Surgical diseases of infants and children / by P. Guersant ; translated from the French by Richard J. Dunglison.

SURGICAL DISEASES

INFANTS AND CHILDREN.

BY

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TRANSLATED FROM THE FRENCH

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PREFACE.

My object in publishing these notes on the surgical diseases observed in children has not been to embrace the entire domain of infantile surgery. I have wished only to sum up my views on cases which I have most frequently met with, and which particularly served as subjects for my clinical lectures at the Hôpital des Enfants from 1840 to 1860. I have wished to make known the results of my practice, and to point out both my successes and my reverses. If I have omitted several points, it is because I have hesitated to speak of very rare malformations, which I have scarcely ever met with, or of diseases which are very rarely observed in children, as aneurisms of the arteries, varix, or varicocele, of which I have seen but one example operated upon with success by the plan of M. Ricord. The same may be said of congenital luxations, which I have seldom seen, except luxation of the coxo-femoral articulation, that of the superior extremity of the radius, and of the clavicle, and a few others that I have scarcely been able to observe sufficiently.

I have rather preferred not to speak of those subjects on which I could not base very practical opinions; and I have limited myself

to offering to students and practitioners, in concise descriptions which doubtless leave much to be desired, what I have learned by examination and study, what I have done, and what I have observed in a large number of cases in my experience with little patients.

NOTE BY THE TRANSLATOR.

In offering to the American reader a translation of the valuable work of M. Guersant, it has been deemed expedient to preserve, without note or comment, the original text of one whose authority on the surgical affections of early life is so generally recognized. As allusion is liberally made by the author to the experience of other French writers and practitioners on almost all the subjects discussed, this treatise on the Surgical Diseases of Children may be justly regarded as a reflection of the views of the most distinguished surgeons of that country, in the very interesting class of cases embraced in it.

PHILADELPHIA, Nov. 1872.

CONTENTS.

PAGE

THE

SURGICAL DISEASES OF CHILDREN.

CHAPTER I.

SURGICAL OPERATIONS.

HAVING been connected with the surgical service of the Children's Hospital for twenty years, we have had sufficient experience with surgical operations on children to induce us to present, as the result of our own practice, some general reflections on the manner of performing operations on the young. The three subjects we propose to discuss in this section are, 1. The preparation of the patient; 2. The performance of the operation; and 3. The after-treatment.

1. *Preparation of the Patient.*—Certain vices of conformation, especially imperforate natural openings, should be operated upon at birth without any preparation. Others, which offer no obstacle to the performance of the functions and to the development of the child, may be deferred to a somewhat more remote period. This last class includes club-foot, phimosis, webbed or supernumerary fingers, complicated harelip, cleft palate, etc. We are of the opinion that, as a general rule, operations, even in those cases seeming to demand early treatment, are much more likely to succeed fifteen days, three weeks, or a month after birth, when full time will be afforded the surgeon to know if the infant thrives, and if its functions are properly executed—in a word, if it is healthy—than if attempted a day or two after birth. This delay will also afford an opportunity, if there be reason to fear a variolous attack, to vaccinate the child several days before resorting to a surgical operation.

If the operation is not urgently demanded, and can be post-

poned to a period still more distant, good surgery would suggest the propriety of choosing, either in hospital or in general practice, a time of the year most exempt from diseases, and especially when epidemic affections, such as smallpox, measles, scarlet fever, and diphtheria, are not prevalent. Rarely would it be advisable to operate in the spring, as has been sometimes suggested; generally we should prefer the months of June, July, August, September, and even October, which ordinarily present a more regular and less variable temperature than any other period of the year. In these cases it will be better, first of all, to vaccinate the little patient, if this has not already been done, and even to revaccinate, by way of precaution, those who have attained the age of fifteen or sixteen. Without such preparatory attention, we may see our patient die of smallpox just as he is recovering from the successful operation to which he has been subjected. We had occasion, in a child five years of age, to make a disarticulation of the thigh for osteosarcoma of that region (the pathological specimen being afterwards deposited in the Musée Dupuytren); the wound was nearly cicatrized and the cure seemed assured, when the child, which unfortunately had not been vaccinated, was attacked with smallpox, and died thirty days after the operation.

It is of the highest importance, before deciding to operate, that the surgeon should act also as a physician, and examine the case with the most scrupulous attention, in order to be thoroughly confident of the non-existence of any internal disease, or of any special disposition which might affect the result of the operation and the life of the patient. It is also expedient to know if the child is subject to convulsions, or if it has a constitutional tendency to hemorrhage. It is a well-known fact that in certain individuals the slightest wounds are attended with hemorrhages that are extremely difficult to arrest, and we have on more than one occasion met with this predisposition in children. In one case of this kind, we were compelled to postpone an excision of the tonsils in a little patient who had purpura hemorrhagica, and he was under treatment for two months with astringents, iron, etc., before we decided to operate. In spite of this precaution, after the removal of the tonsils, a hemorrhage followed which gave us much uneasiness. We deem it best, therefore, to prepare children subject to hemorrhage by administering the perchloride of iron internally, in divided doses, fifteen to thirty grains daily, for at least eight days. In another

instance, we lost from convulsions, also after excision of the tonsils, a child subject to that nervous affection, on whom we had very frequently practised cauterization of those glands for the cure of the hypertrophy of which they were the seat.

We may also add that preparation of the young patient is sometimes indispensable from the very nature of the operation to be performed upon him. When, for example, we are about to establish an anus in an imperforate rectum, we must first empty the bladder; when we are about to perform lithotomy, we must evacuate the rectum. In all operations, we should take care that digestion is properly accomplished, and that the bowels are freely opened.

So far as the moral preparation of the patient is concerned, we are not usually required to interfere. Those, however, who are old enough to listen to reason should be brought to the operation by explanation of its necessity, and be made to understand, that if they suffer pain, it is with the view of curing them. But the majority of children should be operated on by surprise. In every case it is indispensable that the surgeon should be surrounded with assistants capable of exerting a firm hold on the patient, and of displaying a force proportioned to that of the child. Sometimes, even in a simple examination of the case, in inspecting the throat especially, we must act promptly and by surprise, boldly carrying the tongue-depressor over the base of the organ. Sometimes, if we propose to administer chloroform, it will be necessary to attempt its use before the day of the operation.

2. *Performance of the Operation.*—In quite a large number of surgical cases, we can dispense with the use of anæsthetics. We generally operate without chloroform in opening abscesses, in sounding the bladder, and in touching the rectum and removing a small polypus from that region. There are some operations, indeed, in which we should absolutely reject the use of that agent; those, for instance, performed on very nervous and excitable patients. In some cases, too, we may resort to local anæsthesia by means of chloroform, or, what is still better, of ice applied for a certain time on the point selected for operation. There are other operations, again, in which anæsthetics are wholly inadmissible, such as excision of the tonsils, tracheotomy, etc.

There is a very large number of cases in which the use of chlo-

roform has appeared to us to be strongly indicated; and we may truly say, that having used it with more than five or six thousand children, we have no dread of the employment of anæsthetics. We always have recourse to Charrière's instrument, as suggested by Robert, with which we have been sometimes able to chloroformize our patients in spite of their resistance. A mushroom-shaped sponge may be used, presenting an opening sufficiently large to allow a free passage of air when it is held before the mouth. We have never had to deplore a single accident from its employment. Extreme infancy is not a contra-indication. We have used chloroform in the youngest subjects; among others, for two cases of strangulated hernia in children of less than four months. Solely with the view of more conveniently examining diseased organs, we have in this way frequently put children to sleep, who, suffering with affections of the eye, obstinately refused to open their lids. We have resorted to the same means in investigating some cases of very painful coxalgia.

Finally, we must express our great appreciation of the use of chloroform in certain operations which are accompanied with severe pain, and which especially demand precision in their execution; lithotomy, for example. Once the young patients are asleep, whether they be so partially or perfectly, we must take every precaution to hold them securely while we proceed with the operation; for, though insensible and not conscious of pain, they may nevertheless make sudden movements and thus disturb the operator.

It is worthy of remark that at the moment of the execution of the operation on children the task claims from the surgeon the most exact knowledge of anatomy, for the region being of less extent, and the spaces smaller, we are often obliged to limit the incisions, and to give them only such dimensions as are absolutely necessary. The neck of a child of two years, for example, upon whom tracheotomy is to be performed, does not allow of the same field for action as in the adult. The incision of the perineum, in a patient of the same age, demands more care on the part of the surgeon in the performance of lithotomy. We should, in short, be well persuaded of a fact, of which many persons seem ignorant, that operations are more difficult in children than at a more advanced age.

In some cases, we must deviate from the principle that recommends us to operate slowly, for children do not bear pain for as long

a time as adults, and loss of blood is generally more dangerous. It is almost always advisable, therefore, to remove the tonsils very rapidly. Sometimes it is of importance to perform tracheotomy speedily to prevent the patient from dying on the surgeon's hands, especially if the veins are opened and serious hemorrhage results. For these reasons, the anatomical knowledge of the operator should be positive, in order to allow him to act with perfect confidence.

3. *After-treatment.*—The first local attention to be given to those operated on includes the application of the ligature and torsion of the vessels. When but few ligatures or but little torsion have been used after a large amputation or the extirpation of a tumour, which has involved a large loss of substance, we believe that it will be best—as confirmed by our own experience—at our leisure, to make the dressing a half hour or an hour after the operation. This rule, laid down by Dupuytren, has the great advantage of affording time to the circulation to re-establish itself, and prevents hemorrhages, which so often come on a considerable time after the dressing, and necessitate changes in it—a very painful procedure for adults, and still more painful for children. If, after certain operations, we should consider it advisable to tampon the wound with perchloride of iron, it should be combined with equal parts of water, to avoid gangrene of the wound. We should invariably aim, in all our operations, to secure union by the first intention.

Faithful to a rule suggested in the first instance for certain operations by Dupuytren, and afterwards generalized by Lisfranc, we have nearly always dressed our patients afresh the day following the operation. This practice, in which only the charpie and the linen covering the wound are removed, and the bandages and the stitches are left undisturbed, obviates numerous accidents, such as, in the first place, erysipelas, by not allowing the charpie, impregnated with blood and serum, to remain in contact with the skin; the retention between the edges of the wound of the suppurative discharge, if it has been already formed; and the contraction of the wound, if the points of union are too numerous or too tightly pressed together, for we can then raise or loosen them. By this half-dressing, made on the day after the operation, we may often discover the cause of a fever, for whose presence we may not otherwise be able to account. If there be erysipelas, we may use collodion, which, in the traumatic form of the disease in children, has often

proved successful in our hands. This application, employed externally at once, with the internal use of the alcoholic tincture of aconite-leaves in divided doses, fifteen to twenty drops in the twenty-four hours, has sometimes prevented purulent absorptions, an accident of sufficient rarity, it is true, in children, but one which has come under our observation. If the wounds become pale and grayish, the application of charpie steeped in solution of chlorinated soda has been found of service. Pure lemon-juice has succeeded in giving by the next morning a healthy appearance to a wound of an unpromising character.

But if the local treatment we have just indicated, and the frequent or occasional renewal of the dressings, according to the increase or diminution of suppuration, be of great importance to the success of operations, the general after-treatment is, in a majority of cases, still more essential. Usually, when there is no supervention of convulsions—and this is an accident which we have rarely observed, even after the most serious operations in children—or there are no special indications, we would do well to attend to the nourishment of the patient from the very day of the operation. On the first day, children nursing should be given the breast in preference to the bottle, should this be possible, and as much or as little food of this kind should be given them as they may desire, but they should only be nursed every two hours. For other children, it is proper to commence by some fluid nourishment, on the first day giving them milk or broth, and after the succeeding day soup, wine, etc., gradually bringing them back to the diet to which they have been accustomed. To this may be sometimes added tonics, chocolate, coffee, and often cinchona in its various forms.

This diet has seemed to us indispensable, except when there exist internal diseases which attack the patient consecutively, and which demand on the part of the surgeon a ready medical knowledge, so that he may not overlook these affections, and may properly combat them. Without this there is but little success in surgery. We should not, then, lose sight of the fact that before an operation we must be physicians, surgeons in its performance, and at last physicians again to cure the patient and bring to a successful result many of our surgical operations.

Finally, all the means we have just extolled may fail, if we neglect the hygienic surroundings of our patient. All things

being otherwise equal, children who are operated upon in the city, with parents in comfortable circumstances, and who occupy chambers well aired and well warmed, according to the indications, are in better condition for recovery than those on whom we operate in hospitals, where numerous patients are brought together in the same ward, the atmosphere of which is more or less vitiated, whatever may be done to avert it. It is always possible in town, when the accommodations will admit of it, to make a change for the patient from one room to another. This will give an excellent opportunity to renew the air alternately in the room which he has just quitted, and which he will re-enter when thus purified and warmed, or not, according to the season.

CHAPTER II.

CERVICAL ADENITIS.

ADENITIS of the neck in children is met with so frequently in practice, and so often leaves frightful traces of its invasion, that I deem it expedient to speak of this affection, which is, unhappily, too often seen either neglected or badly treated. Enlargements of the lymphatic glands of the neck, whether in front, at the sides, or on the posterior portion, are sometimes symptomatic of wounds or blows on the scalp or on the face. They are very often the consequence of various affections of the skin of the head or of the face. Occasionally, we can only trace the cause to some disease of the mouth, lips, teeth, or throat. Finally, they may be symptomatic of a more or less lymphatic constitution.

Whatever the causative condition may be, whether general or local, the indication always is at first to attack the cause. If it be a small wound of the head or of the face, we must attend to the wound; if an eczema of the scalp, we must subject it to the proper treatment; if a diseased tooth, and in such a case the glandular enlargement will be seated in the neighbourhood of the upper or lower jaw, the tooth should be extracted. If the cause be a general one, such as a lymphatic constitution, the indication is to prescribe the appropriate remedies. In every case, we must at the same time act

locally, either to obtain the resolution of the swelling, or to promote suppuration from it, or to modify the induration, which is a frequent termination of cases of adenitis.

The local symptoms of this affection are sometimes acute, and progress rapidly; at other times, their course is slow or chronic. In all cases we may recognize three stages: 1. Swelling, redness, and increased sensibility over the seat of the ganglions, and, as constitutional symptoms, more or less pronounced fever and *malaise*. 2. Pain, more circumscribed, with augmentation of sensibility, diminution of volume, and often appreciable fluctuation, coming on with more or less rapidity; spontaneous openings, disintegration, fistulæ, irregular scars, slow in their formation; sometimes ulceration of long duration, and more or less disfiguring cicatrization. 3. Diminution of pain, without any notable amount of suppuration, induration, varying in degree, and terminating in a tumour, which gradually disappears by resolution. Finally, the swelling sometimes remains stationary, hard, and free from pain, and may even pass into an enchondromatous condition, but this is only met with in exceptional cases.

1. *To obtain resolution*, we no longer rely, as formerly, on repeated applications of leeches, and if, under exceptional circumstances, they seem to be indicated, we should only venture to have recourse to them in cases of adenitis arising from local causes, such as a wound or contusion, and in a person who was not constitutionally lymphatic; otherwise, we should fear that we would obtain only a temporary relief for a few days, while we would retard suppuration, and in all cases weaken the patient.

We depend rather on resolvents, such as the pure Neapolitan (mercurial) ointment, combined with extract of belladonna; or else, to replace the mercurial ointment, we would advise the employment of an ointment of calomel. The iodized ointments have not answered so well, but it is always necessary, in using these remedies, to associate them with glycerine, and to observe if they produce redness of the delicate skin of children, when their further use must be suspended and only resumed at a favourable opportunity. Sometimes emollient poultices, made especially of marsh-mallow flour, are of advantage; but if any objection exists to their use, wadding, and even sheep's wool with the grease on, which contains the salts of soda, may be substituted for them. Layers of

pure tincture of iodine applied with a pencil every other day may hasten the resolution of the swelling. This method is often to be preferred to poultices, which may become sour or grow cold. Such are the means to be adopted to prevent suppuration and induration from occurring.

2. *To hasten suppuration.*—When the process of suppuration is fairly established, we can no longer rely upon the use of resolvents. Sometimes, but rarely, blisters may succeed in aborting the abscess. We content ourselves then with emollients, usually in the form of general baths and greasy and ripening cataplasms. Finally, when fluctuation is evident, even before the skin becomes red, we, in common with many of our professional brethren, are favourable to opening the abscess, to prevent spontaneous openings, sometimes multiple, which lead to disintegration of the skin and to frightful scars. We do not absolutely reject the use of the knife, for there are some cases in which we have recourse to it, but we greatly prefer a procedure extolled by MM. Alquié and Bonnafont, namely, the filiform seton, which leaves no traces of the operation. We take for this purpose three or four silk threads, which we pass through the abscess by means of a fine flat needle, in the proper direction, that indicated for the incision, in such a manner that one of the punctures shall be more sloping, and the threads shall be in the direction of the folds of the skin, or following the direction of the muscular fibres, those of the sterno-mastoid, for example. When the little seton, which is tied over as soon as it is passed through, is introduced at the time when fluctuation is evident, the pus will be seen escaping from the punctures, and its flow may be increased by means of pressure. The application of poultices must be continued, and care taken every day to move the thread. Under this treatment the abscess discharges itself in a few days. The seton should be withdrawn when there is no longer pus or swelling, for if any tumefaction still exists, its presence hastens the softening of the hard part of the abscess. There remain after this but two punctures, which, at a little later period, leave no traces.

3. *To remove induration.*—When, in certain cases, the adenitis terminates in induration, we resort to all the resolvents already suggested, iodized ointments, compound plaster of mercury, etc.

But if these remedies fail, even when associated with the internal administration of the preparations of iodine, we may employ with advantage the seton applied in several places to bring on inflammation and suppuration. We have obtained in this way, by four or five little setons, the suppurative discharge of these chronic cases of adenitis. When enchondroma results, extirpation is the only remedy.

All that we have just said applies to cases of superficial adenitis; but we may add that we have seen quite a number of instances of the same affection deeply seated, even in children at the breast, and other surgeons have mentioned such cases to us. Dr. Fleming and MM. Velpeau and Bouvier have reported similar cases. We have treated several in which the deep ganglions, after being inflamed, commenced to suppurate and to form abscesses along the larynx, the trachea, and occasionally behind the œsophagus and the pharynx. True retro-pharyngeal abscesses may be recognized by a general tumefaction of the neck, which sometimes is more marked on one side than the other, and is occasionally seen on the side of the pharynx. The patient has fever, sometimes delirium, great suffering in moving the neck, difficulty in the use of the voice and in deglutition, and often the inconvenience is so great that asphyxia results. When the patient is old enough to speak, he has a snuffling voice similar to that met with in children with enlarged tonsils. Children have even been brought to me for the purpose of removing their tonsils, who were really suffering from retro-pharyngeal abscess. In examining the little patient, depress the tongue, and, if the abscess is in the median line, a reddish, smooth, fluctuating tumour will be detected.

At other times these abscesses, giving rise to a prominence over the lateral portions of the larynx, cause the sterno-mastoid to bulge more or less outwards. In such cases emollients in the form of general baths, and poultices around the neck should be applied at the beginning; but as soon as fluctuation is evident, incisions should be made at once, either along the sterno-mastoid, or in the back of the throat over the posterior wall of the pharynx. By such operations the lives of patients are sometimes saved who would otherwise die asphyxiated. Very often these abscesses, being opened, empty themselves completely, and the sufferer is cured without a relapse.

We must not confound these purulent collections which progress

quite rapidly, with those that are symptomatic of caries of the cervical vertebræ. The latter are developed much more slowly, are always preceded with a different set of symptoms, especially connected with the bony tissues, and are much more serious in their character on account of the destruction of the articulations or of the vertebræ themselves, which are the source of these abscesses.

We need make but brief mention of tuberculous deep-seated lymphatic ganglions, which are developed in the course of the larynx and the trachea. These tumours, scrofulous in their nature, of varying consistence, and having a chronic course, are met with in the form of a string of beads on the lateral portions of the respiratory canal, along the great vessels of the neck. They are more or less voluminous and numerous, having the consistence of raw chestnuts or softened horse-chestnuts, and are often confounded with the bronchial glands, which they resemble.

Surgery has sometimes endeavoured to remove these degenerated tumours, in order to relieve the patient from the asphyxia which may have resulted. Such operations, which should be rarely attempted, may in the course of their performance expose the sufferer to the greatest dangers, and are often left half finished. It is much better, then, almost always, in this class of cases, to refrain from the use of the bistoury, and to restrict ourselves to general anti-scrofulous remedies.

CHAPTER III.

PHIMOSIS.

Contraction of the prepuce is the most frequent of all the vices of congenital conformation. In certain countries it brings with it so many inconveniences, that the lawmakers of the Jewish people did not hesitate to make circumcision a religious practice. Phimosis is not met with less often in our own country, and some surgeons, reasoning upon the advantages derived by the Israelites from this operation, favour its introduction with us under pretence of its being a hygienic measure—a view of the subject we do not now propose to discuss. We are aware, however, that certain

practitioners too persistently refuse to adopt the curative treatment of this infirmity.

Phimosis presents itself under varied aspects, the prepuce being sometimes long and contracted, at others short, but invariably contracted. When the orifice is very narrow, the urine accumulates between the glans and the prepuce and dilates it, and the child will make considerable effort to facilitate the outlet of the fluid. In such a case, a small quantity of urine remains confined, and provokes repeated inflammation of the mucous membrane, which may lead to the production of secretions or false membranes, resulting in the adhesion of the glans and the prepuce. Even when the opening of the prepuce leaves the meatus urinarius free, all danger has not passed, although micturition may be accomplished without any obstacle. The child is sometimes led to expose the glans, and though ever so little of that organ is left uncovered, strangulation occurs and produces paraphimosis.

If the narrow prepuce generally becomes gradually dilated in proportion to the development of the child, this is far from always being the case. When the prepuce is long and its opening very narrow, there is no chance of the orifice opening naturally, and of eventually allowing of the uncovering of the glans. The orifice may not be very seriously contracted, and yet the secretions may often produce and become the exciting cause of balanitis. Finally, we may add, that all glands habitually covered are more impressible and more susceptible to herpetic or venereal inflammations.

With the probability of such accidents occurring, we should be to blame if we failed to act promptly. In our own practice, just as soon as we have recognized the existence of balanitis, we do not hesitate to operate for phimosis, even in cases in which the opening of the prepuce only allows the partial exposure of the glans, and renders the child liable to paraphimosis. Still another circumstance that induces us to operate is when we have reason to suspect the patient to be guilty of masturbation. The operation, in such cases, has a great effect upon the *morale* of the little sufferer, at the same time that it renders it impossible for him to handle the organ for several successive days. If this practice has not always attained the object proposed, it has succeeded sufficiently often for us to recommend our professional brethren to follow our example. The operation for phimosis may be performed

at all ages, although we rarely do so before the fourth or fifth year, because only at that period will it be possible to judge whether the opening of the prepuce is likely to enlarge sufficiently to uncover the glans.

The surgeon may choose between two principal modes of operating, circumcision and simple division of the contraction. When the prepuce is excessive, we should resort to the former; when it is not too long, the latter method is preferable.

For circumcision in adults, we may employ indiscriminately the plans of MM. Ricord and Vidal (de Cassis), or that of M. Chassaignac; in children we generally prefer the procedure of M. Bonnafont. This consists in introducing into the orifice of the prepuce a dilator, which allows of the opening and dilatation of the prepuce, and then with scissors making at a single sweep a section in front of the glans. By this mode of operating, surface is saved, the skin of the prepuce and the mucous membrane which borders upon it are cut off on the same line, and the glans freely exposed. We next place *serres-fines* in greater or less number, in order to reunite the skin with the border of the mucous membrane. In the course of twenty-four hours, we may frequently obtain union by the first intention, and be able to remove the *serres-fines*. If the first application of these requires any length of time, it will be well to chloroformize the patient, and to prolong the anæsthesia until they are properly adjusted. If any reason exists for not administering chloroform, the time spent in applying the *serres-fines* may be so protracted, that we may be satisfied with using the following dressing. By means of a fenestrated linen compress, cut in the shape of a Maltese cross, presenting in the centre a hole large enough to engage the glans in it without strangulation, we may push back the prepuce behind the base of the glans, next applying over it a circle of charpie, leaving the glans always exposed, and finally a new compress open in the centre, which allows all the dressing to be thrown still further back, the glans being exposed all the time without any risk of strangulation. A suspensory bandage completes the apparatus. With this dressing the patient can urinate without wetting the coverings, whether he be standing or kneeling. It is important that the dressing should not be disturbed until the lapse of forty-eight hours, when the child should be put in a bath, and the various pieces gently detached, while the patient is in the water, to prevent pain. We rarely obtain a rapid cure,

and, until perfect union takes place, we should daily renew the dressing with great care, lest the prepuce should return upon the glans. In neglecting this precaution, we have reason to fear a recurrence, which may demand a second operation. The surgeon can always avoid this danger by personally attending to the dressings; as at best they are painful for children, the latter are apt to be awkwardly handled by those who are unaccustomed to surgical work and fear to make them cry. These are especially the attentions subsequent to an operation, which have much more to do with its success than the precise method of operating to be adopted.

When the prepuce is not too long, it is unnecessary to perform circumcision. Division of the contracted prepuce before or behind, along the frænum, leaves deformities; it is better, therefore, to multiply the incisions, or else make a triangular excision of a portion of the prepuce in the following manner: Pass one branch of an artery-forceps under the prepuce as far as the base of the glans, then make two incisions with the scissors in such a way as to circumscribe a triangle on the dorsal face of the prepuce, the summit of the triangle corresponding to the corona of the glans and its base to the edge of the prepuce. In this way we get a large incision, which gives an oval-shaped opening to the orifice of the prepuce; the dressing is then applied, either with *serres-fines*, or with the apparatus previously referred to.

We have recommended these operative procedures as being those which have appeared to us to succeed best with children, without, however, rejecting those advised by MM. Ricord, Vidal (de Cassis), and Chassaignac, each of which has its value, but which we consider much better adapted for adults. We may add, to complete this subject, that there sometimes exists in children suffering from phimosis quite a common complication, even where the opening of the prepuce is considerable, in the shape of adhesions, which are developed between the glans and the internal face of the prepuce. They are usually very slight, and very easily broken up, and can be separated, with great facility, with the blunt extremity of the forceps or the closed scissors.

It frequently happens in children, the orifice of whose prepuce is not completely contracted, that those who are guilty of masturbation sometimes retract the prepuce behind the base of the glans, and cannot get it back again. This constitutes paraphimosis. We always commence our treatment by reducing this complication

before resorting to an operation for phimosis. This reduction has nearly always been effected most easily by following the plan recommended by Dupuytren. This process consists in surrounding the whole penis, the glans and the collar-like swelling formed by the prepuce, with a compress smeared with cerate or oil, grasping with expanded fingers also the compress which already embraces the organ, and squeezing gradually, while restoring to itself the constricting ring of the prepuce, which passes over the glans; the latter being compressed takes a conical form which allows it to re-enter at its place of departure. Compresses steeped in cold water, and lotions of bran and water, may be used to cause the disappearance of swelling in the parts. This method is a painful one, but, on the one hand, it allows of complete reduction, and on the other the pain it gives rise to will always serve as a lesson by which the child may profit and be cured of a vicious habit; but at a later date it will often be necessary still to resort to an operation for phimosis.

CHAPTER IV.

FRACTURES.

Fractures, or solutions of continuity of bones, are of nearly as frequent occurrence in childhood as in other periods of life. They are divided, as in adults and old people, into direct or indirect fractures, fractures of the body of the bone, of its extremities, and those involving joints. They may be transverse, oblique, longitudinal, simple, complicated, and comminuted. We have never yet seen a case of angular fracture, as described by M. Gosselin, and if it occurs in childhood, it must be less frequent than in adults. But the bones of children, not having reached a period of complete ossification, present us with another variety of fracture called the incomplete. We include under this name two conditions, which differ in their pathological anatomy; in one, the bone is curved and breaks like a stick of green wood, that is to say, it is fractured in only one-half of its cylinder; in the other it is entirely broken, and yet the fracture remains incomplete. This is due to the fact that the periosteum, being more or less completely pre-

served, retains the fragments in their relative positions, which, so long as external violence or unskilful manipulation do not complete the fracture of the bone, or tear asunder that portion of the periosteum which supports the fragments, the too feeble muscular system of the child cannot alone overcome. We now understand the full importance of this fact. The frequency of incomplete fractures in children explains the comparative infrequency of overriding of the bones, and of changes of relation between the fractured surfaces, a condition decidedly favorable to the rapidity and regularity of consolidation, to which we are accustomed in young subjects.

A long experience has taught us that children suffer from fractures quite as frequently as old people. The comparative study of *predisposing causes* sufficiently accounts for this equality of frequency. Thus, if we look at the texture of the bones, we find an important analogy in the two extreme periods of life. In children, as in the aged, the medullary canal of the long bones is larger, and the walls of the shaft are more delicate; but whilst the osseous tissue is dry and fragile in the old, it is soft and flexible in children. The physical properties of the bones of the latter would seem to give them more power of resistance to fracturing causes: this is nothing, however, for experience shows that the bones of children, in spite of their suppleness, can only to a very limited extent be bent without breaking. Another predisposing cause, common to children and old people, is found in the feeble condition of muscular power in both classes. These are the two ages at which there exists the greatest liability to falls, and, for this very cause, to fractures; for they do not know how to support themselves, or else they yield to falls, or cannot resist external violence. In adults, on the contrary, the muscular mass may rather deaden the effects of direct causes; the muscles may contract to resist these, but their contraction, while preventing falls, may also produce fractures. So also falls lead to accidents more frequently in adults than in the young and the aged, who, like paralyzed people, may, in falling, avoid certain fractures. We may remark, too, that the majority of accidents occur to children and old people; this depends upon the rashness of the one class, who are not conscious of danger, and to the want of reflection of the other, who, forgetting that years have diminished their strength, and slackened their pace, cross the street in the midst of passing vehicles.

Among the special predisposing causes of fractures in childhood, we may particularly mention rickets, an affection of frequent occurrence in very young children, who, owing to their debility, are more liable to falls, and in whom the osseous tissue is more likely to become fractured. We have not referred to scrofula as a predisposing cause of fracture, and, in fact, the osseous tissue of scrofulous patients has the same density and solidity as that of healthy individuals, as long as it has not become the seat of the manifestation of that diathesis. As a general rule, every constitutional disease will predispose to fractures only when the morbid principle shall have attacked the osseous system.

If we pass now to the *exciting causes*, we recognize the long list of violent agencies which standard writers have indicated in the fractures of adults. We must put falls in the front rank of causes, on account of the uncertain step of the youngest children, and of the sports, the races, and the wrestling of those more advanced in years.

With regard to the *special bones fractured*, in seventy or eighty cases brought to our attention in a year at the hospital, we have established the fact that those of the thigh were much the most common, after which, in order of frequency, come those of the forearm, the elbow, and the humerus, the tibia alone, sometimes the fibula, and finally the clavicle, the ribs, and the jaw. Fractures of the patella are very rare, but three or four cases having come under our observation. In the arm, we meet with fractures of the body of the bone, but frequently the inferior part of the humerus is divided obliquely or longitudinally, in such a manner that the epitrochlea and epicondyle become detached. These fractures are often intra-articular.

The middle portion of the bones of the limbs is usually the seat of the lesion, and we desire to draw more particular attention to a point connected with fractures of the forearm, which is fractured by preference at its middle or superior portion. Contrary to what takes place in the adult, we rarely meet with fracture of the inferior extremity of the radius. The cause of this inversion of frequency has appeared to us to depend on the entirely different manner in which children and adults resist external violence. In a fall, the latter throw out their hands instinctively to save themselves to the extent of their ability, and an indirect fracture of the radius at its lower extremity is thus produced. Little children, on the other hand,

fall in such a manner that the upper extremity strikes directly on the ground, or on some hard substance; the fracture is thus often produced from a direct cause, and sometimes only affects the ulna.

It is a fact worthy of mention that fractures of the neck of the femur are extremely rare, and we have only observed the epiphysary separation of the head of that bone, and this very rarely. As all varieties of fracture occur in children, they should present, and indeed do present, all the signs characteristic of fractures in the adult. Nevertheless in children they seem less prominent to the eye than in adults and old people, mainly by reason of the smaller dimensions of the limbs and the greater infrequency of deformity. This is especially true of incomplete fractures.

Crepitation is sometimes absent, when the bone is completely broken, and the periosteum supports the fragments. If, however, this symptom is present, it is more obscure than in complete fractures; but there is also pain, sometimes more or less swelling, and always suffering in the movements of the limb and abnormal mobility, for the portion of bone fractured and retained by the periosteum may experience a greater or less amount of flexion.

In complicated fractures we may have wounds, even the projection of fragments, and yet have to deal with an incomplete fracture. In such a case the periosteum will have been torn in several places by the points of the broken bone, but it will still have sufficient power of resistance to support the fragments by several points.

Be this as it may, in simple fractures, we must seek the place where pain is at its maximum; it is at this spot that we can recognize mobility and crepitation. But frequently children cry and become petulant the moment they are touched, and then it becomes impossible to estimate accurately the influence of pressure upon the pain. In such a case we cannot too forcibly recommend the surgeon to be delicate in his explorative manipulation; for independently of the fatigue occasioned to the young patient, we run the risk of breaking parts which have been incompletely divided; in other words, of transforming an incomplete into a complete fracture. It is much better to remain in doubt. We thus see how difficult it sometimes is to diagnosticate a fracture in a child, for frequently there is no deformity, no crepitation, and consequently an impossibility to form a correct idea of the seat and intensity of the lesion, leading in many cases to a very laborious and often incomplete investigation. Added to this, if the child is intractable, the

firm and solid condition of the cellular tissue which covers the injured parts obstructs the exploration. Nevertheless, this is not always the case, and in many instances, the fracture may be recognized at a glance, if deformity exists—as it does in a sufficiently large number of cases—or is produced when the surgeon slightly bends the bone supposed to be broken.

Fracture being recognized, what is the *prognosis?* We do not hesitate to say that when it is simple, it is an accident of but little importance; and as a general rule we should encourage the parents, letting them know that fractures at that age are not of equal gravity with similar injuries observed in adults and old people. At a middle period of childhood, consolidation is effected in eighteen or twenty days; but in the new-born it may take place in fifteen days. Simple fractures, when the patients are in good health, usually unite with perfect regularity, without apparent shortening, provided, however, that the treatment has been judicious. The case is modified by time, as is proved by the fact that when we receive visits from conscripts at the period of re-examination, who seek from us certificates testifying that we have treated them at an earlier date for fractures of the thigh, we cannot decide, in many cases, that any fracture has ever existed, although the records prove that they were treated at the hospital. Nearly all of these young people are considered to be fit for military service.

When there is shortening of the femur, at the removal of the dressing, for example, it soon ceases to be apparent, and can only be detected by the most accurate measurement. If it be otherwise, the individuals affected are not lame for any length of time, for they soon accustom themselves to balance the body in walking by a corresponding deviation of the pelvis. In a little girl, four years of age, who was under treatment for twenty-five days in 1858 for a fracture of the thigh, it was impossible in 1860 to find the least trace of the lesion. When we have happened to see children mutilated by the wheels of machinery or crushed in the streets, we have established to our own satisfaction that, all things being otherwise equal, complications are attended with less danger at this than at any other period of life.

When the fracture is complicated, whether it be with necrosis, or elimination of sequestra, the process of healing is much more rapid than in adults. If the complication is general, and attended

with any acute affection, debility, diarrhœa, etc., then the work of consolidation is more tedious, and the prognosis often grave. A boy died of smallpox thirty days after the accident, by which his thigh had been fractured, and the autopsy did not reveal the slightest commencement of consolidation. If the fracture takes place in a scrofulous subject, who does not at the time exhibit constitutional symptoms, the prognosis will not be more unfavourable than in any other case. If, however, a contrary condition exists, especially if the osseous system is attacked, the prognosis will be more serious.

In those affected with rickets, consolidation may occur very rapidly, and callus is found to be formed with them as promptly as in better constitutions. Sometimes, on the contrary, rickets really retards the union of the bones, and this difference seems to depend on the stage of that affection. If the fracture occurs during the last stages of rickets, the callus will form rapidly, as in healthy children, while consolidation may be postponed an indefinite time, if the disease is at its commencement, or in its first or second stages.

Just as in adults, we sometimes in children meet with fractures which will not unite, without our being able to discover the cause. We had in our wards a little girl whose leg had been amputated for pseudarthrosis. We made, as might be supposed, numerous attempts to cure it before resorting to extreme measures, including the immovable apparatus, the cautery, in the form of needles heated to a white heat, introduced between the unconsolidated osseous extremities, setons, scraping of the ends of the bone, and perforation of the extremities by the method of Dr. Brainard, of Chicago. These serious operations were performed without accident, but also without any decided result. We compelled this child, so to speak, to walk with a mechanical apparatus for two or three years. At the end of that time, the parents, as well as the child, who was tired of the apparatus, requested the amputation of the leg. This was successfully accomplished, and she now walks very well with a wooden leg. (This is the patient presented by us to the Société de Chirurgie, and referred to by M. Bouchut in his work.)

The *treatment* of fractures in childhood may be surgical, hygienic, and medical.

The *surgical treatment* will present three phases, depending on

the nature of the fracture, whether it be doubtful, simple, or complicated. We all know how easy it is not to recognize a fracture, when being incomplete there is absence of deformity and crepitation; when in the vicinity of an articulation, the abnormal mobility is not so striking; when in the leg or forearm, but one of the two bones is fractured, and the other acts as its support; or else, finally, when the surgeon, being summoned too late, a considerable amount of swelling has taken place. Our advice would be to act as if a fracture existed, to put on a retaining apparatus at first, and employ the proper means to cause the disappearance of the swelling, if there be any. It is not troublesome to apply the apparatus, and indeed, several days afterwards, the surgeon can examine the limb, and make out his diagnosis with precision. If he finds a fracture, he continues the treatment he has commenced. If the case is a simple contusion, with tumefaction, the bandage which has already been applied will be found serviceable by its moderate compression, in causing the more rapid disappearance of the swelling. Whatever the condition may be, we should content ourselves with such symptoms as are indispensable to the diagnosis of fracture, and not seek to establish the presence of all; for, in addition to the dangers of which we have already spoken, irritation and suffering may be caused the little patient by unnecessarily moving the limb.

The fracture being recognized, is reduced, as in adults, and often more easily. And it is here the proper place to inquire whether fractures in children can be treated by position alone, or demand the early application of apparatus. The want of docility in children but rarely allows us to dispense with the use of the latter. The employment of retaining apparatus appears to be indicated in almost all cases, for children generally pay but little attention to what is said to them, and move and are restless in spite of the pain which their movements cause them, and thus, among other accidents, run the risk of breaking up adhesions which might retain the fractured surfaces in contact with one another. Besides, it is by no means rare, as a sequel of fractures, to see convulsions occurring, and even in rare cases, tetanus, when they are accompanied with wounds. It will always be well in such cases to apply apparatus that will render the fragments perfectly immovable, and not to depend on position alone. The application of apparatus will also be invariably of service, even when employed as speedily as possible, if only for the purpose of preventing accidents, relieving

the anxiety of parents, and giving a feeling of security to the surgeon.

But should the apparatus be applied immediately after the occurrence of the fracture, or would it be better to delay? Dupuytren had recourse to it as soon as possible, to avoid the very accidents of which we have just spoken, and to give confidence at once to the patient, who having arrived at the age of reason, awaits not without apprehension the application of apparatus. At first he used only moderate compression, and he did not hesitate in the evening to take off an apparatus which had been put on in the morning, and which gave the patient annoyance. Every day he paid an evening visit to the hospital, frequently with the view of examining patients on whom such dressing had been applied in the morning. Lisfranc, on the contrary, removed the bandages only at the end of several days, and during that time employed externally refrigerants and emollients. We adopt the course recommended by Dupuytren, and unless special indications exist, we think it at least prudent to give immediate support in the fractures of young people, especially by the application of but moderately tight apparatus.

The treatment of complicated fractures is the same as for adults. If there be only a slight amount of contusion, we should immediately apply apparatus, being careful not to make it too tight. If the swelling is considerable, we may modify the dressing by omitting one or two splints, carefully giving the limb a correct position, and covering it with compresses steeped in some resolvent liquid or cold water. When the fracture is complicated with a wound, we must first combat inflammation by the appropriate remedies, depending mainly on cold water, and apply the apparatus modified in such a way as to leave the wound open, according to the plan of Scultetus or Seutin, making over the wound only a simple dressing, which may be taken off every day, and the linen soiled with pus removed. When the fracture is accompanied with serious mutilation of the soft parts, we prefer to every other method of treatment continuous irrigations, which we must check gradually, for we have every reason to fear the effect of sudden suppression of refrigerants applied over the wounds of young patients. It may be remarked that the most extensive mutilations are more easily cured in children than in adults.

