many mothers either can't or won't perform this first of all maternal duties? Suckled children have the best teeth. From recent investigations regarding internal secretions the importance of breast feeding may be deduced. The mere fact of a mother having normal nursing power almost guarantees normal internal secretions. Human milk fully supplies the harmones and vitamins which there is reason to believe play a very important part in the active vital processes of the young cells occupied in building the teeth, etc., during infancy. The glands which provide these stimulating and vitalizing internal secretions don't function much in early life; hence the need for supplies through the mother's milk.

"Bottle-feeding adds a serious danger by causing highly arched palate, contracted jaws, adenoids, mouth-breathing, etc., resulting in deficiency of oxygen for the blood. These conditions are still further aggravated by the irrational diet that the child receives when it has to change its food on the time for weaning arriving. Many children, even when they have got teeth, and perhaps have had them for some time, are fed almost exclusively
on liquid or semi-liquid food, such as porridge, gruel, puddings, etc., to say nothing of soft bread thoroughly soaked in milk or coffee. The jaws, the muscles of mastication, and the teeth have little opportunity of performing their work, and yet Nature herself has clearly indicated the method to be adopted by the development of instinct in the child of the wish to gnaw some hard object.

"Not mothers alone, but doctors too, have been guilty of mistakes in this matter. Fearing to overtax the digestive organs of the children, doctors often prescribe a too long-continued milk diet, and follow this by pap-feeding. Hyper-civilization also comes into play. People did not coddle their children in olden times as they do now. Our efforts should be directed towards reforming the opinions of the doctors as regards the diet suitable for very young children. When the child has begun to get its teeth some food that offers a certain resistance—such as toast, crusts, an apple, should form part of its daily diet. The result of the effort expended by the teeth, jaws, and muscles of mastication when gnawing these articles of food would be that not only would these organs become more powerfully developed, but the secretion and development of the salivary glands would also be promoted—a matter of the greatest importance."

Coming from a great dental conference nothing more significant could be said as to the stupendous importance for the teeth of ante-natal hygiene, suckling, and the avoidance of pap-feeding and coddling. Is the world at last going to pay heed to the clear, forcible, devoted appeals made in the same direction on behalf of the Nation's teeth for over a dozen years by Dr. Harry Campbell, as a physician, and Dr. Sim Wallace, as a dental surgeon—appeals based on suckling, and hard-feeding afterwards, as against bottle-feeding followed by pap?
Oral Hygiene, or the keeping of the mouth healthy, sweet and clean, and the teeth as free as possible from injurious microbes and fermenting food particles, is left to the end of the pamphlet, simply because the earlier part of the story of the teeth has to be dealt with first.

It is supremely important to start the child very early with foods compelling active work in the form of chewing, and capable of inducing abundant salivary secretion, especially for cleansing the mouth at the end of meals; but such matters are better appreciated when the origin, growth and structure of the teeth have been explained, and the causes and nature of decay have been led up to.

PART II

What are the teeth built from?
Blood.

What is blood made from?
From the food taken into the stomach, and the air taken into the lungs.

Whose blood are the teeth made from?
The first material used is drawn from the blood of the mother, and building is continued with the child's own blood. The teeth are made or marred before birth and during infancy and early childhood.

But a new-born babe has no teeth?
Certainly he has! Long, long before the baby is born every tooth that he will ever have has been begun.

Where are the teeth built?
They are all built, out of sight, deep down in the gums.
How are they built?

As every part of the body is built—namely, by hosts of tiny little cell-workers, specially told off for their particular duties. No building work in all the world is more beautifully and wonderfully carried out than the building of a baby's tooth.

When does this work begin?

Seven months before the baby is ready for birth an army of cells, specially raised for the purpose, is getting into place in the lines of the gums. Regiment by regiment, they take up their separate stations where each tooth is to be formed.

If we could take a peep at what is going on, some months later, we should see twenty compact regiments of "Ivory-builders" in full swing, making ten little domes of ivory for each jaw, and twenty separate regiments of "Enamel-builders," hard at work enamelling the outside of each of these domes. The miracle of enamelling the crowns of the first set of teeth is approaching completion by the time the baby is born.

In order to help you to understand this, I have specially prepared the diagram on page 17: but bear in mind that, though highly magnified, the diagram is a greatly simplified sketch of the much more wonderful reality.

You are to regard the section as made through the Gums and developing Tooth of a baby's Lower Jaw, a month or so before birth, to show how the "Ivory-builders" and "Enamel-builders" are already well advanced in the work of forming the "crown" or body of one of the temporary teeth.

It may help you to grasp the situation if you understand that, in the early stage of its formation, the crown of a lower tooth is like the bowl of a tiny egg-cup turned upside down, and that our section is made through the centre of this dome.
The “Ivory-builders” are busy inside the cup, making the wall of the dome thicker and thicker. This will go on until only a little central tube will be left, known as the “Pulp-cavity”—the seat of the blood-vessels and nerve of the tooth.

At the same time as the ivory domes are being built the Enamel-builders are hard at work covering these domes, or crowns, with enamel—the enamelling being practically finished off and complete just about the time when the baby is born.

