cryptogamous growths have only existed for a few hours; they soon become confluent at some places, form large patches, and often cover the entire mucous membrane with a thick white scab, which, on drying, turns yellowish from contact with the air, and may even become brown through an admixture of blood. Much difference of opinion has existed hitherto regarding these membranes; the manner of their adhesion to the mucous membrane, their relation to the epithelium, and the place of their primitive appearance, have been much disputed.

First of all, as regards their connection with the mucous membrane itself, it is claimed by some that they may be detached from the subjacent mucous membrane without producing any hæmorrhage; others deny this; both, however, are right. It all depends upon the time after their origin that the attempt is made to detach them. Shortly after their appearance they are really very firmly connected, and cannot be detached, even by an experienced hand, without inducing hæmorrhage; but, after a few days, they become loose, and the mothers will easily remove large patches with the finger without causing pain or hæmorrhage.

In order to answer the question in reference to the epithelium, I must, in the first place, review more minutely the microscopic condition of these membranes. There are seen, in every thrush-membrane, *spores*, *spore-bearers*, *thallus filaments*, and *basement epithelium*, all surrounded and enveloped in *a white, finely-granular substance*, from which, on the borders only, these structures can be made to project by squeezing. If successful in detaching a large piece, and its surfaces can be distinguished and separately examined, then, on the upper surface, mostly spores will be found, fewer thallus fibres, and many fully-developed basement epithelium-cells; on the lower surface, the one facing the mucous membrane, less or no basement epithelium-cells at all, fewer spores, but a dense structure of thallus fibres, which permeates throughout the whole finely-granular mass. If a piece of thrush-membrane is kept for a day in a concentrated solution of carbonate of potassa, its epithelium will be the first to disappear; the white granular mass becomes more homogeneous, more transparent, and is recognizable at some places only; the thallus fibres, however, the dense structure of which may now readily be discerned throughout the whole thickness of the membrane, have undergone no change.

On some of the yellow places of the membranes a diffused coloring matter is seen, dyeing the finely-granular mass yellow; it is indebted, for its origin, to small hæmorrhages. Two kinds of thallus fibres may be distinguished:

(1.) Broad with transverse striæ, very much after the manner of yeast fungi; and (2.) Narrow, with scarcely any striæ. The latter have no well-defined contours, are slightly granular, and are seen everywhere and in all cases, whereas the first kind is only exceptionally found. These spores flourish not only in the mouth, but grow also on other moist fermenting surfaces, upon a slice of an apple, for instance, as I have illustrated by experiments. (*Henle* and *Pfeufer's* Ztschrft. N. F. VIII. 2. Heft.) Erosions upon the external part of the lip, and even the anus, may become covered with it.

From all that has been said, the origin of the white membranes, and the relation of the fungi to them, may be regarded in the following manner: The first thallus filaments grow upon and between the uppermost epithelial layer; seek everywhere, like the roots of a tree on stony soil, for favorable space and ground, and finally lock in the entire epithelial strata, in a densely-fungous texture. Having reached the upper, the epithelial surface of the mucous membrane, they stimulate it to increased secretion, or, at least, aggravate the irritation caused by the acid reaction of the fluids of the mouth, and, henceforth, no complete epithelium-cells are formed from the blastema secreted for the formation of epithelium, but only a thick layer of granular substance. The fungi are therefore neither upon the epithelia, nor beneath them, but enclose them everywhere; within the layers facing the mucous membrane, it no longer attains to the formation of complete basement epithelium, the thallus fibres, like the granular mass, seize upon them, and permeate them in every direction.

As regards the primary place of origin, many authors assert that the primary white points represent mucous follicles, and that the fungi sprout from these. This statement can neither be confirmed nor denied, because it is well known that in the living child the orifices of these glands cannot be distinguished, and in the cadaver the presence of these thallus fibres in the follicles is no proof that they have actually originated there before they originated upon the free surface of the mucous membrane.

As regards the spreading of thrush, *Reubold* found that the fungi adhere to the pavement epithelium, and do not thrive upon the ciliated and cylindrical epithelium; consequently the parts subject to it are the mouth, fauces, œsophagus, and the epiglottis, down to the superior chordæ vocales, by which the hoarseness which occasionally supervenes is readily explained. The tolerably wide-spread view entertained by older physicians, that thrush may extend down into the stomach and intestinal canal, has never yet been confirmed by dissection. Although the possibility of thrush-membranes having been

swallowed, and subsequently passing off by the anus in an undigested condition, cannot be denied, it nevertheless does not follow therefrom that they had *originated* in the stomach and intestines.