There remains for discussion the very serious question to decide, when a fracture demands an amputation. We know that in

adults it is necessary to resort to such an operation, when the articulation is largely opened; when the limb is crushed and fractured in several places; when the wound is extensive and communicates with the seat of the fracture, and may thus give rise to a long suppuration and consequently exhaust the patient; and when, even before inflammatory symptoms have had time to declare themselves, gangrene comes on, involving a large extent of surface. In children, we follow the same indications, and in cases where there is reason to fear a fatal termination, we need have less hesitation to operate than in adults, for amputations succeed infinitely better with our little patients. We have frequently had cause to regret that we did not decide promptly in favour of amputation in certain cases in which the limb was almost pulverized. Dilatory amputation has not succeeded in our hands; in a word, when the indications are to operate, we prefer primary amputation after accidents rather than delay. Such was the opinion of Dupuytren. We make an exception to this rule in cases in which the fingers and toes are crushed, for in some instances we derive advantage from the employment of cold irrigations, prolonging their use until the complete separation of the parts, which may have been bruised almost to the point of mortification. We have thus been able to save portions of fingers, which have afterwards been of real service to their possessors.

Let us now examine into the proper method of reducing fractures and of maintaining the fragments in apposition in children. We will not dwell here on the manner of proceeding to effect extension, counter-extension and coaptation, which are similar to those employed in the adult. Fractures in children present this specialty, that but little force is required to overcome displacement. Even in those of thirteen or fourteen years of age, moderate traction is sufficient to reduce it. In addition to this, as we have already said, in young children the fragments have but little tendency to become displaced. The fracture being reduced, or not requiring it, we apply either the movable or immovable apparatus. We prefer the former in all those cases in which we desire to inspect the seat of the fracture, as we sometimes have to do, not only in complicated fractures, when the soft parts have been divided or there is reason to fear the reproduction of displacement, but also in simple fractures. There is still another motive for our preference for the movable

apparatus in children, founded on the fact that when the fracture is seated in the inferior extremity, the apparatus is frequently soiled by excrement and by the urinary discharge. If in such cases a starch or plaster apparatus be used, it becomes soaked and irritating to the skin, and sometimes becomes softened and fails to fulfil the indications.

When the dressing is removed, either to be changed, or to ascertain clearly the condition of the parts, much less difficulty is experienced in children than in adults in maintaining the fragments in their proper relations to one another. The slight volume of their limbs is more favourable to freedom from movement while the dressing is being changed, than in larger persons. If the proper precautions be used, there is no danger in examining the injured parts, if they are again covered by the dressing; and we are enabled to see if any eruptions or excoriations exist, and, finally, to determine the state of the callus, which may be made more regular if necessary. This active inspection should not be neglected in young people, for with them especially the skin is easily wounded by the apparatus, and such wounds may be the exciting cause of grave accidents, such as erysipelas, and deep sloughs, the abundant suppuration from which may retard consolidation.

In all cases, on the contrary, unaccompanied with wounds, when there is no reason to fear displacement or the contact of a liquid that may soften the apparatus or prevent it from becoming firm, we do not discard the immovable apparatus. We have recourse to this method of retention, when the inconveniences already mentioned are no longer to be dreaded, and this fact sufficiently explains why in the same patient we sometimes commence the treatment with the one apparatus, and finish with the other. By way of recapitulation, we may say that we prefer in the great majority of cases the movable apparatus, which allows us, at least two or three times during the treatment, to take a view of the fracture, and, in case of necessity, to modify the formation of the callus, and more certainly prevent shortening.

We will now pass rapidly in review the method of application in our wards of the various forms of apparatus adapted to the treatment of different kinds of fracture. We will not specially describe each form of fracture, for such descriptions may be found in all the treatises on surgery; and the same is true of apparatus. We will

refer only to those kinds of apparatus which we believe to be most useful in the treatment of fractures.[1]

Fractures of the skull, the jaw, the scapula, the ribs, the vertebræ, and the pelvis, in children, do not require any special consideration.

This remark does not apply to fractures of the clavicle, which are far from being rare with them. These are generally incomplete, the periosteum and even some of the bony fibres having resisted the force of the injury. As with adults, so with children, several kinds of dressing have been devised for fracture of the clavicle. Of all these bandages, the most simple is that of Desault, modified by Dupuytren, which we have seen constantly used at Hôtel Dieu, and which we ourselves employ both in adults and children. It consists in, first, a wedge-shaped woollen pad covered with a sufficiently thin and half-worn material; secondly, two bandages, the breadth of three fingers in width, and five or six yards in length, and of a piece of linen large enough to surround the chest, the arm being applied along the trunk, the forearm being flexed across the chest. To apply it, we must proceed to reduce the fracture, by placing the patient in an upright position, or, better still, seated on a stool, if possible; then extend the arm of the side affected, placing in the cavity of the axilla the base of the pad, which is supported by an assistant, by means of tapes stitched to the anterior and posterior part of this base. We very often omit this, without inconvenience, in children. An assistant then lowers the arm on the pad, carrying the patient's elbow inward and applied along the chest. The upper extremity of the humerus is thus carried upwards, and the lower extremity forwards, while flexing the forearm, and placing it, with the hand flat, over the chest. We must previously powder the axilla, the forearm and the hand with starch.

The first bandage is designed to form turns which encircle the base of the chest while supporting the elbow, the forearm, and hand on that part. In the meanwhile, the assistant supports the elbow and carries it forward, pushing the humerus upward. The turns of the circular bandage should reach as far up as the insertion of the deltoid, so as not to press the upper extremity of the humerus inwards should the turns of the bandage be applied too high. The

[1] On this subject a work entitled "Traité des Fractures chez les Enfants," by Dr. Coulon, a pupil of my colleague M. Marjolin, published in 1861, may be consulted with advantage.

second bandage is applied in turns over and behind the chest, obliquely, passing from the elbow to the shoulder of the sound side, and strongly supporting the limb in this position, in such a manner, that after the application of this bandage, the shoulder of the side affected shall be powerfully elevated, and carried backward. In this way we fulfil the indications for reduction, and the shoulder draws upon the external fragment, which is the only movable one. In pushing the elbow forward, we cause the internal extremity of the external fragment to be carried forward, and we thus overcome its disposition to direct itself behind the internal fragment.

Under many circumstances, especially in children a few months old, or in the new-born, we content ourselves solely with bandages, suitably applied to hold the arm and forearm half flexed against the chest, the turns of which are kept in place by stitches, to prevent the apparatus from slipping. The Mayor bandage answers also the same end sufficiently well, and may be employed sometimes in place of the other forms of bandage. We have often used with success the sling of Delpech, and the apparatus of Desault, but when there is no overriding we omit the wedge-shaped pad, designed to furnish a point of support for the humerus, which acts as a lever on the scapula, and thus draws outward the external fragment of the clavicle. By not employing it, we avoid compression of the axillary vessels, as well as of the chest, which might be injured, especially in very little children.

In fractures of the middle portion of the arm, we use the ordinary roller bandage with three splints applied over the first turns of the bandage, which are commenced on the arm, keeping always the forearm flexed on the arm. We do not put splints on the internal aspect of the limb, for fear of compressing the vessels and nerves. The limbs of young children are rounded, without hollows or prominences, from which results the fact that graduated compresses are of no utility. We commence by surrounding the whole limb with circular turns, taking care to supply the bend of the elbow with a little wadding. Then, with the rest of the bandage we secure the splints by new circular turns. We may advantageously employ the immovable bandage, if there is neither inflammation nor swelling.

When the fracture has its seat in one of the humeral extremities, we content ourselves with making the limb immovable by a roller bandage. When the neck of the bone is broken, a body

bandage or circular turns supporting the arm on the thorax, as in fracture of the clavicle, fulfil very well the indications. In these last cases, splints would serve no useful purpose, for they would but imperfectly press upon the two fragments.—For fractures of the middle portion of the forearm, it is sufficient for us, as in the case of adults, to use compression in the direction of the interosseous space, with graduated compresses, and two splints, one on the anterior, the other on the posterior aspect of the forearm, supported by turns of a bandage, or else with three little strips of gum-resin plaster, applied above, over the superior portion below the elbow; below, over the wrist; and in the middle, between the two others. With this last dressing, we may inspect the affected parts without the aid of assistants and without disturbing the apparatus. We may even loosen a strip without removing the whole bandage, and thus expose to view the bare forearm between the bandages which support the splints.

If the inferior extremity of the radius is fractured, we should carefully incline the hand to the ulnar border of the forearm, either by the aid of the bandage or a strip properly applied, or by the elbowed splint of Dupuytren or that of Blandin.

Fractures of the elbow are observed frequently in young people, and deserve the greatest attention on the part of the surgeon. They are always complicated, for they only take place by the application of a direct cause. The swelling is soon so considerable that it is difficult to make a certain diagnosis. But the fracture being once recognized, what is to be done? When the joint is very painful, and the tumefaction very decided, it is prudent to apply leeches, and to neglect nothing that will prevent or moderate the effects of traumatic arthritis, always a grave affection in children. Taking this course of action, I have never seen a serious inflammation after external violence. Inflammatory symptoms once appeased, our attention is called to the fracture. The indications now are different, according to the seat of the solution of continuity of the bone. When it is the olecranon which is separated from the ulna, we maintain the forearm in extension formed with a pad and a splint laid over the arm and forearm; the triceps brachialis thus becomes relaxed, and the fragments experience less separation than in any other position. It is not necessary to protract for too long a time this extension, and in removing the dressing it is better to

accustom the joints to movements of flexion, and, as soon as consolidation is effected, to put the forearm in a state of semi-flexion.

In cases of forcible separation of the coronoid process we must, on the contrary, flex the forearm and support it by a sling, or, better still, by a series of figure-of-eight turns thrown from the arm to the forearm.

When the fracture of the elbow is multiple or comminuted, if attended with very violent contusion, or there is reason to fear that inflammation may lead to loss of movement of the articulation, we must place it in a state of semi-flexion, for in this position anchylosis is much less troublesome than if the limb is extended. The inflammatory symptoms having passed, we would do well to employ immovable bandages, not forgetting that after twenty-five or thirty days at the most, we must take off the apparatus and use every precaution to prevent anchylosis.

Fractures of the hand and of the fingers present the same points for consideration as in adults, and are treated in the same way; that is, by fixing the hand in a wooden scooped splint.

In fractures of the thigh, we frequently apply in very young children only a simple roller bandage with three splints, one of which is on the outside of the thigh, extending from the great trochanter above to the external condyle; another from the inside of the fold of the groin, to the internal condyle; finally, the third, from in front of the fold of the groin to the patella. These splints are placed over the first turns of the bandage applied around the thigh. The first turns cover the whole limb, on which the splints exert a moderate and regular compression; the second secure the splints. The application of the latter ought to be made with the greatest care, and we must particularly guard against their being placed over prominences of bones, for with young subjects pressure rapidly leads to gangrene of the integuments. The external splint should be long enough to reach beyond the iliac bone, to be included in the turns of the bandage or in a body bandage, and thus to serve as a support to the pelvis. By this method we avoid the applications of pads of bran which children so soon soil. After the apparatus has been adjusted it should be covered with a cerate cloth to protect it from the urine and from alvine evacuations.

If the child is already advanced in years, we give the preference to the apparatus of Scultetus, and we always employ the immediate splints of Dupuytren, applied over the first compresses which

surround the thigh and which do not interfere with the use of pads and of the usual large splints. To these immediate splints we owe the regularity of the callus both in children and in adults. At the moment of applying the small splints we must use every effort to obtain reduction and perfect coaptation. To complete this apparatus we must never neglect the employment of a body bandage, which should previously surround the upper portion of the large external splint, and afterwards encircle the pelvis, at the same time fixing it firmly by a number of pins or by stitches on that portion of the bandage which surrounds the external splint.

In fractures of the leg, we also apply three splints with a roller bandage, being careful to avoid pressure by them over the crest of the tibia. When there are no complications, and there is nothing to make us fear a subsequent displacement, we unhesitatingly employ from the commencement an immovable apparatus.

Fractures of the patella are rare in young children. Only three or four of these have come under our notice during our practice at the Hôpital de l'Enfant-Jésus. We have no special remarks to make on the treatment. The limb must be kept extended.

Fractures of the foot offer the same indications as in adults, in whom we attach the injured parts on wooden soles suitably stuffed. If the soft parts are divided, we have recourse to continuous irrigation with great advantage.

For all the forms of fracture, which we have just passed in review, we habitually wet all our bandages at the moment of their application, with a resolvent liquid, such as lead-water or camphorated brandy diluted with water, provided the fracture is not complicated with wounds.

At what period should we finally remove the apparatus? With the new-born, twelve days suffice for consolidation. For children of about two years, it is more prudent to keep the limb immovable for twenty days; for those between twelve and fifteen years of age we should, as a general rule, retain the apparatus for twenty-five days. After this time we rarely meet with an unconsolidated fracture, though we sometimes observe this in fractures complicated either with local or general causes. Consolidation may be delayed for a greater or less length of time, and it is the duty of the surgeon to discover what may be the cause of it. If the fracture is complicated with a wound, it may happen that this

wound may be kept up by the presence of a portion of necrosed bone, and then it becomes necessary to assure ourselves of this fact by examination of the wound, and to wait for the separation of the sequestrum. If the cause is a general one, we must combat it by the appropriate remedies. If a fracture is not consolidated and no sufficient cause can be detected to account for it, surgical assistance may be invoked. These cases of non-consolidation are rarely met with in children. Nevertheless we must employ successively protracted immobility in immovable apparatus. If these means do not answer, we may try acupuncture of the false joint with needles heated to a white heat, setons, scraping of the fragments, or resection of the osseous extremities. Dr. Brainard has succeeded in inducing inflammation of the ends of the bone by perforating them in different directions. We may add that all these methods failed in our hands for a fracture of the leg in the little girl to whom we previously referred.

As for vicious callus, we may, in certain fractures of the limbs, even at the end of three or four months, correct it more easily in children than in adults by applying the usual apparatus, more or less modified according to the circumstances of the case.

Hygienic and medical treatment.—The apartment allotted to the little patient should be well aired and kept at a proper temperature. Cleanliness is indispensable, and the linen of children should be changed whenever it is soiled; if this be neglected, we will speedily produce a focus of infection. Good nourishment is of the greatest importance when no phenomenon of general reaction exists, for children always do well with a tonic regimen. We should carefully wean those who are at the breast.

We now understand that the indication always is, to attack the cause which appears to retard consolidation. Thus, when the patient is affected with scrofula, syphilis, or rickets, we must prescribe a treatment appropriate to each of these diseases. It is for this reason that we often prescribe for patients suffering from fracture, cod-liver oil, iodide of potassium, etc. When complications arise, we must, as a general rule, hasten to relieve them, even if we are obliged to neglect, for the time being, the treatment of the fracture. Of two evils, we must choose the least.

CHAPTER V.

TRACHEOTOMY IN CROUP.

TRACHEOTOMY, which consists in the opening of the trachea, performed with the view of giving respiration to a patient asphyxiated by the presence of false membranes in the larynx, should always be considered an indispensable operation, since it brings back to life one who is suffocating, and is at the point of death. This operation, which, like all others, is only easy to those skilled in its performance, must nevertheless be resorted to by all practitioners, surgeons or physicians, for none is more urgent in a large number of cases. For this reason, we may be pardoned the length we shall give this article, as well as the details, in which we do not hesitate to enter to indicate the method of securing the successful intervention of art.

The operator must be thoroughly familiar with the indications, the counter-indications, the method of operating, and the after-treatment.

1. *Indications.*—Asphyxia would seem to be the sole and only indication necessitating the operation of tracheotomy, which should only be practised when the asphyxia continues with or without more or less complete anæsthesia; but the condition of success which surpasses all others, as M. Millard has declared in his essay, is the predominance of the characteristics of asphyxia. This may seem so to the surgeon, who is purely and simply an operator, but not to him who is familiar with the terrible affection embraced under the name of croup. Unhappily, it is not a disease purely restricted to the larynx or the respiratory apparatus; but very often, though only characterized by the presence of a false membrane limited apparently to the larynx alone, it is caused by a general condition existing in the whole economy, and which, like a poison, infects it with more or less intensity.

The first indication is that the suffocation and asphyxia from which the patient suffers, shall be permanent and without inter-

mission. The second indication is that the disease shall be local and not general. In the former state the patient is in the most favourable condition; in the latter there is but little chance of success. In fact, if false membranes exist in the nose or behind the ears, or, as is frequently the case, there is ulceration even in the vulva; if there are many enlarged glands under the jaw, and if the urine is albuminous, it is necessary for the operator to know that he has very little or no chance of success. The third indication is, that the patient shall be at least two years old. The number of successful operations performed prior to that period has been very small, and the cases are only exceptional in which tracheotomy has succeeded in children of six months, a year, and eighteen months; and yet the successful result achieved by M. Scouttetten on a child of six months, and that of M. Maslieurat Lagémar induce us not to always decline operating on children under a year old.

There will be so many the more indications for the operation, according as the patient has not been debilitated by previous injudicious treatment, such as leeches, diet, emetics, blisters, &c., which are without effect in combating the disease, and put the patient in a very alarming condition, and thus render the operation abortive. When, on the contrary, we have but sparingly employed cauterization, which acts merely on the visible disease, and not at all on that which poisons the whole system; and when we have employed general modifying agents, such as chlorate of potash or perchloride of iron, combined with food and tonics, the patient will be in the most favourable condition, and this will be the best time to select for operation.

2. *Contra-indications.*—General diphtheria, false membranes in the nose, behind the ears, in the vulva or on an existing blister, large and numerous cervical ganglions, epistaxis, and gangrene of the pharynx as a complication of diphtheria, are the causes which make an operation unsuccessful, and which may induce us to decline operating. Intermitting asphyxia will be a contra-indication under certain circumstances, or will at least lead to a postponement of the operation. We have seen cases of croup with intermitting asphyxia cured without operation. False membranes which penetrate even as far as into the trachea and the bronchial tubes are not any contra-indication; we have seen patients spontaneously expel false membranes which represented the cavity of the trachea and bronchi, and yet recover without an operation, while others have only been

cured after tracheotomy. Even the gravest diseases, such as pneumonia, cutaneous affections, typhoid fever, smallpox, scarlet fever, measles, &c., and even chronic diseases, such as phthisis pulmonalis, are unfavourable conditions for cure, but are not absolutely contra-indications; for, in these cases, the alarming condition of the patient is modified, momentarily at least, by the operation, and while at first restoring respiration, we may sometimes save his life. We should therefore, under these circumstances, attempt the operation; *melius anceps quam nullum.*

3. *Method of Operation.*—We cannot dwell too minutely on all the steps of this operation, which is quite as difficult as any other, and demands so much the more care on account of the tender age of the patient. Like all operations, it requires practice, and therefore should not only be performed first on the cadaver, but also on living animals, such as dogs, sheep, etc. It is one of those delicate operations that the surgeon will much more skilfully perform on the child after having had experience with it on living animals, in the midst of blood and cries, than after attempting it on the cadaver. For this purpose, it is important that the surgeons in attendance in hospitals for children should make the *internes* operate on animals, such as rabbits and dogs—a view already expressed by M. Bouvier in a recent discussion at the Academy—for they will all of them undoubtedly be obliged to perform it on children. Though the surgeon should make use of the instruments best adapted to his purpose, it is especially important that an operator who is likely to meet with difficulties should more frequently employ those that are suited to his want of familiarity with the operation, rather than instruments that are in common use, that he does not yet know how to handle. Because an instrument is unskilfully managed by an unpractised hand, we must not modify or change it.

Let us now consider in order the instruments, the position of the patient, the mode of placing the assistants, and the work of the surgeon.

The *instruments* essential to the operation are: a straight bistoury, probe-pointed bistoury, grooved director, ligature forceps, tenaculum, dilating forceps, curved cranesbill forceps, double movable canula,[1] a piece of isinglass plaster, a curved gum-elastic bougie of

[1] Of the thirty-two children first operated upon, in which a simple canula was used, only two were saved.

a size to pass readily into the canula, to serve as a conductor, a small piece of whalebone furnished with a delicate sponge, a small fine feather to clean out the trachea, a gum-elastic tube with the end cut off,—with which to suck out the blood which may flow into the trachea,—sponges, also a syringe, if the surgeon hesitates to put his own mouth to the wound, and threads, in case they be wanted for ligatures. An indefinite number of modifications of canulas and dilators have been invented. We admit the advantages, in principle, of the canulas devised at first by Bretonneau, but M. Trousseau has successfully modified them, as the operation has become more generally practised.

Without referring to the numerous canulas contrived by different persons, we will simply express our preference for the double canula advocated, to the exclusion of all others, by M. Trousseau; it is terminated by a tracheal extremity cut somewhat obliquely, and with the edge rounded and not cutting, as suggested by M. Barthez, and furnished at the outer extremity with a flange with lateral wings to which to secure the tapes. The canula must be made in such a manner as to penetrate in a vertical direction to the middle of the trachea, without being too much curved, so as not to wound the anterior wall, and yet not to press by its extremity on the posterior wall. As M. Bouvier has remarked in an excellent treatise on canulas,[1] the plate with which they are furnished must be arranged in such a manner that the tube is directed, as nearly as possible, in the direction of the trachea. The canula must also be movable, according to the plan suggested by M. Roger, and constructed by M. Lüer. With such precautions ulcerations of the trachea will become much less frequent. The diameter of the canulas should vary according to the age of the child. To insure accuracy in this respect, M. Morax, interne of M. Bouvier, has recently carefully measured the tracheas of children between the ages of two and fifteen. These measurements, ranging for this period between a quarter and a half inch, enable us to fix upon four different sizes, suitable to the various ages of children: 1. A canula of less than a quarter of an inch in diameter and two inches in length for children from one year to four years of age. 2. One of a third of an inch in diameter for those between four and eight. 3. One of two-fifths of an inch in diameter for those between eight and twelve; and 4. One of

[1] Bulletin de Thérapeutique, t. lxiii. pp. 299, 346.

half an inch in diameter for those between twelve and fifteen; the last two being two inches and a half in length. A fifth number, having a diameter of three-fifths of an inch, would be better for adults, in whom the diameter of the trachea varies from five-eighths to two-thirds of an inch.

Several dilators have been devised, and an infinite number of modifications made of these. Dr. Pouquet even proposed to do away with them entirely, and use only the finger as a conductor. We ourselves prefer, and even consider as indispensable, a dilator, which we invented about fifteen years since, now in daily use at the Hôpital des Enfants. This is the dilator of M. Trousseau, much modified, longer, devoid of hooks at its extremity, and furnished with a spring which may be opened by pressure and not by separating the branches. Its extremity is curved at a right angle, while the two branches, being approximated again, form at the end a flattened beak, which is introduced with facility through the incision in the trachea. It may serve as a blunt tenaculum and also as a dilating forceps; in this manner it does not slip from the wound, as the first dilator devised by M. Trousseau did.

Position of the Patient.—Whatever the position may be in which the patient is placed—the light not being allowed to come from above, unless he be in an apartment illuminated by a light suspended directly above him—the light will always be poor, for he must necessarily be on his back, and whatever may be done, it will be badly directed upon the neck. The child should rather be laid upon a convenient table covered with a mattress, and a supporting pillow placed in such a manner as to throw the head backward.

Mode of placing Assistants.—One assistant will hold the head thrown back on the pillow, in such a way as to make the neck prominent. He will apply both hands on the side of the head and face, and will take great care not to be in the way of the operator by passing his hand under the chin. A second assistant may support the legs of the patient by holding them on the bed with one hand, and grasp the hands with the other. A third assistant may be placed to the left of the patient to assist the surgeon, holding in one hand the sponge to cleanse the wound, and with the other a blunt hook with which to keep open the lip of the wound on his side. He should also be armed with some ligatures, in case they may be needed. A fourth assistant may be of use in handing

instruments, but he can be dispensed with if they are put within reach of the operator.

The work of the Surgeon.—The patient being held immovable, the surgeon, placed to his right, should recall the anatomy of the superficial and deep portions of the anterior region of the neck, principally in the median line where the incision is to be made. Thus, in examining the anterior part of the neck from the hyoid bone to the sternum, we find at first the skin, beneath which is the superficial fascia, and next the first layer of aponeurosis covering the anterior borders of the two sterno-mastoids. Between the edges of these two muscles a space exists, occupied by a layer of cellular tissue; in this from above downward run the two anterior jugular veins, uniting at the base of the neck to form one trunk, which passes beneath the two sterno-mastoids, and between the two external jugulars. We next meet with the second aponeurotic layer which covers the sterno-hyoid and sterno-thyroid muscles; and a little more deeply seated we find the deep aponeurosis. In the upper part of this region is the thyroid body, on a level with the upper rings of the trachea, very slightly developed in children; in the lower part, towards the episternal fossa, the left jugular vein, running obliquely across the brachio-cephalic trunk; finally, in the median line, from before backwards and in the following order, the trachea, and, on each side, the veins and carotid arteries; behind the trachea the œsophagus a little to the left, and next the cervical vertebræ. We must not overlook the superior and inferior thyroid arteries going to the thyroid body, and the venous plexus below the thyroid body; and in some rare cases the artery of Neubauer, which ascends along the anterior part of the trachea, arising from the arch of the aorta.

All this anatomical knowledge being present in the mind of the surgeon, he should at first be convinced that in this operation, he must perhaps rely more on his finger than on his eyes, and that, after the division of the skin and of the first aponeurotic layer, while using his eyes, he must not make an incision without employing his hand to separate the intermuscular spaces as far as the trachea. The surgeon makes a longitudinal incision in the median line, in the whole thickness of the skin, and from above downwards. This first incision should vary in length, according to the size of the neck, being longer if the child is fat than if it is thin, for in the latter we more easily reach the deep parts. It should begin a little below the cricoid cartilage, and be continued to with-

in a short distance of the top of the sternum. Having made this first incision, the aponeurotic layer should be divided with a bistoury, the operator using, at the same time, or not, the grooved director. The latter and left index finger may next serve to divide the subjacent cellular tissue, and to separate the superficial vessels, in a manner similar to that practised in seeking for a deep artery. The anterior part of the trachea may thus be reached and felt with the left index finger without risk of opening the veins. Before making an incision, the surgeon should bear in mind that he must not deviate to the right or left, lest the carotid arteries be wounded with the bistoury; nor should it be forgotten by him, in very small children, that in cutting too near the sternum he may come across the brachio-cephalic trunk, which crosses the lower part of the trachea. Finally, if hemorrhage follows from the opening of the veins, the wound must be washed out without waiting until the trachea comes into view, if the blood conceals it; the surgeon, carefully feeling for the elastic tube of the trachea, then makes a puncture, taking his finger, as the guide, with extreme care not to pass entirely through the trachea, and thus open its posterior wall and the œsophagus.

Immediately after making the incision, whether it be large or small, he should continue to hold the index finger on the opening, by which blood might penetrate. The dilator should be carried directly under the finger, and be passed into the opening. In this manner, the surgeon takes with the right hand the dilator, which is in the shape of a blunt hook terminated by a lenticular extremity, slides the hook across the inferior angle of the wound of the trachea, retaining it in the same manner as he would a double tenaculum, and approximates the rings to close up the wound. The mucus and blood now flowing from the wound, the patient is placed in an upright position, and thus afforded the opportunity of coughing and of expelling the false membranes from the trachea. The child being thus placed in a strong light or before the window, the operator can at that moment get a better view of the parts, for, as soon as the dilator is removed, the patient breathes, and the circulation being rëestablished, the venous blood ceases to flow. The surgeon may also find out whether it is necessary to tie the vessels which would give rise to hemorrhage in spite of the rëestablishment of respiration. If the wound is sufficiently large, he need not entertain the idea of making an additional incision; if, on the contrary,

it seems to be too small for the volume of the canula, it may be enlarged by the probe-pointed bistoury, either upwards or downwards, as may seem most convenient to him. To make this incision, it is not necessary to change the hand for using the dilator, which facilitates the performance of this operation, and is always held in the right hand; the left hand should always hold the probe-pointed bistoury.

In regard to the introduction of the canula, which has been previously furnished with a ring of isinglass plaster to intervene between the skin and the flange, as well as with tapes to fasten it to the neck—this is a very difficult stage of the operation. The finger may be used with advantage as a conductor, but it is better to leave the dilator always held in place by the right hand, whether we employ the one used at the Hôpital des Enfants, or that of M. Marjolin, a double tenaculum, or that devised by M. Garnier, which is a spring forceps with crossed branches, the extremities of which, curved at a right angle, rest only in contact by the spring of the branches, and separate by pressure applied above their point of crossing. This dilator takes up less room in the trachea than the other, and offers some real advantages.

With the left hand, the canula should be introduced, which is furnished with a conductor passing beyond its extremity an inch or more. It may very readily enter between the separation of the branches of the dilator, the extremities of which are directed downwards. After this conductor has penetrated and been pushed a little further into the trachea, the dilator must be withdrawn. The canula is not interfered with by the dilator, and slides easily on the conductor, if the wound is of the proper size. When it is fairly in the trachea, its presence being recognized by the noise of air passing through it, the conductor is withdrawn. In this manner much better success follows than without the conductor. Practice is of course necessary to insure the success of this operation, as of every other, and the surgeon must, without precipitation, push the conductor sufficiently far, withdrawing the dilator before sliding the canula, for it would be an inconvenience if it was made to enter before removing it.

The operator may, as previously remarked, without these agents, introduce the canula directly by conducting it with the finger, or with the conductor, which we contrived, and Dr. Pouquet advised, and which he considers as the most easy to apply. But having per-

formed tracheotomy more than three hundred times, we believe that the best procedure will be to employ the dilator and the gum-elastic guide to give more ready entrance to the canula. Only on the evening of the operation, or the next day after, when the wound is no longer inclined to bleed, may we remove the dilator and the conductor, because we can then get a good view of the opening in the trachea, when the patient is placed in an upright position. I will add also that the dilator with three branches devised by M. Laborde has appeared to me to take up more room in the trachea than the dilator with two branches, thus rendering the introduction of the conductor and the canula more difficult.

We must not pass over in silence the accidents which may occur during the operation. The first is the opening of the superficial veins, which may be avoided by making the first incision slowly, by separating with the blunt hooks such veins as present themselves, and especially by discontinuing the use of the bistoury, as soon as we have reached the point where they are met with. It will be found best to isolate them with a blunt grooved director. When we reach a deeper point, we must introduce the finger, which will thus enable us to separate the cellular tissue, in front of the trachea, in the same manner as when the surgeon wishes to reach a deep artery, so as to expose it to view; an assistant in the meanwhile being directed to apply his blunt hook. A second accident is, after puncturing the trachea, to have the incision escape the eye of the surgeon. This may be avoided by making the incision in this canal beneath the left index finger, which should secure the trachea, and should be applied immediately after this first incision. When, in spite of this precaution, the opening being too small escapes us, we must not lose time in hunting for so minute an orifice, but make a new one.

On the forefinger as a guide, we may introduce the extremity of the dilator; the instrument being tightly closed, the lenticular end of the forceps, which may pass into an incision of an inch or more, enables us, when they are once introduced, to hold the trachea so that it cannot escape us. We may, if necessary, make an incision with the probe-pointed bistoury, always holding the dilator in the right hand, and the bistoury in the left; otherwise, in changing the hand, we may allow the dilator to slip from the trachea, and render an operation very long which should be performed, if not rapidly, at least in general without loss of time. An accident which some-

times happens is making the incision on the side of the trachea; the index finger, held over the wound, enables us to properly direct the dilator, which itself may serve to restore to the median line the lateral wound.

Sometimes it happens that the incision is made longer than was intended; it must not be forgotten, under these circumstances, that if we have an ordinary canula, it may stretch and bend so as to escape from the wound, and it is only with a long canula that this accident can be remedied. When, after having opened the trachea, we cannot immediately find the aperture, the neighbouring cellular tissue becomes infiltrated with air in such a manner as to swell out the neck and the inferior part of the face. We have nothing else to do than to seek for the opening in the trachea with the left index finger, to introduce the dilator, and to separate the edges of the wound, to facilitate respiration through the latter. We are thus afforded time to keep the wound of the trachea separated, and to quietly introduce the canula over its conductor.

Emphysema disappears in time, when respiration is well established, and the canula properly adjusted. As regards the danger of introducing the conductor of the canula into the cellular tissue surrounding the wound, this is only observed when the dilator is improperly applied. This does not take place when the surgeon remembers that this instrument serves as a double hook to retain the trachea, and that he must withdraw it after the conductor has been properly introduced.

In tracheotomy a serious accident may compromise the life of the patient, when any length of time is allowed to pass before opening the trachea, and vessels have been opened, which give rise to hemorrhage. If these should be arterial vessels, from which the blood leaps in jets, they must be tied; if veins, this need not be done, but the surgeon should always speedily open the trachea, and the blood will then cease to flow. To avoid the introduction of blood into the trachea, the surgeon immediately places his finger on the incision made in it, for without this precaution the blood entering the air-passages may asphyxiate the patient. We must then introduce into the trachea the gum-elastic tube and suck out the blood through it, either with the mouth, or with a syringe attached to its extremity.

4. *Surgical after-treatment.*—The after-treatment of tracheotomy is

both medical and surgical; let us first examine the latter. Immediately after having introduced the canula, we must apply in front of its orifice a light neckcloth or scarf, performing the function of a 'breathing veil,' and having the advantage of preventing the direct entrance of air. Without this, we may witness the drying up of the mucus which passes into the canula, and consequent difficulty in respiration and irritation of the bronchial tubes. The operator must also frequently withdraw the inner canula, when it becomes choked with mucus, and clean it in warm water, passing into its interior a small swab. This little operation is very easily performed, when the manner in which the inner canula is fixed has been ascertained. Every time that it is withdrawn, it should be quickly cleaned, so that the outer canula may not be encumbered while the other one is being wiped, ready to be put back.

If false membranes obstruct the trachea or the canula, they should be extracted with the cranesbill forceps, which, when introduced, follows the curve of the canula even into the respiratory tube. This is preferable to using a small whalebone furnished with a sponge, which has the disadvantage of pushing and not of extracting. If the patient does not expectorate by the canula, we may sometimes, by introducing rapidly the extremity of a small feather, excite cough, and thus favour the expulsion of false membranes or mucus. Sometimes when expectoration is absent, and the trachea and the canula are dry, a few drops of tepid water introduced into the canula may cause the patient to expectorate. Better still, however, would it be to make him breathe moist air; and for this purpose it is important that the air of the chamber should not be allowed to get dry, and consequently that it should not be warmed by a stove or a fireplace in which coke is burnt. It will frequently be advisable, if dryness exists in the respiratory tube, to put on each side of the patient's bed large vessels containing boiling infusions of emollient plants, the vapour from which will fill the air breathed by him.

If the trachea is clogged up with thickened mucus or false membranes, which prevent the child from breathing, it is best to withdraw the canula and to boldly seize in the trachea, with the cranesbill forceps, everything which obstructs the respiratory canal. For want of this care patients who are almost cured may die asphyxiated. We thus see how extremely important it is that children operated on for tracheotomy should be watched, for a few days, by those capable of performing this operation of extraction.

The first dressing consists in removing the entire canula to clean it, and to change the threads, and this should be made at the end of twenty-four or forty-eight hours, and the surgeon should make use of this moment to cauterize the wound with nitrate of silver. The following days he may, either daily or every other day, remove the canula to clean out the wound, and every time assure himself whether the air has commenced to pass into the larynx. To determine this, he should apply for a few moments a sponge over the wound, and if the child breathes without suffocating—if he can, while the wound is closed, extinguish a light with his mouth—it is pretty evident that the larynx is free. Otherwise the canula should not be finally withdrawn until the end of three or four days at the very earliest, often eight or ten days, and sometimes even longer.

It is always advisable to withdraw the canula as early as possible, for its curvature is such that it may produce by its extremity ulceration, most frequently on the anterior wall of the trachea, sometimes on the posterior wall. With the view of avoiding this accident, our colleague, M. Roger, caused to be made by M. Lüer movable canulas, which are carried easily in all directions, following the movements of the neck, and which prevent the extremity of the canula from constantly pressing on the same point. By means of this improvement, ulcerations produced from this cause are very rare; nevertheless, we have seen even movable canulas produce ulceration. We think this accident may be best recognized by the expulsion of bloody expectorations through the canula, which cease when it is withdrawn; and when the patient is not yet able to breathe by the larynx, we must employ a canula curved at a right angle, the extremity of which is directed in the vertical direction of the trachea. In such cases the canulas usually employed do not have a proper curvature, and it will be better to have at the same time a canula made movable after the plan of M. Lüer, and curved nearly at a right angle after that of M. Charrière. With this kind of instrument, one canula cannot be placed in another of the same curvature. The inner tube, to be able to enter, must have a movable articulated extremity which will bend so as to enable it to penetrate.

There are circumstances in which the canula remains longer than the operator wishes, depending sometimes on the exist-

ence of adherent false membranes on the vocal cords of the larynx. We may sometimes in such cases with advantage institute a swabbing out of the larynx. This operation is very simple; to perform it it is necessary to have a small dossil of charpie tied with a double thread at its middle portion, arranged like the tampon used in closing up the posterior opening of a nostril in arresting epistaxis. This tampon, of nearly the volume of a kidney bean, is furnished with a thread which is passed into the eye of a gum-elastic catheter; the latter being introduced from below upwards through the wound in the trachea, and passing easily into the mouth, is disengaged from the thread, and then withdrawn downwards, and the thread being in the mouth serves as a means of drawing from below upwards the little tampon, which passes between the vocal cords, and relieves them of any false membranes which may be present there. As a result of this procedure we have seen respiration restored immediately in patients who have been able at once to give up their canula and have no further occasion for its use. Unfortunately this method has not always succeeded, and we can recall patients who have worn their canula for several months, some of them for several years, always wearing it in dread of the loss of respiration. We may add that this difficulty in the final withdrawing of the canula may sometimes depend on paralysis of the larynx, analogous to paralysis of the velum palati, so well pointed out by M. Maingault. Patients thus affected may in time do without the canula; but when the paralysis is persistent, a good result may be obtained from the effect of electricity on the larynx, an example of which has been cited by M. Debout.

We may call special attention to a troublesome accident observed immediately after the operation—and sometimes, when we wish to finally withdraw the canula—consisting in difficulty in swallowing liquids, and even solids; the patient swallowing the wrong way, fluids and solid food pass through the larynx and through the wound. In such a case it is sometimes sufficient to wait with patience, to make the sufferer swallow carefully, without unnecessary haste; to give him thick food, such as pap, macaroni, and no fluids, and in a few days we will find things modified. But there are also cases in which deglutition continues to be poorly accomplished, and if the patient should waste for want of nourishment, we must employ the means already advised, even with those who, immediately after tracheotomy, refuse, as they sometimes do, to take any nourish-

ment. Children should be nourished by means of a curved gum-elastic tube introduced through the nose, and pushed as far as into the œsophagus. We have seen children get accustomed to this operation performed three times a day, injecting each time with a glass-syringe either milk, or coffee and milk, broth or chocolate, who were restored to life when almost dead from deprivation of nourishment. This little operation for the introduction of the tube through the nose, passing through the pharynx and œsophagus, is much more easy than that by the mouth, in which we have reason to fear that the food may pass into the larynx. The important point, in this introduction, is to follow closely the posterior wall of the pharynx, directing the extremity of the tube along the vertebral column.

When finally we are able to permanently withdraw the canula and it is necessary to close up the wound, it is not worth while to apply adhesive strips. The opening of the trachea must be first closed, and the wound in the integuments afterwards. For this purpose, a simple dressing is sufficient, and sometimes the application of nitrate of silver, if the wound is slow in healing, or lotions of wine may hasten cicatrization. When we cannot finally withdraw the canula, there are cases in which we may leave the patient for an hour or two without a canula, and then replace it, or we may withdraw it during the day and return it at night. In this manner, children resume the habit of breathing which they had temporarily lost, after having been abruptly deprived of respiration by the mouth. The canulas devised by M. Laborde may also be employed, as they have been constructed by MM. Robert and Collin.[1]

5. *Medical After-treatment.*—If the surgical treatment, to which we have already referred at some length, is of such extreme importance, the medical treatment may be considered as indispensable. The disease for which tracheotomy is performed being due to a general cause, cannot be cured by an operation which is, in reality, only a method of allowing a patient to breathe, who would otherwise die of suffocation. Time and medical care are absolute essentials in the completion of the cure. Should the surgeon have confidence in the modifying treatment of diphtheritic inflammation by chlorate of potash or perchloride of iron, or any other agent, he should continue its use, but it is also absolutely necessary that he

[1] These canulas are described and represented in the Bulletin Général de Thérapeutique for Nov. 15, 1863, vol. lxv. p. 417.

should support the strength of the patient, and give him good nourishment. Milk or light broth should be allowed him, and wine and solid food gradually administered. Cinchona, in its various forms, may also very often be prescribed with advantage. It is undoubtedly the fact that more cures are obtained in patients who are well nourished from the very day of the operation, than in those who are averse to taking food.