The roots of the temporary teeth are not gone on with until the teeth are about to make their way through the gums many months later. The roots are composed only of ivory, and are never enamelled.

Note that the gums, in which the tooth is being built, are largely made up of blood tubes, and that the main supply of these tiny tubes is delivered to the “Ivory-builders” and “Enamel-workers.” These workers derive their building material from the mother’s blood; and into the passing lymph-stream in which they are bathed, they cast their waste and poisonous products, which have to be got rid of by the mother’s lungs, kidneys, skin, etc.

Would the accumulation of waste-products in the mother’s blood really affect the building and durability of her baby’s teeth?

Certainly it would! The little cell-workers would be poisoned, more or less, and their building operations would not only be slowed down, but their work would be badly done—just as the portions of one’s nails built when the blood is thinned and poisoned by fever are thin and weak. This is not a serious matter, as regards the nails, because such structures are so temporary—but the enamel, even of so-called temporary teeth, is not “temporary” in the same sense. This enamelling is done for good or ill, once for all, and if the enamel of the first teeth does not last sound and
Note what is the "Crown" of a tooth, and how the embryo Crown, shown above, becomes the mature tooth, by growing a root, etc. Note the food particle lodged between two teeth, setting up decay ending in congestion of vessels, inflammation, and pus in the "pulp-cavity." For further notes re the above see pages 35-37.
good for six years, or more, the teeth will decay. Then pain will ensue, food will be badly chewed, indigestion and impaired growth and nutrition will follow, and the jaws and permanent teeth will not only suffer in the course of their development, but they will be liable to infection by the decaying first teeth.

All this disastrous train of events is predisposed to by the mother not having enough open air and exercise throughout the ante-natal period—the nine precious months before childbirth, in which her baby is alive and being built out of her very self—and to neglect of other simple essentials for the maintenance of pure healthy blood. Indigestion and constipation are bad enough for the mother herself, but they are even more injurious to her unborn babe.

Is there any other common source of injury to the mother's blood which can impair the growth of her baby's teeth?

Yes, if the mother takes drink (beer, stout, etc.) the presence of alcohol in the blood interferes with the proper nutrition and building of the teeth. Further, any form of debility or disease affects the blood, and in this way damages the formation of the teeth.

Why are the first teeth called "Milk Teeth"?

Because of the mistaken idea that they are built "out of milk," during the suckling period, whereas they are built direct out of the mother's blood, mainly before birth—before her milk begins to flow.

If the term "milk teeth" is to be retained at all, it should be applied rather to the second or "permanent" set; because, though they too are built out of blood, the baby derives the blood for their manufacture from the mother's milk at first, and later largely from cow's milk. Of course all teeth are really "blood teeth"—that is, made out of blood.
Note the "Crowns" of the "Temporary teeth" in front of black line—2 incisors, 1 canine, and 2 molars. Also note (6) the beginning of the crown of the first permanent molar—called the "Sixth-year Molar," because it comes through the gums at that time, about a year before any of the "Temporary teeth" are shed.

The above shows what would be revealed on cutting away the side portions of the gums and bone which conceal from view the wonderful work which has been going on under cover of the gums during the last seven months before birth.

Observe the crowns of the teeth enclosed in the little fibrous sacs in which they are kept until the time comes for pushing their way through the gums.

If the mother realized that the normal baby is thus wonderfully equipped with more or less completely enameled teeth before birth, and that the quality of the workmanship really depends on the purity and goodness of her own blood, she would have the strongest incentive to keep in the best of health throughout pregnancy, breathing pure air, taking proper daily exercise, and regulating her habits as to food, drink, etc., for the sake of her unborn child. **Neuralgia, headache, and lassitude are the Prayers of the Nerves for Healthy Blood.** The mother should answer these prayers herself by living sensibly and wisely, bearing in mind all the time that the poisoning which gives her temporary pain stunts and damages the teeth and other organs of the rapidly growing child more or less for life.
How and when are the Permanent Teeth built?

Thirty-two little squads of cells for building the permanent teeth are all assembled at their proper stations seven months before the baby is born, but they don’t multiply much or set seriously to work until about the time of birth.

Then they start work, and have most of the crowns nearly completed by the time a baby is three years old—and remember, it is only the crowns need enamelling; the roots have no enamel. Whether the work is good or bad depends mainly on whether the workers are kept fully supplied all the time with rich red blood. If the blood supply to the jaws and gums is poor and scanty, the jaws and permanent teeth will be feeble, and the enamelling badly done. In this case the blood is manufactured by the baby’s own digestive organs and lungs, etc., not by the baby’s mother, as in the case of the first teeth.

In order to further impress this extremely important matter, I quote the following clear statement from Drs. Pedley and Harrison’s book on Our Teeth, which is further referred to on page 22:

Although the beginnings of the second set of teeth are found in the embryonic jaw, and it may be said their foundations are there laid, the actual building up by the ivory workers and enamel builders does not commence until birth, just when the crowns of the first set are completed.

It is therefore obvious that imperfections in the first set will be due to supplies received before birth, and it is equally true that imperfections in the second set will be due to supplies received after birth, mainly during the first two or three years of infancy.