The duration of thrush, as a rule, is a short one, and in cleanly-kept and well-developed children very rarely lasts beyond the eighth day. In atrophic children, particularly when their incessant restlessness is appeased by the sugar-teat, it will last for many months, or until death.

This affection of the mouth, especially in foundling and lying-in houses, is extraordinarily frequently complicated with intestinal catarrh of the most malignant character. This complication is so common that *Valleix*, physician to the Foundling-house at Paris, regards the intestinal affection as an integral part of the disease, and describes it as such; but that is sufficiently contradicted by observations in private practice.

Children are attacked by cholera-like symptoms, become collapsed, the anterior fontanel becomes depressed, the eyes sink back deeply in their orbital cavities, the integument loses its elasticity and warmth, and, in from twelve to twenty-four hours, often become remarkably emaciated. The green, watery fæces, smelling strongly of rancid, sour fat, react decidedly acid; redden and erode in a short time the anus, genitals, the inner surfaces of the thighs, and the heels. That this diarrhœa, or rather its effects, and not the affection of the mouth, may lead to death, follows from this, that some children, with very severe thrush, suffer from no intestinal catarrh, and are perfectly well again immediately after the membranes have been cast off.

The *causes* of thrush are, then: (1.) The preponderating acid reaction of the mouth, which in the new-born is due to a faulty salivary secretion. The quantity of the acid mucus outweighs the alkaline saliva, and then the mixture reacts acid. (2.) The transportation from one child to another, particularly through one and the same wet-nurse in foundling-houses. (3.) The almost unexceptionally fermenting substances of the sugar-teat, which is sometimes allowed to lay about upon all dirty tables and places, and afterward is thrust into the mouth of the infant.

Therapeutics.—From a large number of experiments which I have instituted in this direction, I have come to the conclusion that a thrush-membrane, when kept in sugar or well-water, and in a not-alkaline reacting solution of salt, at a temperature of about 110° F., will, at the expiration of two days, produce a new crop of fungi, whereas in solutions of alkaline or metallic salts this does not take place. Thrush-membranes are effectually dissolved in concentrated solutions of caustic

alkali only, which, of course, cannot be resorted to for therapeutic purposes. We have, therefore, no useful remedy that will chemically destroy the membranes in the mouth when once formed, but we can easily prevent their further spreading by topical applications of salts, with slight alkaline reaction. The whole treatment is based upon this: to rectify the acid reaction of the mouth, and this purpose is completely achieved by a solution of borax, ℈j, to water, ℥j, applied with a small camel's-hair brush every hour. The good effects of this remedy, however, are often completely thwarted by the unnecessary admixture of honey or syrup, for all substances which contain sugar very decidedly promote the growth of the fungi. By this solution of borax no diarrhœa is produced, nor is an already-existing one aggravated. It is absolutely necessary to discard the sugar-teat; even a milk-diet is injurious, on account of its containing sugar and casein. So long as the membranes exist it is best to feed the child upon bouillon and mucilaginous broths, and infus. verbasc., with little or no sugar at all.

APPENDIX.

(*a.*) The Signification of a Coated Tongue in Children.—It is necessary, first of all, to state that most nurslings in the first weeks of life have a white-coated tongue, along with which they do not display the least digestive disturbance.

Aside from that, the tongue becomes coated in most of the gastric and intestinal affections of small children, and probably only in consequence thereof does the appetite decrease. A thickly-furred tongue is but seldom met with in children; as a rule, a white flush only is observed, but this may exist for a long time after the appetite has returned, and may just as well be produced by local diseases of the mouth, thrush, stomatitis catarrhalis, diphtheria, injuries, chemical irritants, and burns, as by disease of the stomach or bowels. There are also permanent, or at least of several months' duration, partially-coated tongues, which possess no influence whatever upon the continuation of good health. A special name has even been invented for this condition, *pityriasis linguæ*. It consists of white islands, or circles or semicircles, the rest of the tongue being of a normal rose-red tint; these spots are entirely indebted for their origin to an accumulation of epithelium-cells. In atrophic children, transverse fissures are often seen upon a very smooth red tongue; the fissures display yellow bases, obstinately resist the cauterizing treatment, and do not disappear before death. The furred tongue of measles, scarlatina, typhus fever, etc., has the same significance in older children as in adults, and will be specially described with every individual affection.

The diagnostic and practical importance of the coatings of the tongue in children is, on the whole, not particularly great. In a uniform, although but a very thin, coating of the tongue, it is always advisable to be careful with the diet of the children, and, by regulating it, the digestion will improve, and the tongue will become clean.