We cannot too strongly recommend that the chest should be examined, in order that the complications that so often supervene may be checked. Even in convalescence we must combat every morbid condition that may arise, such as affections of the chest or of the stomach, or paralysis of the velum palati, and modify the diet according to circumstances. It is especially advisable in this operation that the patient should be at night in one room, and change in the daytime to another, taking care to air the apartment well which he has just quitted. This last precaution is of extreme importance, both for those operated on and those who have the care of them. In the interest of those last mentioned, it is highly expedient that they should be relieved to take repose and fresh air, this being the only means by which they may escape contagion.

CHAPTER VI.

HYPERTROPHY OF THE TONSILS.

ENLARGED tonsils are met with in children of all ages, even in those of only a year old. Examined anatomically, they present considerable variation in increase of volume and in consistence. Sometimes they are without any definite shape, divided into separate lobes, very prominent and not in their normal position, either projecting inwards, or descending downwards into the pharynx. At other times, they are buried between the pillars of the velum palati, and become enlarged in such a manner that the anterior pillars cover them, and they mount upwards so as even to press upon the Eustachian tube. Their tissue is generally firm and consistent, sometimes softened, and even tearing easily. The vessels of the substance of the tonsils are more largely developed in proportion to the duration of the hypertrophy. These organs are sometimes

adherent, but I have never found them degenerated or cancerous, as in adults.

This disease is much more frequent in children than in adults; more than a hundred cases come under treatment annually in the surgical service of the Hôpital des Enfants. Not a year passes by without our operating on eighty to ninety children at the hospital, and fifteen to twenty-five in our private practice. Hypertrophy characterized by permanent, and not transient, enlargement of the tonsils, frequently has for its sole cause a lymphatic constitution; nevertheless, it sometimes depends on frequent inflammations of the throat.

The *symptoms* of this affection are generally easy to recognize. Usually children thus affected have the mouth wide open almost constantly, speech somewhat inarticulate and snuffling, with sometimes even a little deafness. During sleep they snore more or less, are somewhat disturbed, and lie with the mouth open, and consequently the tongue becomes dry. Some children have narrow chests, because they insufficiently dilate their lungs. If we depress the tongue we perceive in some of our little patients that the tonsils meet in the median line. There are some cases in which this is not so marked, the tonsils being concealed by the pillars of the velum palati, which are likewise enlarged in front of them; a condition to which the name of *encysted tonsils* has been given. They are, in fact, clustered together in the fossæ for the tonsils, and they ascend more or less upwards. All children thus affected suffer from frequent pain in the throat, and are extremely distressed when attacked with inflammation. Left to themselves, these enlargements of the tonsils, in some children, quite often diminish in time, especially if we attack their lymphatic constitutions, and, above all, when they reach the age of puberty, about twelve or fourteen years of age in young girls, and about sixteen or eighteen in boys. We frequently decline operating at this age. After the period of puberty, the tonsils may remain stationary or diminish in volume, but before that they have a tendency to assume a certain bulk, and to retain it.

Diagnosis.—Unless special attention be paid by the surgeon, he may occasionally confound abscess of the tonsils with hypertrophy. The tonsils have sometimes been supposed to be increased in volume, when the swelling was only due to a retropharyngeal abscess, causing the posterior wall of the pharynx to project, impeding speech, pushing the tonsils forward, and giving the patient a snuf-

fling voice. The greater or less rapid development of this last affection and careful investigation will prevent a mistake being made in the diagnosis.

Prognosis.—Hypertrophy of the tonsils is more grave in proportion to the greater youth of the patient; in fact, the more narrow the pharynx and the more seriously the tonsils interfere with the free entry of air, so much the more do they narrow the passage, when acute inflammation increases their volume. For this reason, the younger the patients, the greater success in curing them. An operation is more difficult to perform with them, but I have several times performed it on children from eighteen months to two years old without difficulty. If, in very young subjects, in whom this portion of the pharynx is narrowed, enlargement of the tonsils is not usually of a nature to alarm by hemorrhage after the excision of these glands, the case is very different in individuals of eighteen to twenty years or more. We frequently have to fear hemorrhage in them, because, the hypertrophy being of longer duration, the vessels of the tonsils have become more developed. I have operated on more than a thousand children, and I remember scarcely three of these who had sufficient loss of blood to make me uneasy. On the contrary, I have operated on twelve or fifteen adults, and I must acknowledge that at least four or five gave me anxiety, and that I was only able to arrest the hemorrhage in these cases by iron heated to a white heat, or the perchloride of iron. As the result of my own experience, I may therefore say that the operation is so much the more beneficial as the children are younger, and so much the more grave as they are more advanced in years. We may, and even should, operate on young children, but it must be done by surprise, a procedure which is not possible when the patient is older.

Treatment.—If in many cases he should decide promptly in favour of surgical treatment—that is to say, excision—the surgeon should be perfectly well aware that his intervention is not always expedient, and that he may be content, in certain cases, to wait, counting on time, the efforts of nature, and sometimes on local means to produce a beneficial effect. In fact, the modification of the lymphatic constitution by iodides, bitter tonics, and the preparations of iron may be sufficient. Certain local applications, such as astringents, alum, nitrate of silver, and tincture of iodine are employed with advantage. Sulphurous douches have given good results in the hands of M. Lambron, at Luchon, but they invariably require patience

and perseverance. Excision will always be the means preferred to relieve children promptly, and to spare them the repetition of local applications, which to them are really operations, irritating them, and laying the foundation for convulsions. I lost, by the latter accident, a child on whom, for several weeks before the operation, I had made repeated applications of powdered alum, and other astringents. Each application was to him more irritating than excision itself.

Excision of the Tonsils.—We dismiss from consideration the ligature and cauterization, to speak only at present of excision proper, performed with a sharp instrument, a bistoury or scissors, and a tonsillitome. The operation should be resorted to only when those affected are really inconvenienced by the presence of the tonsils, and when, besides this, they are in a healthy condition. It would be improper to operate in cases in which pseudo-membranous inflammation was commencing to develop itself on the tonsils, for after excision of these organs, even when sound, a false membrane often becomes developed after operation. It is better to prepare those who are subject to hemorrhage by the use of astringents, and even by the internal administration of perchloride of iron for several days, and the employment of gargles of water and lemon juice. Mustard foot-baths the evening before, and attention to diet on the morning of the operation, are also necessary. It may be beneficial to prepare children by depressing the tongue for a day or two before, in order to accustom them to it.

For the performance of the operation, we employ either the forceps of Museux, curved scissors, a probe-pointed bistoury, or, better still, the instrument of Fahnestock, in its simple or modified form. We may have recourse to any of these, dispensing entirely with tongue-depressors or plugs between the teeth, which interfere with the manipulation of the surgeon. In all cases we attach much importance to having the child held firmly while being operated on, without which precaution he may slip away from him, and the surgeon be unable to finish the operation he has commenced. The assistant should hold the child between his legs, retaining with his left hand the patient's head pressed firmly against his own chest, and keeping his two hands grasped in his right hand. The assistant must appreciate how absolutely necessary the vigorous retention of the child is to the success of the operation, no matter how young the latter may be. He should never underrate the powers of the little

patient, and he must always be prepared to meet with a certain amount of resistance.

I need not dwell on the operation with the bistoury, which is everywhere described; I will call special attention only to the mode of using the tonsillitome, either simple or modified, which seems to me indispensable for children. The operator, whatever the form of the instrument used, should have at command two, no matter which, whether it be that requiring two hands or only one, that of M. Charrière or of M. Mathieu. The important point, in our judgment, is to have recourse to the one with which the surgeon has the greatest skill, with the mechanism of which he is most familiar, and, above all, the opening of which presents the greatest diameter in a vertical direction, for the tonsil is of greater extent from above downwards than from before backwards. It is also best to use an instrument proportioned to the age of the child, one of small size being sometimes more convenient than one that is too large. I have had an instrument constructed, the fenestra of which is a little smaller and more oval, so that we may draw the encysted tonsils behind the pillar of the velum palati, and more easily seize them. When we use two instruments, it is with the view of removing the tonsils one after the other, without losing time in disengaging the first from the tonsil. We thus follow the method of my colleague, M. Chassaignac, which consists in placing at first an instrument on each tonsil, and only operating upon them one after the other. This plan, which requires another assistant, has the advantage of allowing the instruments to be perhaps better applied, because the hemorrhage from the first tonsil renders the application of the instrument more difficult for the second.

In any event, to use the tonsillitome, the operation may be divided into four stages: depression of the tongue; engaging the tonsil in the ring; puncturing the tonsil and drawing it inwards; and causing the cutting ring to act. It is well if the surgeon be ambidextrous. The operator, standing in front of the patient, who has his face turned towards the light, places the instrument with his left hand on the right tonsil and with his right hand on the left tonsil. He at first depresses the tongue, carrying the ring flatwise over the base of that organ, then turning the ring, either to the right or to the left, depending on which tonsil is to be removed, engages the gland in the ring, and not until this is accomplished must he push the little fork to puncture the tonsil and

draw it inwards, giving the fork at the same time somewhat of a see-saw motion. Finally, after this third stage, he should withdraw the cutting part of the ring to excise the tonsil. As soon as one tonsil is removed, he should take the other instrument which he has under his hand, and proceed to the excision of the second, without for a moment relaxing his hold upon the child.

When the operator has but little skill in this operation, he may fail to seize the tonsil firmly and only clip it, an accident that may depend on his not sufficiently engaging it in the ring, or that he has not supported enough of it on the extremity of the fork, or that he has not given the latter sufficient see-saw motion. This clipping is sometimes sufficient, but nevertheless we must not trust too much to it; it is much better boldly to re-apply the instrument, and seize the remaining portion of the tonsil. We may sometimes bruise the pillar of the velum palati, and even slightly wound the velum itself, but this is an insignificant accident. Sometimes the excised tonsil may escape from the fork, and be swallowed by the patient, but this is not a serious matter. By attentively examining the mechanism of the instrument, the surgeon need not in the least dread cutting the velum palati or the tongue, or wounding the carotid artery as it runs along the pharynx, on the side on which the tonsil rests. He should be aware that in the operation the ring, which is dull, presses outwards and pushes away in this direction the pharynx, thus removing the artery from reach, while the fork draws the tonsil inwards. It may thus be excised and enucleated without risk of touching the artery; and very often we do enucleate the tonsil. We should remark, however, that this method of operating does not protect from hemorrhage any more than the old method by means of the forceps and bistoury. If with the tonsillitome we avoid wounding the carotid, we may still have hemorrhage from the wounding of the vessels which creep along in the tissue of the tonsil. This accident is very rare in children, being met with especially in adults, in whom the hypertrophy is of longer standing.

Hemorrhage occurs at two periods, either at once after the operation or four or five days afterwards. In the former instance, cool water acidulated with lemon-juice or vinegar usually answers the purpose. A camel's-hair pencil dipped in lemon-juice mixed with alum may be carried over the part from which the blood flows; but the most certain means is the use of a little medal-shaped cautery heated to a white heat. We may be content—and I at present

adopt no other plan—to apply over the tonsil a small tampon of agaric steeped in perchloride of iron mixed with a third part of water, and held for a moment over the surface of the wound. With this may be combined the use of a collar of vulcanized India-rubber, applied in the form of a chin-bandage, and containing pounded ice. This method of applying ice may be employed even before having recourse to the perchloride; having succeeded several times with it in my own practice, I believe that it is best to commence with its use and afterwards unite with it acidulated and iced drinks. In other cases, when there is secondary hemorrhage several days after the operation, ice, acid drinks, and perfect rest suffice.

After-treatment.—In every case there is hemorrhage to a greater or less extent, which usually ceases after the patient has spit for several minutes, and rinsed and gargled his mouth. It must not be forgotten that very young children do not always spit up, and then they swallow the blood, and it often happens that a little while afterwards they vomit up the blood they have swallowed. Sometimes this does not occur, the blood passes into the bowels, and the first evacuation contains clots. The parents should be forewarned that this may happen, so that they will not be alarmed unnecessarily. It is important that nothing warm should be applied around the neck. If the hemorrhage is very slight in children, it is only necessary that they should breathe the air, and not cry. Cool and acid drinks, lemonades, orangeades, cherry syrup and water, or even orange or lemon sherbet may be given, and it is also desirable that children should be able to gargle. For nourishment, the first day, the patient should take only cold milk or cold broth; and on the next and following days his diet should be increased gradually and include articles of diet that can be easily swallowed. Children should be allowed to talk very little the first days after the operation, and even for the first week.

It must not be forgotten that false membranes have very frequently been met with on wounds produced by the operation, which have not the character of diphtheritic membranes. These occur only about the fourth or fifth day, producing a little hemorrhage, which becomes of greater moment if the child, by his cries, his singing, or any other cause, detaches them too soon. These secondary hemorrhages are very readily arrested by acids and cold applications; but quietness on the part of the patient, and the avoidance of talking, are especially important. These false

membranes should be carefully watched, and sometimes their decline may be facilitated by touching them with lemon-juice. We have had cases, but very rarely, in which diphtheritis and even croup have supervened, but this complication depends on whether the patients were predisposed to either of these affections or were operated on during the prevalence of an epidemic. Under such circumstances, we must at once treat the general diphtheritis, and even sometimes, if there be croup, resort to tracheotomy.

The positive results of excision of the tonsils are often very remarkable. Deaf children sometimes hear after the operation, while those who speak indistinctly often pronounce much better. Those who sing gain also in clearness of the voice, although it is true that though some adult vocal artists have gained, others have lost. Finally, and this is one of the greatest advantages resulting from the operation, those who have narrow chests breathe more freely; and the ribs, from being depressed as they were before, frequently return to their normal condition, and the chest assumes its proper breadth. This last result necessarily reacts on the whole economy.

CHAPTER VII.

POLYPUS OF THE RECTUM.

Polypus of the rectum is far from being rare in children, and not a year passes in which we do not have occasion to treat at least six or eight cases, either in hospital or in private practice. Polypous tumours are usually found in the rectum, above the sphincter, and yet, in some autopsies, we have seen them higher up, and even in one case observed one of these growths in the cæcum. They are generally single, the largest of them having the volume of a small nut, although occasionally there are several of them. They are pediculated, and by examination are found to be composed of a mucous covering continuous with the internal membrane of the bowel and constituting the exterior of the little tumour. This is formed by a mucous follicle which has increased in volume and become hypertrophied. The mucous envelope constitutes the pedicle, which unites the polypus to the intestine, and is quite large when the tumour has not been of long duration, and more delicate when

it has existed any time, on account of the mechanical distension to which it has been subjected at the time of the passage of fecal matters. These tumours are generally soft and liable to bleed, at other times firm and resisting; and may be divided with a cutting instrument. Their tissue is vascular, presenting the appearance of follicles of the intestine augumented in volume.

We may seek in vain for the cause of these tumours: the *symptoms* are less obscure. Children suffering from them will pass blood with their evacuations, especially towards the end of the passage. Sometimes they have tenesmus and frequent desire to go to stool, but without any result. If they pass hard substances, these are grooved in a manner to indicate the presence of a resisting body, which has stamped upon them a depression during their passage through the bowel. The tumour may exist for a long time without the general health being affected, if the quantity of blood lost is of but small quantity, but the hemorrhage is sometimes so considerable as to weaken the little patient, who becomes pale, colourless, and of a chlorotic appearance. In the majority of cases, if children are examined after they have just finished an evacuation, a red tumour may be perceived at the entrance of the fundament, which re-enters after the evacuation. The parents believe the child is suffering from a prolapsed bowel or a hæmorrhoidal tumour, which we have never met with in our little patients. If we inspect it carefully, we become satisfied that it is not a hæmorrhoid and still less a prolapse of the intestinal mucous membrane. In the latter case, a red cushion will be noticed filling the anal orifice, while if a polypus be present a tumour of a vivid red colour may be seen, of the volume of a small strawberry, and held by a pedicle. The diagnosis is satisfactorily established, if, when the polypus is pushed upwards, the finger introduced into the rectum comes in contact with a body of greater or less size, attached at one point, very generally on the posterior wall of the bowel, which on being pressed slips under the finger like a cherry-stone.

These polypous tumours are often unrecognized, it being sometimes thought that the child has dysentery, for which he is accordingly treated. It sometimes happens also that they disappear without their existence being suspected; in fact, when the pedicle is but slender, it breaks under the pressure of the fecal matter, and the tumour being driven out with it, a spontaneous cure results. In the majority of cases, however, the polypus is more securely held

and remains firm, and we are not consulted in regard to it until it shows itself at the anus after each evacuation.

While the *prognosis* is not grave and there is no cause for alarm, the surgeon should always relieve the little patient of tumours of this kind, the indication being still more urgent if there be much loss of blood.

The *operation* is very simple. It consists at first in giving the patient an injection, when the little tumour will generally be seen to appear at the anus at the moment when the child has just finished voiding the injection. The tumour is then seized with a pair of forceps, and a silk ligature thrown around the pedicle. The polypus often falls off immediately; and at other times it is not detached until somewhat later, the tumour being allowed to pass up with its ligature and become separated the same evening or the next morning. We prefer the ligature to division with scissors, for we had in one case, when a cutting instrument was used, quite an abundant hemorrhage. It sometimes happens that we have to bring the polypus to the anus, introducing the finger into the rectum; very often it slips under the finger like a fruit-stone and cannot be brought down. Under such circumstances, we must not withdraw the finger, which serves as a conductor, but apply over it a small polypus forceps, which enables us to seize the tumour and draw it outwards, or better still, without seeking to bring it down, to twist off its pedicle. We have never observed any serious results; hemorrhages are arrested by cold injections, but if they persist, injections of rhatany may also be employed. When the polypous tumours are situated in such a manner that they cannot be felt by the finger, their presence may be suspected if the fecal matter is grooved, as we have previously stated. We may then have recourse to repeated injections, even those of a purgative character, which may act mechanically in breaking up the pedicle of the polypus, and thus enable it to be spontaneously expelled.

A recurrence sometimes takes place, but in such cases the disease runs less risk of passing unperceived.

CHAPTER VIII.

VASCULAR TUMOURS AND SPOTS—NÆVI MATERNI.

Erectile tumours are characterized by an abnormal development of capillary bloodvessels, presented in the form of spots or tumours, which resemble one another in the predominance of the bloodvessels, their anatomical structure being the same, but their form different. Some of them are developed during intra-uterine life, others appear sooner or later after birth, as the sequel of a blow, of long compression, or else without appreciable cause.

The *spots* (taches) are seated in the thickness of the skin, on all parts of the body indiscriminately, often on the face. They are not accompanied with any elevation, are flat, and do not stand out in relief, are in the majority of cases congenital, and are frequently seen in several members of the same family, as brothers, sisters, and children, whose progenitors had presented a similar affection. They vary in shape, number, and colour; but they are always of a more or less deep hue, either rose-coloured or red. They are in their nature venous, sometimes diffuse, but more generally circumscribed. They become obliterated under pressure of the finger, but return as soon as it is withdrawn. Some of them, those the least pronounced in colour and the most diffuse, disappear in time without any appreciable cause; others, becoming the seat of a slight furunculous inflammation at their centre, suppurate, become modified, and leave scars which at last become sometimes scarcely visible. Finally, the great majority of these spots continue and remain stationary, but frequently they increase in extent, with a tendency to overrun more or less the surface of the skin.

Erectile tumours are situated under the skin, and are different from the spots, as they occupy the subjacent cellular tissue; for they may extend to deeper regions, as the muscles and fibrous tissues, and indeed involve all the soft parts. A little patient, a cast of whose face was made and deposited in the Musée Dupuytren, suffered from enormous erectile tumours, not only on the face, but also in the lungs and the liver. All the tissues, even the bones, may be thus affected.

As regards their structure, these tumours may be compared to the cavernous structure of the penis and to all erectile organs. They are composed of veins, arteries, and intermediate cellules, in which these vessels communicate, and a true spongy tissue—fibrous and areolar. The arterial and venous capillaries become dilated, communicate with one another, and with the cellules which are filled with blood. Such is the anatomical composition of these tumours. In this we have adopted the same views as J. L. Petit and Dupuytren, and the injections performed by us have demonstrated that generally the venous predominate over the arterial vessels; and this applies to the spots as well as to the tumours properly so called. The spots are nevertheless more particularly composed of veins, while in the tumours there may be a predominance of the arteries over the veins, or an equal development of the two systems.

These tumours may present very great irregularities, being either sessile or pediculated, or, as in some cases observed by us, like a mushroom with several heads. Some of them are as large as a millet-seed, others the size of a nut and even larger. They rarely come singly on the same patient, and we can usually count from one to eight, ten, or even more. Vidal (de Cassis) has seen as many as nine on a single shoulder. The little girl cited above had her face covered with them.

Their development and progress offer many points of difference; they may scarcely increase at all for years, and even remain stationary, while at other times they may at some period or other completely cover a region. They are generally, at the outset, small spots of a vermilion red or wine-dreg colour, sometimes quite limited in extent, and without appreciable elevation of the skin, but the cellular tissue becoming gradually developed, a prominence results. This development is observed at once in the very first months after birth, or else only takes place at the commencement of puberty. Desault and Defrance have noticed in young girls a hemorrhage which took place periodically from the surface of these tumours, and became a kind of supplemental menstruation. Other surgeons have made similar observations. The nucleus of the tumour is generally formed beneath the cutaneous spot. This tumour, at first of small volume, circumscribed and movable, appears to be attached at its base and its circumference by means of prolongations, which are not always perceptible externally, although

spreading sometimes to a distance. The surface becomes irregular and uneven like a cock's comb, and the distended skin becomes thinner and assumes a bluish-brown tint. The tumour may remain subcutaneous, without the skin undergoing any very perceptible discoloration, or, as is sometimes the case, it may have its origin in the deep parts and at last reach the skin, which it elevates. These last are soft, smooth to the touch, yielding to pressure and sometimes becoming in a great measure reduced; the fluctuation being more obscure than that of an abscess, because the blood, to pass from one point to another, traverses the cellules which retard its movement.

Venous tumours are accompanied neither with expansion, fluctuation, nor pulsation, but, though not ordinarily the case, we may hear in arterial tumours a peculiar sound, a sort of murmur, less pronounced than in arterio-venous aneurism, but still appreciable. We may also on applying the hand detect pulsation and movements of expansion, but only when the tumour is of large size or in the vicinity of an important artery. We have considered it as worthy of remark that tumours of the parotid region are most frequently arterial. Rest diminishes the discoloration and the volume of erectile tumours, but, on the contrary, cries, muscular exertions, exercise of all kinds, and even, in adults, moral emotions, will increase them. A crack by becoming distended, a blow, a wound, and every form of solution of continuity may give rise to hemorrhage or inflammation, which will sometimes produce a radical cure. In very young children, these tumours often become inflamed without any perceptible cause, though this may arise from friction of the clothes against the dressings. One of our little patients, to whom such an accident happened, was cured after cauterization with nitrate of silver applied for the purpose of arresting the hemorrhage that followed.

These tumours may strictly be confounded with those of quite a different character, especially when they are deep; but those met with in children are generally easy to recognize. Nevertheless we presented in 1845 to the Société de Chirurgie a pathological specimen which revealed an extraordinary error of diagnosis. A child having in the inner angle of the right orbit a small tumour presenting all the characters of subcutaneous erectile tumours, several members of the society were in favor of passing seton threads through the tumour—a view which we shared. Shortly after this operation,

the child was attacked with cerebral symptoms, from which it soon expired. An autopsy revealed that the tumour was an encephalocele, the sac of which, of the volume of a pea, after having passed through the fronto-ethmoidal suture, had just projected at the inner angle of the orbit, and was formed by a small portion of the cerebral substance surrounded by its membranes. Prof. Moreau reported a similar case. A practitioner who had written on the disease in question, mistook a parotid erectile tumour for a collection of ganglions. It will thus be clearly seen that very serious difficulty may be experienced in the diagnosis of these lesions.

The *prognosis* varies according to the predominance of elements belonging to either the arterial or venous systems, and according to the tissue invaded by the tumours or the region in which they are developed. Thus, the former are less grave than the latter, and erectile tumours of the orbit, the bones, etc., are naturally more dangerous than those seated in other regions. Many surgeons, Dupuytren at their head, scarcely admit the possibility of a cure without surgical interference. In this respect their views are extreme, for in three cases, Prof. Moreau was of the opinion that no operation was demanded on children, in whom Dupuytren had considered the intervention of art indispensable, and nature produced in them a radical cure. We have ourselves observed analogous cases, the most interesting that we may cite being that of a young girl who had several erectile tumours on the head and one on the face. The latter alone was cauterized, but those on the head afterwards became inflamed, without any known cause, and were spontaneously cured.

Treatment.— When the spots or the tumours do not undergo rapid development, as a spontaneous cure may be produced in the manner already mentioned, we should restrict ourselves to the exercise of a continuous surveillance, being fully prepared for active interference if the occasion should arise.

Operative procedures may be reduced to three principal methods: 1. To prevent the blood from reaching the affected part; 2. To obliterate by inflammation the dilated vessels; 3. To effect by operation the destruction of the morbid tissue or remove it. Finally, we may refer to a fourth method, purely palliative, certain procedures which have for their objects a modification in the colour of the tissues. The first plan comprises four principal agents—topical astringents or refrigerants, compression, ligation of

the arteries, and circular incision of the base of the tumour; while the second includes five—puncture with laceration, vaccination, the seton, pins (Lallemand's method), and incision. In the third, we have six—ligation, excision combined with the ligature and the suture, caustics, and extirpation. Finally, the fourth or palliative plan, for which we are indebted to M. Paul (de Landau), consists in the tattooing of the erectile spots. As all these methods may be found described in detail in standard authorities on the subject, we will now refer only to such procedures as have been attended with the most gratifying success at the Hôpital des Enfants.

If the majority of the methods just enumerated have been successful, we have also had to record many unfavourable results. We have, for example, by the employment of about fifty setons, effected a satisfactory cure of an enormous tumour of the parotid region in a young girl we saw with Vidal (de Cassis) and M. Velpeau, and for whom we had almost considered ligation of the carotid indicated. But, on the other hand, a distinguished medical professor lost the grandson of one of the richest financiers in the world, after having introduced one or two threads in a small erectile tumour; erysipelas rapidly carrying off the little patient. We may likewise report also a certain number of successful cases obtained by means of the ligature suggested by M. Rigal (de Gaillac),[1] and yet we lost by this very method a little girl with a tumour in the anterior region of the neck. The most brilliant surgical operations sometimes meet with reverses, so that we should attempt to popularize those which are attended with the fewest accidents, even when they produce much less rapid cures. Faithful to this principle, we have employed, especially for the treatment of erectile tumours and nævi, the actual cautery and caustics, powerful remedies to which we resort in all surgical diseases in which they are applicable. We have also obtained excellent results from vaccination, particularly in cases of nævi, and many other practitioners could furnish quite a number of observations going to confirm the efficacy of this procedure.

Thus, taking up these methods in order, we put in the first rank in the treatment of spots, especially when they are limited in extent and thickness, vaccination, which may be applied even to those that are slightly prominent and to tumours of very small volume.

[1] Bulletin de Thérapeutique, t. lxiv. pp. 16, 202.

The punctures must be made as nearly as possible around the morbid tissue, which, if itself wounded, might give rise to hemorrhage in sufficient quantity to carry off the vaccine virus. Next to this method, we have had recourse with success to blisters, the surface of which may be covered with perchloride of iron. MM. Guillot and Thierry have commended this plan of treatment, and deservedly so. We may also, by aid of the small syringe of Pravaz, inject into these tumours a solution of perchloride of iron.

When the spots are somewhat deep, we employ Vienna caustic, of which we can only speak in terms of praise, spreading one layer of it, of a thickness and length proportionate to the dimensions of the part affected. It is not neccessary to cover the whole extent of the morbid surface; it will be sufficient for us to apply it within an eighth of an inch of the circumference, on account of the eliminating inflammation causing the rest of the erectile tissue to separate. If it be a spot or small tumour that is to be subjected to treatment, an application of the caustic for five or six minutes will be enough to produce its complete destruction. The instantaneous effect is the effusion of a small quantity of blood, which flows over the layer of caustic, but rarely in sufficient abundance to carry it off and destroy its effect. If it be otherwise, we must immediately remove the Vienna paste and arrest hemorrhage with the perchloride of iron and compression. A single application of caustic is in almost all cases sufficient; but if necessary a second may be made, a very delicate layer being applied. After each application the slough must be covered with a small shield of agaric, which adheres to it and falls off at last simultaneously with the part cauterized. A cicatrix then more or less rapidly results. Vienna caustic is followed by white regular scars, which are in no way repulsive to the eye. We may have recourse to it in cutaneous and even subcutaneous tumours, if superficial; but some of these last are very deep and extensive, and in such cases the application of caustic would be difficult and dangerous. In a case of this kind, that of the tumour of the parotid region to which we previously referred, we were obliged to employ quite a large number of setons.

If there be strong pulsations, and a pronounced vascular murmur, we should prefer to perform ligation of the corresponding arterial trunk, yet I have seen one case in which the facial artery was tied for a small vascular and arterial tumour of the cheek,

and the pulsation returned soon afterwards. If, on the contrary, the flexibility of the tumour, and the absence of movement and of the vascular murmur, lead us to suppose that this deep tumour belongs more particularly to the varicose variety, setons may be employed.

The procedure attended most frequently with favourable results in our hands is the use of the actual cautery. Most authors nevertheless consider the results of its application as much more grave than that of the bistoury, and advise its restriction to tumours of small extent, and those which are too much commingled with healthy tissues to admit of their extirpation, and to the destruction of the remains of the morbid tissue which may have escaped the bistoury. We are far from coinciding in this view. It is certain that too great destruction of tissue would be followed by a suppuration, which might weaken and exhaust our little patients. We therefore take care to practise this method in such a manner as to render it as harmless as possible. Following the example of Carron du Villards and Aug. Bérard, who have recommended it, our aim is to modify the erectile tissue rather than to destroy it. We use for this purpose a needle of steel or platina, from three quarters of an inch to an inch and a quarter in length, mounted on a metallic ball sufficiently large to allow us to make several punctures without any very considerable loss of heat. This needle is heated to a white heat, and plunged quickly into various points of the tumour or of the spot. (We may likewise resort to the electric cautery with the greatest benefit.) We generally puncture at first the base of the tumour or the periphery of the spot. If the needle is not sufficiently heated, blood will flow at each puncture, and the inflammation of the tissues will be insufficient; it is important, therefore, not to apply it until it is properly heated. Compresses of cold water are immediately applied over the tumour, and, when suppuration is established, if the inflammation threatens to be intense, we may have recourse to poultices. In all cases, we resort at last to simple dressings.

The vascular tissue is rarely permanently modified by a single operation. We were compelled to practise as many as ten cauterizations in a little girl for the radical cure of an erectile tumour of the volume of a currant, seated in the angle of the eye, the affection having returned several times. We were obliged to riddle with punctures, at seven or eight successive visits, the nose of another child, which had been, so to speak, transformed into erectile tissue. In cases of this kind we always allow an

interval of eight days, fifteen days, and even more, between successive operations. In every case we cannot too strongly recommend watchful care for quite a long time over all our young patients, even those who appear to have most completely escaped all danger of relapse. If a red point shows itself afresh, a single puncture suffices to insure a definite cure. We have never seen erysipelas occur as the result of the employment of this method, and we have only lost one patient, who died of convulsions four or five days after the operation, so that we did not consider that this accident could be attributed to our mode of cauterization.

We will conclude this list of remedies by mentioning the fact that in recent times a return has been made to the metallic ligature; but it is open to the objection that it never completely removes the tumours and leaves behind some of the vascular tissue. We have also recently been satisfied of the superiority of the linear *écraseur* in the extirpation of these tumours without hemorrhage, but in the employment of both of these methods, we have had a recurrence of the tumours and have found it necessary to return to the use of caustics.

We have but little to say of true nævi or *birth-marks*. These pigmentary products, so variable and irregular in volume and form, are sometimes only simple little circular spots, known as mothers' marks, more or less deeply coloured, smooth or giving origin to hairs. They may be destroyed with an application of Vienna caustic or even by means of a point of white heat. Others, which are larger and deeper, generally of a brown colour, may invade the whole of one side of the face, be covered with hairs, and resemble the skin of an animal. They are not susceptible of increase. Tattooing has been tried to make them disappear, but we have never recognized the necessity of employing it.

A plan which succeeded in our hands in one case where the nævus was limited in extent, was the application of Vienna caustic. The paste may be applied over the whole surface of the tissue which we wish to destroy, if its dimensions are limited. If otherwise, we must use the caustic at several different times, successively at several points, taking the precaution, after each application, to cover the slough with a piece of agaric. The whole of this may be allowed to separate at the same time, and when the elimination of the slough takes place, we find beneath a cicatrized surface. In every case, fresh application of caustic should only be made when the first has entirely produced its effect.

CHAPTER IX.

CYSTS AND ENCYSTED TUMOURS.

It is not our intention to enter here into the history of cysts; we desire to refer only to those met with in the earlier periods of life, and to make known the methods of treatment which have been successfully employed by us. In children as in adults, we meet with cysts of various kinds and in different regions.

1. *On the exterior of the body.* We find in children wens or encysted tumours on the hairy scalp, on the face and neck, and on the trunk and limbs. These cysts, formed by a fibrous envelope, contain different fluid or solid substances; they may be congenital or developed after birth. In the new-born, we sometimes, but quite rarely, meet with cysts in various parts of the body, which contain the bones, teeth, hair, and different portions of a fœtus. These curious and familiar facts may be explained by the unequal development of two germs, one of which is encroached upon by the other, and remains, so to speak, nestled in it. They are sometimes for a very long time stationary, and in some cases terminate in inflammation.

The form of cyst most frequently met with is the wen, seated on the hairy scalp, the face, and especially the eyelids, and varying in volume. Although this form of tumour, which is everywhere composed of an envelope containing a sebaceous substance, melicerous or otherwise, may become inflamed and thus be cured by elimination, or even become dissipated by means of resolvents, we believe that when they persist and increase in volume, or resist such resolvent methods as may be adopted, the indication is to extirpate them. We do not hesitate to say that as the bistoury sometimes induces erysipelas, we have relinquished the use of cutting instruments in extracting these cysts, and we apply to all, indiscriminately, even of those of the eyelids, the Vienna caustic, unless they are seated on the inner surface of the lid, when the knife will be required to remove them. These cysts are laid bare by the slough

produced by the caustic, and sometimes disappear without further interference, although in some cases it becomes necessary to enucleate them. The cicatrices following these operations are regular and not prominent, but they differ from those consequent on incisions, by being a little longer delayed in their formation. We have met with no bad results, especially when we allowed the cysts to become separated without assistance; in this way doing nothing to provoke traumatic irritation. Once or twice, being anxious to hasten their separation by pressure, we were the cause of the production of a small amount of erysipelas.

The application of the caustic should be made by means of gum resin plaster, with which rather more than the mere surface of the tumour should be covered. Before doing this, however, an oval or linear opening should be made in the centre, of a shape and size corresponding to that we wish in the skin, for the discharge of the cysts. We then apply over the surface thus exposed the Vienna paste. At the end of eight or ten minutes the effect is produced, and a slough results, which may be dressed with poultices, or else with some digestive, to facilitate the separation of the cauterized portion. The separation of the slough may be delayed for eight or ten days, and as soon as it is detached and the cyst discharged, it may be simply dressed, and the cicatrization made more regular by nitrate of silver. We may even resort to this method to facilitate the separation of the cyst, and if it adheres and is slow in becoming detached, cauterize its interior. Following the plan of Dupuytren, I open small cysts on the eyelids, and after having emptied them cauterize the interior.

Cysts of the neck are of frequent occurrence in children, and are of a different nature from those just referred to. They are often observed at birth, being sometimes unilocular, at other times multilocular, and distinct from one another. They contain fluids of varying character, limpid and albuminous, sometimes serosanguinolent. These cysts are sometimes accompanied with marked fluctuation, and are almost always indolent, without change of colour of the skin, and most frequently transparent like hydrocele, from which resemblance the term "hydrocele of the neck" has been given them. When they are not preceded by this transparency, we may consider that we have a cold abscess to treat. These cysts are ordinarily seen on the lateral portions of the median line of the neck and in close proximity to the lower jaw; although I have

met with them at the base of the neck in the neighbourhood of the clavicle.

We have sometimes seen these cysts become inflamed and filled with sero-purulent fluid. In most cases we have punctured them and injected them either with wine or tincture of iodine diluted with water, with the addition of iodide of potassium, as in hydrocele of the tunica vaginalis, and have generally obtained good results. A seton thread introduced and left for several days has been found beneficial in the treatment of multilocular cysts, by enabling us to induce simultaneous inflammation in the various spaces traversed by the thread. As this last method sometimes results in erysipelas, we prefer puncturing multilocular cysts with platinum needles heated to a white heat, which pierce the spaces and inflame the cysts. We never have recourse to this plan at the outset; we prefer commencing the treatment by making one or even two punctures to satisfy ourselves that the tumour is locular.

We have met with hydatid cysts in children seated on the exterior of the body, some of them being on the gluteal region. These fluctuating tumours, often resisting and unaccompanied with pain or change of colour of the skin, make very slow progress. In some cases we may meet with the peculiar sensation produced by pressure on an elastic body, as described by M. Piorry. The resemblance to abscess is so great that we have opened them expecting to meet with pus, and have found true hydatids. The cyst being evacuated, we have successfully injected modifying fluids, such as salt-water or wine and sweetened barley-water, or water iodized by the addition of tincture of iodine. These cysts became inflamed and were cured without any bad symptoms.

2. *On the Interior of the Body.*—We have met with hydatid cysts in children only in the liver, and have observed that they differ in nothing from those met with in adults. They are more or less decided tumours, very often single, sometimes protuberant, of obscure cause, very slow in their development, producing uneasiness but little pain, indolent, without change of colour, fluctuating, but rarely sensitive. When they are of large size, they may sometimes produce dulness on percussion, on account of their pressing upon the diaphragm, and may lead to difficulty of respiration, from compression of the right lung. We have been led to operate in some cases on account of the inconvenience produced by these tumours on neighbouring organs, such as the lung and stomach. We have gene-

rally employed for the treatment of these cysts the procedure of Récamier, in other words the application of Vienna caustic, before making the puncture. This plan has succeeded in our hands several times, yet in one instance, while using an injection of salt-water, the child made a movement by which at one point the adhesions produced by the cauterizations were torn apart, the fluid becoming diffused in the abdomen, and a terrible peritonitis ensuing, from which the patient died the next day. At the autopsy, we found pus and flakes of false membranes in the cavity of the peritoneum. In one case we injected water iodized by the addition of tincture of iodine, and cured the patient.

There is another kind of cyst met with on the exterior of the body, seated in front of the patella, but rarely seen in children; in two or three cases, punctures, followed by the iodized injection, have produced a limited amount of inflammation and pleasing results. Once we introduced a seton thread after the puncture, allowing it to remain five or six days; the resulting inflammation was inconsiderable, and was modified by the use of elastic collodion; adhesion of the cyst was produced, and the child cured.

Synovial cysts or ganglions, developed by muscular effort in the course of tendons, having only for their covering the synovial membrane, are without change of colour of the skin, and contain synovia, a viscous white or rosy fluid of variable gelatinous consistence. We have used three methods for their cure, with good results from all. The first is the *écraseur*, followed for several days by compression with a small piece of linen, folded several times, applied over the seat of the tumour, and secured by turns of a bandage. When the use of the *écraseur* is contraindicated or there is a recurrence, we puncture these cysts with a fine lancet-shaped needle, pressing out the synovia with the fingers, and afterwards applying compression with a bandage. When these means fail, we should not hesitate to introduce, by means of a fine needle, a small seton thread through the cyst, and after having emptied it, cover it with elastic collodion to prevent erysipelas. The next day, having withdrawn the seton, we apply another layer of collodion, and continue the use of a moderately compressive apparatus. Finally, we remove the little seton when there is no further discharge through the punctures. We have had the good fortune not to meet with severe erysipelas, except in a case of ganglion of

the dorsal aspect of the foot, and yet after one or two abscesses, confined to the subcutaneous tissue, we succeeded in curing our patient.

CHAPTER X.

VESICAL CALCULUS—LITHOTOMY—LITHOTRITY.

THE study of one hundred and forty cases of calculus which were under treatment during twenty years of my surgical experience at the Hôpital des Enfants enables me to decide that age makes no difference in the physical and chemical constitution of these foreign bodies. Calculi in my little patients were composed, as in the adult, of uric acid, subcarbonate of lime, of ammonia, magnesia, oxalate of lime, and urate of ammonia, and consequently some of them were very hard, others very friable. Their form and volume have varied not less than in the adult, for we have extracted some as small as a pea, and others as large as a hen's egg. Among other specimens we have preserved, are two calculi extracted by the bilateral operation from children ten and eleven years of age, one of which, of ovoid form, is two inches in its long, and an inch and a half in its short diameter; the other, of similar shape, presented the same large diameter, and a little less than an inch and a quarter in the small diameter. Both children were cured. We have often found the calculi multiple, and in one case we even extracted from the bladder of a child of eleven years, previously subjected to lithotrity by M. Ségalas, so large a number, that we were unable to count them, but taken altogether they weighed about three ounces. The patient was cured without a fistula.