The crowns of the teeth when once formed, built up, and calcified are finished once and for all.
What is the best way to feed the baby in order to ensure pure good blood for building the permanent teeth?

For the first nine months nothing can compare with suckling by the mother. Breast-milk contains exactly what is wanted in the best form, and suckling ensures better exercise than the best of bottle-feeding. It causes a freer flow of blood to the whole mouth, jaws, and gums, where the "Ivory-builders" and "Enamel-builders" are engaged working their hardest to get through their contracts. In all such operations the most expeditious and best work tends to be done in the earlier portions of the time allowed. By the second year the rate of work has greatly slowed down, and towards the end of the third or fourth year most of the Enamel-builders are getting tired, and are leaving their task for ever—whether it has been performed well or ill.

Does this apply to the Ivory-builders also?

Only to a certain extent. The enamel of teeth is scarcely more living than the enamel of a teacup; but so long as a tooth is alive the ivory is a living tissue, lined by a layer of Ivory Cells which dwell in the pulp cavity. These cells should now be called "Ivory-maintainers" rather than "Ivory-builders,"—their active building operations are at an end, but they are still responsible for maintenance and repairs.

How is this work carried out?

As the bodies of the Ivory-builders become forced inwards towards the centre of the pulp cavity of the tooth by the increasing thickness of the ivory they build, each little builder leaves a tiny soft, living thread of himself in the solid ivory, and this extends through from the pulp cavity to the enamel.

I shall show you the importance of this later on when dealing with decay of the teeth. All you need remember now is that enamel is lifeless, but ivory is a living structure.
Was it not rather fanciful and far-fetched to speak of the cells of our bodies getting tired and weary, as if they could "feel" like ourselves?

Not at all. As Tyndall said, science would be a deadly dull pursuit if it were not lit up by the imagination: without imagination little progress would be made in the understanding and unfolding of Nature.

The sober truth regarding the development of the human body is like a fairy story all through. Dr. Marshall, in his great book on Reproduction, says:

"Minot has compared the growth of the body to a man building a wall. 'He begins at first with great energy, full of vigour; the wall goes up rapidly; and as the labour continues, fatigue comes into play...and so as the wall grows higher and higher, it grows more slowly and ever more slowly.'"

The average rate and power of growth and multiplication of each cell of the body is thirty times greater five or six months before a baby is born than it is at the time of birth, and the falling off exceeds this as regards many of the Enamel-builders engaged on the first teeth. The mother has indeed to make hay while the sun shines.

Can we get back now to some hard, dry, practical facts about the teeth?

Not yet. I want to give you the privilege of reading the following passage from a most illuminating and fascinating little book on the Teeth, written by two of the leading English dental authorities—Drs. Pedley and Harrison:

Every human being is composed of cell-workers. In numbers uncountable, in arrangement perfect, they work without ceasing or obvious rest. Guided by an almost unerring instinct, they grow to their duties. Like

*Our Teeth*, by Dr. R. D. Pedley and Dr. Frank Harrison. Blackie & Son, London.
immature soldiers, early trained to obedience, they become specialists ere their task is ended. Like an army in the field of operations, some are told off to construct, others to remove all obstacles. Their supplies are brought to them through the lymph channels by the blood stream, and their waste products are removed through the same medium.

We know that when the supplies are entirely cut off from an army, for a sufficient length of time, the army ceases to exist, for death comes; but often the supplies are merely deficient, or they are tainted at their source. Under such conditions the soldier will still fight on, and the cell worker will do his duty.

If, however, this deficiency of supplies extends to materials required by the builders of bridges, or the constructors of arches, or if there be an abundance of material but it is of inferior quality, then obviously those bridges and arches can never really be strong. When the stress and strain for which they were intended comes upon them, weak spots will be found, and long before their allotted time they will break down and fall.

This is true of an army on active service and of its engineering works; it is emphatically true also concerning the development and growth of the human body, and particularly so of the teeth. For, unlike soft tissues, when once built no additional supplies can affect the teeth for good or ill; they must bear their burden on the strength of their original outfit, or break down under the strain of daily use.

The ‘original supplies’ we refer to are MATERNAL. By no other way, through no other means, can the necessary upbuilding be secured. It is therefore absolutely essential that the mother shall receive every care, for the sake of her offspring. Her life should be
simple in the best sense of the word; no profusion, no need; luxury and idleness, grinding poverty, and overwork are equally injurious to mother and child.

The mother must be nourished wisely with pure air and wholesome food; she must have plenty of healthy exercise and rest; her work must be consistent with the cares of

The two teeth behind the black line are "permanent teeth"—there have never been any temporary teeth in that region.

The most important tooth to bear in mind is the one marked 6—the "Sixth-year Molar." Owing to this tooth appearing about a year before the first temporary tooth is shed it is generally mistaken for a so-called "milk tooth," and tends to be extracted, instead of being stopped and saved if it happens to show decay.