(*b.*) Difficult Dentition (*Dentitio Difficilis*).—As the physiological condition of the eruption of the teeth has already been minutely treated of in the Introductory Remarks, it only remains to speak of the pathological conditions which originate during that process, and are decidedly dependent upon it.

Redness, pain, swelling, and increased secretion (or, in short, catarrhal stomatitis), are present in all cases. The frequent formation of blisters and small painful ulcers may be regarded as an aggravation of that process, and should be treated according to the precepts laid down on page 87 (*Stomat. catar.*). The necessity of the children to bite at something is satisfied by a piece of yew-tree root, or by a thimble firmly stuck upon the finger.

As ordinary or sympathetic results of the eruption of the teeth, the following make themselves manifest:

(1.) *Fever*, consisting in an increased temperature of the skin, especially on the forehead and cheeks, one of which often becomes red. Since no other cause for the fever can be discovered in the children, and as it nevertheless frequently occurs in dentition, it must therefore be assumed that it is induced by the latter.

(2.) *Convulsions*—the so-called spasms (*Fraisen*). The convulsions which occur here have nothing characteristic whatever, and are of the same nature as symptomatic convulsions in general. The most frequent muscular contractions are those of the eye; teething children often sleep with half-closed eyes, the eye-bulbs rolled upward, and nothing but white sclerotica can be seen through the tolerably wide-open palpebral fissure, a phenomenon so terrifying to the inexperienced parents, that medical aid is usually quickly sought. Twitchings of the facial muscles, a peculiar smile while sleeping, and short twitchings of the extremities, are observed in many teething children, who are extremely nervous, and attacked by reflex convulsions from the least indisposition—even from emotional causes. Since they make their appearance in many children every time a tooth breaks through, there is no reason why they should not be regarded as having direct connection with the dentition. Still, eclamptic attacks occur in some children with and without dentition, which may destroy them in a few minutes; and at the autopsy no material lesion whatever of the nervous centres can be discovered.

Treatment.—As these convulsions mainly occur in children with sluggish digestion and hard stools, and disappear when diarrhœa supervenes, the first indication must therefore be to increase the intestinal secretions and to accelerate the peristaltic movement of the bowels. A clyster or two of cold water should be administered to them, and, if this does not answer, a little manna, or a few teaspoonfuls of ℞. rhei aquosa. But, if a hot skin is also present, it will be necessary to produce more frequent stools, and a diminution of the temperature, which may be accomplished by a few powders of calomel, gr. $\frac{1}{8}$ to $\frac{1}{4}$ each. Much *éclat* has lately been made in England and France with the scarification of the gums. Some recommend a crucial incision; others, the removal of the whole cap which covers the head of the tooth. But, as an admonition, it is premised, in all the reports and laudation, that the tooth has to be very near eruption, otherwise the scarification will be of no benefit. I have frequently performed this operation, but have always found that the lancinated wounds of an inflamed mucous membrane heal very badly, and ulcerate for a long time; that the nervous symptoms continue notwithstanding, till ultimately artificial or spontaneous diarrhœa supervenes. Indeed, if we have to wait until the tooth is "very near" breaking through, then the process is in fact near its end, and any other simple remedy is as efficacious as this, which is attended by a considerable amount of pain. Affusions of the head with cold water, performed every hour or two, are, it is true, a not very tender, and by parents not much admired, remedy; it is, however, very useful against all convulsions in children, and therefore also against those occurring during dentition.

(3.) *Cutaneous Eruptions.*—Children with a fine, smooth skin, or the progeny of parents who are affected with chronic skin-diseases, are attacked in each of the five periods of dentition by one or the other form of eruption, which, in the subsequent dentition periods, displays tolerably similar pathological characters to those which took place at their first appearance. The principal forms are:

(a) *Urticaria.*—An eruption of wheals (Quaddeln) (Pomphi).—By this we understand a severely-itching eruption of the skin, of several lines in circumference and mostly round, or sometimes of an oblong shape, not very prominent, and having a flattened upper surface. Most of the wheal-like eruptions are of the normal integumentary color, while the part of the cutis contiguous to them appears to be reddened. Occasionally they are even paler than the rest of the skin; the epidermis never becomes detached from the cutis. The stings of nettles (hence nettle-rash), in some persons also the bites of fleas, will produce a wheal-like eruption, which differs in no respect from that produced by internal causes—dentition, for example. It disappears

almost entirely in a few hours, the red zone remains for a short time, but that also fades very rapidly, and then nothing is to be seen of the eruption. From fifteen to twenty of these circular patches make their appearance, either simultaneously or one after the other, disappear, and are succeeded by others on other parts of the body. Generally, this affection of the skin is relieved only after the completion of a dentition period, and breaks out anew at the beginning of the next period. The treatment should be limited to the use of bran-baths, and inunction of fat, to mitigate the excessive itching, which is very troublesome and annoying.