We have met with calculi of very regular form, round or ovoid, with smooth or rugous surfaces, some of them wedge-shaped, with facets, while others were mulberry-shaped. In two cases they were adherent to the bladder. We have likewise found calculi in the kidneys, and an autopsy has enabled us to detect quite frequently catarrhal and even purulent nephrocystitis, similar to that of old people. Sometimes even the mucous lining of the bladder, and the whole of that organ, were hypertrophied, and a very narrow cavity was the result. So far as the causes are concerned, we have met

with calculi in children of all ages, even at birth; frequently in boys, rarely in girls. Sometimes the parents or grandparents were gouty, but we have never had under treatment children whose parents were sufferers from calculus. The principal cause which we have established, and which applies to it in all countries, is the influence of improper alimentation. The great majority of our little patients were born in the suburbs, or more frequently still in the country, and were supplied by poor parents with such nourishment as vegetables and fruit, without wine or meat. We have scarcely ever met with calculi in the well-clothed, well-warmed, and well-nourished children of parents in comfortable circumstances. We have found that generally the urine of a number of the children affected was sufficiently charged with calcareous phosphates to incrust with a deposit catheters which had been left twenty-four hours in the bladder.

The *symptoms* detailed by standard authorities as signs of calculus in the adult apply as well to children, from nephritic colic to pain at the extremity of the glans, including, in addition to these, pains in the loins shooting in the direction of the ureters, a sense of weight in the region of the bladder—more marked during carriage-riding—frequent desire to urinate, tenesmus, pain—sometimes very severe at the commencement or completion of micturition—longings that cannot be gratified, erections, twitching of the penis, stamping of the feet, interrupted jets of urine, prolapsus of the rectum, followed by efforts to accomplish micturition, retention or incontinence of urine, hæmaturia, more frequently catarrh, and sometimes small calculi expelled through the urethra, at other times arrested at the membranous portion or at the urinary meatus. We may also add that children affected with stone for any length of time have the penis more largely developed than in the normal condition; erections and frequent plucking at the organ account for this development.

Of constitutional symptoms, fever is occasionally met with, sometimes of a continuous form, but febrile symptoms are not well defined at the outset, being only especially prominent when the affection has lasted for some time. In proportion to its increase in size, the calculus irritates the mucous membrane of the bladder, and the general symptoms become aggravated; the fever becoming continuous, and the appetite lost, followed by emaciation and often terminating in adynamia. Add to all the symptoms just enumerated

the establishment of the presence of the calculus by catheterization, and the diagnosis will not be doubtful; but we must also mention that if we always, or nearly always, meet with several of the symptoms just referred to in calculous children, frequently only one or two of these signs may be present. In cases of adherent calculi, for example, many symptoms are wanting, and then there will be great difficulty in deciding promptly on their cause.

We should not overlook the fact that children suffering from a simple inflamed phimosis have been brought to us for treatment for stone, while others who were afflicted with cystitis produced by cantharides applied over a blister have presented symptoms which might deceive practitioners who are not familiar with this fact. Finally, before making a positive diagnosis, we should always sound the little patient.

The presence of a calculus being ascertained, the prognosis will vary according to the period at which we are consulted. If the disease is just commencing, the calculus small, and the general health good, the prognosis will be favourable, and the calculus, by reason of its small volume, may pass into the canal of the urethra. Under these circumstances, the foreign body will be extracted in one way or another, frequently with success, and the case is much less grave than if the affection is old and complicated with the vesical and nephritic lesions already referred to. The prognosis is then serious, and equally so if the child is rachitic or subject to other chronic diseases. Finally, there is danger when the patient has suffered from the presence of a calculus of large size for a long time, and his general health is already affected.

The rational symptoms we have already pointed out having been determined, it remains for the surgeon, before deciding upon the treatment, to practise direct exploration of the bladder, which ought to be repeated several times, in order to prevent all possibility of error.

Catheterization of Children.—It is especially important that the little patient should be laid on his back and be firmly held, with the thighs flexed on the pelvis and the legs on the thighs. It is not absolutely necessary that we should have very fine catheters for children; for a new-born child, one of one-sixth to one-fifth of an inch in diameter will answer, and for children five or six years of age instruments of one-fifth to one-fourth of an inch. It is much easier, however, for proper exploration, to employ much shorter catheters than those required by adults, having only a moderate

curve, such as characterizes instruments used in lithotrity; and they should be from six to six and a quarter inches in length. It is not worth while to chloroformize children for ordinary catheterization, as in cases of retention of urine. Very often anæsthetics may be omitted even when searching for the calculus; but if we believe that a small calculus, difficult to detect, and requiring minute investigation, is present in the bladder, we have always found it best to put the child under the influence of an anæsthetic, and often to use, for simple exploration, a small lithotrity instrument. The child thus moves less, and bears the exploration better. The lithotrity instrument with two branches often enables us to detect more readily a small calculus than the simple sound, from which it escapes. We thus have the advantage of being able immediately to seize the stone, and to make an approximative estimate of its size. We must take care to sound the little patient lying on his back, and even in a standing posture, and this not only once, but several times, to remove all doubts.

The presence of the calculus having been established, four indications present themselves: 1. To wait and prescribe a palliative treatment; 2. To attempt the use of means commended for the dissolution of the calculus; 3. To practise lithotrity; and 4. Lithotomy.

1. When the calculus is small, and there are no general symptoms, we have reason to hope that by delay, by giving the patient drink very freely, and by frequent baths, the calculus may pass into the urethra. Then, if its volume allows the child to urinate, it may happen that in a day or two, more or less, solely by the efforts of the child, the calculus makes its way along the canal and reaches the urinary meatus; arrived at which point, if it cannot be spontaneously discharged, it may require a slight incision of the meatus with a bistoury to free it, or else to make its seizure with extracting forceps more easy. In cases in which the calculus remains in one of the depressions of the urethra and cannot move, especially if the child is unable to urinate or does so with great difficulty, we may employ with advantage the articulated curette of Leroy (d'Etiolles), which has on several occasions done me good service. If this method fails, the indication is to perform the button-hole operation, but we must first be very sure that we cannot extract the calculus by other methods or crush it where it is. Although this operation, which consists in making an incision in

the canal directly over the calculus, generally succeeds sufficiently well, bad symptoms may arise, such as erysipelas or even a subsequent fistula.

2. *Internal Treatment for Solution of the Calculus.*—I have no facts in my own experience which would induce me to put a child suffering from calculus on treatment with Vichy water, but I think, when there are no general phenomena debilitating the patient, we may try the effect of a season at Vichy, especially if the calculus is small. We may also suggest the use of baths of subcarbonate of soda, and give the bicarbonate in solution, or, better still, the natural Vichy water.

3. *Lithotrity.*—We will not repeat at the present day that which we wrote in our thesis for the degree of doctor of medicine in 1828 —"lithotrity is impracticable in children under five years of age." At that time the operation was in its infancy, while now, on the contrary, our own experience and the experience of all those who have performed this operation is favourable to its employment at all ages, even in children fifteen or eighteen months old, without regard to sex. Lithotrity is always applicable to the youngest children, when—1. The calculus is of but small size, being not more than three-fifths to two-thirds of an inch in diameter, and we are enabled to operate several times—three times at the most; 2. When the general health is good, and the bladder appears to be in good condition and exempt from purulent catarrh; and 3. When, above all, there are not more than one or two calculi. Lithotrity is, on the contrary, inapplicable—1. When the calculus is too large (three-quarters of an inch or more); 2. When it is adherent; and 3. When it is very hard and mulberry-shaped, instances of which have come under our notice. In conclusion, we have become partial to the use of lithotrity in a large number of cases in children, because, in proportion to our familiarity with this operation, after following the rules laid down by MM. Leroy (d'Etiolles), Heurteloup, Civiale, and Ségalas, we have succeeded in avoiding many bad symptoms which attended our early professional experience. While advising lithotrity in children, we should not conceal the fact that, if this operation is attended with great advantages, especially by its obviating the serious symptoms consequent on the performance of lithotomy, it is not always exempt from inconveniences. As the result of our own experience, let us now give in detail our views on lithotrity in young children, taking up successively for con-

sideration, the preparation of the patient, the mode of operating, and the after-treatment.

Preparation of the Patient.—This is an indispensable step in the treatment, our object being to combat diseases which are connected with the existence of the vesical calculus, and even to prevent those which may arise to complicate the operation. We may, for instance, vaccinate our little patient, if this has not already been attended to. Our earliest attention should be directed to the accustoming of his canal to the contact of instruments, by introducing each morning and evening bougies, which may be left in the urethra for several minutes, and gradually increased in size. Baths should also be given him every two or three days. At the end of eight or ten days, if everything is favourable, we may proceed to the operation, having first given the patient an enema.

Mode of Operating.—At the present time we do not employ any other instrument than the lithotrite with two branches, the power of which has been tested and its mechanism understood. It should be furnished with a rack, or the lever of M. Guillon, or else with a broken screw. The lever gives more power than the other two, and the work can be done more speedily. As it is impossible, however, to graduate the force, the instrument may be much more easily broken. It will be much better to combine with these instruments either the kind of curette constructed for us in 1830 by M. Charrière, to keep the instrument clean, or the evacuator, which M. Guillon added to his instrument.

Three different sizes suffice for children from one to fifteen years of age. The extremity being the largest part, we will mention three instruments, the extremity of which is terminated like a duck's bill; the smallest of them, for the youngest children, those of about a year old, is one-fifth of an inch in width and one-eighth of an inch thick; one of medium size, for older children, one-fourth of an inch in width and one-sixth thick; and for the oldest children, one of one-fourth of an inch in width and one-fifth to one-fourth thick. With these three instruments, we are almost always able to free the urinary meatus without making an incision in it, although we have sometimes been obliged to do this also. We have sometimes found it well to have at hand, in case the stone be a hard one, the instrument with a female branch terminated in a mortise in which the male branch fits, by which we may break

up the calculus in a short time, and which we frequently employ, even at a first operation.

In addition to the principal instrument, we should have a gum-elastic catheter; a syringe with which to inject water into the bladder; a mattress folded in the middle and arranged on an inclined plane, placed on a convenient table or other article of furniture of the proper height, to replace the tilting bed of M. Heurteloup; chloroform, which has been attended with good results in our hands with children; and several, at least three, assistants, one to administer chloroform, and the two others to support the pelvis and the lower extremities. The patient being placed on a mattress properly arranged, the pelvis is supported on the base of the inclined plane, in such a manner that the breech may be very much elevated and the trunk dependent. The calculus may thus be thrown to the upper part of the bladder, which, on account of the child's position, is the dependent portion. The patient being held and placed under chloroform, we introduce a gum-elastic catheter to inject water into the bladder, and we replace it by the instrument, endeavouring at the same time to prevent the water from escaping. Children are very often unable to retain this injection, and we are obliged to operate on an empty bladder. We open the instrument, inclining the vesical extremity right and left successively, in the dependent part of the bladder, and opening and closing it alternately. When we have grasped the calculus, it is very important to move the instrument, to be certain that we have seized the calculus alone, and that we have not pinched up the mucous membrane of the bladder. We then crush the stone successively at several efforts for four or five minutes; never prolonging the operation beyond that time, and completing it by entirely closing the instrument before withdrawing it. The curette is often very necessary at this moment to clean the bowl, which is full of fragments. Finally, we inject water through a gum-elastic catheter, and this, when expelled, brings away the pieces that are of sufficiently small volume to pass through the catheter.

After-treatment.—When we operate on children who urinate in bed, we apply a suspensory bandage, to the opening of which is attached a kind of gauze gusset in which the penis is introduced. The urine is thus discharged into a sieve as it flows, and the gravel expelled is collected. Should no bad symptoms arise, we may merely prescribe tepid baths, to be given immediately after the first

operation, and continued the following days, and good nourishment. But if inflammatory symptoms arise, they should be combated, sometimes by simple poultices, but in certain cases by leeches applied either to the perineum or the hypogastrium. Cystitis is one of the sequelæ we have most reason to anticipate.

Quite a common accident in children, more than in adults and old persons, is the arrest of a fragment of calculus in the urethra. This depends on the different conditions of the bladder and its neck in those periods of life, and especially in old persons. In children, the contraction of the bladder is very powerful, and its neck readily dilating, the fragments are forcibly driven by the muscular contraction into the urethra, from which results in the child a most serious condition following the operation. The fragments may pass beyond the neck, even when they are quite large; but when they reach the membranous portion of the canal, they are arrested at that point, and cannot be driven further. Under such circumstances, the calculus may be felt by passing the finger over the perineum. Orchitis sometimes results in these cases. When the calculus is lodged in the membranous portion, the indication is to endeavour to push it back into the bladder, and to crush it immediately. If this is impossible, it should be broken up in its place in the urethra by means of instruments devised for the purpose, or else it should be brought to the extremity of the canal by the articulated curette of Leroy (d'Etiolles). Finally, in cases of extreme difficulty, we must perform the button-hole operation. We sometimes, but rarely, meet with a condition in children, which we have seen at Bicêtre in old persons—a sluggish state of the bladder, in which it does not contract. In such cases we have derived benefit from the use of ergot, fifteen or thirty grains in the course of the day, in divided doses, under the influence of which, children who were unable to expel fragments of calculi, after lithotrity have discharged them with tolerable ease. It is very important that this agent should only be employed when the fact is established that there are no more large fragments retained in the neck of the bladder.

The second and succeeding operations of lithotrity should be conducted like the first, and be performed at intervals of five or six days, or even longer. But they may be rendered necessary at shorter intervals by the condition of the little patient after the first operation. If we have been sometimes fortunate enough to completely crush the stone in but one or two operations, we must

not expect a similar result in all cases in which the calculus is small. Many surgeons still prefer lithotomy in children, for we must acknowledge that bad symptoms may occur after lithotrity, if performed when the calculus is too large. Alarming complications of cystitis or nephritis may arise, carrying off the patient. Be this as it may, we are not exclusive, and we perform lithotrity in cases in which it is not contraindicated.

4. *Lithotomy.*—In cases in which lithotrity is not practicable, we must necessarily resort to lithotomy. Indications for the performance of this operation in children exist, when the stone measures more than one-half to two-thirds of an inch, and when this foreign body is hard, and by its long stay in the bladder has caused an alteration in that organ. We have always performed perineal lithotomy, preferring this to the hypogastric method, which we only have recourse to in the child, exceptionally, for a calculus of unusual dimensions. Among the various methods by the perineum, we like the bilateral operation best, because it enables us to extract very large calculi, and in our own experience obviates the risk of injury to the rectum and the ejaculatory ducts. Besides, as the perineum has less depth in children than in adults, as the prostate has in them scarcely any existence, and as the vessels of the deep region of the perineum are less developed, we have, for these anatomical considerations, more probability of success than in adults.

Preparation for the Operation.—This consists in baths given the patient on the days preceding the operation, a gentle purgative on the day previous to clear the intestinal canal, and an enema the night before, repeated even on the morning of the operation. The rectum will thus be placed in proper condition, and all risk of wounding that portion of the bowel prevented. That this precaution is attended with good results is evidenced by the following: A child on whom we were about to operate had been purged and taken enemas, but unfortunately he had been given a cherry, the stone of which he swallowed; thinking the intestinal canal was perfectly clear, we began the operation, in the midst of which, at the very moment when we were springing the blades of the lithotome, the cherry-stone, which had descended into the rectum, was expelled by the efforts of the child. The anterior wall of the rectum was raised up, and the blade of the lithotome was felt to bear upon the

cherry-stone, which was immediately discharged from the wound made in the intestine.

The Operation.—A mattress is placed on a convenient table or other article of furniture of proper height, to receive the patient. The instrumental apparatus necessary consists of a catheter adapted in size to the urethra of children, a straight and a probe-pointed bistoury, a double lithotome, a gorget, and pincers; to which we may add chloroform, bands to secure the patient, a lithotrite in cases in which the calculus may be too large, a syringe furnished with a gum-elastic canula, a gum-elastic catheter supplied with rings of agaric for the instantaneous plugging of the wound, a tenaculum, threads for ligatures, water, and sponges. The patient being placed on his back, and the buttocks brought as near as possible to the edge of the bed, the operator introduces the catheter before securing the feet. The instrument having been introduced, and the presence of the calculus established afresh, the child is fastened by the feet and hands, by means of bands, but these may be dispensed with if chloroform be used, although even then it is better to take this precaution to prevent the movements which patients who are chloroformized sometimes make to defend themselves.

Everything being thus arranged, an assistant placed to the right of the patient secures the pelvis by pressing it down upon the bed, while two others hold the knees supported against their chests, and keep the two thighs uniformly flexed on the pelvis and an equal distance apart, right and left; a fourth assistant, placed behind his head, being intrusted with the administration of chloroform, while a fifth has charge of the instruments. The operator, placed between the patient's knees, whose perineum is turned towards the bright light, begins by properly placing the catheter, intrusting it to a sixth assistant, who should hold it in the following manner: standing at the left side of the patient, he holds the catheter with the right hand and leaves the left free for use, the successful performance of the operation being facilitated by the manner in which the catheter is held, this being in the direction of the median line of the perineum, inclined a little towards the hypogastric region, the convex part of the catheter being made to project slightly, and pressed towards the perineum, which should be made to bulge out. Feeling all the while with the concavity of the catheter the angle formed by the pubes, in order that it may not bear too much on the side of the rectum, which the instrument may press down on the

median line, a procedure which would cause the intestine to project to the right and left, and thus expose it to be wounded.

The surgeon, who has previously fixed the separation of the blades of the lithotome at from three-quarters of an inch to an inch, according to the size of the perineum, then performs the bilateral operation, so well described in the works on surgery, the details of which I need not here repeat. I will nevertheless add, that if the calculus is very large and cannot be extracted with the forceps, I have considered it best to perform the quadrilateral operation of Vidal (de Cassis), and have sometimes found the lithotrite useful to disintegrate the stone and then extract it in several fragments. Under such circumstances, when the stone is extracted after having been first broken, it is important, in concluding the operation, to inject warm water into the bladder by means of a syringe furnished with a gum-elastic canula introduced into the wound. In any other event, after the extraction of the calculus, when the surgeon, after introducing the left index-finger into the bladder, detects nothing further, he should bring the operation to a close. The wound having been previously sponged, the patient is then carried to bed, laid upon his back, and a roll of linen placed under his hams to keep the thighs separated and flexed upon the pelvis.

After the operation, if there is no hemorrhage, we give the patient a warm bath for about twenty minutes, repeating it frequently the next and following days, if everything is favourable. The day of the operation, when the patient suffers for an hour or two afterwards, we prescribe for him two or three fluidrachms of syrup of white poppies. If everything is favourable, we administer to him a broth or two the same day, and on the following days soups, gradually increasing each day the supply of food.

Primary Accidents.—When, during the operation, a vessel has been opened, which gives rise to external hemorrhage, we may sometimes detect the point from which the blood flows, and apply a ligature. If this cannot be found, it will suffice to inject cold water into the wound. Sometimes we have introduced a gum-elastic catheter through the canal of the urethra as far as the bladder, and injected through it cold water, which passes out through the wound. Finally we have applied a bladder filled with cold water to the perineum or the hypogastric region. These methods of arresting hemorrhage have generally succeeded in our hands.

Yet, under some circumstances, we have had recourse to a kind of plugging performed as follows. We take a curved gum-elastic catheter without the wire stylet, of a quarter to a third of an inch in diameter, securing, at a distance of an inch and a half to two inches of the eyes of the catheter, two discs of agaric, rather larger than a five-franc piece. These discs, perforated at the centre, allow us to pass the catheter, which is retained at the point desired by means of waxed threads, which press the agaric solidly around the opening and over the catheter. In this manner, we may introduce the extremity of the catheter as far as the bladder, and the agaric is arrested in the tract of the wound, and compresses its walls. The whole is then secured by turns of a bandage surrounding the pelvis, and intersecting one another over the perineum around the catheter, the extremity of which remains exterior to the wound for the passage of urine. This kind of tamponing has appeared to us more gentle than that performed with the canula of Dupuytren. It has been used by us on several occasions, and we have never left it more than twenty-four to forty-eight hours, that period being generally sufficient, and we have never lost any patients by hemorrhage.

In a hundred operations performed at the hospital or in our private practice, we have three times wounded the rectum. This accident was detected immediately, or at the very latest the next day. The wound may heal up naturally, as it did in two of the cases; but in the third, the child remained with a vesico-rectal fistula, in spite of several cauterizations made at periods more or less remote from the time of operation—fifteen days, six weeks, and more.

Usually, the results of lithotomy are happy. There is a little fever; and sometimes, a day or two after the operation, the patient passes the urine through the natural channel, if the edges of the wound are swollen, but the urine soon returns through the opening in the perineum, and when everything is favourable, the urine does not again flow through the urethra until the fifth day. On the sixth or seventh day, the wound contracts, and every day afterwards a somewhat smaller quantity of urine passes by the wound and a larger quantity by the canal. From the twentieth to the twenty-fifth day, the wound, which has been stimulated by cauterization with nitrate of silver, has diminished until it is now closed,

the urine passes by the urethra, and the cure is complete. This is ordinarily the case, but not always so.

Accidents after the Operation.—The evening of the operation, or the next day after, the patient may be attacked with pains in the hypogastrium, principally in the vesical region, caused by the presence of a clot of blood in the bladder; a poultice applied over the stomach will suffice to facilitate its expulsion. This accomplished, the pain and fever excited by the presence of the clot will disappear. We have found a bath of great service under these circumstances, so that we sometimes order one on the evening after the operation, in order to obviate this accident. When the child has not had an evacuation from the bowels after the lapse of two or three days, we give him at first a little castor oil in preference to an enema.

Should other symptoms arise, such as chills, fever, inclination to vomit, sensibility in the region of the bladder, with swelling and more or less marked infiltration of the penis, we have reason to fear as a result—and one that sometimes occurs—an inflammation of the cellular tissue of the smaller pelvis, and consequently peritonitis. We then boldly prescribe the application of a considerable number of leeches either to the perineum around the wound, or to the hypogastrium, following up the treatment with poultices or fomentations over the stomach, inunction with the mercurialized belladonna ointment, warm baths, and purgatives; in a word, an antiphlogistic treatment graduated to the powers of the child. To this may be added a mixture containing the alcoholic tincture of aconite, in doses graduated to the age of the child, to obviate the effects of purulent absorption. We have had the good fortune to save several patients by the use of these remedies, but unhappily not all. Of a hundred children operated on for lithotomy, we lost fourteen, six of whom died of intercurrent affections, such as scarlatina, croup, and pneumonia, and the remaining eight of inflammation of the cellular tissue of the lesser pelvis, arising at the neck of the bladder, and thence spreading to the peritoneum of the abdomen, the morbid changes in which were revealed at the autopsy. In our post-mortem examinations we discovered, to our own satisfaction, that we had not wounded the ejaculatory ducts. We have seen several of those on whom we operated, some of whom had reached the ages of twenty-one and twenty-four years, and they informed us that their

generative functions were not in any way impaired by the operation for stone.

We may sum up the accidents occurring subsequent to lithotomy and lithotrity as follows:—

1. From lithotomy performed in a hundred cases, we lost fourteen, as above stated, eight of these deaths, dependent on the operation, being from inflammation of the cellular tissue of the lesser pelvis, and even from cystitis accompanied with nephritis; and six of intercurrent affections, as just mentioned. Of three rectal fistulas, following the operation, two were cured; and, so far as we know, two perineal fistulas still remain uncured, while three of our little patients continue to be affected with a certain amount of incontinence of urine.

2. In forty operations for lithotrity—thirty-five boys and five girls—seven deaths occurred, four of them produced by intercurrent diseases, such as croup and scarlatina, and only three as the result of the operation. In one of these latter cases, death was due to cystitis consequent on pinching of the bladder, and in the other two also to violent cystitis, complicated with inflammation of the ureters and kidneys. The results of lithotrity performed in cases in which the calculi were so large as to require four, five, and six applications of the instrument, were such as to give us great uneasiness, on account of the supervening inflammatory symptoms, and from the difficulty often experienced in the extraction of calculi lodged in the urethra. We have not met with incontinence of urine as a result of our lithontriptic operations, and our little patients were shielded from all danger of urinary fistula.

We are, therefore, of the opinion, as the result of our practice, that it will be best to encourage the use of lithotrity in children, restricting it to the circumstances already referred to, but that we must still resort to lithotomy by preference, when the calculus is very large and inflammation of the urinary apparatus exists as a complication.

Fistula after Lithotomy.—After perineal lithotomy, there sometimes remains a fistula, which is either vesico-rectal or vesico-perineal. The former results from the wounding of the rectum at the moment of operation, the urine flowing through that bowel, and fecal matter sometimes passing from the intestine into the bladder and through the urethral canal. In three cases of this kind which came under my observation, two were cured by the efforts of na-

ture alone, but one resisted every means employed for its relief, such as catheters worn constantly, cauterization with nitrate of silver, and afterwards with the actual cautery, assisted by the use of gelatinous saline and even sulphurous baths. The child still suffers from fistula, with involuntary discharge of urine, which sometimes contains fecal matter. We have met with perineal fistulas in children who had a long time previously—several months or even several years—been subjected to the lateral operation, who were treated by cauterization with nitrate of silver, but we never derive good results from this application, because we cannot act upon the whole tract of the fistula.

We have successively tried the use of a seton thread introduced through the fistula and traversing the urethra, and, still later, have cauterized the whole fistulous tract with a stylet heated to a white heat. To perform these two operations, we were obliged to have a metallic catheter constructed, the eye of which was on the convexity on a level with the curvature, and afterwards a hollow stylet capable of passing through the eye of the catheter and of acting as a conductor. Through this tube a long needle-shaped stylet, drawing through a double silk thread, may easily pass and enter. By means of this arrangement, the catheter is introduced in such a manner that the eye is brought in relation with the internal orifice of the fistula, the hollow conductor engaged in the eye is next carried into the fistula, and the stylet carrying the seton is passed through. After having withdrawn the instruments, the operation is completed by tying the two ends. The foreign body is left in for three or four days, and when it has produced sufficient irritation in the tract of the fistula, it is withdrawn, and cicatrization may be effected.

The plan which has succeeded best in our hands is cauterization of the whole fistulous canal with a hot iron; to perform which we again resort to the catheter just referred to, having introduced which, the eye of the catheter being in apposition with the internal orifice of the fistula, we introduce a steel stylet in such a manner as to reach through the fistula into the eye of the catheter, which prevents us from going farther. Withdrawing it, we chloroformize the little patient, and then rapidly introduce the stylet heated to a white heat into the fistula as far as it can go. In this way, we do not pass beyond the fistulous tract, and have no fear of touching the upper wall of the urethra with the stylet. This mode of cauter-

ization is much more certain than the seton. To increase its efficacy, a gum-elastic catheter may be introduced and left in place, and we have seen cases in which the fistula cicatrized after four or five days of this treatment. The vulcanized rubber catheters of M. Galante will be of great service in such cases, for they do not fatigue the bladder, and themselves undergo no change.

If the child under treatment is old enough to reason upon the subject, and gives notice every time he has an inclination to pass his urine, we may employ the vulcanized rubber catheter, and thus have still less cause to fear wearying the bladder by the presence of the catheter worn there; but, to accomplish this, it is necessary that the little patient should have near him some one who can readily pass it, or that he should be old enough to do this himself. This facility may be acquired in children of about twelve years of age.

CHAPTER XI.

HYDROCELE.

Hydrocele is frequently met with in children, and is of two kinds—hydrocele of the tunica vaginalis, and encysted hydrocele of the cord. The former presents two varieties; one in which communication exists with the peritoneum, as in hydrocele which has originated previous to birth, but we have likewise seen children who have come into the world with a hydrocele that was devoid of any such communication. In the former case, hydrocele existed before the descent of the testicle, and in the latter, it followed the descent of that organ into the scrotum. We may, therefore, say that congenital hydrocele does not always communicate with the abdominal cavity, although it does so in the majority of cases. The fluid is generally found on examination to be lemon-yellow and albuminous. We have seen it of a different colour only when the testicle was diseased, when the fluid was thick, opaque, or puriform. The vaginal tunic is distended, but healthy, without change of colour or increase of thickness, and transparent. Sometimes the testicle is affected, is tuberculous and even cancerous, but these two alterations are very rare at the youngest periods of life.

Causes and Symptoms.—When the testicle is diseased, the hydro-

cele is the consequence of the principal disease, but as that organ is usually healthy, the cause is very obscure. General debility of the child seems sometimes to be the only cause we can assign, while at other times we may refer it to contusion or bruising of the testicle, or orchitis. Whatever the cause may be, we observe the following symptoms: An oblong swelling of variable size, fluctuating, transparent, without change of colour of the skin, extending from the inguinal ring towards the inferior part of the scrotum, not capable of reduction into the abdomen when there is no communication with the peritoneum; being reduced, on the contrary, by slow and graduated compression, when such communication exists, and reappearing as soon as the child is made to cough, or to walk or jump. This symptom, which is also observed in hernia, might lead to confusion of the two affections, but one of the tumours is transparent and fluctuating, and the presence of a fluid is positively determined, while there are no such symptoms in the hernial tumour, which is opaque, and yields the sensation of gas or gurgling, when felt by the hand.

The *prognosis* of this disease is not grave, and it may generally be cured, with or without an operation. In fact, hydrocele abandoned to itself may disappear spontaneously, especially that form of hydrocele which communicates with the peritoneum. We may assist the cure by lotions of a somewhat tonic nature and by the use of a suspensory bandage.

Treatment.—Compresses steeped in coarse wine, in which Provence roses are infused, may be applied with benefit over the scrotum, retaining them with a suspensory bandage. A mixture of equal parts of tincture of digitalis and water has sometimes succeeded as a topical application in our hands. Compresses steeped in these substances, and applied for fifteen days or three weeks, have resulted in absorption of the fluid, but we can only depend secondarily on these agents. Operation is our main reliance.

Operation.—In the child, as in the adult, the operation may be palliative or curative. In both I have sometimes simply punctured it, without any recurrence, and I believe no inconvenience can result from this simple treatment. Should the hydrocele return, however, we must resort to the use of injection, which constitutes the curative treatment. The only preparation the patient requires for this operation is that he should be restricted in his diet the same morning, and we then proceed to operate as follows: The patient

is laid on his back, the assistants holding the thighs separated, the surgeon ascertaining anew that fluctuation and transparency exist. Having made sure of the position of the testicle, he seizes the tumour with the left hand, and makes a puncture in front, in such a manner as to penetrate the cavity of the tunica vaginalis, without touching the seminal gland. This puncture is preferably made with a flat instrument, the trocar being terminated by a lancet-shaped point, which can gently penetrate like a lancet, and without a sudden thrust, as is done with the ordinary instrument. We make the puncture exactly where we wish, gently and without forcibly thrusting it. The trocar being withdrawn, the canula gives outlet to the fluid, and may be buried deeply so that it cannot slip from the tunica vaginalis, the injection being next made with whatever fluid we may have selected. For nearly twenty years we have abandoned the use of wine, and even tincture of iodine; we only employ alcohol at a temperature of 36° (*Cent.*) and cold. We allow a sufficient quantity of the fluid to penetrate to restore the tumour to the volume it had before the puncture, letting it remain for two or three minutes, and then flow out through the canula, and we do not attempt to empty the whole of it at once. We even allow a small quantity of it to remain, and this may be done without any risk to the patient. The canula is then withdrawn, and the little patient remains in bed without any application being made over the scrotum. By this method, we produce less pain than with wine and tincture of iodine, and the inflammation, without being intense, is always sufficient.

The next day after the operation, if there is but slight swelling, we allow the patient to get up and to walk in his room. If there is a little tumefaction and sensibility, we keep him in bed and apply a suspensory bandage. The tumour increases in volume little by little, to return nearly to the size it presented before the operation. We sometimes cover it with compresses steeped in water strengthened with a little camphorated brandy, or else simple alcohol, the whole being supported by a suspensory bandage. Finally, before the end of the second week, the tumour will have gradually diminished, everything return to its normal condition, and the patient be cured. We have very rarely met with inflammatory symptoms which necessitated the use of baths or emollient applications. In more than a hundred operations, we have not yet witnessed a recurrence. In those cases in which, before the operation or even after making

the puncture, we have found the testicle swollen, especially if the patient is scrofulous, instead of using pure alcohol, we prefer for injection the alcoholic tincture of iodine, one part of the latter to two of water.

Sometimes we have seen hydrocele with one or two partitions in which case we have crossed successively the spaces with the trocar, and we have passed a seton of two or three silk threads across the spaces. After three or four days, we have withdrawn the seton, and we have always cured our little patients. When this method produces too much inflammation, we prescribe body baths and apply poultices without at once removing the seton, which we withdraw only when there is a proper and sufficient amount of swelling, with sensibility. The application of compresses steeped with some resolvent liquid completes the cure.

Hydrocele communicating with the Abdomen.—This form is often met with. Its causes are obscure, and it may be said probably very often to be developed in the womb of the mother, before seven months of conception, a period at which the testicle has not yet descended into the tunica vaginalis. This form is generally called *congenital hydrocele.* The symptoms are clearly marked. The tumour is soft, without change of colour of the skin, and fluctuating. By exerting pressure upon it, in the same manner as in reducing hernia, we cause the fluid to re-enter, and we therefore have under the fingers a peculiar sensation of liquid, not of gas. The re-entrance of the fluid is sometimes produced with the greatest facility; at other times prolonged pressure continued for quite a considerable period is required, depending on the dimensions of the opening of communication, which is so small that we may be deceived into believing that the case is one in which there is no communication with the peritoneum. It often happens that this form of hydrocele re-enters completely while children are lying down, and reappears when they get up and are again put on their feet.

Treatment.—We have seen these hydroceles absorbed, cured by time, and by the use of a simple suspensory bandage, at other times by a hernial bandage very carefully applied, and well looked after by the parents, who should endeavour not to let him get rid of the fluid through the opening of communication. In this way these hydroceles have sometimes been cured. Generally, however, we must resort either to a palliative operation by simple puncture—a

plan which is frequently successful—or puncture with injection of a fluid, like that already described in hydrocele, except that we need only decide on the latter after one or two palliative punctures. Finally, when we wish to inject alcohol, we must exert very careful compression over the inguinal ring while the liquid is being forced in. This operation should be performed very slowly, in order that the fluid injected may not pass into the peritoneum. Yet on one occasion, believing that I was operating on a hydrocele that had no communication with the abdomen, because the opening was extremely narrow, I injected nearly an ounce of alcohol without any bad result following, although the fluid passed into the abdomen. Nevertheless, we must be very careful to prevent this penetration of the injection into the peritoneum; and with this object in view, we should in all cases exert compression over the external inguinal ring.

Encysted Hydrocele.—This form of hydrocele consists in a small tumour, of greater or less size, developed in the course of the cord. It does not produce any change of colour of the skin, is fluctuating and transparent, more or less resisting, slipping readily between the fingers as they grasp it, descending when we endeavour to bring down the testicle, and again mounting upwards towards the ring, when we relinquish our hold. This is a proof of its undoubted connection with the cord of the testicle. This tumour is developed without appreciable cause, does not produce pain, remains a long time stationary, and sometimes increases in volume. It never terminates in any alarming manner. It should not be confounded in children with varicocele, for I have never observed these venous dilatations in the youngest children, and I may make the same remark in regard to hæmorrhoids. Neither should it be confounded with a hernia, for it does not pass back into the abdomen. We should be aware, however, that we sometimes in this region meet with false encysted germs, very rare tumours having special characters—non-transparency, for example. In encysted hydrocele, the simple injection of alcohol has generally been sufficient to produce a cure. A small seton, introduced in the same way as in an abscess, has also given good results, without very intense inflammation and without any recurrence.

CHAPTER XII.

PROLAPSUS ANI.

Prolapse of the rectum is met with in children quite as frequently as, or more frequently than, in old persons. This affection, characterized by a procidentia of the rectal mucous membrane, should not be confounded with invagination. The prolapse of the mucous membrane presents itself under the form of a reddish cushion around the circumference of the anus, only making itself visible under certain circumstances, especially as the result of efforts of defecation. When we examine the periphery of this cushion, we notice that it takes the circumference of the anus, and that it presents a superficial circular ridge, prominent to the extent of three-quarters of an inch to about an inch and a quarter. In invagination, on the contrary, there is a reddish prolongation over a much greater extent of surface, forming a kind of tube with a projection of about two or two and a half inches, or more, around this kind of tubular tumour; and a blunt stylet may be readily introduced, or a catheter which may be easily turned around the cul-de-sac formed by the intestine when turned back upon itself.

In the former case, in which there is simple prolapse, we recognize, always as a cause, either diarrhœa, constipation, the presence of a polypus of the rectum or of a vesical calculus, or finally, and most frequently, general debility. Especially do we meet with it in children of from one to three or four years of age. The little patients are nearly always weakly, and exhausted by diarrhœa and bad nourishment. When their bowels are opened, the mucous membrane of the rectum projects, going back again to a greater or less extent after the evacuation; is sometimes of a bright red colour, and covered with bloody mucus, but at other times presents ulcerations when the mucous membrane is exposed for any length of time. The patient remains a long time on the vessel, making efforts that are often futile, and the anus is often infundibuliform. These

prolapses recur at greater or less intervals, sometimes two or three times a week, sometimes more frequently, and even every day.

Generally this affection in children is not serious, yet it sometimes terminates in mortification of the exposed portion of mucous membrane, which becomes inflamed gradually, and finally becomes detached. Frequently general and local treatment modify the condition; in children, for example, who are constipated, if by a proper regimen, and by enemas, we relieve the cause, and thus destroy the tendency to its production. If diarrhœa is the cause, just as soon as it is cured everything will return to its normal condition. Of course, in cases in which a polypus of the rectum or a vesical calculus gives rise to the affection, the latter yields only when the polypus or the calculus is extracted.

If the case is simple and uncomplicated, we may be content to build up our patient with good diet and strengthening baths. If general tonics are not sufficient, we must employ astringent lotions, decoction of walnut leaves, Provence roses, or else solutions of alum or tannin, a vinous solution, cold applications, even ice, or other means to be presently detailed, when these fail. Taxis is indispensable at the moment for the reduction of the mucous membrane. The patient should be laid on an inclined plane, the head and trunk depressed, and the pelvis elevated. In this manner, by pressing the cushion formed by the bowel surrounded by a linen compress covered with cerate, we compress it at the same time laterally and in the direction of the curve of the sacrum, while also pushing the compress with the finger—thus for a time reducing the mucous membrane, which may be retained with a tampon of charpie secured by means of a bandage. But this is only a palliative method, and we often have to resort to others of a more active nature.

I need not refer to excision of the protruded portion, or its destruction by cauterization, a plan which has succeeded in my hands at Bicêtre in old persons. With children, the division of the radiated folds of the anus, as advised by Dupuytren, has not been attended with good results in my experience, and has been followed by erysipelas around the margin of the anus. Since 1845 we have employed cauterization by puncture in this circumference, four cautery needles being sufficient. We always use chloroform in making this application, and then apply cauterization with a small dental cautery to the space corresponding to the coccyx, then over the opposite side in front, and two others to the right and

left. This mode of cauterization has answered the purpose, if we take care that the instrument is buried to a slight extent, in such a way as to reach the sphincter ani, so that its muscular contraction, which had been impaired, may be restored. Several patients have by this means been cured in a few days. The after-dressing consists in lotions of cold water.

It occasionally happens that the prolapse of the mucous membrane reappears even when cicatrization is complete. Once or twice we have been obliged to resort to a second operation, but this may be due to the fact of the first cauterization being too superficial and not penetrating as far as the muscle, and the object of the operator not being attained. The frequent occasions on which we have had to apply this form of treatment have made us familiar with one difficulty in the use of these cauterizations. Though the patient is asleep, he expels by the efforts of the bowel, and we are obliged, to avoid cauterizing it, to incline it in a direction contrary to that in which we introduce the needle. As the swelling is lubricated with mucus, it frequently slips, and time is thus lost. We have for a long time preferred to introduce into the rectum, while the child is asleep, a fenestrated speculum, which has the advantage of pushing back the mucous membrane. We are thus enabled, by turning the instrument, to make the opening in the speculum correspond with the point on which we desire to apply the cauterization, at the commingling of the mucous membrane with the skin—a spot which corresponds exactly with the sphincter ani, on which we propose to operate. This method, like all those in which iron heated to a red heat is used, is rarely followed by any bad symptoms, so that we prefer it to other modes of treatment pointed out later, either by one of our pupils, Dr. Duchaussoy, who first employed it in my presence at the Hôpital des Enfants, consisting of blisters with the application of strychnine, or by another method comprising the instillation, in the circumference of the anus, by means of Pravaz's syringe, of two or three drops of a thousandth-part solution of strychnia. M. Dolbeau has had a successful case of this kind in my own practice; but my colleague, M. Giraldès, has not been so fortunate, having failed with it. Nevertheless, as this treatment is very simple and harmless, when we do not exceed these doses, it might be attempted before resorting to cauterization.