The crown behind 6 is that of the twelfth year molar. Observe that the tooth seen on the extreme left, with the saw-like edge, is the first permanent front tooth to come through. The root of the temporary tooth next to this has almost disappeared, and the permanent tooth seen below is about to take its place.
Maternal life, and she should be shielded from undue stresses and worries of every kind.

All that can be done in Private Life, in Public Life, Nationally, should be done to make a mother a happy, healthy woman. Then the supplies for her offspring will be pure and sufficient—then, and not till then, will the teeth and all other structures of the growing child be properly built.

When do the teeth appear?

The first set usually grow through the gums at from six months to two years after birth, and the second set come through from six years of age onwards.

What becomes of the crowns of the permanent teeth when they are finished?

They are kept tucked away in little sacs under the temporary teeth, ready for use when their time comes for pushing through the gums. The formation of the roots of the permanent teeth is not gone on with until the roots of the temporary teeth are disappearing and their crowns are becoming ready to fall out.

But in what sense do the roots of the temporary teeth "disappear"?

Their roots are gradually dissolved, and absorbed into the blood and tissues, where the material can be used for further building purposes. Thus does the hard solid ivory, manufactured from the blood, become soft and fluid again, and ready for use, if need be, by the second set of ivory-builders in constructing the roots of the permanent teeth!

Are there any other such economies and miracles going on in the world?

Yes—all around us. Thus, to prevent waste, preparatory to the "fall of the leaf" in autumn, Nature draws back into the flowing sap of the tree the nutrient materials contained in the leaf;
and she arranges for the severance of the leaf-stalk so beautifully that it has been said "the wound is practically healed before it has been made."

So, also, in the case of a tadpole—which has to lose its tail before it can turn into a tiny frog—the tail "disappears" but it does not "drop off" and leave a scar, as people generally suppose. Nature dissolves the tail and takes the material back into the blood and tissues of the body for further use—no wound is made, no pain is caused, and nothing is wasted.

ILLUSTRATION SHOWING TADPOLES, FROGS, AND TEETH. (All actual life size).

The roots of the two "temporary teeth" to the right show the stages of absorption corresponding to the absorption of the tadpole’s tail immediately below.

In the same way there should be practically no wound and no pain in the shedding of the first teeth. However, if the crowns decay the inflammation involves the roots, more or less, and this interferes with the normal process of absorption. The result may be that the permanent tooth, finding no open passage, forces its way through in a wrong position. To prevent this a dentist would naturally draw such a tooth to make way for its
successor, but the extraction would not be painless, as Nature would have arranged matters had she not been thwarted by disease.

What are the main things the mother can do to ensure her baby strong jaws and good sound teeth—teeth that will not decay?

By taking plenty of outdoor exercise, breathing pure cool air, and leading an active well-regulated life as regards food, habits, etc., the mother can ensure for herself pure wholesome nourishing blood. Good mother’s blood is the first thing needful, not only for the direct building of her baby’s teeth before birth, but for establishing a proper supply of breast milk for the baby with which to continue the good work in the case of the permanent teeth.

Is nothing more needed than healthy mother’s blood and healthy mother’s milk to ensure the baby strong, sound, well-built jaws and teeth?

Much more is needed. The baby must work for his living, he should not merely absorb his food.

Does breast-feeding ensure this?

Yes, suckling is hard work, and brings an ample flow of blood to the baby’s mouth, nose, and throat; this causes these great gateways of the body to grow and become strong and spacious. Further, a full blood-stream provides for the covering of the permanent teeth with a thick even protective layer of hard enamel—just as hoeing or hammering, by stimulating the skin and increasing the bloodflow to the hands, causes a protective horny layer to form on the palms, analogous to enamel, though not like it, almost everlasting.

Can anything be done to promote Enamelling of the permanent teeth in bottle-fed babies?

Yes. Imitate Nature, by providing food resembling mother’s milk as nearly as possible, and by
using a teat with the smallest hole an infant can be induced to draw his feeding through in about a quarter of an hour. Further, the bottle should be held by the nurse or mother all the time, and a slight pull should be kept up, so as to stimulate tugging and activity. The worst fault is to allow milk to dribble passively down a baby’s throat from a bottle left propped up on a pillow—the hole in the teat being so large that almost no sucking is needed, and the baby remains half asleep.

Can anything else be done to stimulate and bring still more blood to the baby’s mouth, jaws, and teeth?

Yes. From six months onwards the jaws can be gradually habituated to munching or chewing. First, the baby can be given a bare bone for instance, and later he should have successively tough crusts, crisped dry bread, hard plain biscuits, raw ripe apple, etc., instead of being “pap-fed.”

**FAR-REACHING EFFECTS OF MASTICATORY EXERCISE**

Perfect, capacious jaws and sound, beautiful teeth cannot be built without fulfilling all the simple and universal requisites for health throughout babyhood and childhood—especially ample daily exercise of the mouth organs.