(b.) *Lichen and Prurigo.*—These are two papular exanthema; the first, also called lichen strophulus, has its hard papules mostly accumulated in clusters, while the papules of the latter are flatter, lower, and isolated. In both exanthema the tubercles are at first paler than the normal skin, but through scratching are soon bereft of their apices, and in place thereof display a small brown crust of the size of a pin's head. If a lichen papule is pricked open very superficially with a fine needle, a drop of blood will exude; a prurigo papule contains only a minute drop of serous fluid, but, by severe scratching, may also be made to bleed. When these scratched papules are situated near each other, their crusts will coalesce, and present a large ulcerated surface, and it will then be entirely impossible to recognize the primary manner of their origin.

(c.) *Eczema and Impetigo.*—By eczema, we understand an inflammation of the skin, produced by an accumulation of serum beneath the epidermis, in the form of minute aggregated vesicles, and is distinguished as eczema simplex and eczema rubrum. In eczema simplex the skin is but slightly swollen and reddened. Thin yellow scales form after the vesicles have burst and dried up, and, after they have fallen off, a new epidermic layer is produced. Eczema rubrum mostly develops from the former, and is differentiated from it by the integument around the vesicles being of a darker red color and more tumefied, and the course of the disease becoming more chronic. There is a tendency to form a new crop of vesicles, and a red, infiltrated furfuraceous skin remains behind for a long time after the crusts have desquamated. In impetigo, in place of vesicles, larger pustules, filled with matter, usually aggregated, originate, and, after they have ruptured, thick moist, yellowish-green or brown scales form, and, when these have dropped off, the reddened corium will be seen exposed, discharging a sero-purulent fluid, and soon becomes covered anew by a thick crust. The affected part of the skin remains brownish red and infiltrated for a long period after recovery has taken place.

The forms of skin-disease mentioned in paragraphs *b.* and *c.* natu-

rally do not disappear immediately after the eruption of the teeth; they improve very much, however, while previous to that they constantly grew worse. It is not yet conclusively settled that they are always connected with dentition, for there are many children who do not acquire these eruptions until after they have cut all their teeth. But this much *is* established, that very many children are attacked by these exanthema, most frequently by lichen, at the eruption of the first tooth, suffer from it a while, lose it, and at the next new difficulties of dentition again become affected with it.

The treatment of these skin-diseases is extremely simple. The hairs should be carefully removed, if any eruption exists beneath them. Thick crusts must be softened with oil, and the hairs cut off at the roots beneath the crusts. I have found the ung. zinci oxid., rubbed in twice daily, to be very efficacious against the intense itching. So long as the patients are free from fever, they should be bathed in a tepid bath of wheat-bran for a quarter of an hour daily. There is no very great indication here for internal remedies, and those which derange the digestion should be avoided. In eczema rubrum, which often lasts very long, the liq. potas. arsenicalis, from two to five drops daily, may become necessary, in regard to the use of which, more minute details will be given in the chapter on the Diseases of the Skin. It is always advisable to cut off the nails as short as possible, of all children suffering from cutaneous eruptions, in order to make the scratching as harmless as possible.

(4.) *Intestinal Catarrh.*—When a child cutting its teeth has a red mouth and augmented salivary secretion, it becomes affected with watery evacuations as a result of swallowing the saliva, for the salts it contains act as a mild aperient. A mild diarrhœa, five or six evacuations in the twenty-four hours, is very beneficial to teething children, for cerebral affections are thereby most surely prevented. It occurs, in fact, as often as stomatitis catarrhalis, and both processes might very appropriately be regarded as physiological conditions, if their aggravations, which often attract attention, did not attain to distinct diseases, and really display serious characters. The transition of this simple catarrh of the bowels into an infiltration of the follicular apparatus of the mucous membrane, attended by profuse discharges and rapid general emaciation, very frequently occurs, and in most instances terminates in profound collapse and death.

The treatment is precisely the same as that of intestinal catarrh originating from other causes, and will be described in detail with the affections of the bowels.