As for invagination of the colon in the rectum, the case is much more rare and more grave, as it always depends on a general

depraved condition of the digestive apparatus. It is accompanied with colic, vomiting, and symptoms of strangulation, and presents itself in the form of a mucous tube of variable length escaping at the anus. The general condition must, first of all, be combated by medical treatment, such as by tonics and astringents, for this affection is met with in weakly children. It sometimes happens that the portion of intestine invaginated becomes gangrenous, and is expelled from the bowel, when the affection persists for any length of time. At the commencement of the prolapse of the intestine, the surgeon may make efforts mechanically to press back the bowel, but this can only be done by means of a thick gum-elastic catheter, olive-shaped at its extremity, or else with an instrument devised by me, consisting in a metallic ring secured to the extremity of a piece of whalebone, in such a manner as to make a right angle with it, the ring having a diameter of about three-fifths of an inch, and the handle being about eight inches in length. The portion of invaginated intestine being engaged in the ring, which is previously greased, the instrument is gently pushed and turned towards the cul-de-sac, where it becomes arrested if the invagination is old, but yields readily to pressure if it be recent. This method of reduction may only be palliative, yet we may sometimes indulge a hope that the bowel will not become invaginated afresh.

CHAPTER XIII.

CHRONIC ARTHRITIS.

Acute and chronic arthritis, or white swelling, are met with in children as in adults and old persons, but in the young the chronic form is infinitely more frequent than the acute. Besides, the majority of rheumatic articular inflammations being especially within the domain of internal pathology, we desire at first to call attention only to traumatic arthritis, which follows the same course and requires the same treatment as in adults. We will, therefore, confine ourselves to the remark that those forms of the affection which are caused by external violence demand an antiphlogistic treatment; that, nevertheless, we must be very particular in the abstrac-

tion of blood in children as in adults, and yet that we must use our best efforts to prevent the inflammation from passing into a chronic condition—a formidable termination of the disease in young subjects, who are most frequently scrofulous. Thus, in cases of sprains in children, we are very partial to the use of cold water and of kneading, which have often succeeded in our hands. We follow up this treatment by the application of wadding around the articulation, or else of immovable bandages, which are always of service in such cases.

An important observation we may make is, that traumatic arthritis, properly treated, rarely passes into a chronic condition, a fact which we have had many opportunities to verify, although often fearing the contrary. The cure is assured if the patients are not predisposed to a scrofulous constitution.

As for chronic arthritis, which form the disease assumes at the outset, and most frequently without very appreciable local causes, it is of such common occurrence at the Hôpital des Enfants, that not a day passes without two or three cases presenting themselves for advice. Under this name we include such cases of arthritis as occur without open inflammation, with little or no fever, five times in a hundred, under the influence of a traumatic cause. The same phenomena are observed in all the joints which are the seat of this painful affection. In the large articulations of the limbs, as well as the small, the tarsus, the knee, the vertebræ, etc., we find arthritis acting in the same manner, and improving or being cured with the same treatment, when a cure is possible, or most frequently resist all methods of relief. These athritic attacks offer nearly always two almost constant symptoms—swelling and preservation of the white colour of the skin—from which the name white swelling is derived. But, besides this expression seeming to imply that the skin never changes colour—which is not exactly the fact—it is improper to confound under one name very different morbid conditions, and surgeons are therefore obliged to classify more systematically the numerous affections which attack the articulations.

Modern authorities adopt a mixed opinion on this subject, between the views of Lloyd and Brodie, who were of the opinion that any kind of tissue may be the point of departure of white swellings, and of Rust, of Vienna, who restricted it to the bones; and they fix the seat of the disease sometimes in the osseous tissue, sometimes in the soft parts. Thus, a white swelling may have its point of

departure in the bones, and thence invade the soft parts, or else the disease, commencing in the soft parts, extends thence to the skeleton. We thus understand at once how important it is to commence the study of white swellings, taking first a rapid glance at the anatomical alterations in the articulations. In the composition of these last, we find the osseous and cartilaginous tissues intimately united together, and the fibrous and serous or synovial tissues equally bound by close relations. The former form the skeleton, the resisting part of the articulations; the latter maintain the relations of the various bony parts and facilitate their movements. Around all this system, which composes the articulation properly so called, there are the subsynovial cellular tissue, tendinous sheath, muscles, and the cutaneous envelope—in a word, all the soft parts which separate the articular cavity from the external surface.

In order to understand the connection between the various morbid changes, we must study in succession the pathological lesions in each of the tissues entering into the composition of an articulation. The synovial membrane loses its polish and becomes covered with very fine granulations at first, which soon become true fungous growths, spreading to the cartilages. These growths are covered with false membranes, and the cellular tissue lining the synovial membrane, rich in bloodvessels, becomes engorged and secretes plastic lymph, which soon becomes organized, and daily increasing in volume gives to the synovial membrane, jointly with the fungous growths and false membranes secreted on its internal surface, a thickness sometimes amounting to from two-fifths to four-fifths of an inch. A fluid soon collects in the articular cavity, at first reddish, then sero-purulent, and finally purulent, increasing in quantity, and distending the synovial membrane, which would burst were it not supported by the resisting thickness of the fungous growths and false membranes; the patella is raised up, and we are then induced to think we have a simple hydrarthrosis to treat.

The cartilages themselves are also the seat of important lesions. They live at the expense of the bones on one side, and at the expense of the synovial fluids on the other, and may therefore be regarded as parasites, which must themselves inevitably suffer the consequences of alteration in the bones and of the secretions from the synovial membrane. The most frequent lesions connected with the cartilages are—1. Loss of elasticity. 2. Partial or general thin-

ning, commencing on the deep or the superficial surface. 3. Peeling off, which is produced by the development of granulations between the bone and the cartilage, in which case the cellules of bone are denuded. 4. The loss of polish, which accompanies all these lesions, should be constant, for it frequently takes place in children as in old persons, in whom we find the cartilages reduced to small fragments of the volume of a millet-seed, and floating in the fluid of the articulation. 5. Erosions characterized by a partial loss of substance, extending even to the bone. The cartilage around this perforation loses nothing of its normal qualities. At the bottom of the perforation the bone is seen, or fungous growths, which in some cases project into the articulation. At other times there are openings cut perpendicularly in the cartilage, and constituting a narrow canal, opening on one side into the articulation, on the other into the spongy tissue of the bone. Some of these canals are not complete, and are still covered with a portion of cartilage on the free surface. Brodie, Russel, and other surgeons consider the loss of substance as ulcerations, but we coincide with the views of Richet, Cruveilhier, and Velpeau, that ulceration cannot take place in tissues in which vascularization is impossible.

What becomes of the fibrous tissues in the midst of these disorders? Sometimes they undergo softening, and this is the most common effect, their fibres seeming to be disconnected, the cellular tissue between the fibrils being converted into jelly, and cohesion being so much destroyed that the cartilages may be stretched and elongated with ease. They lose their shining appearance and become pale, as if they had stood in an alkaline solution. At other times they seem to be hypertrophied and indurated, when some thin bloodvessels may be seen running through the fibrils; but this is a very unusual condition, and is rarely ever observed unless the disease is beginning to retrograde. We believe that these two varieties of alteration are consequent on lesions of the synovial membrane, and that the ligaments are never primarily affected. The subcutaneous cellular tissue becomes infiltrated and swollen, the skin becomes smooth and generally preserves its normal colour and heat, but is sometimes attended with bright redness and increase of temperature. In the majority of cases the skin presents the openings of fistulas or abscesses, through which the sequestra of diseased bones have an outlet. The muscles retract, and the tendons, raising the skin, are felt like cords, on account of the want

of motion of the affected limb, which also produces thinning of the muscles, in such a manner that the tumour appears less bulky than it really is.

But the most serious lesion is that of the bones; it may be, as we have already said, primary and the cause of the white swelling, or else consequent on an alteration of the soft parts. The ends of the bones, on account of their vascularity, will suffer from the morbid influence sooner than the diaphysis, which is more compact. All diseases of bones are capable of producing tumours, and, among others, osteitis, caries, necrosis, etc.

Osteitis may be simple or consequent on a general affection, such as tuberculization or syphilis. When it is simple, the bone becomes infiltrated and swells, pus is produced, and there may be caries, necrosis, and separation of sequestra, which last come from the surface of the bone, on the outside of the articulation. In cases of tuberculization, which is not a very rare condition in children, there may be an encysted tubercle inclosed in the extremity of the bone, and increasing in every direction. If this tubercle reaches the surface of the bone, it may open an outlet through the cellular tissue, on the outside of the articulation, and a cure is not then impossible. If, on the contrary, it penetrates the cavity of the joint, the affection increases in intensity, all parts of the articulation become disorganized, and general symptoms arise, which may eventually destroy the life of the patient. Under other circumstances, the tuberculous matter is infiltrated into a portion of the bone, which becomes necrosed and eliminated by sequestra, and the cure is thus established. But if infiltration makes its way into the joint, the cartilage is totally or partially destroyed, the cavity of the bone is obliterated, and the sequestra of the cartilage may remain in the articulation and keep up an interminable suppuration there. Caries and necrosis are easily understood as the result of osteitis and a complication of white swelling.

In the midst of all these disorders just referred to, displacements of the articular surface are produced, which are easy to foresee. They depend—1. On inflammation of the soft parts surrounding the articulation, which lose their resistance and are readily distended, the ligaments being unable longer to retain the bones, which, yielding to the traction of the strongest muscles, finally become displaced, giving rise to more or less complete luxation. 2. On the retraction of the muscles resulting from the faulty

position of the patient. Thus, in the majority of cases of coxalgia, the patients lie on the sound side, flexing the thigh of the side affected on the pelvis. It thence follows that the nates, being tense, press the head of the femur on the cotyloid prominence, that the cotyloid cavity loses its natural shape as a result of this continued pressure, and that finally a luxation results, generally, it is true, in an incomplete manner. But sometimes the head of the femur is displaced as far as the external iliac fossa, and a complete luxation then results. Displacements by muscular retraction only occur slowly.

Let us now consider the order of frequency in which the different articulations are attacked in children.

The occipito-atloid and atlo-axoid articulations are less often attacked than those of the other regions of the vertebral column, which, in their turn, are much less frequently involved than the articulations of the limbs.

Chronic arthritis of the temporo-maxillary articulation is exceedingly rare.

The scapulo-humeral articulation, the articulations of the elbow, the wrist, and the phalanges, are very liable to inflammation, and we have often seen this form of morbid alteration in children.

The articulations of the lower extremities, especially of the knee, are often attacked with white swelling.

The coxo-femoral articulation, which is frequently attacked with coxalgia, deserves special mention, and we shall treat separately of everything relating to it.

Causes.—Chronic arthritis may be due to two sets of causes, one local or traumatic, quite rare with children, although they frequently suffer from falls; the other general, quite common in early life. The local or traumatic cause will only act if the child is predisposed to it, and will only occasionally occur. It is evident that all children will not have a white swelling as a result from a fall on the knee, whilst, if the tissues are prepared for it by a bad constitution, they will become the seat of an inflammation, which may before long take a chronic form. The constitutional cause is nearly always scrofula, which prevails more particularly in children of both sexes, placed in specially unfavourable hygienic conditions, and appears to predispose those who are subject to it to the development of white swellings, to such a degree that the slightest accidental cause may produce in them this terrible disease. When the white

swelling is developed under the influence of scrofula, the affection often commences in the bones; but it may commence in the soft parts, as in the case of acute arthritis passing into a chronic condition. All diseases which exert their action upon the bones may give rise to white swellings.

Symptoms.—The affection most generally commences with a soreness or transient pain, which is reproduced at varying intervals, and which increases in intensity until it becomes permanent. Sometimes the pain is felt several months before the appearance of the white swelling, ceasing for a greater or less length of time, and then returning, and not leaving the unfortunate patient for a long time. A child threatened with white swelling feels after rather violent exercise more or less sharp pain, which after a night's rest disappears. The following days fresh sufferings follow fresh fatigues, and thus the pain reappears, becoming more intense and enduring, to such an extent that the patient cannot bear the affected limb to be touched or the bed jarred. A remarkable phenomenon may be observed, especially at the commencement of the disease, in the fact that the patient refers the pain to the joint situated beneath that really attacked. Thus, in coxalgia, the knee is sometimes the only part at first complained of, or, at least, the pain in the knee, being more intense than that of the hip, has thrown off their guard physicians who are not familiar with this fact, and has led them to believe in the existence of an affection of this articulation. This phenomenon may be explained by the transmission of the pain through the medium of the nerves which are spread around the femoro-tibial articulation, but this explanation is not admissible for other articulations. M. Richet is of the opinion, that as the two extremities of a long bone communicate by the hollow canal in its diaphysis, when one of these extremities is affected with osteitis, the other will also feel it. But, as M. Nélaton has judiciously observed, if this pain was the index of an osteitis of the lower extremity of the femur, for example, it would soon be followed by an affection of the knee-joint, a condition that is never met with. Whatever may be the seat of these pains, they are more intense at night than in daytime.

The other more constant symptoms are—1. Swelling, which may be caused by tumefaction of the bones, by an effusion from the joint, or by the swelling of the soft parts on the external surface of

the articulation; like pain, it finally becomes permanent. 2. Lameness, which is produced at first by the pain induced by walking; but when the disease is cured the child may still limp, either from habit or as a result of muscular contraction or anchylosis. 3. Deformity of the articulation, which is especially caused at the outset by the swelling of the bones or the soft parts, or may proceed from hydrarthrosis. Abscesses and softening of the ligaments, as a result of their contact with pus, cause the bones to yield to the action of the strongest muscles, and displacements are thus produced. The articulations will also become deformed by the position of the patient, which accommodates itself to the action of certain muscles while suppressing that of their antagonists; a continuous traction on the bones thus resulting, which modifies the shape of the joint. 4. Shortening or elongation of the affected limb, which is sometimes more apparent than real, for variations of length sometimes only result from the two limbs being placed for comparison in different positions. We were able to study in our own case a shortening of the thigh, which was developed whenever we wished to walk, at a time when we were attacked with a rheumatic affection of the coxo-femoral articulation; the muscular contraction caused by the pain resembled shortening. But shortening and elongation may be real, as the result of displacements of the articular surfaces. Muscular contractions sometimes produce shortening, and yield only to tenotomy. 5. Anchylosis. When the bones have suppurated they mutually send out bony stalactites, and at other times the ligaments become hardened or ossified, more or less complete anchylosis resulting. M. Richet has determined that when there is displacement, pseudarthrosis may be produced, which is likewise susceptible of white swelling. Finally, a not uncommon symptom in chronic arthritis is crepitation, which takes place when the articulation is dry, or when the cartilages being worn away the bones rub against each other, or these same cartilages being exfoliated are spread in little grains over the interior of the joint.

By way of recapitulation, we may say that chronic arthritis presents three principal periods: 1. Soreness, pain, and swelling of the soft parts. 2. When the inflammation invades the articulation, we meet with abscesses, ulcerations, straight or tortuous fistulas, if the pus becomes diffused and makes its way to a dependent point,

fungous growths and crepitation. 3. Deformity, luxation, separation of sequestra, and anchylosis.

This disease sometimes progresses rapidly, and in a few months reaches so serious a point, that the limb must be amputated to prevent the patient from dying of exhaustion; but more frequently it occupies several years in passing through its various stages. Generally, it is more chronic in proportion to the complication of disease of the bones.

The *diagnosis* of white swelling, in the ordinary meaning of the word, is very easy, but this cannot be said of the point of departure of the disease in any of the tissues, or of certain complications. Thus when fungous growths are developed in an articulation, we detect a fluctuation which may deceive us into believing that we have an abscess to treat. Chronic arthritis can only be confounded with hydrarthrosis or articular rheumatism, but these two affections, passing to the chronic state and disorganizing the tissues of the joint, would impair the functions of the limb. In such a case, should we not have to deal with a true white swelling, in the acceptation that we have reserved for that term? Besides, would not the treatment, in the existing state of science, be the same, whether we diagnosticate it to be a white swelling, chronic rheumatism, or a hydrarthrosis, the fluid of which has become purulent?

With regard to the general treatment, it would be well to know under what influence the disease is developed. If the child is scrofulous, he bears most frequently other evidences of that condition, although it might happen, as we have already remarked, that the whole scrofulous vice is concentrated on a single point. Scrofulous antecedents are also found to exist in the parents. This is true also of syphilis, which only attacks the bones in the tertiary stage, and then we almost always have to deal with an hereditary affection. Tertiary syphilis commences by attacking the shafts of the bones, and in proportion to its duration it approaches the joints; but when it is transmitted by the parents, it may at the outset manifest itself in the articulation.

It is sometimes very difficult to determine whether the bones are diseased. The swelling of the soft parts may obscure it, and it has happened to us to perform amputation in cases in which the bones were either not affected or very slightly so, at a time when they appeared to us as well as to others who examined the articulation, to be attacked. These mistakes can only occur when there are no

fistulas so disposed that, in introducing a stylet, we detect the sound of crepitation on the denuded bone.

The *prognosis* of chronic arthritis is nearly always serious; yet it often varies, according to the cause, the stage of the disease, and the age of the patient. 1. The cause being determined, whether traumatic or any other, except scrofula, the prognosis will be quite favourable. There are some tumours which are cured by time and under the influence of general tonic remedies. 2. The stage of the affection will render the prognosis so much the more serious, as the disease is older, unless a remarkable tendency to improvement is established. If there is effusion, suppuration, displacement for any length of time, etc., we can anticipate no good result. 3. Childhood is favourable to a cure, yet it often happens that the disease is only checked completely at puberty or during the period of youth, at a time when the constitution is improved.

A cure is frequently only obtained with deformity, shortening, luxation, or anchylosis. Our little patients also die from excessive suppuration. In any event we should always remember that there is perhaps no disease which gives rise to more mistakes than the one which now engages our attention.

Treatment.—The treatment of chronic arthritis may be either general or local. The latter is directed against the various material alterations which may be detected; the former will be addressed to the patient's constitution, and most frequently through the same to the cause of the disease.

The *local treatment* is of great importance. It may be that the cause which produced the white swelling has disappeared, and then local attention alone may produce good effects. Even in cases in which the disease has a constitutional origin it becomes indispensable. We may cite, for instance, the exasperation of the disease produced by injudicious movements, and the good results, on the contrary, which ensue from perfect rest, and we might illustrate it by other examples; but we must pass in rapid review the various therapeutic agencies that we have employed.

Antiphlogistics at the outset, when there is redness and heat—in other words, inflammation—have not proved of great benefit in our experience at the Hôpital des Enfants. In several cases of chronic arthritis, for which we employed blood-letting, only two or three seemed to be slightly improved; but this ill-success is intelligible when we reflect that the children we had to treat were lymphatic,

scrofulous, and anæmic, on whose general health even a trifling loss of blood might exert a most injurious influence. Yet this mode of treatment should not be completely rejected, for it might prove useful in patients affected with white swelling who have received a blow on the diseased articulation, at the moment when their constitutions were commencing to be benefited by general treatment; or else, when at the outset, in patients of proper strength, the arthritis is accompanied with fever and manifest symptoms of inflammation. In such a case we prefer cups to leeches, thus bringing to the skin a salutary derivation.

Emollients are of but little use, yet we employ poultices sprinkled with laudanum, when the pain is severe. Emollient fomentations, general baths, and vapor douches, may be resorted to, when the patient feels shooting pains in the joint. Frictions, or, better still, inunction with colliquative substances, and especially with mercurial ointment, either simple or mixed with belladonna, when there is great sensibility, have proved really beneficial in our hands, but usually these means are insufficient. Topical applications—such as antimonial ointment, or croton oil at the outset, and the mercurial ointment already mentioned—to be used when there is swelling or puffiness, are not devoid of good effects. We have little confidence in the ointment of the iodide of lead or the iodide of potassium, which may, nevertheless, be employed. We are not partial to blisters, from which we have never witnessed any gratifying results at the hospital. We have been quite well satisfied with spreading tincture of iodine, every two or three days, around the affected joint, repeated more or less frequently according to the effect produced.

We have sometimes derived benefit from the use of the flying cautery made with Vienna paste, when we desire to act energetically; four of these may be applied around the articulation, and others put in their place after they have healed up. We have, however, seen these affections progress, even after numerous flying cauteries. We have abandoned the use of moxas, because they produced too much pain for the small amount of good derived from them. The actual cautery—lines, plates, and points of heat—have, on the contrary, an undoubted efficacy, and practised with the cautery heated to a white heat, are accompanied with but little pain. Besides they have the advantage of being capable of application more or less superficially, according to the indications, without the least difficulty. We may

add, however, that very often we have derived very little advantage from them.

Apparatus is, before all other remedies, of the greatest utility, and indispensable in all cases; in fact, it puts the patient's articulation at rest, while at the same time enabling the body to take exercise. Lugol made his patients walk when suffering from white swelling, even of the knee, to save them from the debility which inevitably results from a prolonged stay in bed. As this procedure is not without inconveniences, it is prudent to apply apparatus to prevent injudicious movements of the affected joint, and to substitute for walking the use of small carriages which supply a method of taking children into a healthy atmosphere. We may simply apply around the articulation wadding supported by a moderately tight bandage. The apparatus may be of metal, trellis-work, gutta-percha, etc. They may be made of the dextrine bandage, which has the advantage of moulding itself exactly on the affected parts and of preventing every kind of movement. If there be any suppuration, or if the cautery has been applied, we must take care to leave openings, which detract nothing from the firmness of the apparatus, and enable us to inspect the wounds. Besides, these bandages have the advantage of facilitating the expulsion of the pus, and by compressing the limb preventing its engorgement.

Before applying the bandages, the affected part should be put in a suitable position, in order that, if anchylosis occurs, the child will not have a useless limb. Thus we should keep the articulation of the elbow flexed, while that of the wrist will be put in a state of extension. The lower limbs must likewise be kept extended, and the foot at a right angle on the leg. These dextrine bandages should be renewed about every fifteen days, in order to see if any complication has arisen; and then, if the engorgement has diminished, the apparatus will become too large. When there is muscular contraction, and the limb gets into an objectionable position, mechanical apparatus may be advantageously resorted to, which corrects the position of the limb by continuous traction, which may be graduated at will. We are sometimes obliged to practise tenotomy, as if we had a club-foot to treat.

White swellings may be complicated with abscesses, which form in the tissues in the vicinity of the articulation, and have been described by Gerdy under the name, *abcès circonvoisins.* When

they are connected with the formation of the abscess, we may endeavour to arrest them by resolvents, by compression—when they are not accompanied with pain—or by successive applications of tincture of iodine every two or three days, but very often these means are unsuccessful. We must then, to give an outlet to the pus, make an opening, which must be as much as possible subcutaneous, as M. Guérin has suggested, and we may have recourse to this several times. In cases in which there is an intra-articular abscess of considerable extent, we may treat it by subcutaneous puncture, and iodine injections. When osteitis occurs as a complication of white swelling or is the cause of it, we must temporize; nature of herself does alone all the work necessary for the elimination of sequestra, and then cicatrization is promptly effected. Nevertheless, when the constitution of the patient is too much deteriorated, there is danger that we may wait too long, for the excessive quantity or long duration of the suppuration may be fatal to the patient. We have then to resort to amputation or resection of the joint, which succeeds better with children than with adults, but then we are very cautious, because we have seen many unexpected cures.

When anchylosis results, we should apply metallic grooves, which will prevent its rupture, and then carefully place the limb in a proper position, as we have just remarked. Following the example of Bonnet, of Lyons, we must even put the patient under the influence of chloroform, place the articulation in a normal position by judicious manipulation, and apply the apparatus for a long time. If complicated with luxation, we must leave it alone, if it is of too long standing; but if formed almost under the eye of the operator, the articular surfaces should be maintained in relation to one another by immovable apparatus, or else we may reduce the newly-formed luxation, and likewise apply an apparatus.

General Treatment.—We have now to consider the general or medical treatment, which is at once hygienic and therapeutic. As the main point is to combat the scrofulous vice, we must urge the primary importance of giving the patient good nourishment and a healthy atmosphere, and afterwards we may direct our treatment to tonics and depuratives. All forms of antiscrofulous remedies may be prescribed. We are in the habit of advising the use of cod-liver oil, bitter tonics, and preparations of iodine and iron. We must take care to alternate the administration of these medi-

cines, for fear of fatiguing our patients. Thus, for example, we prefer to use the cod-liver oil during cold and dry seasons, and bitter tonics during warm and moist seasons. The iron will succeed well with patients who have chlorotic phenomena, or a predisposition to diarrhœa. The preparations of iodine agree especially with those who have ganglionic swellings. We likewise obtain good results from sulphurous and sea baths. In the use of any of these, it must not be forgotten that the cure of the disease is to be ascribed to the general treatment. The local treatment is, in some respects, only a palliative of pain and deformity.

CHAPTER XIV.

BURNS.

Without repeating all that standard authorities have said and written on burns in general, we may state that these lesions in children present the different stages met with in the adult, but are then more frequent and more grave than at any other period of life. Children are more especially liable to burns, on account of their imprudence, and of their own want of foresight, or that of the persons about them. The smallest of them, at the moment of being burned, can, of themselves, do nothing to escape the accident of which they are the victims, while larger children are agitated without doing anything useful, and often, by running, only give the fire increased activity, if their clothing has caught fire from any material burning. It results from this that children are frequently burned over a very large surface of the body, the burn sometimes being almost general.

Not a year passes without a large number of little patients being brought to the Hôpital des Enfants, burned over nearly the whole surface of the body, or at least over a large extent of it. The majority of these children are burned in the absence of their parents, and some of them die before assistance can reach them. All burns, which, by their great extent, destroy life, sometimes in twenty-four or forty-eight hours, take place from a fire in a chimney-place, a stove, or a dish before the fire, and often from chemical matches, which children ignite for their own amusement.

We meet with burns in all degrees of intensity in these unfortunate little sufferers, from the slightest to complete carbonization. Some of them are partially burnt in one region of the body, others over a very large extent of surface. Cases in which the burn is circumscribed are always painful, and require time for their cure; but very extensive burns, even though moderately superficial, often throw little children into a state of profound prostration, rendering them insensible, and sometimes producing convulsions which speedily lead to a fatal result. Other children, less seriously burned, some of them more advanced in years, resist for a considerable time, and finally die, exhausted by the excessive suffering and suppuration.

The *prognosis* of burns in children is not then very grave, if they are superficial and of limited extent; but when they involve a large surface of the body, as the whole of the face or of a limb, everything else being equal, more grave in children than in adults. They bear pain less patiently, and the younger they are the more reason have we to dread the occurrence of convulsions; they endure a long suppuration with more suffering; they have an apprehension of all painful dressings, and very frequently they recover with irregular cicatrices, because they fail to comply with all the means employed to make them avoid them. Small superficial burns are very often completely cured, but always leave some scars apparent. Deep burns, which are, besides, cured very slowly, always leave behind them more or less irregular scars, adhesions, etc., whatever may be done for them. The progress of burns is extremely slow, and is often embarrassed by complications of intestinal or even pulmonary inflammation. Debility occurring after abundant suppuration retards the cure.

Treatment.—The numerous remedies recommended for burns are the same for children as for adults. The treatment, which is either local or general, should vary according to the principal stages of the burn, whether immediately after the accident, at the period of elimination of the parts destroyed, of suppuration, of cicatrization, of formation of adhesions, and finally, when such adhesions are wholly formed. On these six points, I shall not repeat all that has been usually said in standard works, but confine myself to the treatment which has been found most successful with children.

1. *Immediately after the accident*, whether the burn be circum-

scribed at one point, or general, or else spread over a considerable part of the body, we at first employ various forms of refrigerants, rejecting the numerous remedies resorted to by the people generally; every cold application is beneficial. The burnt part may be plunged into cool water, this being practicable with the hand or the foot. When we cannot employ immersion, compresses, soaked in cool water or glycerine, may be applied over the affected part, and frequently renewed, or else we may resort to the application of a bladder filled with water, to irrigations, washes, etc., according to the region which is implicated. When burns are produced by caustic, as potassa, nitrate of silver, phosphorus, etc., water should not be used, oil being substituted for it. After the various kinds of refrigerants have been called into requisition, I know nothing preferable to the topical use of the following liniment, to exert at the same time a refrigerant and soothing effect:—

R.—Decoct. lactuc. fol. fℨvj.
Amygdal. dulc. ℨiss.
——— amar. ℨss.—M.

Or the linimentum calcis (U.S.), or the following:—

R.—Olei amygdal. dulc. fℨiiss.
Aquæ calcis fℨxx.—M.

This must be painted on the burnt surface with a brush, several times in the day or night.

A plan generally advised, and with which we have had success, is the use of wadding to protect it from the contact of the air; but in resorting to this dressing, which should only be removed at the end of several days, we must first, in applying it in its natural condition, cover the burn with a fenestrated cloth smeared with cerate or glycerine, and place the wadding over it. This enables us to readily remove the first dressing, a procedure which would be very painful without this precaution.

2. *At the time of the elimination of the destroyed parts*, we may excise the epidermis which is detached, and remove the sloughs which are separated, and the refrigerants may be replaced by a dressing of wadding, such as we have just described, or with charpie applied in the same manner, the linen being always covered with cerate, glycerine, or glycerole of starch, with the addition of the extract of lead or several drops of laudanum; or better still, we may moisten the charpie with a mixture of chlorinated water, which has the advan-

tage of dissipating the disagreeable odour which exists at this time. This kind of dressing is used for only a few days when the burn is superficial, being employed for a short time longer in cases in which the separated epidermis leaves beneath a slight suppuration; but when the burn involves the thickness of the skin, the muscles, etc., the suppuration does not cease so soon, and may last for a considerable length of time.

3. *At the period of suppuration*, especially if persistent, it is important that we should continue to apply chlorinated water. In my own experience, all the methods recently advised have no other advantages than water to which has been added solution of chlorinated soda, which exerts a good effect upon the wound, diminishes suppuration, and destroys the odour. In some cases, alcoholic liniments, with which the charpie is impregnated, may be employed. At this period, proceeding carefully, the dressing being properly applied, and being sprinkled from time to time with chlorinated water, we do not fatigue the children with the dressings, which we only apply every other day, in this manner avoiding their cries or the agitation that sometimes gives rise to convulsions. When we have to treat burns involving a large extent of surface, this method is indispensable.

It is often very important to replace ordinary dressings with the use of powders, such as starch, rice flour, tannin, or cinchona, on the genital organs, the penis or scrotum, or the vulva, parts in which it is impossible to retain the dressings; giving them a daily ablution to take away the powder of the evening before, and to powder it afresh. In burns in the immediate vicinity of the anus, it is well to frequently introduce suppositories of cocoa butter, and even pieces of charpie, in cases in which we have reason to fear the contraction of this natural opening. For extensive burns of the trunk, we modify the dressing in order to diminish the period of prolonged suffering to our little patients. We have adopted the plan, with these large and almost general burns, of laying the children on some material powdered with starch, or rice flour, or potato flour, in such a manner that the burns are constantly covered with powder, which absorbs the suppuration. Crusts are thus formed, which become detached every time the child is moved to be pow dered. With this treatment, they suffer scarcely any pain, the dressing is quickly applied, and the burnt surface is exposed to the air for a shorter time than is required in the ordinary dressings.

The crusts which are formed are alone detached, and the cicatrix underneath is produced more or less rapidly. Sometimes, to promote cicatrization, we apply a mixture of powdered tan and cinchona.

When children suffer much, it is better not to lay them on an ordinary bed with a sheet, but on a long box of bran. They are then like *chrysalides* in bran, and pressure on them is nearly null.

4. *At the moment of cicatrization*, the dressings, which up to that time have been very light and without any compression, should be modified. The application of fenestrated linen covered with cerate should be continued, but the compresses and bandages should be applied in a sufficiently firm manner, and especially, with the view of avoiding contraction, should we prevent by dilating substances the natural openings from closing, keeping the eyelids separated, the nostrils clear, and the vulva and anus open by pledgets of charpie. We must give the patient different positions, according to the situation of the burn.

If the anterior and posterior portions of the trunk are involved, the parts should be placed as much as possible in a perfectly straight position. If the neck, it should be inclined forwards or backwards or to the side, according as we wish to prevent contraction in any direction. If the limbs, we should keep them approximated to or separated from the trunk by means of bandages, cushions, and splints, keeping the limbs in a state of flexion or extension, according to the side on which we wish to have a large cicatrix. If the fingers, they should be separated from each other by splints, in order to avoid adhesions between them, and to prevent the fingers from being cicatrized in a flexed position on the hand. It is important, in all cases, to arrange the bandages so as to diminish the sufferings of children, while at the same time making the applications in such a way as to fulfil the indications. It is proper to add that we should sometimes promote cicatrization by steeping the charpie in tonic solutions, which may advance the development of granulations, or sometimes repress them with nitrate of silver or else with astringent and tonic powders, such as cinchona, tannin, and alum. In certain cases, we may accelerate cicatrization by making the dressings by occlusion, which should only be changed every three or even four days, as in the treatment of an ulcer.

5. At the time *when there is a tendency to the formation of adhesions*, our attention to the dressing must be redoubled, and we must

have courage to combat the tendency to contraction by resorting to the use of bandages adapted to stretch the adhesions—though this is painful for children—and even sometimes to tear them gently apart to prevent their formation.

6. Finally, *when the adhesions are formed*, it is necessary, at a period more or less remote, when the cicatrices are complete, to destroy them by transverse incisions, or else by incisions into them make flaps, so that we may slide them to produce extension or flexion, which these adhesions would interfere with. In certain burns of the face, the nostrils, which have become obliterated, must be opened, and canulas worn in them for a long time. Then, these painful operations, varying according to the nature of the case, demand the employment of chloroform, and afterwards require very painful dressings, with several kinds of bandages. Under these circumstances, where there is much suffering, the surgeon should have sufficient firmness not to allow himself to be disturbed by the cries of the child. Agents that oppose the return of the adhesions should be prolonged for a very long time, and be continued even after complete cicatrization, for a recurrence is always to be dreaded.

We have only spoken of the local treatment, but the constitutional treatment is very important. At the outset, general antiphlogistic remedies may be of service; antispasmodics and narcotics are frequently indicated. Finally, in many cases, when suppuration has exhausted the patient, tonics are indispensable; and there are circumstances in which cinchona and wine ought to be prescribed. The general treatment varies according to the various periods of the burns, and according to the indications. In such a case, the surgeon should be a physician as well, in order to restore the patient to a complete cure.

CHAPTER XV.

HARELIP.

WITHOUT discussing the causes of harelip, we will refer successively to the different varieties of it met with in children, leaving out of consideration accidental harelip, to speak only of the con-

genital form. This vice of conformation, sometimes hereditary, which children present at birth, is especially seen on the upper, and very rarely on the lower lip. Three kinds are met with: simple, double, and complicated harelip.

Simple harelip (Fig. 1) consists in a division of the upper lip, on one of the lateral edges of the median line, this division corresponding to one of the nostrils, and extending from the free border of the lip in the direction of the nostril, which it approaches more or less. Sometimes we observe a small adhesion, a slight bridge, passing from one border to the other, near the nostril. We have seen the deformity consist in a kind of gap of very slight extent, or else prolonged into the interior of the nostril.

Fig. 1.

We have also had occasion to meet with harelip half cicatrized when the children were born, the cicatrix being quite like that obtained by art. The free borders of this solution of continuity are rosy, like the borders of the lips, and are covered by the prolongation of the labial mucous membrane. Sometimes there is a very slight separation, at other times it is very great. In some cases adhesions exist between the lips and the gums.

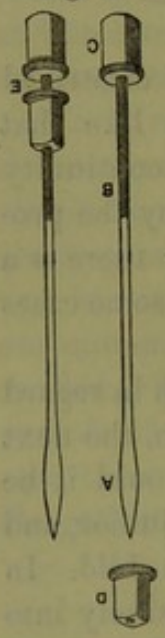
The first question which presents itself for consideration in regard to treatment, is this: Should we always operate at birth, the next day, or the following, on cases of simple harelip; or would it be better to defer it to a later period? Bonfils, senior and junior, and Buth favoured an operation at the time of the birth of the child. In 1845, M. Paul Dubois and his pupils put this plan actively into practice. M. Danyau and other surgeons succeeded, and we have ourselves had favourable results at that time. Nevertheless, the experience we have acquired has taught us, as it has taught those who habitually perform this operation at birth, that when attempted at that time it was far from being always attended with success. It is because we have sometimes had failures at this period that we postpone operating on simple harelip until about a month after birth. By that time we can see if the child is in a healthy condition,

and is well nourished, a fact of which we are not certain during the first day or two of its life. The period of icterus of the new-born will then have passed, and we can have more confidence in the result of the operation. In case of the prevalence of epidemic smallpox, we have thus full time afforded us to vaccinate the child, and thus remove one cause of ill-success, especially in hospitals.

In all cases, we are of the opinion that simple harelip should be operated on during the first months of life, for adhesion is then more easy, the child has no fear of the operation, it will cry a little afterwards, and the suture will not prevent it from sucking immediately after, without any apprehension existing that it will produce a separation of the flaps. The operation at this age does not compromise the health of the child, and if it fails there is no reason that it cannot be attempted afresh at the end of several months.

Operation for Harelip.—A bistoury, or sufficiently strong straight scissors; straight harelip needles of silver or steel, with a movable point, or simple German pins; waxed silk threads; silver threads, which do not cut any more than the others when moderately tightened; curved or straight needles, with sufficiently large eyes to allow a double silk thread to pass through; Thierry's screw needles (Fig. 2), which have given us good results:—such is the instrumental apparatus necessary, which will be completed by adding a tenaculum.

Fig. 2.

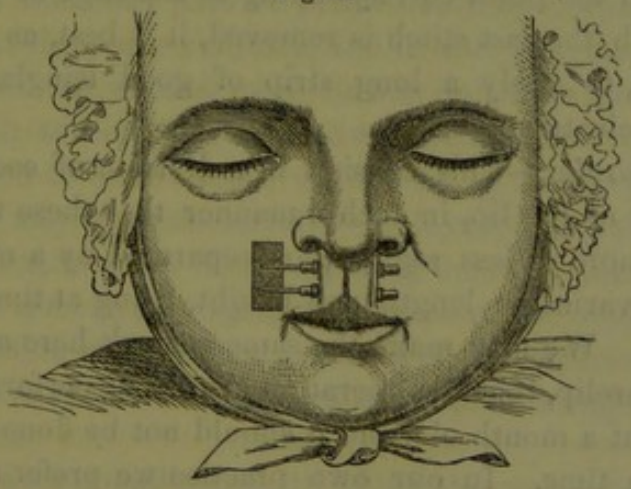


The little patient should be given in the charge of an assistant, who is seated and presses its head against his chest, taking the precaution to hold the child's arms, leaving his own hand free. The surgeon, placed in front of the child, having at his side the instruments already mentioned, and also a sponge slightly soaked in water, proceeds in the first place to pare the edges of the fissure. A second assistant holds himself in readiness to compress the lip with his fingers, the coronary artery being cut and giving rise to hemorrhage. The fingers of the left hand may be used to grasp the thickness of the lip, or else to pass through it a tenaculum towards the inferior angle. Then, either with a bistoury or with scissors, which we prefer, the surgeon cuts at first the adhesions, which sometimes retain the flaps, removes the rosy part of the border of one of the flaps, and makes a vertical section on the other side in the same manner. Then, with the scissors,

he cuts from one side the lower angle, leaving a small flap at the inferior portion of the other side, in such a manner that in approximating the two edges, the small flap becomes applied on the cut angle. We thus prevent the notch which we so often notice in making the two vertical sections.

The edges of the wound being thus freshened and put into the proper condition for union, several forms of suture have been suggested. After having employed them all successively, we cannot decide in favour of always adopting the twisted suture, which many surgeons use, and which, to be efficient, should be made with great care. Sometimes when pressed with a little extra force, the pin cuts through from behind forwards. We prefer the needle of Thierry, made of iron with a movable lance, which, when once removed, enables us to slide on it a little screw, that may be tightened or loosened at will, by means of two small nuts, one of which is fixed, and forms the head of the needle, and the other, movable at will, is applied after the extraction of the lancet needle, and screws on the threads of the screw which are on the needle. By this contrivance, the edges of the wound may be approximated at will. (Fig. 3.) When we do not use these needles, we may resort

Fig. 3.



to the plan of M. Mirault of Angers, which we employ almost exclusively. It consists in making interrupted sutures by means of a curved needle, furnished with a double silk thread, or a silver thread. This has succeeded very often in the hands of other surgeons, among whom I may mention M. Giraldès, my successor at the hospital.