The mouth is indeed a great primal “Driving-Station,” whence the Nerve-fibres carry impulses to the Nerve-centres, which quicken the life and activity of every tissue of the body. When the jaws are doing natural, honest, hard work the whole of the rest of the organism is impelled to activity—the heart pumps quicker and more forcibly, the pressure of blood in the arteries rises, and its stream flows more rapidly, even to the very finger-tips: at the same time the digestive juices are poured out freely, not only into the mouth, but also into the stomach and bowels, as the result of messages transmitted from the mouth to the Nerve-centres and out again when we are busily engaged in Mastication.
Apart altogether from the consideration of the building of the teeth and jaws, active "mouth-exercise" is thus necessary for the nutrition, growth, and health of every organ of the body. "Feeding exercise" is the most primitive, fundamental, and essential of all forms of exercise. A horse fed mainly on hard dry food (and reasonably treated in other respects) becomes the ideal of strength and "fitness." Feed the same horse with soft mashes, made from similar food-materials, and he will become soft and "out-of-condition," simply because his whole organism will then lack the primary stimulation of daily, normal, active exercise which formerly he had to devote to crunching the oats, etc.—activities not called forth when dealing with food provided ready ground and softened—food on which the work has been already done by mill-stones and mashing outside the animal's body.

The same applies to ourselves—particularly to the young, who are always nearest to Nature. We need the exercise of active mastication, and the only effective means of ensuring this is to start training at the dawn of life. Never let a healthy infant take a meal on which he is not compelled to do active work in the form of sucking or chewing. We must begin with the baby and foster his natural tendency to masticate, instead of doing everything to make the function die out by disuse.

The mother should banish from her mind the idea that "pap-feeding" or "mince-feeding" is natural for a child who has teeth.

What kinds of foods induce mastication?

Beginning with tough crusts about the ninth month, such hard, dry foods as toast, hard plain biscuits, vegetables, raw ripe apple, fish, poultry, meat, brown bread, oatcake, etc., should be introduced as the child grows older and is able to cope with them.

What kinds of food should be avoided, and why?

Soft, sticky foods, such as sweet biscuits, cake, caramels, chocolates, etc., should be avoided
because they tend to lodge between the teeth, and cause decay to set in. Such sticky food should never be allowed the last thing at night.

Is it only the nature and quality of the food which makes or mars a child's teeth?

No, the quantity of food taken and the frequency of feeding times have a marked effect on the general health and therefore on the growth and development of the teeth.

Be careful not to overfeed children, and don't give "pieces" between meals. This practice tends to upset the digestion, and prevents the digestive organs from having sufficient rest. Meals should be perfectly regular and never hurried.

Three meals daily of simple, plain food are ample after eighteen months or two years of age.

Should a child drink milk or other fluid with his meals?

Milk should be used sparingly after eighteen months—a pint a day being ample. Diluted with water, milk should then be used as a nutrient drink at the close of meals, not as a fluid in which to soak food which would otherwise need chewing and insalivating. No doubt the children of the poor are often unduly stinted with regard to milk, but children in general tend to be given too much milk and cream—too much ready-made fluid food which merely drains into the stomach—to the exclusion of cruder materials on which work would have to be done, suited to the natural tendencies and activities of infancy.

What harm is there in drinking milk or any other fluid during a meal?

If milk or other fluid is taken with food it reduces the solid material to pap, and does away with the natural incentive to thorough mastication. This prevents a free flow of saliva and causes the child to take his food too quickly.
SECTION OF MOUTH AND NOSE SHOWING FORM OF PALATE AND POSITION OF TEETH WHEN—

(A) Tongue, jaws, etc., have been normally worked and developed during babyhood.

(B) Mouth has been given little work to do.

SECTION OF NORMAL NOSE, MOUTH, AND THROAT CONTRASTED WITH STATE DUE TO ADENOIDS.
Bolting food is very injurious. If a proper quantity of saliva is not mixed with the food, especially at the close of a meal, the mouth is not properly cleansed and the processes of digestion are impaired both in the mouth and in the stomach, and the blood stream, which nourishes every part of the body, suffers in consequence.

Few people realize that from one to two pints of saliva ought to be poured into the mouth every day under the stimulus of food and vigorous mastication.

**Have bad teeth anything to do with Adenoids?**

Apart from predisposing lack of vitality and vigour which may be present at the time of birth, the most important of all causes of Adenoids is the fact of a baby not being breast-fed. A bottle-fed baby lacks the hard work and full supply of the best blood for mouth, nose, and throat, which is essential for building up strong resistive tissues. This applies to the region behind the nose in the same way as we have seen that it applies to the building of sound good jaws and teeth.

The exercise of suckling tends to make the tongue broad and full, as shown in Fig. A (page 31), whereas bottle-feeding, especially if aggravated by the use of the *Dummy*, tends to lead to a narrow, poorly-developed tongue. The tongue, being the organ mainly concerned in forming the palate, or roof of the mouth, occupies, in the one case, a broad spacious vault, and in the other, a narrow peaked one.

The jaws and the nose chamber are similarly involved, as will be seen in both sets of diagrams. In consequence of these restrictions and imperfect developments the child becomes subject to colds, catarrh, swollen tonsils, adenoids, etc., and breathing takes place through the mouth.

In short, what is called a vicious circle is set up which, on the one hand, restricts the entry of air to the chest, and, on the other hand, interferes
with the proper chewing and mastication of food. As a natural result the whole body comes to suffer. This matter is very fully described and explained in the Society's book *Feeding and Care of Baby*, to which the reader is referred for any further information.