(5.) *Bronchial Catarrh.*—There are children who, at the eruption of every tooth, are attacked by a severe bronchitis, which dis-

appears again immediately after the tooth has broken through. This bronchitis seems to be induced by external causes. The large quantity of saliva secreted in stomatitis catarrhalis soaks through the clothes, covering the chest, and produces a diminution of the temperature of the breast, as a result of which swelling and increased secretion of the bronchial mucous membrane ensue. If the chest is prevented from becoming wet, for example, by inserting a piece of oil-silk between the garments, the child will pass through the whole process of dentition without once being affected with bronchitis. So many striking and oft-recurring examples of this dentition-bronchitis have occurred to me, that I do not hesitate to attribute a part of the bronchial catarrhs to dentitio difficilis.

Treatment.—The treatment consists in protecting the chest, best accomplished by employing large-sized slavering-bibs lined with thin gutta-percha cloth or oil-silk; the cough then almost always disappears spontaneously in a very short time.

(6.) Finally, there is *a blennorrhoic affection of the conjunctiva palpebrarum*, which occurs at the eruption of the upper cuspid and incisor teeth. Here both eyelids, particularly the upper, suddenly swell up, and become so infiltrated that it is only with the utmost difficulty, and scarcely ever without bleeding from the squeezed eyelid, that a sight can be obtained of the globe. The discharge is not so yellow and purulently thick as in ophthalmia blennorrhœa neonatorum, but more muculent, shreddy, resembling more the discharge from the nose after a catarrh of the nasal mucous membrane has subsided. I have never been able to ascertain whether it possesses any properties of infecting the other eye of the same or of another person. The parts around the lids are generally eroded. On examining the mouth of a child laboring under this form of inflammation of the eye, a painful redness and swelling of the corresponding upper jaw, and one or two tubercles answering to the first molar or incisor-tooth, will be found; its popular denomination, "eye-tooth," is therefore not without sufficient reason.

After all, this inflammation of the eye has nothing wonderful about it, when we bear in mind that the floor of the Highmorrian cavity is often barely of the thickness of paper, and consequently a propagation of the congestion or inflammation upon the mucous membrane of this cavity may very readily take place. But the mucous membrane of the antrum Highmorri stands in direct communication with the conjunctiva through the nasal passages and lachrymal sac, and we merely have here a propagated inflammation of the mucous membrane. The prognosis of this seemingly very dangerous evil is favorable. Formerly, in accordance with the precepts of the most

eminent ophthalmologists, I used to torture the poor children with cauterizations of nitrate of silver, and was delighted with my splendid success. But, for several years past, I have treated at least a dozen cases with nothing but dry warmth, discarding the cauterizations altogether, and have accomplished still more rapid and painless cures. I apply a piece of cotton-cloth to the eye, smeared with simple cerate or ung. zinci, and over that a bag loosely filled with warm bran. I cause the cerate rag to be removed every two hours, the eye to be sponged with a pointed piece of soft sponge dipped in warm water, and then reapply the warm bran bag as before. After one, or at the most two days, the œdema has subsided so much that the patients are again able to open the eyes tolerably wide; then they will no longer tolerate the bran bags, and, after several days more, there is nothing more to be seen about the affected eye than a slight redness and irritability of the lids. If the mouth is now examined, the stomatitis will be found improved or wholly gone, and a previously unperceived head of a tooth cut through. During and after the subsidence of the œdema of the lids, mild astringent eye-washes, zinci sulph., or cupri sulph., gr. j, to water ℥j, may be dropped into the eye with advantage.

These are the principal and most frequent complications of dentition; their actual dependence upon it has long ago been acknowledged by all thoughtful physicians. Of late, however, a few, and some of them widely-known Pædiatricars, have denied this connection *in toto*, and either did not observe the frequent concomitance of the just described diseases with dentition, or declared them to be merely accidental.

B.—*PAROTIS.*

(1.) Inflammation of the Parotid Gland (*Parotitis*).—There are three kinds of parotitis: (*a*) idiopathic, (*b*) secondary, and (*c*) metastatic parotitis.

(*a.*) *Idiopathic parotitis* occurs only in an epidemic form, and, on account of its general spreading, and the almost comical appearance which it gives to the patients, has received a number of, in part, scurrilous names, such as mumps, clown's disease, Ziegenpeter, etc. It has many analogies to the acute exanthema, attacks a person but once in his life, occurs most frequently in the youthful age, and has a tolerably well-marked cyclical course. Children under one year of age are hardly ever affected with it. It prevails most frequently in the spring of the year, sometimes also in the autumn; and on the damp coasts of Holland, England, and France, it is said to be endemic.