Having once applied the threads, two or three in number

according to the height of the lip, we no longer employ bandages, as formerly, which slip and do more harm than good. If the pins used are found to be too long, we must cut their extremities.

The after-treatment necessary for the child is very important. If the patient be newly born, we need have no fear of letting it take the breast, but whenever it cries it is indispensable that the thumb should be placed on one of the cheeks, and the index and ring fingers of the right or left hand on the other, to prevent, by the pressure thus exerted, the separation of the commissures of the lips which draw upon the sutures. The pressure should only cease when the child falls asleep or stops crying. This precaution, which is much more practicable in private cases by nurses or mothers than at the hospital, enhances the prospects of success.

We have endeavoured to remove the stitches on the third or fourth day, at first one, and then the other on the next day; but we have found it better to follow the plan recommended by MM. Mirault, of Angers, and Giraldès, to wait at least seven or eight days or even longer, for stitches do not exert any injurious effect unless they are improperly applied or too tightly pressed. Whatever may be the period at which we withdraw the stitches, we must not at once remove them all, but leave until the last the one which is situated on the point corresponding to the edge of the lip. The day on which the last stitch is removed, it is best, as a precautionary measure, to apply a long strip of good isinglass plaster to support the cicatrix.

Double Harelip.—This consists in a division of each side of the median line of the lip, in such a manner that these two divisions, which are more or less regular, are separated by a median lobule which also varies in length and height, being at times very short and narrow. We may make the same remark here as in referring to single harelip, that the operation should be performed when the child is about a month old, and it should not be done on both sides at the same time. In our own practice we prefer an interval of three weeks or a month between the two operations, and we have met with much better success than in making the two sutures the same day. We also prefer the use of interrupted sutures with silk or silver threads. All the precautions already referred to for simple harelip apply as well to the double form. Sometimes, when the median lobule is too short or too narrow, it may be sacrificed, and a double harelip thus be transformed into a single

one. At other times the lobule may be too short, but sufficiently large at its base to be freshened on one side or the other, and to form a triangle which may be preserved by adjusting it to the two lateral flaps, either by passing through its base a long needle, or by securing it on each side by means of common stitches.

Complicated Harelip.—We meet with a great variety of complications of harelip, such as a simple solution of continuity of the lip with a fissure of the alveolar border, or sometimes a cleft of the vault of the palate only, as far as the velum palati; in certain cases division of the velum without cleft of the vault, or in others division of both. These last may occur with double harelip. In all cases it is prudent at first to leave out of consideration the various complications, and in infancy only pay attention to the division of the lip, treating it in the manner pointed out in discussing simple and double harelip; then, at a later date, we may attend to the cleft of the palatine vault and the velum. In time these divided parts will have a tendency to become approximated a little, and then, at the age of twelve or fifteen, a time of life when the patient will be more tractable, we may entertain the question of an operation to approximate the velum palati, a suture which succeeds when it alone is divided. Perhaps we may even attempt to fill up the fissure of the palate, yet for this bony part we prefer obturators, which are made at the present day very skilfully, and in our judgment are more useful than all the unions, more or less imperfect and difficult to procure, which several surgeons have attempted to bring about. It has appeared to us advisable, while waiting for the period when the obturator may be most usefully employed, or for the union by means of sutures, to apply for a very long time and almost continuously, at least during the night, a compressor, the object of which is the compression of the lateral portions of the superior maxillary bones. By this method we always accomplish a slight degree of approximation.

A much graver complication, to which the name "wolf-mouth" has been given, consists in the following deformity: the lip is divided in the median line in a rather irregular manner, with a very variable amount of separation; and the two superior maxillary bones leave also a space of variable extent, in which frequently the vomer is suspended. It is prolonged forwards, and drives the incisive bone into the space between the lips; this extremity of bone then pushes forward the median lobule of the lip, which comes

to the end of the nose more or less elevated. The alæ of the nose become, to some extent, separated and altered in shape.

Generally the deformities just referred to present modifications of a varied character; but they are nevertheless for the most part essentially analogous. Not only do they render the countenance of the child repulsive, but they create the greatest difficulty in its taking the breast, for it cannot press the nipple, and can in many cases only be nourished with a bottle, or a spoon, and yet the greatest care must be exercised that fluids do not return by the nose. We are all familiar with the imperfect manner of speaking of children who suffer from such a deformity, and the difficulty they have in making themselves understood, as they grow older. We have, nevertheless, seen adults, and among others the father of a child having a similar deformity, who came at last to speak with considerable facility, and to make himself understood daily by a numerous service of workmen whom he directed. He had applied himself constantly with great attention to pronunciation.

In view of such serious complications, we may appreciate how desirable it is to remedy these frightful deformities, and how anxious parents are for surgical intervention. But, while we are favourable to operating for simple harelip in the first month or six weeks of life, we think it better to postpone it for six, eight, and even ten months, if it is complicated. In fact, although in these operations we ought not to think of operating at birth for the closure of the space between the superior maxillary bones by means of the mucous membrane of the palate, or even to unite only the velum palati—for these unions fail at this period—it is nevertheless certain that the operation, without regard to that required to remedy the separation of the jaw-bone, is injurious and more or less laborious, according to the multiplicity of the different stages; that the pain is protracted when we are obliged to prolong the operation; that the child loses so much the more blood from the same reason; that having lost blood, he is weakened, and is in bad condition for union of the wound; and finally, his nervous system being more fatigued, he is in a state that predisposes to convulsions.

If we freely express these views, it is because they are the result of observation, and because we can bear our testimony, not only from our hospital experience, but from our private practice, that in operating during the early months, we expose ourselves more to

failure, on account of the pain, the loss of blood, which interferes with cicatrization, and the exhaustion of the nervous system, which disposes to convulsions, the consequence of which is the tearing apart of the sutures and even death.

Let us now consider successively what it is necessary to do to meet these various complications. There are some cases in which the fissure produced by the harelip is of very considerable size, and is sometimes complicated with adhesions to the gums. It then becomes necessary, to promote union, to dissect boldly and freely, sometimes very high up, on the superior maxillary bones, in order to obtain the approximation of the flaps, which are frequently only easily attacked, by making sufficiently large dissections.

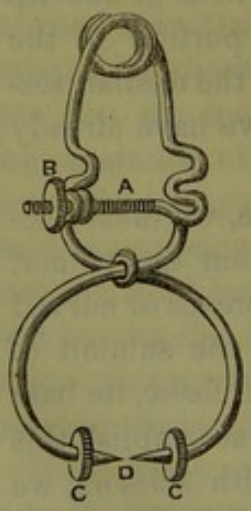
In cases of "wolf-mouth," an operation should always be performed, at the age of ten months or a year at the very earliest, and in two or three different stages, at an interval of fifteen days or three weeks between each. Thus, in cases in which the vomer causes a prominence in front, and pushes away the incisive bone, we should advise excision of the vomer by removing the intermaxillary bone. The first step of the operation consists then in division with the scissors or the bistoury, in such a manner as to allow the approximation of the two portions of the lip. Before making this division, the lobule should be broken off, which may be left hanging at the extremity of the nose. We must endeavour to preserve as much of the thickness and length as possible, and then, when the excision is made of the parts we wish to remove, and the portions of the lip involved are pared, we must freshen the upper portion of the lobule, raise it up, and attach it to the upper part of the median section. This last is in other respects performed as we have already described it in simple harelip.

If we do not wish to sacrifice the incisive bone, we must operate twice, at first removing a triangular piece from the vomer. This division may be performed with a dissecting forceps or curved scissors. In the vomer a triangle should be cut, the summit of which is directed towards the upper part of the nasal fossæ, its base corresponding to the lower part of the septum. To accomplish this stage of the operation, which is quite difficult with scissors, we had constructed by M. Charrière a cutting-punch in the form of a forceps, one side of which is engaged in one nostril, and the other side in the other nostril. We are thus enabled by a single cut to divide the triangle which we wish to remove. This first step of

the operation being accomplished, we should put on the child's head a small closely-fitting cotton cap; then, by means of a long strip of plaster applied over the occiput, the middle of which is placed over the nose, and the ends tied behind the head, compression is established which confines the two parts of the vomer. We may, in the same way, apply a narrow bandage rolled into two globes, the middle of which is applied on the nose, and its ends carried, crossing each other, behind the head; the incisive bone is thus pressed backward, and is engaged in the space existing between the two superior maxillary bones, which are more or less separated, but at other times are very closely approximated; this last condition being a contraindication to the preservation of the incisive bone, which can never be restored to its normal position. By means of the long strip or the bandage with two globes, the middle of which is applied over the nose, and passed and re-passed around the head, and by carefully watching the dressing every day, we produce a depression of the incisive bone, and in about fifteen days the divided portions of the vomer will be found to be more or less solidly united. At the end of this time the second stage of the operation may be performed, and at this period there will be only a double harelip to operate upon.

In harelip with serious complications, the nose is often greatly flattened, and the two soft parts forming the harelip are approximated with great difficulty, even after making free dissection of the adhesions. We have found it best in these cases to have large, strong serres-fines (Fig. 4), the points of which are applied even with the furrows behind the alæ of the nose. These press with sufficient force, and may bring together the deep parts which have a tendency to separate. We have had placed on these serres-fines a transverse piece, with a female screw, which enables us, by means of a male screw, to tighten or separate them as we find necessary. The serre-fine is secured to the child's head by means of a tape; it should be the first point of union removed, and therefore should usually be taken off before the stitches.

Fig. 4.



We need hardly add, that after both simple and complicated

operations the surgeon should watch his little patient diligently, in order to detect and combat the medical complications which may arise in a number of cases.

CHAPTER XVI.

COXALGIA.

Coxalgia is an inflammatory or sub-inflammatory affection of the coxo-femoral articulation, characterized at the outset by lameness and pain, which is sometimes only provoked by movements of rotation or by pressure of the head of the thigh-bone in the cotyloid cavity, or else by soreness rather than pain, without appreciable elevation of temperature over the point affected. This disease has often been called spontaneous luxation, pathological luxation, coxarthrocace, etc. Whatever be the name given it, in our view it is certain that it has numerous points of similarity to the majority of articular diseases of a scrofulous character. The pathological alterations are as variable as they are complicated.

We are seldom afforded the opportunity of examining coxalgias anatomically at the outset. In the only case in which I was able to make such a study, in a patient who died of an intercurrent affection, I discovered a slight injection of the articular synovial membrane. Should I conclude from this that a moderate amount of inflammation of the synovial membrane always exists at the commencement of coxalgia? This single fact alone does not authorize me to affirm it, and I am even induced to believe that, in certain cases, there might be, from the beginning, only a simple congestion of the fibrous parts around the joint. But in proportion as the affection of the joint progresses, the inflammation becomes more characteristic, and sometimes a purulent synovitis is established. The morbid conditions then extend progressively, the cavity of the joint becomes filled with pus, and the distended fibrous envelopes become softened, and cause the purulent collection to project, so as to open outwards. When the union of the various parts has yielded to the pressure from within outwards, by the process we have just referred to, the head of the femur, wasted and carious, tends to depart from the cotyloid cavity. Such is sometimes the origin of spontaneous luxations.

In the progress of the disease, the two articular surfaces become successively altered, at times to a considerable extent. The cotyloid cavity especially is enlarged by the alteration of the cartilage, and the destruction of the substance of the bone itself. Frequently the borders of this cavity are pressed back, as if trodden outwards, and thus allow the surfaces of the bone to lose their relations, and to produce luxations, to which the term "spontaneous" has been applied. The round ligament becomes softened and elongated, and is destroyed. I have never seen any of these spontaneous luxations produced around articular surfaces that were not altered, but always in a slow and gradual manner, consequent upon the destruction of the surfaces of bone. These luxations are very generally incomplete, yet the complete form is sometimes met with, and in such cases the cotyloid cavity is effaced, either by morbid vegetations which fill up its depth, or by the disappearance of its edges, so that it becomes transformed into a surface almost devoid of excavation. On that part of the iliac bone on which the dislocated head of the femur rests, a new but imperfect cavity will be formed, which greatly interferes with the movements of the limb in this new position.

Although we have seen coxalgias in little children six or eight months old, it is not less true that between four and fifteen years of age this disease most often takes its origin. Beyond fifteen years of age, we generally observe only relapses from coxalgias that have been temporarily improved. Patients who appear to be perfectly restored should also not forget that the injudicious choice of a profession, which compels them to keep much on their feet, and a defective hygienic condition, may provoke a recurrence. The constitution of the child most certainly exerts a very important influence on the manifestation of the coxalgia, for it is generally developed in the lymphatic and scrofulous. To appreciate the etiological value of scrofula, we should be fully aware that a child may be lymphatic without presenting engorged ganglions or ophthalmia from an internal cause. While this affection may be constitutional, we sometimes recognize exciting causes; thus bad hygienic conditions, rheumatism, or neglected traumatic causes may bring on coxalgia in many individuals, who, but for these serious circumstances, would have doubtless escaped its attack. There even exist traumatic coxalgias, properly so called, and these last have not by any means the same gravity as spontaneous coxalgia.

The *symptoms* of coxalgia vary according to the case. I need

not dwell on details that may be found recorded in the authorities on the subject. Let it suffice to say that very generally this disease is slow and insidious in its inception. We may divide its morbid manifestations into three very different stages. The first, corresponding to the first stage of pathological alterations of a rheumatic, traumatic, or scrofulous character, is characterized by slightly marked lameness, pain of but moderate intensity, a deceptive appearance of lengthening or shortening of the limb, produced by muscular contraction, which is itself an instinctive result of the pain, and distress in one or several movements of the coxo-femoral articulation. Generally there is a deviation of the pelvis, the side corresponding to the affected joint being depressed or elevated, and thus occasioning a lengthening or shortening of the limb. On the posterior side it presents a kind of saddle back, which may be considered as characteristic. Those affected nevertheless continue to walk, and devote themselves to the ordinary occupations of their age.

If the disease is not arrested by a natural modification of the general health of the patient under the influence of a proper medical treatment, it passes soon to the second stage. The preceding symptoms then become aggravated, and the patient ceases to run, and then obstinately refuses to walk, so as to avoid the intolerable pain provoked by movement. In bed he takes a special position, and we find formed around the joint purulent collections which are very slow in being absorbed, or in opening externally. When these abscesses make their appearance on the exterior surface, they constitute inexhaustible fistulas, which commence the third stage of coxalgia. The articular surfaces destroyed by suppuration are the seat of the displacements already referred to. This suppuration, often very abundant, exhausts the little sufferers, who become marasmic, and often die after a variable length of time. We have sometimes detected in an autopsy perforation of the cavity of the joint, and the head of the femur projecting into the pelvis.

Sometimes, instead of abscesses which at last open around the articulation, there are fungous growths which fill up the cotyloid cavity, drive out the head of the femur, and at last perforate the skin like a genuine abscess. We may find patients surviving the ravages of the third stage, but it is only after a long treatment of the fistulous canals that they escape a fatal termination. Still this

cure is never thoroughly complete, for they remain infirm, and exposed to relapses. We have sometimes, but rarely, seen examples of cure of this third stage.

Generally the progress of coxalgia is very slow, the disease lasting for years. Most frequently the cure is only effected about the age of sixteen or seventeen. We are sometimes surprised at the slight influence exerted by coxalgia on the general health of those who are its victims. During the first and second stages of the disease, the patient may retain all the appearance of perfect health. The termination of coxalgia depends on the cause which has produced it, and the stage which has been reached. The first stage may terminate without deformity, while the second always leaves a certain amount of stiffness in the articulation, or even anchylosis. Such patients, though lame, are nevertheless, after a considerable time, very strong on their limbs, and are able to devote themselves to quite rough work without fatigue. We can never produce a cure in the third stage without considerable deformity. Generally, a long suppuration leads to a fatal termination.

So far as relates to the *differential diagnosis*, we may mention prominently rheumatic pains, which resemble those connected with the first stage of coxalgia; but their sudden appearance, occurring under the influence of cold or moisture, will enable us to recognize their nature. Abscess of the iliac fossa, and certain muscular contractions, may lead us into error, if we have not taken care to use every precaution for an accurate investigation. Congenital luxation, with real shortening, closely resembles coxalgia, especially when complicated with rheumatic or neuralgic pains around the articulation. Under such circumstances, we must study the antecedent history of the case, and be assured that the patient has always been lame, under what conditions the pains are produced, etc. Nervous or hysterical coxalgia, described by M. Robert, may be confounded with it; it is met with in very excitable young girls, and will generally coincide with other nervous phenomena, and get rapidly well under the use of ferruginous and tonic preparations.

The cause has much to do with the *prognosis* of coxalgia. We know that scrofula plays the principal *rôle* in the manifestation of non-traumatic coxalgia; but as that affection has only one stage in which it uses our little patients roughly, we must form our prognosis after the period of apparent evolution of the scrofulous diathesis. Sometimes, as our predecessor, M. Baffos, remarked, scrofula spends

its full force on a single joint, the general health being excellent, and the patient, being otherwise well, may have only a coxalgia. In such a case, assisted by his age, we may effect a durable cure; I say a durable, not a complete cure, because those who, at the end of several years, recover the use of the affected limb, always have more or less deformity, and are always cured in a weakly condition. Nevertheless, they are satisfied even with this result, considering themselves lucky in regaining their health, after eight or ten years of suffering and continuous care.

It need hardly be said that the prognosis of coxalgia assumes a fresh degree of gravity at each of the three stages in which it is presented to us. If the first and second stages leave us generally room for hope, the third is almost always discouraging; and yet we must not forget that even the gravest cases of coxalgia may be cured, especially if they are of a rheumatic character. Traumatic coxalgia is less serious than those that are spontaneous or connected with a constitutional cause. I could cite several cases consequent on external violence, the happy termination of which was secured after only seven or eight months of treatment. In the course of the year 1859, M. Roger sent us a young patient who had fallen from a tree upon her hip; an undoubted coxalgia followed, which was cured by rest in the space of eight months.

Treatment.—Like the majority of chronic affections, coxalgia borrows its therapeutic resources from both local and general remedies, which act so much the more efficiently, as they are resorted to at the outset. Let us at first examine the local agents which are more especially within the province of surgery.

The *local treatment* varies with each of the three stages of the disease. When the system of Broussais was in full force, leeches were often applied at the beginning; I have myself sometimes obtained by this means a momentary relief in cases of acute coxalgia, with very sharp pains around the articulation. For several years we have almost entirely renounced the use of bloodletting, which weakens the patient without giving sufficiently durable results. It is only, then, in these exceptional cases, when an intensely acute condition exists, that we have sometimes resorted to the use of the scarificator. The state of the patient must be our guide. After bloodletting, resolvents have been much extolled, such as inunction with the ointment of mercury and belladonna, iodine ointment, etc. We resort to them unhesitatingly, in conjunction

with poultices and vapor douches around the joint, and are sure that we have often obtained good results from the combination.

Revellents have also had their day. We may repeat, in regard to flying blisters, what we have already said of bloodletting; they produce a temporary improvement, but blisters become easily inflamed, and sometimes produce sharp pain. On account of these annoyances, my father preferred flying cauteries successively applied. From the results of his practice, I have persevered in the use of this form of revulsion, and have applied as many as forty around the same joint. These issues, of the size of a twenty centime piece, are retained for a variable length of time, with plaster and *onguent de la mère*.[1] I have produced a soothing effect, of a more lasting character than with the remedies already referred to, and I may add that, in some cases, the cure has been permanent. We have, nevertheless, to acknowledge that with these cases of rare success, we may cite a fearful number in which we have completely failed. In spite of the uncertain results obtained by the cautery, I do not consider that I should yet renounce its use. I am convinced that in certain forms of coxalgia it may be of some service. This is not in accordance with the views of all surgeons—and of M. Bouvier in particular—who, after having used flying cauteries for a long time, have given them up, being persuaded that these continuous suppurations weaken the patient, and that, after all, the efficacy of these cauteries is too problematical to counterbalance their inconveniences.

Bonnet, of Lyons, recommends perfect immobilization as a curative means, without completely relinquishing the use of cauteries. We had long been familiar with the good effects of this treatment in articular affections; but to the surgeon of Lyons is due the honour of having made a methodical application for the treatment of coxalgia. Immobility is the surest plan to counteract muscular contraction, which is the cause of all the secondary disorders of this disease, and it should therefore be resorted to at the commencement, before even the slightest deviation of the pelvis manifests itself. With this object, M. Martin constructed an apparatus which held the limb in a state of semi-flexion, a position which has its advantages, and with which we have had some success; but it was also attended with the disadvantage that it kept the articulation

[1] An ointment made of the following ingredients: olive oil, lard, butter, suet, yellow wax, litharge, and pitch.

flexed, and the thigh, therefore, became more difficult to extend. Bonnet preferred to have the limb supported in the position of extension; to fulfil which indication, he at first employed a simple grooved splint, but he soon found that the pelvis must be kept absolutely at rest, as well as the lower limbs. He at first used a very complicated apparatus, very difficult to adjust, and dextrined or starched, requiring a large number of bandages, a considerable time to dry, much care in the application, and great difficulty in changing. This is not the form of apparatus we recommend.

Bonnet constructed a double-grooved splint, with which every one is familiar; I need not, therefore, enter into a detailed description of it. It should, however, be mentioned that for its proper application the patient should be kept constantly under the influence of anæsthetics, that he may be placed in a proper position, by extending the contracted muscles. It must be also understood that the anæsthesia should be prolonged until the surgeon is able to extend the limb to its normal condition; to accomplish which object he evokes gentle and gradual movements of flexion and extension, to obtain a proper position of the joint and of the lumbar region. The limb should then be firmly fixed in the grooved splint, and the healthy limb be also cared for. The results obtained by this improved apparatus of Bonnet are admirable. By applying it at the beginning of the disease, we may often prevent the alarming conditions already indicated; and, if our patients are not always cured without lameness, they can walk quite well, and rest their foot on the ground without a crutch, and even without a cane. We have but a single objection to make to it, and this is that its price is too high for the generality of those who have occasion for its use. Having, in the majority of cases, to treat coxalgia in persons of moderate circumstances, we have made every effort to devise a system of perfect immobility within reach of their pecuniary resources, to replace the apparatus of Bonnet.

The apparatus decided upon after a number of experiments, which has appeared to us to fulfil the double purpose proposed, seems to us preferable to that of Bonnet for keeping children clean. It is composed of two oak splints, about one-fifth of an inch thick, an inch and a half to two inches in breadth, and rather longer than a crutch of a size adapted to the patient. These should be applied on the outside of each of the lower extremities, to reach as high up as the axilla, without however interfering with the movements of the arms,

and should pass downwards below the feet from four to six inches (Fig. 5.) These two splints are symmetrical, presenting three mortises thus arranged; the first corresponds with the pelvis, and in extent to the height of the pelvis, and serves to secure the body bandage. It may be replaced by two: one on a level with the upper border of the iliac bones, the other on a level with the great trochanter, in such a manner as to prevent the bands from becoming displaced. The other two mortises correspond with the knee and above the malleoli, and are designed to receive scarfs to secure the limb. Beneath the lower mortise are placed two notches for the purpose of securing the lower bands of the pad to prevent it from ascending along the splint. The upper extremity of the splint is rounded, and when applied is capped with a gusset secured to the pad. (Fig. 6.) The lower end, passing beyond the

Fig. 5.

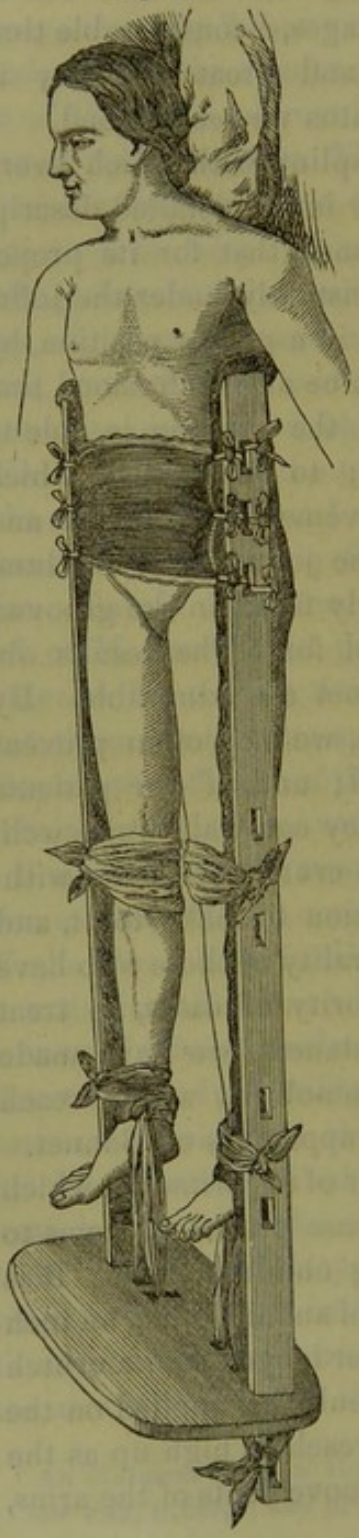


Fig. 6.

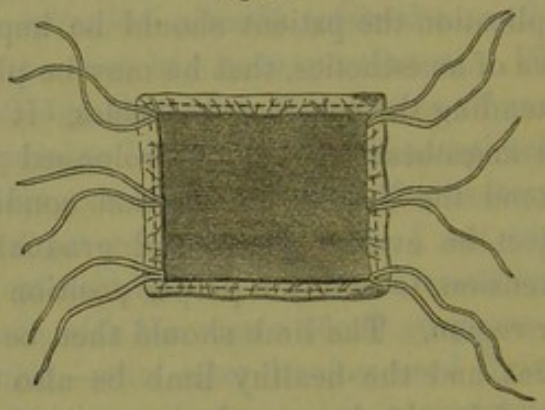
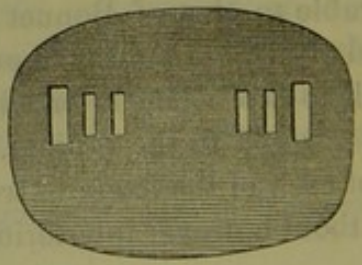


Fig. 7.



feet, as already described, terminates in a cleft with a hole for a peg, arranged in such a manner as to secure it firmly in the mortise of the cross-piece.

The cross-piece consists in a small board transversely elliptical, and on this cross-piece, in a vertical direction, are six rectangular mortises (Fig. 7.) Two of these are larger, and closer to the posterior curve, and are designed to receive the fork of the splints, and the space between them is equal to that of the feet when in a vertical position. The four others, which are smaller and arranged in pairs, and are placed a little higher up and to the inside, serve to secure the extending bands. By this arrangement, the cross-piece secures the splints, and at the same time gives firmness to the apparatus, protects the toes from the weight of the coverings, and prevents the heel from suffering from severe pressure from its own weight. Another important advantage is that it enables the surgeon easily to move the patient on his side, when it is necessary to examine him posteriorly. So much for the mechanism of the apparatus; let us now consider the mode of putting it together.

The other parts are more especially within the province of the needle. We require—1. Two symmetrical fracture-pads, placed on the inside of the splints, beyond which they pass upwards and downwards for about two inches. Each pad is composed of a linen bag, two or three times wider and a little longer than the splints, and filled with bran. The upper extremity of each is furnished with a gusset, which receives the corresponding extremity of the splint. On the rest of its extent are arranged three tapes, to secure it to the splint. 2. Two modes of securing it; a body bandage formed of two pieces, one in front, the other behind, and two small square wadded mattresses, which may be placed under each piece of the body bandage. This last is cut; in other words, the half designed to attach the splints behind, although like it, is independent of the half designed to secure them in front. Each half of this bandage is composed of a rectangular piece of strong linen, or better still, of some sufficiently firm elastic substance, having three pairs of thread tapes sewed on the sides. These bands are attached two and two, in such a manner as to produce free compression, when they are tied on the edge of the mortise, in which they should readily glide. The small wadded mattresses are a little wider than the pieces of the body bandage, and have for their object relief from too great pressure of the material. The scarfs require no special mention, being

simple handkerchiefs folded like a scarf, two for each side, one for the knee, and one for the lower part of the leg. Sometimes, to support the foot in a proper position, we may make use of another scarf arranged like a stirrup, as in the apparatus for fractures. This stirrup may be attached to the lower mortise, and be useful in making extension.

When patients present a very decided saddle-shape, and the body bandage is not sufficient to keep the pelvis in proper position, we add to our apparatus an ordinary body bandage, which we place around the nates, lower than the preceding. The middle of the full part of this bandage is placed behind; and the ends are brought to the front, between the pads and the hips, then reversed again at the rear, on the splints, which make a return pulley. In this manner the pelvis is firmly pressed forward between the pieces of the apparatus, while the rest of the trunk is supported by the anterior piece of the cut bandage. These two forces acting in a contrary direction are sufficient to overcome the saddle-shape, and to give to our apparatus still another advantage.

If the bony surfaces are already worn, and there is a tendency to displacement, we attach two extending strings around the leg with a roller bandage, or else by means of a silk handkerchief folded like a cravat, arranged in a slip-knot beneath the malleoli, and we then secure the extremities of the handkerchief, more or less tightened, on the mortises of which we have already spoken. As very slight extension is sufficient, the weight of the body effects sufficient counter-extension. Nevertheless, if very strong traction is necessary, it would be easy to support the trunk with a large scarf attached to the bed or the under part of the thighs, which may be moved alternately to the right or the left, so as not to injure by continuous pressure.

Thus prepared, our apparatus is of extreme simplicity; its selling price is moderate; it requires only a carpenter and a seamstress to make it; and provincial practitioners will always have it in their power to procure it, this being, in our view, an important advantage it offers over the grooved splint of Bonnet. When ready for use, it is applied as follows: if there is any deformity of the hip or of the pelvis, and the straightening of it produces ever so little pain or provokes muscular contractions, we anæsthetize our patient, and can thus more conveniently give to the limbs and to the pelvis a proper position, while at the same time we profit by the state of

sleep resulting from the chloroform to determine the exact condition of the affected joint. When the patient is in the attitude desired, the limb being well extended, the child lying on its back, we cause the apparatus to be slipped into place, well carried from below upwards, and then pass under the lumbar region the small mattress, and the posterior half-bandage. We carefully tie the bands in a double knot to the right and left, in order that the splints may be equally pressed on both sides. We must necessarily tighten it at first behind, for the various parts of the apparatus have a strong tendency to become displaced in front, and to let the great trochanter project behind the splint, a result which must be carefully avoided.

The anterior half-bandage and the small mattress are secured last of all, and the scarfs which surround the splints and the limbs from below upwards are successively tied, the surgeon being careful not to produce too firm compression, so as not to interfere with the circulation. The apparatus being once properly adjusted, we must half raise the patient, and this may be easily done without causing him pain. Starch or rice powder may be laid on the bed, in the place corresponding to the nates. Every day the patient should be inclined to the right or the left, to keep him clean and to powder him. Every time that the necessity arise he should be raised up, and a flat bed-pan passed beneath him. He may also be placed on a sofa or another bed, while his own is being made. It will always be well also to arrange the patient's bed in an inclined plane, so that the trunk may be more elevated than the feet. From time to time the scarfs on both sides may be loosened, in order to allow of movements which may prevent the articulation from becoming stiff.

The time during which this immobility should be maintained is very variable. Since having recourse to our mode of treatment three months were sufficient to produce in one of our patients such an improvement, that we considered ourselves justified in taking off the apparatus. This result is as satisfactory as possible, but we can very rarely remove it so soon, and are generally obliged to let it remain a very long time. With the view of relieving convalescent patients from the fatigue induced by a prolonged stay in bed, we advise the withdrawal from time to time of the apparatus, reapplying it only at night. But to avoid weakening the patient by keeping him constantly in his room, we give him exercise in

the fresh air in a small carriage, in which he is placed with the apparatus on.

As a general conclusion, we may say that up to this time our apparatus has appeared to unite the advantages of much more expensive apparatus. Our patients may, as with Bonnet's grooved splint, be transported from one place to another without experiencing any painful shocks. They are kept sufficiently immovable not to suffer any more, and to become anchylosed, if necessary, in a proper position. Besides, there is a better circulation of air in our apparatus, and a greater opportunity to attend to cleanliness. Nevertheless, when it becomes a question of intrusting the patient to a railroad, for example, for a long journey, the double-grooved splint of Bonnet will be preferable, for it protects more closely the affected parts. As this apparatus requires perhaps less watching and is less liable to get disarranged, we give it the preference over our apparatus in all cases in which the patient is in a pecuniary condition that enables him to incur the expense. In hospital practice, however, and among the poorer classes, we may substitute our own for it without losing any of the advantages of immobility. Whatever may be the apparatus used, whether that of Bonnet of Lyons, or our own, it must be applied as soon as possible after the commencement of the disease, and be watched for a very long time, the patient not being allowed to walk until after several months of treatment, a year, or even longer. From time to time we may attempt to let the patient remain a day or two without the apparatus, which must be reapplied the next day.

Before completing the subject of local treatment, let us say a word in regard to abscesses. When the abscess becomes decidedly prominent, is it our duty to open it? As a general rule, we postpone this as late as possible, to avoid the exhaustion consequent on a long suppurative discharge. When we decide to open it, we sometimes have recourse to puncture with a long flat trocar devised by M. Guérin, and to suction by means of a syringe, which may be screwed to the canula; sometimes to simple puncture, or the application of a drainage-tube, according to the method of M. Chassaignac. Sometimes the purulent collections emptied by the trocar do not fill up afresh. Most frequently the abscess is reproduced as before, or else the puncture becomes the seat of a fistulous tract. We have in such cases derived advantage from iodine injections (one part of tincture of iodine to two parts of water) according to

the suggestion of our colleague, M. Boinet. The drainage tube has the advantage over ordinary setons of allowing of detergent injections into the purulent collection, by adapting to it the canula with a syringe.

Finally, if the pathological luxation is an accomplished fact and recent, we must endeavour to reduce it and to support it with apparatus. In cases in which the luxation is likely to be of long-standing, or anchylosis to result, we must give proper attention to the lesion, and abstain from all such attempts, fearing to provoke a renewed occurrence of the symptoms which are in course of extinction. It must not be forgotten that, in certain cases of coxalgia, the head of the femur becoming dislocated, and not having been kept in place by apparatus, is carried near to the skin, which it tends to perforate. This necrosed portion of bone acts like a foreign body, and may be removed with advantage. My predecessor, M. Baffos, performed this operation successfully, and I was desirous of undertaking it myself, but the parents of the child objected to it. MM. Follin, Dolbeau, and others before them, have also had good results. It is an operation which, under certain circumstances, should not be rejected.

In regard to the general treatment, we have nothing to add to what has been already said of white swelling in general.

CHAPTER XVII.

IRRIGATION OF THE PHARYNX.

THERE are a great many cases in which the indication is to prescribe gargles for children, but the majority of the latter, the oldest as well as the youngest, do not know how to employ them. There are even adults who are not skilled in their use. In gargling one's own throat, it may be remarked that most generally the fluid does not reach the tonsils, and that it does not act as well as we may desire. We must also observe, that in cases of very intense inflammation of the pharynx, the patients have much trouble in opening their mouths, and that they can scarcely separate the teeth. For these cases, and especially for children, in simple or violent inflammation of the tonsils, in abscess of those organs, in pseudo-

membranous stomatitis, in diphtheritic pharyngitis, or gangrenous inflammations, or even in chronic granular or other forms of angina, we have derived advantage from injections, or, better still, irrigations of the throat. As we must always use a syringe, or an irrigator, which we can have at home or within easy reach, it would only be a question of having a suitable canula, to depress the tongue and make the fluid spirt into the different parts of the throat. The ordinary gum canulas do not depress the tongue, and may be bitten and broken by children.

We have had constructed an instrument which we call the canula tongue-depressor (Fig. 8). Having experimented with several

Fig. 8.

metals, on the suggestion of M. Charrière, we decided on making them of bronzed aluminium, that metal having the advantage of not being altered by sulphurous water, which may be used under certain circumstances, in chronic amygdalitis for example. It has the shape of the extremity of a spoon-handle, is slightly curved, from five to six inches in length, and one-fifth of an inch thick, and hollow in its whole extent. Its extremity, which is designed to depress the tongue, has on its circumference and on its convexity a certain number of small holes like those of a watering-pot. At the other end is a true canula extremity, which may be adjusted to the caoutchouc tube of an irrigator or even of a syringe. Once arranged, and the apparatus filled with the fluid we wish to inject, a basin is placed under the chin to receive the fluid as it reflows from the mouth.

The patient's head should be gently inclined backward, and the tongue being depressed, as if to examine the pharynx, the fluid is made to pass out very gently, so that it at first falls gently into the mouth, then gradually with more force, that it may produce a real irrigation. In this manner, the liquid thrown into the mouth strikes upon the affected parts, and may wash away mucus, concretions, false membranes, and even sloughs upon the mucous membrane of the tonsils, the velum palati, and other regions of the mouth. These irrigations may be repeated several times a day. Older persons easily accustom themselves to its use, and even

children at last consider it an amusement. In certain forms of chronic amygdalitis, and in granular inflammation, I have obtained good results from irrigation, by the use of sulphurous waters, as practised by Dr. Lambron at Luchon.

CHAPTER XVIII.

VULVITIS OF YOUNG CHILDREN.

VULVITIS—inflammation of the vulva—is met with in the youngest as well as the oldest children, and under several different forms, which may be separately described, as follows: Simple, diphtheritic, ulcerative, gangrenous, and syphilitic vulvitis.

Simple Vulvitis commences by a very slight erythema of the mucous membrane of the whole vulva, with or without itching. It occurs in the youngest children, sometimes a few weeks after birth, and is characterized by redness and pruritus with mucous oozing. Want of cleanliness is its main cause, and gives rise to discharge and leucorrhœa, so common among little girls. As soon as its existence is discovered, it may be checked by lotions of cool or slightly astringent water. If these are neglected, it very often happens that the lips of the vulva become glued together, giving rise to adhesion of the labia, which is sometimes congenital, in other words, formed before birth, but we have not had any very positive cases of this kind.

We have been very often consulted by parents, and even by our professional brethren, who believed they had an obliteration of the vagina to treat, which consists, in such cases, in adhesions of the greater labia formed by very small transparent false membranes, analogous to those met with between the prepuce and the glans in several little boys who had had balanitis, and in whom the glans was not uncovered. This false membrane keeps the greater labia pressed together, but does not cover the meatus urinarius, so that the children thus affected are not inconvenienced in urinating; and it becomes detached and tears off very easily by means of a blunt stylet, or when a slight effort is made to separate the labia. In performing this little operation, we destroy an adhesion that might

at some future time become more solid, and occasion much annoyance at the period of the appearance of the menses, when a more painful operation would become necessary. When the greater labia are separated, it will be well to apply pieces of charpie so as to prevent new adhesions. Lotions of water and extract of lead, applied two or three times daily, are of advantage, and may prevent a recurrence, which quite often occurs.

We have sometimes seen cases of vulvitis produced by oxyures vermiculares in the rectum, which, passing from the anus to the vulva, provoke inflammation of the mucous membrane there. In such cases little girls have very annoying itching, which may lead them to masturbation. It is important, therefore, to subdue these symptoms rapidly. Mercurial inunction, calomel suppositories, lotions of infusion of absinthe, and sulphurous baths are the best means to employ to destroy these worms, and to cause the disappearance of the inflammatory irritation they have caused.

Diphtheritic Vulvitis is characterized by false membranes, and is met with either at the outset in children who present no other morbid manifestations, or more frequently in little girls attacked or menaced with diphtheritis in other parts, such as the pharynx, the larynx, or the tonsils. The inner surface of the greater labia is fringed with white false membranes, more or less solid, analogous to those met with on the tonsils in the true pseudo-membranous affection. When these false membranes are detached, the subjacent cellular tissue is raw; they have a tendency to become reproduced; the ganglions of the groin are often swollen, and in addition to this, the general health of the patient is more or less feeble, and there is often fever.

This affection often indicates that the child is the victim of a general diphtheritic condition, which most generally resists local remedies, and rarely yields even to constitutional treatment. Though the prognosis may be serious, we must nevertheless not neglect to attack the disease both by topical and general remedies. The local treatment consists in the application of nitrate of silver, either in crystal or in solution. Lemon-juice may also be employed with success, as well as insufflations of alum and tannin. These agents especially succeed when there is no general diphtheritis, for if it exists, general treatment alone is capable of modifying the disease. We must not confound this false membrane with that

met with in syphilitic children, the latter generally presenting other concomitant symptoms, such as chancre, mucous patches, etc.

Ulcerated Vulvitis.—It is not uncommon to meet with ulcerations or excoriations on the internal surface of the greater labia in little girls. They may be consequent upon neglected cases of simple vulvitis, and are also the result of improper treatment, especially when the children are affected with leucorrhœa; or they may be caused by repeated masturbation. They have no syphilitic characters, and yet they are sometimes accompanied with mucous patches. Some of them yield to local medication, as general and local baths, astringent lotions, lead-water, the application of lemon-juice, chlorinated water, nitrate of silver, and especially attention to cleanliness, followed by a dressing, which consists in keeping the labia separated by charpie.