**EFFECTS OF BABY-AILMENTS ON THE TEETH.**

During illness of any kind all work in the direction of building and repair is imperfectly done. Hence it is that the nails are always marked by a groove after fever—the bottom of each groove consisting of the portion of the nail which was formed during the illness. For the time being all the nails are thus locally thinned, but this matters little, since nails are constantly growing and being cut off. Not so with the enamel of the teeth. *Enamel is formed once for all, in infancy and childhood*, and if there are thin or soft badly formed portions, due to attacks of diarrhoea, etc., during the time when the enamel is in course of formation, the teeth will tend to decay wherever there has been an inadequate deposit of the necessary protective covering.

Dental surgeons are always telling us that nowadays the coating of enamel is liable to be exceedingly thin—sometimes indeed almost absent in places. Not only is this so, but the enamel is often found comparatively soft, and does not wear well. Can we wonder at this, seeing that few children enjoy uninterrupted good health during their early and most important growing years! The mother who wants to ensure her baby, sound, long-lasting teeth must see that he is kept as healthy as possible throughout.

*Every illness should be regarded as at least a temporary victory for the microbes*—a defeat which retards the growth and development of the whole human organism, and renders it an easier prey to most other germs in the future. Pitched battles waged with microbes are a waste of time and energy precious to the growing child, and leave his tissues weakened, not strengthened, by the fight. Yet as soon as the baby has “recovered”
from any illness, the mother thinks the results of her mistakes are at an end, but this is not so—more or less of lifelong damage has been done.

A check sustained in early life always leaves a permanent impress on the organism, whether plant or animal. Farm crops which have been blighted in the seedling stage may flourish afterwards and give a good yield, but not so good as if the plants had gone straight ahead. Trees which have been transplanted or diseased in "infancy," though they may afterwards grow "remarkably well," do not attain the ultimate stature or perfection of trees whose progress has been subjected to no such temporary interruption.

MAKING THE BEST OF THINGS AS THEY ARE

What can be done to make up for lost time—to keep teeth sound in spite of their being weak and poorly enamelled, and to stop further inroads of decay where it has already started?

Everything that tends to promote general health tends to save the teeth, but no one nowadays can afford to neglect the toothbrush, and special care and cleansing of the mouth and teeth. Further, every child should be taken to see a dentist every three months if possible, or at least twice a year, so that decayed teeth may be stopped in time.

A NATIONAL DUTY

Dr. Sim Wallace, the pioneer authority in these matters, wrote many years ago as follows:—

"Surely the time has come really to prevent decay of the teeth and those other (allied) diseases (Adenoids, etc.) which are at present doing so much to ruin the national physique.... We ought to condemn the pap system of feeding children and insist on early mastication, the use of hard resisting food and the general exercise of the jaw muscles."
"The question of bad teeth, as a cause of Physical Deterioration, is not only a Dental question, it is not only a Medical question, it is not only a National question, but it is probably the most important of all questions affecting the physical well-being of humanity throughout the length and breadth of the civilized world."

NATURE OF DECAY OF THE TEETH

In describing the building and structure of the teeth, in order to simplify matters, no reference was made to the fact that the hardest portions of the ivory, and even the intensely hard enamel, are made up of two entirely different substances, namely, a kind of gristle on the one hand and salts of lime on the other.

This can be shown in a very simple way. If a tooth is placed in a strong fire it becomes perfectly brittle and readily breaks down into powder like ordinary lime. If a tooth is placed for some time in vinegar the lime salts will be entirely dissolved out, and a tough structure, identical in form with the tooth, will remain—a soft, india-rubber-like tooth.

If the enamelling of the crown of a tooth is thoroughly sound and hard no ordinary acid, acting for a short time, can soften and spoil it by dissolving out the lime salts; but certain microbes, which swarm in particles of food kept warm and moist for a considerable time (as is liable to occur where sticky food accumulates between the teeth or in crevices in the crowns of the back teeth), have the power of forming acid from sugar or starch which is capable of insidiously robbing the enamel of its lime. The mere trace of soft material which remains after acid has dissolved the lime out of enamel has no power of resisting inroads of microbes; and once they have become established in a tiny pit or cave they can scarcely be dislodged, and naturally they are kept well supplied with food particles which would be washed away by the saliva if on any open exposed surface.

Once the microbes have made their way through the enamel they can travel readily along the tiny soft
fibres which were described earlier as passing from the living "Ivory-builders" in the pulp cavity right through to the under surface of the enamel. All this will be readily understood by referring to the figures on page 17. Both in the upper and lower figures the living threads in the ivory are represented by the thin black strokes.

The microbes, which swarm along the course of the ivory fibres, continue producing acid, and thus the softening process may be comparatively rapid. Other microbes digest the soft tissue which remains, and thus a growing cavity is formed which undermines the more resisting shell of enamel. This is how it is that an innocent looking tiny black speck, neglected because it appears so insignificant, may be found to lead into a spacious cavity underneath—a cavity which may have broken into the normal and natural "pulp cavity" of the tooth, and become too far gone to stop before a dentist is consulted.