Gangrenous Vulvitis.—This affection is often the termination of the forms of vulvitis already referred to. It nevertheless only declares itself when the children are in a miserable condition of general health. It occurs also as the result of severe fevers, of adynamic diseases, and of certain grave forms of scarlatina. It is characterized by a transformation of the mucous membrane bordering the greater labia and the entire vulva into a blackish tissue constituting a genuine, soft and moist slough, which tends to become developed, and to gain ground, as long as the disease is abandoned to the efforts of nature.

The treatment may be local or general, the principal indication being to combat the disease, which debilitates the patient. Thus the various kinds of tonics, as cinchona, bitter tonics, broth, wine, coffee, etc., may be placed in the first rank. The local treatment is not less indispensable. Applications of lemon-juice, powders of cinchona and camphor, vinous lotions, etc., may answer the purpose, but these means often fail. The best means of limiting the gangrene is the use of iron heated to a white heat. Cauterization should go beyond the boundary of the slough, which may still often be crossed by the disease the next day. When this powerful local agent succeeds, there remains a large ulcer, a real burn of variable depth, which requires the same dressing as burns of this region. It is important that we should apply slightly camphorated powders of cinchona and charcoal; and lotions including aromatic wine or chlorinated water may be found of service. Finally, all possible precautions for the prevention of adhesions of the labia are of the

highest importance. The dressings should be carefully made and frequently renewed.

Syphilitic Vulvitis.—This is characterized by chancres or mucous pustules: but the mucous patches which are seen between the greater labia and are also observed at the anus, are not always of a syphilitic character, and are frequently developed as a result of improper treatment, and of want of cleanliness. They then yield to washes of lead-water, to applications of nitrate of silver, and to general baths, without a constitutional treatment being necessary. When, on the contrary, these mucous patches resist such remedies, and they are accompanied with true chancres, or pemphigus of a syphilitic nature, we must, independently of attention to cleanliness, add to the treatment cauterization, and a general treatment either by corrosive sublimate baths, or by the liqueur de Van Swieten internally or the protiodide of mercury. This affection, in very young children, is hereditary, and often makes its appearance fifteen or twenty days after birth. In older children, those of eight to ten years of age, for example, it is acquired and produced by contact with individuals affected with syphilis.

In the new-born, we have used the following treatment with advantage. Every day a bath should be given it in a wooden tub, to which half a drachm to a drachm of corrosive sublimate has been added, and eight to ten drops of Van Swieten's solution in a small spoonful of syrup of gum Arabic should be administered internally. If the mother nurses her child, we must subject it to a general treatment. If the child cannot be suckled by its mother, the indication is not to give it to a nurse, and while following the treatment prescribed, to nurse it with the bottle. We think in some cases it would be better to nourish the child with the milk of a goat that had been submitted to mercurial frictions. It will be especially important that the animal should be well cared for, being as much as possible in the open air, that its milk may be of the best quality. Again, we may nourish syphilitic children with the milk advised by Dr. Labourdette, which is daily brought into Paris, and is produced from cows fed in the pasturages of Normandy. These animals every day swallow a bolus of iodide of potassium expressly prepared, and faithfully administered to them before their departure for the pasturage and after their return. We are familiar with the good results of the use of this milk, which we prescribe in cases of syphilis and scrofula in the new-born.

CHAPTER XIX.

FOREIGN BODIES IN THE EAR.

If we except ceruminous concretions, which are principally met with in old people, and rarely in children, we may state that in the latter, more than at any other period of life, foreign bodies are found in the external auditory canal. For our own part, we have seen a considerable number of such cases in hospital and in private practice. The foreign bodies which we have found, are of very different character, comprising hardened cerumen, pebbles, cut stones extracted from rings or ear-rings, pearls, peas, fruit-stones, beans, fragments of glass tubes, paper pellets, fruit-seeds, etc., etc. Insects have also been found there, but never in our own experience. Itard, the learned surgeon of the deaf-mute institution, has reported several cases, in which they were found in the ear.

All foreign bodies, when they remain in the auditory canal, may lead to complications, principally of a class attended with tumefaction, such as inflammation, suppuration, buzzing, cerebral phenomena, or meningitis. The indication is, of course, to relieve children as speedily as possible, who have a pea in the ear or a seed, which may become developed under the influence of moisture. The surgeon should first be thoroughly satisfied of the presence of the foreign body, for very injurious explorations have sometimes been made, when no such body existed there.

If, after having placed the patient in a proper position, with the light introduced in the direction of the canal, we detect the foreign body, we should adopt a different treatment to suit the circumstances of the case. 1. If the body is fluid, as water from swimming or oil, a single succussion of the head will be sufficient to expel the fluid. 2. If hardened wax accumulates in the ear, a simple ear-pick, previously dipped in oil, will enable us to get rid of this concretion. We may be compelled to precede its use by softening this foreign body with several injections of tepid water, oil or glyce-

rine. 3. Peas, beans, seed, and paper pellets swell and soften, and may be grasped or torn sometimes quite easily, either with a small pair of forceps, or with a small short hook, which penetrates the foreign body. 4. Hard bodies, such as pebbles, fruit-stones, or different kinds of resisting seed, may be removed in several ways, and especially, as was advised a very long time since, and practised by Menière, physician of the deaf-mutes, by injections. We have very often followed this plan, and for all forms of foreign bodies, but they must be applied in a certain way, and steadily persevered in. We ought, therefore, to explain to parents how these injections should be given, for we have often to repeat them for several days in succession, before crowning the treatment with success.

To administer these injections, it is well to procure an Eguisier irrigator (No. 2 or 3), armed with a straight canula, and filled with cold water, or, better still, warm water. The child should be held by some one, who takes the precaution to surround it with a cloth folded several times, the arms being thus kept wrapped up, and this cloth should surround the child's neck to avoid wetting it. Besides, an assistant should place the patient in such a manner that the head may be slightly inclined, and a basin be arranged under the ear so as to catch the water as it flows out.

The surgeon introduces the canula of the irrigator into the auditory canal, discharging the fluid from it at first very slowly, that the water may pass between the foreign body and the walls of the canal, strike on the membrana tympani, and by the return shock expel the foreign body, which falls into the basin, sometimes after the first injection. It is important that the surgeon, while making irrigation with the right hand, should draw the pavilion of the ear alternately upward, downward, forward, and backward, so as to modify the direction of the current, but it is not necessary to adhere to this rule under all circumstances. We may urge a repetition several days in succession, if no results have been obtained at the first injection. Having taught parents how to use these injections, I have met with with some of them who, after eight or ten days, succeeded in extracting the foreign body. It is essential, therefore, to success, that the operator should not lose patience. Nevertheless, when this method is not attended with success, the operations which have appeared to us to succeed best, are those performed with simple small forceps, especially useful in cases in

which soft substances, such as paper, charpie, etc., are present in the ear, or else those with the ordinary curette, or the articulated curette devised by M. Leroy d'Etiolles for small calculi entangled in the urethra, which is generally easy to use and successful. In many cases, it is important to introduce it mainly along the lower wall of the canal, which is wider.

The introduction of the curette being more painful than the former method, and children being always disposed to move, if this plan be followed, we should unhesitatingly resort to the use of chloroform, in order to operate with more certainty on unmanageable and excitable children. When children are, on the contrary, docile, besides the inclined position of the head, M. Debout has recommended the opening of the patient's mouth. The extremity of the little finger should be introduced into his external auditory canal, and his jaw moved, so that the surgeon may be made aware of the enlargement which the canal undergoes each time the condyle of the jaw leaves its articular surfaces. This posture facilitates the putting into practice of all the various operative procedures, but that which it mainly aids is the very unobjectionable method of injections.

CHAPTER XX.

CATARACT.

CATARACT, in children, consists, as in adults, in opacity of the crystalline lens. It may be of two kinds, congenital and accidental.

Congenital cataract is met with at birth, and is sometimes hereditary, but most frequently has no appreciable cause. Sometimes it is very complete, when the child comes into the world; yet it sometimes happens that it has its commencement during the earliest periods of life, and it only becomes well-marked at the end of several months and even years. We have seen in the new-born well-formed cataracts; are they caused by an arrest of development, or are they the result of an intra-uterine inflammation? This form of cataract may be membranous or capsular, clear or milky. Whichever of these varieties it may be, it offers to view the following characteristics: in the centre of the pupil a white portion of a bluish tint

like that of starch when prepared in a paste for the purpose of stiffening linen, all the crystalline lens having the same tint; the iris, which is very movable, preserving its normal condition, and the anterior chamber having its full capacity, the uvea which circumscribes the pupil being distinctly traceable on the bluish opacity.

From such children as come into the world with an incomplete congenital cataract and reach the age of reason, we find that vision is greatly enfeebled, especially in the evening, but never completely extinguished, and that they are able to distinguish the day from the night. We also meet with cataracts in the new-born that are attended with opacity of only the centre of the crystalline, and in these cases especially we detect nystagmus and strabismus; in this condition they see a little, not through the centre of the lens, but through the circumference. The new-born who have cataract, if left to themselves, are still able to see at seven or eight years of age, but they reach that period without having any idea of objects. Frequently the eye may have lost its volume and its visual power, and it tends to become atrophied, so that we should not postpone too long an operation in congenital cases, for the greater the delay the more we have to dread the diminution of power in the retina, and the more we have to fear not only that the education of the vision may take place slowly and imperfectly, but also that the child's intellectual development, which is associated so intimately with the faculty of seeing and appreciating objects, may be greatly retarded. All children, who are operated on very late, take not only a considerable time to learn the use of their organs of vision, but also see more imperfectly than those who have received early surgical attention. We are therefore partial to the performance of the operation a short time after birth.

Prognosis.—The child affected with congenital cataract will be in a favourable condition, if its eye makes movements to find the light, the prognosis under other circumstances being serious. In any case there is nothing to be gained by waiting, especially if, during the first month after birth, the opacity continues. At this age, when the child is one month, six weeks, or two months old, we derive advantage from operating on cataracts of this kind. At this time, the child has passed the period of the small complaints of the earliest stages of existence. The child may be vaccinated, and in this way it is in proper condition to be subjected

to the operation, without there being so much apprehension of alarming complications.

Operation.—Having dilated the pupil by a drop of a collyrium containing atropia, and having emptied the intestinal canal, either by enemas or a light purgative, such as syrup of succory, or calomel, we may proceed to operate in the following manner: The child should be laid on a pillow firmly fastened to a board of the same length as the little patient, secured by means of two napkins arranged like scarfs, one passing under the arms and the chest, the other pressing on the pelvis and thighs. We may then keep the child lying down, as Dupuytren did, or in an erect position before the light. Then, the head being secured by the hand of an assistant, he supports the upper lid with the other hand with the pulpy part of the middle or index finger, or else with an elevator. The operator, placed in front of the patient if the latter be raised up, or to one side if the patient be in bed, may resort to the operation of extraction or depression. This last method seems to us preferable, for generally the cataracts are soft, or milky, or else capsular, and under these circumstances, depression is favourable and absorption easy, and, besides, the operation is more simple. If the child is of the age of a year or more, we may administer chloroform, but we should abstain from its use, if the patient is only a few weeks old.

The operator, provided with a flat needle, very slightly curved, keeping the lower lid depressed with the pulp of the middle finger of the right or left hand, according to the eye to be operated upon, follows for the operation the different stages indicated for the method by depression. After having carefully attempted the couching and depression of the crystalline lens, it frequently happens that the cataract being soft, the latter flows towards the lower part of the eye, without the surgeon being obliged to depress it; or else the cataract being soft, and the membrane of the crystalline opaque, we must move the instrument from above downwards with great care to divide the capsule; or if the cataract has a resistance which does not allow us to depress it, we must divide it, and after thus operating, lacerate it. We have not found it advisable to let the fragments of the crystalline pass into the anterior chamber; these portions are readily absorbed, and after having sometimes filled the whole chamber, they are found to dissolve more or less rapidly, especially if the fragments are small.

After the operation, we apply, over the eye, a compress steeped

in cool water, which we support lightly and renew frequently without opening the eye. We lay the child in a curtained bed or else in a room in which the light is shut out by blinds or heavy curtains. We continue the application of cold water for two or three days in succession. If there be pain or sleeplessness, we give a spoonful of coffee with syrup of codeia. We also employ a strong infusion of lettuce leaves, or the application of compresses steeped in a collyrium composed as follows:—

℞. Zinci sulph.,
Morphiæ sulph., āā gr. ij.
Aquæ destillat. f℥ij. M.

If inflammation of the eye exists, with much pain, we should not hesitate to apply a leech behind the ear corresponding to the eye operated upon, and we may spread around the eye an ointment containing mercurial ointment and extract of belladonna. We give calomel as a purgative, and keep both legs constantly surrounded by a layer of wadding and covered with adhesive plaster. When the case does well, we gradually diminish the application of compresses steeped in cold water, and also lessen the darkness, but allow the light to penetrate into the chamber only when there is freedom from pain and from acute sensibility.

The education of the eye is thus accomplished in a very slow manner, and requires that this organ shall not be exercised in too bright a light. Consequently children that are operated upon should wear a shade for some time, or else a veil or spectacles with glasses coloured with lampblack, if they are old enough to wear them. When, after a month or six weeks, absorption of the crystalline is not complete, we may, advantageously, introduce the needle afresh, with proper precaution, and endeavour to complete the operation at a second effort. We may take a similar course, if, after a first operation, a secondary cataract should form. In all cases, we must only operate a second time when there no longer exist traces of ocular inflammation.

Accidental Cataract.—This affection is developed most frequently without any appreciable cause, yet it is sometimes met with in children who have gazed at the sun or remained in sandy regions where the light of the sun is intense. The same symptoms and the same treatment apply to them as to adults. We have seen this form of cataract occurring in children debilitated by long

chronic diseases, under which circumstances the operation will be unsuccessful.

Traumatic Cataract.—This variety of the disease is quite frequently observed in children, as the result of contusions of the eye or of wounds of the eyeball. It is only developed after an inflammation of greater or less intensity, which must be combated with perseverance, and an operation should not be decided on for a long time. The mercurial ointment, belladonna, purgatives, and flying blisters behind the ear corresponding to the eye affected, are remedies that must not be neglected, and we have had satisfactory results in cases in which we were called to operate; yet we need not persevere too long with these remedies, if after five or six months they produce no good effects, but decide to operate. It is not uncommon to find these cases complicated with amaurosis, when an operation will be contra-indicated. The collyrium with atropia may then make the diagnosis clearer. If there is opacity of the lens, and the pupil is movable, we may, in cases of traumatic cataract, follow the operative procedure already pointed out. The necessity will often arise to destroy the adhesions of the capsule to the iris, and this must be done with extreme care, so that the iris will not be wounded. The after-treatment will be the same as that previously referred to.

CHAPTER XXI.

ABDOMINAL HERNIA.

ABDOMINAL hernia, which is characterized by the escape of the abdominal viscera through natural openings, is met with nearly as often in childhood as at other ages, especially in the earliest months of life, and more frequently, in our experience, in little boys than in little girls.

Several facts authorize us to declare that this affection may be hereditary, but without dwelling at present on this point, there are certain peculiar conditions to remark in children, which may explain the development of a considerable number of hernias. These causes are due, on the one hand, to the arrangement of the openings, which are less tense and less tightly closed than in the adult, and

on the other hand, to the freedom which children use in the efforts they make. In fact, the child that is new-born or but a few months old, checks its cries as little as it does its desire to evacuate, and it expels with all its strength, often intensifying this as much as possible. In our view, these are the chief causes of hernias in children; not that we should exclude in them causes that prevail among adults, but these act much less frequently in childhood, and at the same time they are much less appreciable.

The constituent parts of a hernia are not always the same. We have seen it formed by the epiploon, the small intestine, the large intestine, and the ileo-cæcal appendix; and in three young girls there was a hernia of the ovary through the inguinal ring, that organ descending to the greater labia. The other abdominal organs may also present themselves. Generally, all these hernias are enveloped in a sac formed by the peritoneum, except in cases of congenital inguinal hernia in which the displaced organs descend directly into the tunica vaginalis. The openings through which hernias are produced in children are at first, in the youngest of them, at birth the umbilical opening, and the space of the linea alba; at a later period, and yet sometimes at birth, the inguinal ring. The symptoms are generally as nearly as possible the same as those of adults.

Let us examine in regular order umbilical hernia, that of the linea alba, and of the inguinal ring.

Umbilical hernia is seen at birth or a very few days afterwards; it may have for its cause at first the cries of the child, and sometimes the want of proper attention in supporting the belly with the body bandage, and sometimes also the want of plumpness and feebleness of the child. It is easily recognized in examining the umbilicus; we detect either through the opening or a little to its outside, below or above, a tumour without change of colour of the skin, having the volume of half a hazel-nut, or of a walnut, easily reduced and giving the sensation under the finger which presses it of a marked gurgling. It may be made to disappear by pressure, and it shows itself afresh as soon as the finger is removed; sometimes the child has colic, but what is especially to be remarked is that the tumour is increased by the cries of the child.

When the hernia is of small volume, it will be sufficient to support the belly, when the umbilical opening will be found to be contracted, and the tumour will diminish promptly, especially if the

child increases in strength and gains flesh. Frequently, however, it tends to augment in size, and the indication is to confine it by means of a bandage, several forms of which have been devised, but most generally these bandages slip, do not support the hernia, and are totally insufficient. We believe as the result of our own experience, that it is better to reject entirely the elastic bandages whether they be of the most simple or the most complicated kind; belts with cushions fastened in their centre do not render any better service. We consider it better to employ adhesive strips, and we also prefer to all bandages the application of a simple hemisphere in yellow wax or in vulcanized rubber to form the cushion, attached with a long strip of gum resin plaster applied in the form of a belt. This passes around the body one and a half times, and has a width of about an inch and a half; it adheres to the skin and easily supports the hernia. This simple bandage, which seems to us superior to all others, and which is always at hand, should be carefully prepared. We make a hemisphere with yellow wax, by softening the latter by heat, and forming with it a kind of ball, which is cut in two. This half-ball may be of variable size, according to the dimensions of the opening of the ring, on which it has to be adjusted in such a manner as to exert compression; but it is necessary that it shall be larger than the opening, into which it should not enter, for it would then do more harm than good.

This cushion, wrapped in fine linen, should be placed in such a way that its convexity may be in relation with the ring, and its flat part with the strip of plaster, over which we make several circular turns of a bandage around the abdomen. Before applying this bandage, it will be well to powder with starch or rice powder the umbilicus and the portion of the trunk and loins which may be in contact with the plaster, and thus prevent the occurrence of erythema, caused by the action of the plaster upon the skin. This kind of bandage should be left in place three or four days in succession, and when it is to be removed, it is better to prepare in advance a new cushion and adhesive strip. In removing the bandage, we must at once place the finger over the umbilicus, in order to prevent the hernia from escaping before we can apply the fresh cushion; and thus, if the umbilicus is already contracted, we do not lose, by the escape of the intestine, all that we have gained. With children, whose skin is irritable and becomes reddened by the use of plaster, we must use only a bandage tightly applied

around the abdomen, but this form of bandage has the disadvantage of slipping, and becoming displaced, and does not support as well as the plaster.

Umbilical hernia is cured most frequently in six weeks, two months, and sometimes longer, by carefully applying this form of bandage. We have never thought of resorting to the method of radical cure by the ligature after the reduction of the portion contained in the sac, for whether the ligature be simple or multiple, and with or without torsion, it does not inspire in us a sense of perfect security, for it is attended with danger. I have never met with strangulated umbilical hernia in children; I have seen them slightly choked up, but they were reducible, after the application of poultices.

Hernia of the linea alba is sometimes produced by quite a considerable separation, either above or below the umbilicus. It presents a tumour of oval form more or less elongated, is fluctuating, and re-enters under pressure. In such cases, the ventral belts properly applied are of advantage.

Inguinal hernia, in children, and in small boys especially, is quite common. It may be simple or double. In children as in adults, the symptoms may be both local and general. The latter consist of colicky pains varying in degree, sometimes of repeated vomiting. The local symptoms are the same as those met with in adults. In the region of the groin we detect a tumour of greater or less volume, sometimes very small, as large as a hazel-nut, at other times much larger, always devoid of change of colour of the skin, fluctuating and easily reducible, with gurgling, generally by a moderate amount of pressure, which causes the intestine to return through the inguinal ring. These symptoms are frequently met with on the right and left side at the same time, for it is not uncommon to have two inguinal hernias occurring simultaneously. The parts contained are generally small or large intestine, with or without epiploon. We once found, while operating for strangulated hernia, the ileo-cæcal appendix in a child of seven or eight years of age, who had died of peritonitis. In three little girls, we have seen a hernia of the ovary through the inguinal opening.

Inguinal hernia in children may be confounded with hydrocele, cyst of the cord, a descending testicle, a tumour of malignant character of the testicle, and in little girls with a descent of the ovary. The first case of this kind we saw was misunderstood. We had under treatment in the Hôpital des Enfants, in 1851, a girl of

eleven years of age, who, below, and on the internal surface of the left greater labium, had a small tumour, which was mistaken for a cyst by myself, by M. Broca, and others of my professional brethren, and from which the child had suffered since she was a year old. Believing that we had a small encysted tumour to deal with, and as it had become very painful and interfered with her walking, we removed it. After having uncovered it by an incision, finding that it was suspended by a prolongation, a ligature was placed on the pedicle, which was then cut. It proved to be an ovary, and the child died two days afterwards of peritonitis, which took its origin on the broad ligament that formed the pedicle. We avoided making a similar error in two other little girls, whose cases came under our attention at a later day. We then discovered that these hernias presented a small tumour placed on the inside of the greater labium, which rolled like a cyst, and on being pressed slipped between the fingers. It appeared to be retained when an attempt was made to draw it downwards, and it reascended when it was relaxed, as a cyst of the cord ascends when we endeavour to bring it down. In both cases, we could not cause the tumour to return.

We must not confound hernia with simple or encysted hydrocele. At first, in simple hydrocele, there is an appreciable fluctuation of fluid and not of gas. There is often reduction, but this only occurs in hydrocele communicating with the abdomen, and finally its transparency may be detected. Encysted hydrocele is a small transparent tumour, circumscribed over the tract of the cord, which ascends or descends as we lower or raise the testicle.

It is very important to distinguish a testicle descending through the ring from a hernia. This descent usually happens towards the seventh month of conception, but it frequently takes place at the time of birth, or occasionally some time afterwards. When the testicle descends, we learn at first from the parents, or by the examination we ourselves make, that there is nothing in the scrotum on the corresponding side, and we detect at the inguinal ring a rounded, moderately firm tumour, which may be made to pass back by pressure, without gurgling. We may also, by taking the tumour between the fingers and drawing it downwards, discover that it is held by a pedicle, which is the cord; and that it will re-enter completely to appear again, if the child be made to cough or even to walk. This tumour is no longer painful after it has passed up,

while the compression exercised by the ring, when it reappears through it, sometimes produces pain.

We must also make a distinction in the child between congenital hernia and the accidental form of the affection. In the former, the hernia is formed in the tunica vaginalis, a condition which is often met with in children, whose tunica vaginalis is not closed; in the latter, there is a sac independent of the tunica vaginalis.

Inguinal hernia is generally formed by the epiploon or the intestine. Left to itself, it tends to increase in volume and may become enormous. Children may suffer from this form of hernia without any grave symptoms accompanying it, yet they generally have colic, especially when the hernia has not been returned, or is incompletely supported. It may become inflamed by pressure of the bandages, when there will be pain, and under these circumstances a few baths, poultices, and temporary suspension of the bandage, if the child is wearing one, are sufficient to cause a cessation of these symptoms. The hernia may also, as in the adult, become choked up or even strangulated.

This choking up of the intestine (*engouement*) is characterized by the presence of fecal matters in the bowel. This accident, which is especially met with in feeble old people who do not support their hernias, is seen also in weak or delicate little children. Several surgeons, and among them M. Goyrand, have seen such cases. It is characterized by augmentation of volume and of weight, and its soft and doughy consistence; and by borborygmi and eructations. The skin covering the tumour has a normal colour, and the abdomen is swollen, without being painful. Sometimes there is nausea and even vomiting. By the use of emollients applied over the hernia, and of several enemas, we may frequently remove the obstruction, which is effected through the evacuations. The taxis and a gentle purgative are indicated.

Strangulation occurs less frequently in children than in adults and old people, but we have met with it several times, even in children but a few weeks old. We have found, in these cases of strangulation, all the symptoms met with in adults, such as hardness and tension of the tumour; a hard and painful condition of the abdomen; eructation and vomiting, the patient at first emptying the contents of the stomach, fecal matters from the intestines being afterwards voided by the mouth, and little or nothing at all by the anus. In a word, the symptoms are identical with those

observed in adults and old people. The tumour may become inflamed and perforated, and an artificial anus be then established with greater or less rapidity, while at the same time the countenance undergoes a change, the pulse, which was frequent at first, becomes weaker, and death may follow.

These grave symptoms are however less frequently seen than in adults, and often the hernia may enter spontaneously, or at least be reduced more easily. In fact, in instances in which we have been called to see cases of strangulated hernia in children, we have generally been able to employ the taxis with success, and we have only met with failure in very rare cases.

When we wish to resort to the taxis, especially in the youngest children, we place them on an inclined plane, in such a manner as to keep the head and trunk lower and the pelvis elevated, and follow the rules laid down for the taxis in adults. We press the tumour near the ring, so as to cause the upper portion to be reduced first, and the rest of it afterwards, and this we attempt for a very short time only without administering chloroform. As soon as we have discovered its inutility—and this often happens, because children in their struggles make a resistance to reduction—we advise the application of a poultice over the tumour. We then give the child a bath, and afterwards have recourse to an anæsthetic, so that we may be able to employ the taxis without having to dread the effect of the cries and movements of our little patient. We have nearly always in this way effected the reduction.

When this is impossible, we must resort to an operation, and success is much more certain if the taxis has not been kept up for too long a time, and if the operation is performed as early as possible after the commencement of strangulation. At the end of eight or ten hours, reckoning from the beginning of the symptoms, we should employ the bath and the taxis, with chloroform, and not stop short of an operation, if the hernia is unreduced. In fact, Pott lost in two days a child suffering from strangulated hernia; Gooch one six weeks old; Dupuytren operated on a child twenty days old; M. Goyrand on one four months of age, which he cured; and Prof. Roux on one two years old. We have met with several cases of strangulated hernia which we usually had the good fortune to reduce by the taxis assisted by chloroform, even in children but six weeks or two months old. Rarely have we had occasion to perform an operation, and in the only three cases in which we

operated we had unfortunate results. The precautions to be adopted in the operation should be the same as for adults. The after-treatment is likewise very important and more minute on account of their tender age. We have to combat peritonitis.

The accidents just pointed out are very rare in children, and generally if we are consulted early there is the greater probability of having them promptly cured of their hernia, by constantly and carefully applying properly-fitting bandages, especially if the children from being lean become fleshy. Those who are treated in the early months of life may be cured by the regular application of a bandage in four or five months, and those a year and more of age may often be cured by wearing the bandage for a year. But when they are older, they must not be allowed to give up the use of the bandage for several years, and then, when they wish to relinquish it, they must not finally do so all at once. We should, in the majority of cases, at the commencement make them wear the bandage night and day, and when we consider it necessary to withdraw it, it is advisable to suspend its use at first only at night, and resume it the next day.

Generally, we find it advantageous to apply bandages as soon as we are consulted. At first we use light bandages of fine caoutchouc with air-cushions, for the new-born; but for children from six months to a year old, we prefer elastic bandages, of very fine material, covered with fustian, and then a cover of gummed silk. It is absolutely indispensable, for very young children, always to have at least two bandages, because they are so often soiled, and require to be changed every day.

We may conclude this subject by remarking that whenever the testicle has cleared the external orifice of the inguinal canal, and is very near the ring, the indication clearly is not to let it re-enter and to leave it outside. Sometimes in time it descends further, unless the cord be too short, as we have seen it; but it also happens that the testicle compressed in the canal causes frequent pains, which are repeated at close intervals. If, in such cases, we cannot support the testicle outside the ring by means of a hernial pad expressly arranged for the purpose, which can support the returned intestine and the testicle outside, without compressing it too much, it is much better, in our view, to follow the advice of Marjolin, who said that if there existed a hernia of the testicle and a hernia of the intestine, if the latter could not be supported without compressing

the testicle, it was better to return the hernia and the testicle, and support the whole of it reduced, rather than expose the child all at once to the accidents of compression of the testicle and of strangulation of the intestine.

CHAPTER XXII.

LEUCORRHŒA.

LEUCORRHŒA, an affection characterized by a white or yellowish-green discharge from the vagina, is frequently met with in young girls from the first months of life to the age of puberty.

Among the *causes* producing it, the first and principal one is the lymphatic constitution. It is quite often hereditary, as proved by numerous examples. It may become developed only under the influence of the scrofulous diathesis, or as the result of an acute disease, or succeeding the suppression of an eczema of the vulva. Local causes may also give rise to it, such as oxyures passing from the rectum to the vulva, occasioning vulvitis, and, as a consequence, inflammation of the mucous membrane of the vagina with leucorrhœal discharge. Finally, it may be the result of the introduction of foreign bodies into the vagina or of masturbation.

Symptoms.—Sometimes there is heat, pruritus of the vulva, and at other times neither pain nor itching. The discharge is often colourless and mucous, or else it is thick, yellowish and even greenish. Sometimes, in examining the vulva, we find it bathed with sero-purulent fluid and even fetid pus, as in true uterine and vaginal catarrh. By carrying the finger into the rectum, and pressing from behind forward the posterior part of the vagina, the fluid is made to escape by the vulvar orifice. Sometimes these local phenomena exist alone without affecting the general health, but we quite often see little girls pallid, with circles around their eyes, complaining of loss of appetite and feeble digestive powers, easily fatigued, and shrinking from walks of any length. It sometimes happens that the leucorrhœa ceases of itself without treatment, but it may continue to increase, and then it occasions exhaustion and loss of flesh. In cases in which the discharge is considerable, vulvitis of varying intensity may declare itself, and cause so much

pain that the child refuses to walk. We can readily imagine that this affection, though in itself attended with but little danger, may debilitate the child when its duration is prolonged.

The *pathological alterations* are difficult to determine; we cannot employ the speculum, and it is only by chance that we have the opportunity of examining the vaginas of little leucorrhœal patients, who die of intercurrent affections. Two or three times only have we had such an opportunity. Twice we saw the mucous membrane of the vagina, as well as the internal surface of the uterus, inflamed, and were able by pressure to make the thick mucus ooze through the neck of the latter, and this has led us to think that there is often at the same time utero-vaginal catarrh.

The *prognosis* of this disease is not serious; the latter may last for a long time, and sometimes be alleviated to return with greater intensity. The establishment of the menses is sometimes sufficient to cause its disappearance. The surgeon should therefore be very circumspect, and not give an opinion on the duration of this annoying form of indisposition, for it may also happen that after menstruation has been well established the leucorrhœa may still remain. When the cause is a local one, there is better prospect of a speedy cessation of the discharge, than when it is produced from constitutional causes.

Treatment.—Leucorrhœa should be attacked by both local and general remedies, as lotions of different kinds or emollients early applied, if there is much heat, such as marsh-mallow water, bran water, or flaxseed water. But these emollients should only be employed for a short time, and if the local cause depends on oxyures of the rectum, we must destroy these worms by the use of suppositories of calomel introduced into the anus morning and evening. When the leucorrhœa is not caused in this way, we may especially resort to the use of astringents in the form of lotions or even of injections into the vagina. Water and extract of lead, infusion of walnut leaves, or infusion of Provence roses may be employed as a frequent wash to the vulva; but when the discharge comes from the vagina we prefer to inject these fluids in the morning and evening carefully into that canal, using a syringe furnished with a delicate gum-elastic canula well fastened and capable of being introduced through the opening of the hymen. These injections may be made by intelligent mothers, by placing the child on the edge of the bed and keeping the labia separated. The surgeon should show the mother

at least once how these washes are to be used. They have appeared to give me good results, especially when freely administered with an irrigator, which enables us to introduce at least a pint of fluid to sprinkle the neck of the uterus and the walls of the vagina.

We have used injections of water and nitrate of silver, in the proportion of six grains of the crystallized salt to four ounces of distilled water. When this kind of injection is employed, we should use it once each day with a small glass syringe, for only three or four days in succession, and endeavour to make the child retain the fluid in the vagina for several minutes, by applying at once between the greater labia a tampon of cotton and approximating the thighs. We only return at long intervals to this kind of injection, if we obtain good results from them, once or twice a week, for example. All local medication is successful only when combined with general remedies that act on the whole economy, such as tonics given by the stomach or general baths.

Sometimes gentle purgatives, such as half an ounce of castor oil, administered once a week, produce a diminution of the discharge; or enemas made of about three drachms of the pods of senna in infusion, or an ounce and a half of honey of mercury. Of all purgatives, an enema of colocynth is the most active and even quite violent, and according to Dr. Claude, should be prepared as follows: Bitter apple, if small, one-third of it, if large, one-fourth, which should be macerated for twenty-four hours in a covered vessel filled with about four ounces of warm water. This very active purge is followed by several evacuations, which may even be bloody. We then give the child mucilaginous drinks and light soups. This purgative treatment may be repeated, five or six days afterwards, a second and even a third time. It has caused also the disappearance of the leucorrhœa for a considerable period.

As general remedies acting on the whole economy, full gelatinous and saline baths, sulphurous baths, sea-bathing, and sprinkling and lotions of the whole body with cold water, are powerful means whose very frequent use should not be neglected. The preparations of iodine, and especially those of iron, pills of phosphate of iron, protiodide of iron, natural chalybeate waters, and, for a change, wine of cinchona, and cod-liver oil when combined with a tonic course of diet, constitute a plan of treatment which should be perseveringly employed. We may be assured that all the methods

we advise are useful, and should not neglect them; but some time is necessary before the constitution will become modified, and the disease be thoroughly checked.

CHAPTER XXIII.

TORTICOLLIS.

This affection is a curvature of the neck, with involuntary inclination towards one shoulder. This symptom most generally presents differences according to the nature of the case, and usually requires different treatment according to the diseases which are its cause. It may depend on both acute and chronic affections.

In the new-born, torticollis or wry-neck is due to the feeble muscular power of one side of the neck, the equilibrium being only re-established by strengthening the side opposite the inclination, and a few days will very often effect this. Erysipelas, a phlegmon, engorgement, a recent burn on one side of the neck, or rheumatism may produce it, and we should treat the affection which is the cause of the torticollis, the latter being more or less severe according to the nature of the disease. Chronic affections, such as paralysis, cervical arthritis, caries of the vertebræ, rachitis of the cervical region, and vicious cicatrices after burns, all of which may produce a deviation of the neck, require appropriate treatment. Torticollis induced by muscular contraction, which will chiefly occupy our attention in the present article, consists in a lateral inclination of the neck, occasioned by the shortening of a single portion, or of two portions, of the sterno-cleido-mastoid muscle, as may be clearly shown by attentive examination of a case of this kind, and on this point the views of Albinus and Mickel harmonized. In causing an individual to breathe, it will be seen, as M. Guérin has already remarked, that the sterno-mastoid is a motor muscle of the head, and the cleido-mastoid an inspiratory muscle. This is not the general view of their functions.

The causes of this deformity are obscure. It may depend upon an arrest of development, or convulsions leading to muscular contraction. In carefully studying the symptoms of this contraction,

we perceive the inclination of the head either to the right or the left, a diminution in the length of the cleido-mastoid or of the sterno-mastoid, and, in addition, inclination of the cervico-dorsal region opposed to the inclination of the head. The contraction is seated most frequently in the sternal mass of the muscle; sometimes, however, the clavicular mass is contracted conjointly with the former. The contracted muscle is shorter, and of smaller size, and this is so much the more marked if the patient is older. The muscles of the face on the contracted side are all less developed, and atrophied, and the movements of the head are made all at the same time with the shoulders, and without pain. When the head is carried to the side opposite the flexion, we notice the muscle becoming stretched under the skin and preventing the inclination of the head on the opposite side. We very often notice, also, a tension of the trapezius, which is more or less contracted.

This deformity, if left to itself, may become aggravated. The body of the vertebræ settles down on the side of the curvature. Generally only an operation, combined with mechanical appliances, can overcome it. Bandages, which were formerly employed at the commencement of the deviation, nearly always failed to produce any result. We may employ them to prepare the patient to wear mechanical apparatus, but without relying on them alone. We must, in addition, perform an operation which has been in vogue for a long time; Tulpin and Cheselden practised it, and at a later day, Dupuytren, Roux, Magendie, and Dieffenbach performed the section of the muscle, but in a faulty manner. Since the time of J. Guérin and Bouvier the operation in general favour to-day has been regularly performed, and almost with certainty. We refer to the subcutaneous method of operating.

Laying aside bandages, which were formerly employed to counteract the deviation, all surgeons have come to use a mechanical collar which surgical-instrument makers can easily make, and which should be preferred to all others, unless it is impossible to procure it. This collar consists of two solid portions made with metallic plates properly padded and stuffed, one of which is applied under the base of the skull and under the lower jaw, the other over the upper part of the thorax, the shoulders, and the clavicle. They are both kept separated from one another by means of metallic stems, which ascend on the lateral portions of the neck, and which may be elongated on one side or both in such a manner as to separate the head

from the base of the neck and be reversed in one direction or the other. One of these mechanical collars being appropriated to the patient on whom we are about to operate, and arranged in such a manner as to fulfil satisfactorily the indications, we accustom the child to wear this apparatus for several days, after which we may decide to perform the operation.

Operation.—Surgeons have completely abandoned the old methods, in which the skin was first divided, and afterwards the muscles, a source of great difficulty during and after the operation. We now employ the subcutaneous method, which is very simple and very easy. It is sometimes necessary to cut the sternal portion, the clavicular portion, and even the edge of the trapezius, which we have found contracted. We must then, before operating, endeavour to decide in advance, by careful examination, if we have to divide a single muscle or several of those referred to. We should not, however, be ignorant of the fact, that if we do not obtain complete straightening after the first division of the sterno-mastoid muscle, we must generally operate on the other portions which cause the prominence, and which interfere with the complete success of the operation. In this manner we avoid repeating the division several days afterwards, either of the cleido-mastoid or of the edge of the trapezius.

In all cases we must lay the patient on the side opposite to that on which we are about to operate. If the child is restless and unmanageable, it is better to chloroform him. The surgeon should study on the patient the distribution of the superficial veins, which creep along under the skin, in the inferior cervical region near the sternum and clavicle. The arrangement of these veins is variable; they may sometimes embarrass by their size, and it is well to avoid them as much as possible. The child should be held in such a manner as to make the contracted muscular mass bulge out.

For this purpose the head should be carried in a direction the reverse of the inclination, so that not only will the muscle be made to project, but also be separated from the subjacent parts. This enables us to avoid injuring it. The operator then making a fold in the skin in the direction of the fibres of the tendon, should use a straight sharp-pointed tenotome, with which he pierces the base of the fold between the skin and the muscle about half an inch above the insertion of the latter, introducing it transversely, with the blade flat-wise and without pushing it, so as not to pierce the skin on the other side. This first stage being accomplished, we use

a probe-pointed tenotome, concave on the edge or convex, which having been introduced flatwise through the passage thus made is directed in such a manner as to place the edge in front of the fibres of the tendon, and is pressed from before backwards to divide the tendon in that direction, pressing it rather than sawing so as to avoid accomplishing the complete division too abruptly. We prefer this plan; we may, however, introduce the tenotome behind the tendon, and then direct the edge forward, to make the section from behind forwards without dividing the skin, thus rendering the operation more delicate.

When, after the division of this principal portion, we still find, on inclining the head, the cleido-mastoid muscle prominent, we should treat it in the same way and also the trapezius, the projecting edge, of which it will be sufficient to divide. In the majority of cases, we may confine ourselves to division of the sterno-mastoid; twice, however, in my own experience, I have been obliged to divide the cleido-mastoid. After these divisions, we must not hope to have at once a complete cure of the torticollis, for there is still some passive contraction, as M. Guérin calls it, in the deep muscles of the neck, which only yields gradually to apparatus. The operation once performed, we should place over the puncture a strip of isinglass plaster, applying several turns of the bandage, and waiting three or four days for the wound of the skin to cicatrize. We must not be alarmed at a slight effusion of blood which sometimes occurs under the skin, depending on the wounding of several subcutaneous veins. At the end of three or four days the wound in the skin is closed, and the effused blood absorbed, and we may then resort to mechanical treatment. We may, indeed, be assured that the section of the muscles being effected, the placing of the head in a straight position becomes easy, but it is still far from complete, for the deep muscles, by their passive contraction, resist the inclination and rotation of the head; and on the other hand, the divided muscles have a tendency to become approximated, and a cure can only be effected by keeping the ends of these separated. It is still never perfectly complete, on account of the contraction of the deep muscles that were beyond our reach, and the subsidence of the bodies of the vertebræ, which cannot be made to disappear completely.