If the process of destruction, decay, and inflammation is allowed to travel down the pulp cavity, the foul material crowded with microbes may no longer be able to find a ready enough means of discharge into the mouth through the original opening, but will burrow its way through the socket and appear under the gums as a "gum-boil." All these troubles could be prevented, even where the teeth have been badly formed, by keeping regularly in touch with a good dentist.

From the above description it will be realized that only a dentist having technical knowledge and skill, and equipped with the necessary reflectors and probes, can possibly ascertain the presence of every manifestation of decay of the teeth, even though it should be fairly advanced and possibly too far gone for stopping. This is particularly so in the case of the molars, which are the most valuable of all the teeth. The saving in money, health, and efficiency would be enormous if people would make an absolute rule to take their children to the dentist at least every four months.
As the proper stopping of teeth is a work which calls for infinite patience on the part of the operator, and great conscientiousness and thoroughness, parents cannot be too strongly urged to make sure that they secure reliable advice and help.

**BEWARE OF NEEDLESS EXTRACTION**

It is a grave misfortune for a child to lose one of his first four permanent back teeth (the grinders or molars), and yet this is the fate of most children nowadays. A speck of decay appears, which could be stopped and cured by the dentist quite easily, but generally the decay is allowed to go too far. The loss of this one tooth not only renders the tooth immediately above or below it useless, but causes more or less falling out of position and irregularity of the whole of the back teeth. So much is this the case that a dentist may even sacrifice the three other back molars when one is lost, rather than have an irregular, badly-working grist-mill.

However, he will spare no pains to save the situation. If the crown of the "sixth-year molar" has been
allowed to decay beyond the power of stopping, a good dentist will try to preserve its living roots, and will build upon these foundations an artificial crown. Provided this is successful, it will not only maintain everything in place, but will also enable chewing and grinding to be properly carried on—thus providing the natural nerve stimuli essential for the permanence and utility of the whole of the back teeth, and important also for stimulating the digestive organs.

The first permanent molar is often mistaken for a "milk tooth," and is extracted if it shows decay, without any idea that the loss of this one tooth spoils the whole jaw.

Every mother should jealously watch her children's teeth—especially the back teeth—and directly there is a speck of decay, the tooth should be stopped. If the teeth are kept right in childhood they tend to remain so for life. Decay of teeth is essentially a disease of early life, and spreads from tooth to tooth.

**ORAL HYGIENE AND CARE OF TEETH**

1. *Do everything to maintain good health.* Teeth are built out of blood. *For the baby, suckling is the great essential.*

2. *To ensure good, sound, well-enamelled, lasting teeth,* the food and means of feeding must be such as to *compel ample exercise for mouth and jaws* throughout babyhood and childhood. "Bring up a child in the way he should go, and when he is old he will not depart from it." The habit of slow chewing once firmly established will tend to be maintained for life.

3. *The composition of the food must be suitable*—that is, adapted to the perfect building up of the structures of the body.

4. *Avoid the use of long-tube feeder and dummy,* and make sure that the baby "works for his living."

5. *Give a baby a bone to munch from six months onwards.* This serves to promote the development and growth of the jaws and teeth, and helps the
eruption of the latter. At nine months give good crusts, toast, etc.

In the second year and onwards a fair proportion of the food should be dry, firm, hard, or tough—e.g., crusts, crisped bread, toast, raw ripe apple, etc.

6. Teach the baby to chew his food vigorously and thoroughly, taking sufficient time over his meals. Don’t allow him to bolt any of his food, whether solid or liquid, but, on the other hand, don’t encourage mere dawdling. At the end of a well-chewed meal the jaws should be comfortably tired, the flow of saliva should be ceasing, and there should be a feeling of healthy satisfaction. This constitutes the normal check against over-eating and ensures the highest nutritive results from the food taken, while at the same time developing the child’s jaws and teeth for future work.

7. Hard or tough food, if well chewed, helps to make good teeth and to keep them sound; it also helps to cleanse them. Raw apple and other firm or fibrous fruits are specially good at the close of meals, because chewing and acidity both tend to induce a final active flow of saliva which washes away lingering food-particles and microbes.

8. Soft goods cling to the teeth and tend to cause decay; therefore cakes, sweets, ordinary biscuits, chocolates, etc., should be avoided habitually and should on no account be given at bed-time. All decay commences on the outside of the teeth, never from within; it starts in crevices in the crowns, or between two teeth.

9. The tongue is not primarily for “talking,” but is a “masticatory organ,” and should do a large proportion of the work in eating—squeezing the moistened food against the teeth and forcibly rubbing it on the hard, roughened roof of the mouth. Further, it is practically a kind of toothbrush, which, if properly exercised and developed, does much to cleanse the mouth and teeth. A clean mouth ensures sweetness of breath.
10. The teeth should always be brushed night and morning, all the surfaces being carefully cleansed. The first, or temporary teeth, as well as the permanent ones, should be brushed and carefully watched for signs of decay. In any case, the child should be taken to the dentist every three or four months.

If the first teeth decay early there is a poor chance for the second ones, but they may be saved by unremitting care and attention.

CLEANSING THE TEETH—PRACTICAL INSTRUCTIONS

Don’t wash out or meddle with the inside of a healthy baby’s mouth until he has cut at least half a dozen teeth.

It is not enough for the mother to know that her child’s mouth and teeth must be regularly cleansed—she must know also how to set about it.

First use a soft “Tom Thumb” of the correct form (see next page). Later, a brush with somewhat stiffer bristles may be used, but great care should be exercised, both in brushing and “silking,” not to injure the delicate gums.

Very simple Dentifrices should be used for little children. Two drachms of Heavy Carbonate of Magnesia mixed with an ounce of the best Precipitated Chalk may be used, or ordinary Baking-soda. Unlike soap, they are not unpleasant; on the other hand, their taste is not attractive and the child tends to spit them out. Some dentists prefer a mild acid, as tending to cause a free flow of saliva. It is better not to use a sweet aromatic dentifrice for an infant, because children tend in any case to suck the tooth-brush and swallow the water and “brushings.” Don’t allow this bad habit to be formed.
(A, C, D) Good form of tooth-brush. Note the saw-like profile of the bristles (adapted for entering the crevices between the teeth), the end tuft for going behind the back teeth, and the curved handle.

(A) The brush should be hung up to dry as shown.

(C) This (called the "Youth's size") is better adapted for children than the adult size (D). Still smaller brushes, called "Tom Thumbs," are made for very young children, but these are not everywhere procurable except in the incorrect smooth-surfaced form (as shown for adults in B). The notching of the surface of the bristles and provision of an end tuft are as important for children as for adults.

(B) The smooth surface, presented by this the ordinary form of brush, prevents the proper tooth-pick action of the bristles, and causes such brushes merely to polish the free surfaces of the teeth (where there is no risk of decay) instead of clearing food particles and bacteria out of the crevices where decay always starts.

(F) Shows by means of arrows the proper directions of movement of the tooth-brush. Brush the upper teeth "downwards," and the lower teeth "upwards."
(E) "Silking," though sometimes advisable is not generally necessary. It is effected by passing a piece of the finest ordinary "Filoselle" embroidery silk between the teeth, the ends of the silk being held between the fingers. The food particles adhere to the silk.

(G, H) This shows the easiest and pleasantest means of silking. The apparatus (H) is shown the natural size. It is well adapted for cleaning between a baby's teeth and is much more effective and convenient, even for adults, than a strand of silk held between the fingers. The mother can rapidly cleanse between the teeth at bedtime and the sterilised "Dental Floss" is softer and better than Filoselle. The hooking and fixing of the thread to the metal "bow" takes only a moment.

The art of Rinsing and Sousing out the mouth, so as to effect a final cleansing, is almost as important as the brushing, and the child must be taught how to do it.

As Dr. Pitts says, in his excellent little book on the Teeth, "a mouthful of clean water should be taken and vigorously swished backwards and forwards between the teeth. This effect is not obtained by merely moving the head from side to side, but by vigorous movements of the tongue, lips, and cheeks, so that the fluid is forced between the teeth," backwards and forwards, in and out, and from side to side of the gums.

FORMING A CHARACTER

"Building the Teeth" and "Forming a Character" are parts of construction of the same edifice—standing in the relationship of the underground foundations of a building to the superstructure.

Our dentists tell us that nowadays when they insist on the eating of crusts and other hard food, the mother often says "Our children simply won't!" Such children merely exemplify the ineptitude of their parents—parents too sentimental, weakly-emotional, careless, or indifferent to train their children properly. The "can't-be-so-cruel" mother whose baby cries half the night and frets all day on account of the mother's failure to fulfil one of the first of maternal duties,
should not blame Providence or Heredity because her progeny has turned out a "simply-won't" in infancy, and will become a selfish "simply-can't" in later childhood and adolescence. Power to obey the "Ten Commandments," or to conform to the temporal laws and usages of Society is not to be expected of "SPOILED" babies when they reach adult life. The plain meaning of the word "spoiled" is worth some reflection. Every one grasps the full significance of spoiling a dress or spoiling a dinner, but the spoiling of a child is regarded more lightly!

Unselfishness and altruism are not the natural outcome of habitual self-indulgence. Damaged health and absence of discipline and control in early life are the natural foundations of failure later on—failure through the lack of control which underlies all weakness of character, vice and criminality.

THE DESTINY OF THE NATION IN THE HANDS OF THE MOTHERS

The simple common-sense measures which would ensure to every child at an early age strong, roomy jaws, and a complete set of good sound lasting teeth, would do more than anything else to prevent Adenoids, Appendicitis, and Consumption, and would tend to empty our Hospitals, Gaols, and Slums.

"For the ordinary family lack of physical health and strength means unemployableness and morbid thought and feeling; and unemployableness and morbid thought and feeling mean Loafing, Vice and Crime."—(T. C. Horsfall, Contemporary Review, 1906.)

The universal decay of weak and badly-built teeth is by far the gravest disease of the day, and is the main precursor and cause of unfitness and disease in general.
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