In any event, three or four days after the operation on the muscles, we must come to the mechanical treatment, without which the

result would be incomplete. This is frequently designed to overcome the cervico-dorsal inclination and the contraction of the deep muscles. Bandages applied so as to incline the head might be employed, but not with any good results. There is nothing so really useful and appropriate as the mechanical apparatus known under the name of the casque, applied to an orthopædic bed, or even a helmet; or, what is still more simple, the mechanical collar already described. This may be found at many instrument-makers, with modifications and additions, some of them rather ingenious, designed to facilitate the inclination of the neck and of the head in all positions, to overcome the principal inclination and the secondary inclinations caused by the action of the muscles and by the curvature of the cervical region. This collar should be applied very carefully to prevent excoriation, and should be taken off under various circumstances, but only for a few moments. At the commencement, it should be worn for a very long time, and so much the longer in proportion to the age of the patient; so that it is better to commence the treatment of torticollis of long standing as soon as possible. We consider it proper to operate on children when they are about two or three years old. As a general rule we should prefer to operate at a time of year when there are fewer acute diseases prevailing among children, so that we may prevent the early days of treatment from becoming complicated with some febrile or other affection.

When the neck appears to be restored to its normal straightness, it is indispensable that the collar should not be completely abandoned. We must continue to apply it every day, at least for a few hours, and when not wearing it the patient must put on a cravat surrounded by a firm and resisting stiffener, which will still carry the head on the side opposite to the pathological inclination. To conclude this subject, permanent success can only be assured by acting as in cases of club-foot, resisting for a long time any return of the deformity.

CHAPTER XXIV.

MALFORMATIONS OF THE FINGERS AND TOES.

MALFORMATIONS of the fingers and toes arise from excess or deficiency, or from adhesions. We have met with them in children the issue of marriages of consanguinity, and of others where no such relationship existed. We have seen them come into the world with fingers deficient; in acephalous fœtuses, either mere appendages of fingers or the hand composed of only two fingers; and in one case a phalanx was wanting, but we have more frequently found the fingers in excess. We have discovered in these cases that the malformation was often hereditary, and we have seen two double great toes in a grandmother, mother, and child. We have found it to occur in fingers and toes, or the parts in excess are insignificant, very small, and very slightly developed. On the contrary, we have met with a double left hand, composed of eight fingers well formed, the two thumbs being wanting.

It is not uncommon to find a thumb or a little finger in excess, composed of one or two phalanges, sometimes having tendons, which pass from it and may produce movement, while at other times they even communicate with the principal joint of the finger or the next toe. They may be opposite the joint of the thumb, at other times that of the little finger or the great toe. Some of them are quite well developed and in juxtaposition; in other words, we find two thumbs or two little fingers, or else the same arrangement as in the toes, united by a cutaneous membrane and the bony parts free, and sometimes also fingers held together. Thus we have seen a double thumb and a double great toe. Under such circumstances, the two thumbs are sometimes united by skin only, and have each phalanges and separate joints. Others have the phalanges in juxtaposition, closely consolidated together, while at times the first is single and the others are separated. We have seen a thumb with a single first phalanx and the ungual phalanx double, each part separated, articulated in a detached manner on

the first phalanx and thus resembling a fork, each extremity of which represents the end of a tolerably well-formed thumb. Sometimes this fork is formed by the bifurcation of the last phalanx. Some thumbs are well separated, but both of them articulate with the first metacarpal bone, and this is seen not only in the hand, but also in the foot. Two great toes may be found to articulate at the same point, one of them having a deviation inwards and standing off from the other.

Malformations of the fingers from adhesion are very often seen in the ring and middle fingers. Sometimes four fingers are united by a cutaneous membrane which holds them together in their whole length, constituting a genuine case of web-foot, generally involving only half their extent. We have seen the ring and middle fingers united by a cutaneous membrane as far as the ungual phalanx; and this last may be laterally consolidated with the other, so that the bony portions are not distinct and only make one large deformed phalanx, having both nails united. We have seen fingers when united forming a shapeless stump, in which we could distinguish nothing, either finger or joint. This kind of adhesion is especially met with in children whose hands have been burned, and especially in the new-born, as a malformation.

Let us now examine into the *operations* to be performed for these various malformations.

When the fingers are in excess, we must distinguish those that are useless or annoying and insignificant appendages. In such cases the indication is positive, we must sooner or later remove them, and the sooner the better, unless some concurrent affection may lead us to defer the operation. But it sometimes happens that they are in regular position near each other without being separated, and then there will be nothing better to do than to leave them alone, for they act simultaneously with the others and do not interfere with their movements. If there are supernumerary fingers which stand off from the rest, and form an angle with the thumb or with the little finger, on the hand as on the foot, these should often be removed; but some of them stand off a little, having an appearance like a fork, are articulated on the same metacarpal bone as the principal finger, or on the first phalanx, embarrass the movements, and are perhaps applied to the side of the principal finger. Here an operation is indicated, which consists in causing the adhesion either of both fingers or of both phalanges. The plan of cauterization

suggested by M. Cloquet, producing the adhesion of the two portions, presents sometimes more advantages than the removal of the supernumerary finger. This method has succeeded in one case in which both great toes formed a kind of fork.

As for fingers that adhere together (*syndactilie*), they are sometimes extended and without flexion, or very much flexed and contracted. If there be two fingers or several, the indication is to operate. This is not a matter of much difficulty, but if it is easy to divide the cutaneous membrane that unites the fingers, it is very difficult to keep them separated. We have made a simple incision, prolonging it as much as possible on the dorsal side, to obtain an oblique cicatrix which will restore the normal commissure. Following the advice of Dupuytren, we have exerted compression on the angle of union of the fingers by means of a long narrow strip of plaster or linen, applying the middle part of this over the interdigital angle, and bringing the extremities in front of and behind the forearm. We have employed the method of Rudtorffer, piercing the base of the interdigital fold by means of a needle, with a leaden thread, which should be left in the wound until the edges of the opening are cicatrized. The interdigital fold then presents an opening analogous to that made on the lobe of the ear, and is then divided.

All these means may fail, but such are the autoplastic methods that have given us the best results. Zeller's mode of operating has been successful in our hands; it consists in making on the dorsal surface of the interdigital membrane a V-shaped incision, the pointed end of which comes opposite to the middle of the first phalanx, and the base of which looks towards the metacarpo-phalangeal articulation. We dissect up this flap, giving it as much thickness as possible, and incise the whole extent of the adhesion, reversing the flap in the interdigital space, to apply it over the palmar surface of the hand, and securing it with a strip of plaster. The fingers should be dressed separately, keeping them apart. M. Morel-Lavallée advises that two flaps be made; Dr. Decès, that the fingers should be kept separated as much as possible, and the interdigital fold seized in one forceps, an incision being then made to the right and left in a direction parallel to the united fingers, the fingers separated, and an interdigital tongue of skin left in the interval; the fingers are kept apart by means of a suitable scooped splint, and straightened, and thus, if they were flexed before the operation, they become straight

and draw the arch formed by the tongue against the normal commissure. The wounds of the fingers are, however, dressed separately, keeping them always apart.

Another very ingenious method of Dr. Didot, of Liége, which we have also employed, is thus performed. Supposing the ring and middle fingers to be united, we make an incision along the dorsal surface of the former, from the free extremity of the interdigital fold to the middle of the first phalanx. From each extremity of this incision, we direct two others transversely, the superior one being prolonged to a point opposite the centre of the middle finger, the inferior as far as the free border of the interdigital membrane; and we then dissect this square flap from the ring-finger as far as the middle finger. This flap is formed of the posterior part of the skin of the ring-finger, of the interdigital palm and the middle finger. A similar flap, but cut in an inverse direction, is made on the palmar surface of the middle finger; it is formed of the skin of the anterior portion of the latter, of the interdigital palm and ring-finger. This dissection being made, we divide the few cellular adhesions which retain the fingers, and one of the flaps serves to cover the denuded part of the ring-finger, and the other the denuded part of the middle finger; the cutaneous fold of the base of the two fingers is formed through the medium of a suture. This mode of operating, which is difficult and tedious to execute, demands, like the other methods referred to, the use of continuous sprinkling with cool water. It is quite frequently complicated with inflammation, whatever may be done, and often with gangrene of the flaps. Besides, there is a liability almost always to a recurrence, whatever may be the operation resorted to.

I hold to the view of Chelius, with whom I had a conversation on this subject, that prudence demands that we should not perform this kind of operation before the complete development of the fingers; otherwise we will find new adhesions appearing, either because the skin cannot become developed as rapidly as the fingers on account of the cicatrix, or because the adhesion progresses from the base of the fingers towards their extremity in proportion to their growth in length. We should therefore prefer to postpone an operation until the fingers have ceased to grow. Whatever the plan adopted, or the age of the patient, it is very important to keep the fingers extended on a splint, the fingers of which are separated, and it is indispensable to make continuous irrigation after the ope-

ration, and not to discontinue it abruptly, but in a slow and gradual manner. Especially is it of the highest importance, that when the cicatrix is completed, the fingers shall still be kept extended on a wooden splint, and that the patient, after having worn it for several weeks, day and night, should continue to wear it for several months at night, and exercise the fingers during the day.

Adhesions of the toes are far from requiring the same consideration as those of the fingers. We must remember that malformations of the toes are mainly deviations, forced extensions, or flexions. Under these circumstances we must be cautious about operating, and especially of amputation; mechanical appliances and tenotomy are often the only remedies we have to use. Operative interference is confined to the removal of toes in a rudimentary condition, where they are the cause of inconvenience in walking by becoming caught in the stockings. We need hardly refer to the importance of resorting to these operations only in cases of absolute urgency, and of taking the greatest precautions by appropriate after-treatment to guard against subsequent angeioleucitis.

CHAPTER XXV.

CARIES OF THE VERTEBRÆ (POTT'S DISEASE).

CARIES of the vertebræ is an affection which may be said to be peculiar to childhood, in spite of the few cases occasionally met with in adults, and is one of the diseases most frequently met with in hospitals for children at all ages. It is characterized by osteitis of one or several of the vertebræ, and, anatomically, presents three stages: the commencement, the increase, and the termination.

First Stage.—There is at first osteitis with bony swelling, sometimes slightly sensitive; somewhat later, in the course of one or two vertebræ, a more or less marked gibbosity,—that is to say, a projection formed by a spinous process of one or two vertebræ, This prominence, which makes its appearance in an angular shape, is always accompanied and produced by an alteration of the osseous tissue of the body of the vertebra. On post-mortem examination, we find this tissue more or less red and infiltrated with blood and

pus, and the cellules of bone distended. The presence of tubercles of varying consistence has also been sometimes, but quite rarely, detected. In all cases, the body of the vertebra or vertebræ affected is always less resisting than in the normal condition. The gibbosity, which at the beginning is not very marked, offers an angle of greater or less prominence, according to the extent to which the vertebræ are affected, and their want of resistance. The cervical, dorsal, and lumbar regions of the vertebral column are attacked by this disease, which most frequently, perhaps, involves the inferior portion of the dorsal region.

Second Stage.—The gibbosity may be more or less prominent, on account of the advanced condition of softening of the bodies of the vertebræ, which are in various stages of deformity. When the caries occupies the anterior portion of the body, the sinking of the latter takes place forward, and the gibbosity is then more prominent, if the softening takes place in the whole thickness. There is greater heaping up of the vertebræ in the direction of the thickness of the bone, and then the vertebral column is diminished in height, while sometimes the lesion is more marked on the sides. The trunk then has a lateral inclination either to the right or the left.

It is also in this second stage that we have detected purulent collections, which are only seen on an autopsy, because they are not of sufficient amount to be recognized during life. The pus will be seen spreading in the form of a net under the anterior vertebral ligament, either in the pharyngeal region or the dorsal or lumbar region. The organs in front of these collections are found to be but slightly compressed, when these are only of trifling amount, but are much more so when the abscesses are developed to a point that entirely obstructs and even arrests the functions of the pharynx, œsophagus, bronchial tubes, lungs, stomach, or intestines, according to the region in which we meet with them. These collections are sometimes so greatly developed that we find them effused into the chest, the stomach, or the small pelvis, and in such cases death frequently comes suddenly. At other times, they have become diffused into the iliac fossa, and find an outlet from the pelvis by the inguinal ring, by the sciatic notch, and turn around the articulation of the thigh. They are met with in the sheath of the psoas and iliacus muscles.

We have seen these purulent collections perforating the intestine, the rectum for example, and this explains the relief experienced,

or the cures resulting, from the discharge of pus by the anus. We have quite often seen, as have many others also, purulent collections which were situated behind the vertebral column, but the consequences are much less serious. These may be emptied by the efforts of nature or by the hand of the surgeon. Sometimes the pus is absorbed more or less slowly, or discharges through openings made spontaneously or by art, and if the patient has resisted all this, which may last for years, he then arrives at the third stage.

Third Stage.—This is either a period of aggravation ending in death, or of cure. In the former case, the vertebræ are more and more destroyed, the portions of the bone swim in purulent collections of varying extent, and the pus is more or less diffused. We sometimes find purulent absorption complicated with tubercular meningitis or pulmonary phthisis, which puts an end to the life of these unfortunate patients. When the disease has a tendency towards cure, nature makes prodigious efforts to support the vertebral column, which tends to become more and more flexed. The abscesses diminish in extent and finally disappear either without being opened or are emptied outwards. Fistulas become gradually dried up and close, and the canals are obliterated or reduced to the state of fibro-cellular cords. The vertebræ which were affected sink down, and become consolidated, passing beyond the neighbouring vertebræ, several adhering among themselves, and anchylosis resulting. We see portions of vertebræ remaining in a healthy condition surrounded by true bony stalactites, which serve as a support to the destroyed parts, and finally the vertebral column, which may have considerable deformity, regains, by this wonderful effort of nature, sufficient solidity to support the trunk perfectly, but always with curvature and often compressing the spinal marrow.

Causes.—We recognize two sets of causes of this terrible disease, the predisposing and the exciting. Under the former we place a lymphatic constitution, a scrofulous diathesis—an affection peculiar to childhood; among the latter we class falls, blows on the vertebral column, and also masturbation, which may at the same time be both cause and effect, for it may happen that those unfortunate children, who are for the most part obliged to keep in bed, are led to indulge in it only from this cause, and that this vice weakens them and aggravates the vertebral disease. To produce this affection there must be a special predisposition, which is its true cause. A traumatic

cause sometimes, but rarely, produces vertebral caries. This at least is the result of a large number of observations that we have had occasion to study. We recognize in the symptoms of this disease three stages, as we have already found three in the anatomical lesions.

First Stage.—This includes sometimes pain at a fixed point in the vertebral column; arching more or less marked in the course of one or more of the vertebræ, a prominence to which the name gibbosity, has been applied, pressure at this point increasing the pain; difficulty in walking; sometimes the trunk curved forward or backward; lassitude, pricking in the legs, desire to sit down, and not to remain in the erect position; and when the disease is seated in the cervical region, the necessity of supporting the head by resting the chin on the hand, or on the back of a chair, or some other support. In dorsal or lumbar caries, the limbs become weak or paralyzed, the patients are soon brought to a condition in which they cannot move much, and even remain voluntarily extended on their back complaining if they are touched or assisted involuntarily.

Second Stage.—All the symptoms become increased in intensity; and sensibility is greater over the gibbosity, which becomes more prominent on account of the softening. Sympathetic abscesses become developed and make themselves prominent in the pharyngeal, inguinal, gluteal, or femoral regions, or in any region whatsoever of the posterior part of the trunk. We have, for instance, treated a patient with an enormous collection of pus in the lumbar region, which could be returned into the abdomen like a hernia through the interval above the iliac crest, limited by the edges of the great oblique muscle of the abdomen, and the great dorsal muscle. The sheaths of the nerves emanating from the spinal marrow serve as conductors for the pus, which may be seen diffusing itself in the aponeurotic sheaths of the various muscles of the trunk. The various functions may be interfered with or abolished. Abscesses of the cervical region affect the speech and deglutition, and paraplegia and paralysis of movement and sensation, or both, are produced as the result of compression of the spinal cord or of the nervous cords emanating from it. The simultaneous loss of both these functions is especially observed when the pus makes its way into the spinal canal.

Third Stage.—It is at this time that the opening of internal

abscesses takes place into the cavities of the thorax and abdomen, terrible accidents in both cases. If they open into the thorax, sometimes death occurs rapidly from asphyxia caused by compression of the organs of the chest. When the abscess pours into the pelvis, it sometimes produces a swelling in the groin, and may open spontaneously by passing under the peritoneum. It is likewise in this third stage that hectic fever, diarrhœa, marasmus, and finally death occur. At this period of the disease, however, caries does not attack the vertebræ only, but also the various pieces of the skeleton, and all parts of the economy appear to yield to the destructive effort; or, what may be properly called an ulcerous diathesis. Nevertheless the termination of the disease is not always a fatal one, for we are sometimes fortunate enough to find the caries arrested, having been checked by skilful hygienic treatment or rational medication, or even when abandoned to the efforts of nature. Fistulous canals are established as a sequence of openings made spontaneously, or by the hand of the surgeon. It may happen that these become dried up or obstructed, and a cure takes place, but always with more or less deformity, and very slowly. There are pain and stiffness in movement, and a gibbosity of greater or less magnitude, which in time becomes solid.

Considered in regard to its duration, vertebral caries is an affection which requires eighteen patients out of twenty to be confined to their beds for years at a time. Sometimes we are more fortunate when the disease is treated with intelligence from the commencement, or is less intense. We then may find the constitutional manifestations disappear in a few months, but this is uncommon, and more frequently the cure is delayed. Under all circumstances, we must, to obtain a cure, perseveringly insist on the methods of treatment we adopt. When a fatal termination is about to take place, fever, diarrhœa, infiltration of the limbs, and serous effusions occur; in a word, the symptoms of a complete cachexy, and the patient dies from exhaustion and marasmus.

Diagnosis.—It is important not to confound vertebral caries with other affections having some of its characters. At the commencement of the disease there is some impediment in the walk, with stiffness and even pain in the movements, which are likewise met with in lumbago; but, in this latter affection, the pain is violent and acute, often accompanied by fever, which is of short duration. This rarely occurs in vertebral caries, which is attended with very

little fever at first. Besides, if any prominence exists at any point of the vertebral column, painful on pressure, the question is settled.

We must not confound vertebral caries with rickets, in which the curvatures of the bones are produced slowly without giving rise to sharp angles or severe pain; in fact, we have here no subsidence or bearing down of the bodies of the vertebræ, but rather softening of all the spinal column, accompanied with incurvation and not shortening. Most frequently the projection met with in those suffering from rickets is rounded, but we must not depend absolutely on this as the characteristic, for it is not constant, and may likewise be met with in caries of the vertebræ. We have ourselves seen several illustrations of this. The diagnosis of rickets is mainly established from a general view of the temperament and constitution of the patient. The keel-shaped thorax, swollen abdomen, the nodes on the wrists and ankles, the shape of the head, and the pathognomonic curvature of the bones will be symptoms more than sufficient to prevent all error in the diagnosis. Rickets usually precludes scrofula, which is the most frequent cause of Pott's disease, yet one disease may be complicated with the other. Another differential symptom is found in the fact, that in caries there is increase of the volume of the bones and more or less acute pain on pressure, a condition not met with in rachitis. If with all the symptoms of caries should be combined sympathetic abscess, there is no further room for doubt.

Certain affections of the pelvis, such as sacro-iliac arthritis, may be mistaken for caries, but careful investigation will prevent all error, whether we exert pressure on the painful part or move the pelvis on the sacro-iliac articulation. The pain here would be more lateral, and less in the middle line, than in caries of the vertebræ.

Complications.—This disease may be complicated with all the symptoms of scrofula, of pulmonary and cerebral tuberculosis, and of nearly all the acute affections. Congestive abscesses, becoming diffused to a distance, produce considerable separations of parts. These abscesses may open spontaneously, and the patient be sometimes cured, and we have seen cures result even in rebellious cases. Another terrible complication is the purulent infection which occurs after the opening of the abscess; whether the latter be spontaneous or produced by artificial means, in either case it is mortal.

Prognosis.—Everything in this disease conspires against the un-

fortunate patient and the medical attendant. The structure of the vertebræ singularly favours the origin and development of caries, and its deep situation causes the disease to pass a long time undetected, and there is no possibility of attacking it directly. The prognosis then is always serious. Everything else being otherwise equal, the prognosis will be more favourable, if the disease is accidental and traumatic, and if the treatment is commenced at the beginning. In every instance, a greater or less amount of deformity will remain, which will occur very slowly in the majority of the cases cured. A considerable amount of gibbosity will often result, which does not yield to any treatment; we have rather to treat it as a bony consolidation which the healing powers of nature have produced and which we have to let alone. When fistulas are established, much time is usually required to close them up.

Treatment.—The treatment of Pott's disease presents three principal indications: 1. To modify the general constitutional disposition in virtue of which the caries is developed; 2, to combat the inflammatory action of the bones and neighbouring parts; and 3, to prevent the disorders which may result from the movements which are made in the vicinity of the affected part of the spine. We come then to the therapeutics of abscess.

1. To fulfil the first indication, we must have recourse chiefly to a strengthening regimen. The patient must be placed in the most favourable hygienic condition. Bitter pharmaceutical preparations, such as gentian, hops, juglans regia, chalybeates, and certain medicines whose antiscrofulous properties are generally recognized, such as iodine, iodide of potassium, cod-liver oil, and the preparations of phosphate of iron, may be administered in different forms. As may be readily perceived, the internal treatment will be the same as that for scrofula.

2. With the view of combating inflammation, especially if the caries results from external violence, we may employ wet cups or leeches, but with great prudence, for generally those in whom the disease declares itself, even under the influence of external causes, are of a lymphatic or scrofulous temperament. We prefer to bloodletting the mercurial frictions of Dr. Serres, of Uzès, irritating frictions, flying blisters, moxas, and chiefly the actual or potential cautery, under the form of points. Experience on this subject has taught us that burns from the actual cautery cicatrize much more promptly than cauterization produced by caustics; but as we con-

sider the indication to fulfil is to exert as frequently as possible a revulsion on the skin, cauterization by the iron is to be preferred. As we experience less repugnance on the part of patients and their parents to the application of caustics than to that of the hot iron, we frequently use the Vienna paste, and we hasten the separation of the sloughs by dressings with the *onguent de la mère*, or some digestive ointment. We carefully introduce issue peas in the wound which results from it, as advised by certain physicians, so that we have a prompt cicatrization, and only flying cauteries, which we can renew a very large number of times. We may add that these applications of caustics have never produced, in our hands, any accidents or erysipelas.

The disease often progresses in spite of these applications. Our colleague, M. Bouvier, rejects them in all cases, and contents himself with dry cupping and applications of tincture of iodine, but we consider these agents as very weak for a disease of so grave a character. We only omit cauterization when the paralysis has ceased or diminished, or when pressure, exerted quite forcibly over the prominent spinous processes, does not develop pain. We may still, as a matter of prudence, only omit them gradually. We thus adopt the views of Pott, since we do not reject the cautery in all cases. Nevertheless, in many cases of slight intensity, we abstain from its use.

3. We must, as much as possible, prevent movements in the affected part, and support the vertebral column, not straighten it. After what we have said of the formation of the gibbosity, it is evident that we must treat it with great moderation. We must endeavour to give regularity to the spine, or sustain it by apparatus that has no other effect than rendering immovable the two segments of the column. These segments, on account of the destruction of the ligaments that unite them, have a tendency to exert dangerous friction on each other. These in fact produce pain and induce in the deep parts an inflammatory condition, the least inconvenience of which would be to interpose an obstacle to consolidation. Besides, they may compress the spinal cord, which is frequently already compressed by the suppuration which has been diffused into the vertebral canal.

Let us here inquire into the value of the mechanical means employed, which may be reduced to three: mechanical beds, corsets, and crutches.

We at once dismiss from consideration the use of the bed referred to, for it is in fact, not a question of straightening, but of supporting. If then we make the patient lie down, let it be on an ordinary bed, taking care always that the mattress, made of hair, fern, or seaweed, presents a certain amount of resistance. A soft bed would be objectionable and injurious. We will be able to see, from the region affected, what are the parts to be supported in a straight position. If in the cervical region, the head must be supported either on a hair pillow, or, better still, by means of mechanical collars, which rest on the shoulders and support the head by ascending over the lateral portions of the base of the skull and the lower jaw. This method is followed, when we wish to make the patient get up. If the caries exists in the dorsal region, we should cause the patient to lie on his back or on his abdomen, but not in a curved position, for soon the straightening would present great inconveniences, or would be impossible. A cure might be effected, perhaps even would occur more rapidly, but one of the most frightful deformities would remain. Rickets may be sometimes straightened by the mechanical beds, which are generally prescribed in caries.

Mechanical corsets succeed at a certain stage of the affection. They have this certain advantage, that they support, by means of uprights, which pass under each of the axillas, the upper part of the unaffected body, which would otherwise weigh upon the lower, crushing it, and would augment the disorders already produced by the caries. They may arrest the gibbosity in its formation, and are useful at the commencement. These corsets, in order to be properly made, should fit the hips perfectly by a resisting belt, from each side of which proceed two guards movable by means of a screw, in such a manner as to follow the patient's growth in his successive evolutions. These two guards have the same effect as crutches in supporting the shoulders. The corset has some real advantages both as a medium of protection and support, and the patient should wear it for a long time, and even after a cure, which may be more apparent than real, and be followed by a relapse, if the support of the vertebral column be neglected.

Bonnet, of Lyons, devised two forms of apparatus, which satisfactorily fulfil the indications desired. One of these is designed for patients who are confined to bed, the other to those who are on their feet and walking about. The first consists of a kind of breast-piece in metallic wire, modelled upon the gibbosity, and

padded on its concave face to prevent all painful contact. The second is composed of two springs united in front of the pelvis and terminated by crutches which rest on the external and upper portions of the chest, while a belt placed above the pelvis serves to support the lower part of these crutches. This apparatus is particularly useful when the patients commence to go about.

After what has just been said, we may easily conceive how useful crutches are. If there be complete or incomplete paralysis, the weight of the pelvis and lower extremities will exert a salutary traction, when the shoulders will be supported by the upper portion of the crutches. An immense advantage for the patient, in a hygienic point of view, is the power to walk by means of these forms of apparatus just as soon as there is a probability of cure. But especially must we never lose sight of the fact that no mechanical method can be followed by completely satisfactory results independent of internal treatment aided by a healthy atmosphere and good food. We therefore combine with these mechanical appliances permission to our patients to lie back in a small, gentle carriage, and be drawn through a garden, and over an even soil, which causes no shock to the child.

As for sympathetic abscesses dependent on caries of the vertebræ, they deserve a special mention, on account of the regions they occupy and the difficulty often experienced in reaching them. Sometimes they are even inaccessible to cutting instruments, and they can only be subjected to general treatment; an example of which may be found in abscesses of the anterior dorsal region. Collections of pus in the cervical and lumbar regions are more easily reached.

Abscesses of the cervical region, by the obstruction they occasion to the functions of deglutition and phonation, are promptly recognized, and their fluctuation may be detected by the finger carried into the pharynx; and the pus may be evacuated by the bistoury or the pharyngotome, an instrument which we have for some time found exceedingly useful. It may be objected to this method that it allows the air to enter into the purulent focus, causing putrefactions of the pus, and sometimes purulent absorption; but we have never yet met with accidents from evacuation of the pus, which is driven out by the energetic and simultaneous contraction of the muscles of the pharyngeal region. In the lumbar and gluteal regions, the pus produces a prominence over the iliac crest, or else

it empties through the sciatic notches as far as possible in the deep or superficial regions of the thigh, or in the sheath of the psoas and iliacus muscles.

Under all circumstances, the pus often remains stationary, and then if the abscesses only give rise to a small amount of inconvenience, we must leave them untouched and confide mainly in general treatment and repose. But when they have acquired a large volume or become red and painful, we must decide to open them, and this will only be accomplished by successive subcutaneous punctures by means of the flat trocar and syringe of M. Guérin. A piece of adhesive plaster is then applied on the puncture, and methodical compression exerted on the sac with bandages and compresses. In spite of these precautions, the pus re-forms with considerable rapidity, and at the end of a few days or weeks we are obliged to recommence the operation, taking care, all this time, to continue the general treatment. When the pus collects afresh, we have derived benefit from using injections of tincture of iodine diluted with water one-third or a half, following the example of Dr. Bonnet. These injections are reapplied several times, at an interval of eight days, allowing the fluid to remain only a few minutes.

Fistulous tracts are sometimes established in place of the openings, and the pus flows from them little by little, in a continuous or intermittent manner. It is thus that nature often proceeds to accomplish a cure. When the fistulas remain, they may still be successfully injected with tincture of iodine diluted with water. Flaubert, of Rouen, and after him, Lisfranc, advised that over the abscess incisions should be made, an inch or more in length, not fearing the contact of air, the introduction of which, according to these surgeons, facilitates the adhesion of the walls by producing a slight inflammation. We have tried this method, but not with successful results. We had to deplore the death of a patient from purulent infection, the result of violent inflammation of the sac of the abscess.

There is still another method of opening the abscess. We refer to caustics; but when the slough falls off, the air may penetrate the sac and produce serious accidents. We have considered it our duty, therefore, to abandon this class of remedies, and have given our preference to the trocar, even making several successive punctures, and, if necessary, resorting to iodine injections.

It is certain that, by means of all the local methods we have

referred to, we have cured some of our patients, but we have also frequently seen the disease progress and death result. Under the influence of general medication only, patients have recovered; so that we must not neglect a continuance for a very long time of iodides, chalybeates, cinchona, and all the bitter tonics; and even at the termination of the disease, when it advances towards a cure, it is often beneficial to prescribe sea-bathing and sulphurous baths, even several years in succession, at suitable periods. In all cases, these cures are effected only after a great length of time, and nearly always, also, with more or less marked deformity.

CHAPTER XXVI.

CONGENITAL IMPERFORATION OF THE ANUS AND INTESTINES.

We sometimes meet with new-born children that come into the world with a malformation, in the shape of an imperforate anus. It sometimes exists alone, but is often accompanied with an imperforate condition of the intestines. Without entering fully into all the details of this important subject, we shall speak only of what we have observed and done for it, as well as what our experience induces us to do at present.

1. *Anal Imperforation; Complete Atresia.*—Children born with an imperforate anus or anal atresia are in such a condition that they cannot relieve themselves of the meconium. They are like those who are attacked with strangulated hernia, having the abdomen distended with gas, vomiting at first everything they drink, the meconium next ascending into the stomach and being voided by the mouth, and death occurring in two, three, or four days, unless they are speedily relieved. There are several varieties of this form of imperforation. Sometimes we have found no vestige of an anus; at other times the anus has been well-formed externally, and in the midst of its radiating folds a diaphragm exists contiguous to the intestine, which terminates in a cul-de-sac, so that the rectal pouch is formed even with the sphincter ani; in other instances, we have found a properly shaped anus which would admit the end of the little finger, but presenting a cul-de-sac, in which it cannot

penetrate further than a half or three-quarters of an inch, and there terminates the rectal pouch, which is separated by a partition of the cul-de-sac already referred to.

In these cases of simple anal imperforation, it is sufficient, after having emptied the bladder, to make a puncture directing it on the side of the sacrum, to avoid wounding the vagina or the bladder, and we thus sometimes very readily reach the bowel. To perform this operation with safety, it is better not to operate immediately after birth, but wait until the meconium descends and dilates the lower part of the intestine. For this purpose we have devised a small, curved, grooved trocar, and making the puncture in the normal direction of the rectum, we withdraw the stylet. If nothing escapes through the canula, we should confine ourselves to this explorative puncture, but if the meconium presents itself, as it does in simple cases, it is proper that the canula should be replaced by a gum-elastic tube. The canula is not made with a flange, but in its place is the interior thread of a screw, which enables us to adapt to it a metallic stem, which gives it additional length and readily retains it without allowing it to escape. We may then conduct on the groove of the tube a bistoury, and divide the contraction to the right and left. It is easy to introduce a gum-elastic tube on the stem, and to push this tube into the bowel. If we desire to bring down the bowel with a blunt hook, or with grasping forceps, or with the dilator devised by M. Bonnafont for the prepuce, we may dissect the periphery of the extremity of the intestine, and secure the freshened edges of the bowel on a level with the anus, by means of several stitches.

In cases in which we do not bring down the lower end of the bowel, nor attach it as just described, it will be very important to retain in the anus either a gum-elastic canula, or a piece of charpie, to keep the opening dilated, for it tends in the majority of cases always to become contracted. I have seen children in whom this form of anus performed its functions well without any tendency to become contracted, provided a dilating substance was used for several months, either a canula or the charpie. If, at the end of several days, we do not wish the canula to remain in the rectum, we must at least introduce it every day and let it remain a quarter or half an hour, and do this for several months. As the result of this operation, the sphincter ani sometimes regains its strength, little by little, and the children retain their feces. Sometimes, however,

they are obliged to wear a tampon constantly for this purpose; and yet this infirmity, which frequently persists, is less disagreeable than that resulting from artificial anus established in other regions.

2. *Incomplete Imperforation; Fistulous Atresia in an Abnormal Situation.*—When the anus does not exist in the normal region, it may happen that the rectum will open at other points, which will be seen on examining the child. Authors have cited many anomalies of this kind, and in our own experience we have seen quite a large number. For example, we have observed several cases in which the rectum opened through the perineum, the scrotum, or the vulva, by a very narrow passage, the urethra, the bladder, or the vagina; and in the latter case the child may live, though we must always endeavour to re-establish the anus in the perineum.

3. *Imperforation with Loss of Substance of the Rectum.*—The rectum has been found to be to a greater or less extent wanting. The lower extremity of this bowel is then seen to be replaced by a fibrous ligament, which ascends to a varying height, and descends to the point at which the anus should be. The rectal pouch is sometimes in the pelvis towards the neighbouring part of the lower end of the sacrum, at other times ascending as far as the base of the sacrum, and even getting into the left iliac fossa. It finally may happen that the rectum is wholly absent, and that the intestinal canal terminates in the sigmoid flexure of the colon. The large intestine has also been found to be deficient. In one case we saw a new-born child that was unable to evacuate its bowels, though the anus was properly formed, and the finger could be introduced into it; the large intestine existed, but was so narrow that in its whole extent it would scarcely allow, from the anus to the cæcum, a catheter as large as a goose-quill to be admitted. It presented, in the place of junction of the cæcum and colon, a diaphragm, which retained the feces in this portion of the intestine, the rest of the canal being in a normal condition, the ileo-cæcal valve and the whole of the small intestine having undergone no change.

Among other curious cases, we saw a fœtus with an intestinal tube extremely narrow in its whole extent, from the anus to the jejunum; it was reduced to the size of a crow-quill, and presented at very close distances, say about an inch and a half to two inches, diaphragms, which retained the meconium. This little patient vomited continually, and lived about three days. In these last cases, surgery is totally powerless, but when the large intestine stops

in the left iliac fossa, which we generally hope to find, and when attempts have been made to establish an anus in the perineal region, the surgeon in his efforts to preserve the life of his patient has two kinds of operation to resort to, especially if the parents demand direct operative interference. But they must be told in advance that these operations are very uncertain, and are very often followed by inflammations which carry off the little sufferers; and that if they succeed, the poor children may remain with an infirmity which is frequently the torment of their lives.

It is then very important to arrive at a correct diagnosis of these various forms of malformation of the intestine. Unfortunately it is very difficult at the outset to recognize the particular kind we have to treat. In nearly all cases, percussion of the abdomen gives a sonorous sound, and if there should be dulness, announcing the presence of fecal matters in the intestine, this fact gives us very little assistance in making a diagnosis. We may nevertheless discover that the lower extremity of the rectum is near the imperfect anus, and if we feel fluctuation in the perineum, either before or after making an incision, we may easily detect the communication with the bladder and the vagina; but, in other cases, the diagnosis is impossible.

It will therefore be necessary to use prudence in endeavouring to establish the anus in its normal situation, by the procedure above referred to; or, better still, by at first slowly making a transverse incision, carrying it towards the coccyx to avoid the bladder, vagina, etc. It will be well, so as to guide himself in this dissection, if the operator previously makes the puncture with the trocar we devised, introducing through the opening made in the intestine a blunt hook, putting a metallic curved bougie in the bladder in small boys, in the vagina in little girls, to remove them from reach of the bistoury, and then carefully dissect around the portion of intestine that may present itself. This should be opened and secured, as we have already described, to the wound. In any event, if we do not reach the rectum, we must resort to one of two operations, which have for their object the going in search of the colon, bringing it to the external surface of the abdomen, and establishing an artificial anus, either in one of the iliac fossæ, or in the lumbar region. The first is known under the name of Littre's operation, the other as Callisen's. The latter was actively resorted to by Amussat.

The *operation of Littre* consists in making an incision of six or eight inches, above the left or right inguinal ring. Though the colon is sometimes found on the right side, it is most generally so on the left. The incision being made into the skin, fascia, and muscles of the abdomen, we come to the peritoneum, which should be divided on the grooved director. Generally at this situation we find the sigmoid flexure of the colon, which is divided longitudinally to the extent of an inch to an inch and a half, and we then secure, by means of stitches, the edges of the wound in the intestine to the fresh edges of the wound in the skin. The meconium escapes, the abdomen, which was tense, sinks, and the patient is relieved, a catheter is secured in the wound, and if inflammatory symptoms do not arise, the child may be cured. Such results have followed, but in the dozen or more operations we have performed, our patients died of peritonitis two or three days afterwards, with or without the discharge of fecal matters.

The *operation of Callisen*, perfected by Amussat, is performed in the left lumbar region, without dividing the peritoneum. A transverse incision is made in the soft parts, in the middle of the space which separates the last false rib from the iliac crest of the left side, so that the middle portion is outside of the sacro-lumbalis and dorsalis longus mass. In this direction we meet the descending colon, which we incise at its back part, where it is not covered by peritoneum, and we secure the edges of the wound in the bowel to the incision in the skin by four stitches, as we have previously stated. We must not forget that in the new-born the kidney, which should be our guide in the operation, passes considerably beyond the external border of the quadratus lumborum muscle, and even descends into the iliac fossa. We next come to the posterior surface and external border of the kidney, covered by the colon, which lies alongside of it, or passes in front of it. In the adult, we only meet with the inferior extremity of this organ, which we find surrounded with its covering of fat.

From what has now been said of the operations of Callisen and Littre, we may discover that the execution of the former is more difficult than that of the latter, but there is greater probability of peritonitis in Littre's operation, for the serous membrane is twice divided, and in that of Callisen this is avoided entirely. Nevertheless, several successful cases have been published by Littre's method, and Robert, in his report to the Academy, gave an extract with

favorable results from them. M. Rochard, of La Rochelle, showed us a preparation from a patient operated on by himself according to Littre's plan, who lived five years, and died of diphtheritic inflammation of the throat. The ends of the divided intestine, which was the sigmoid flexure of the colon, were perfectly adherent to the parietes of the divided abdomen. M. Goyrand, of Aix, who advocated this operation, has also reported favourable results with it, while Amussat has, on the other hand, credited success to that of Callisen.

If we consult the small number of patients who have been cured by either of these operations, they nearly always express regret that they ever survived it, for nothing is as annoying as the disgusting infirmity of which they are the victims. And yet some have been cured, and the authorities on this subject have cited examples of those who have lived fourteen, twenty-two, forty, and even forty-three years. (See article by M. Giraldès, *Malformation de l'Anus*, in the *Nouveau Dictionnaire*.)

After these two operations, even immediately, or some time afterwards, if the patient does well, we should be disposed to attempt to re-establish the anus in its normal situation, adopting the method of M. Demarquay. A silver conductor of the size of a female catheter may be introduced into the lower end of the intestine as far as the point corresponding to the anus; and by means of this conductor a needle armed with a thread may be pushed through the partition of the cul-de-sac of the intestine, which should be pierced at the natural situation of the anus. This thread should carry with it a small metallic ball, which, by exerting pressure on the point corresponding to the anus, will cause the adhesion of the intestine. At the end of some time it will serve as a guide to make an incision which would thus penetrate the rectum. This opening should then be subsequently dilated, and the anus in the iliac region afterwards closed, as soon as we are perfectly satisfied of the passage of fecal matters through the perineal anus.

CHAPTER XXVII.

TRAUMATIC LUXATION OF THE FEMUR.

MANY practitioners are almost ignorant of the fact that traumatic luxation of the femur occurs in children. This lesion is so uncommon, that those who have had occasion to observe it may be considered specially favoured. This is not because no one has written upon the subject: the majority of standard authorities are, it is true, silent upon it, but Hippocrates has much more carefully discussed it than any of his successors. He distinguishes in children three kinds of luxations of the femur, those which are congenital, the result of accident, and of disease, and he gives, in regard to the last, a summary description, in which we at once recognize coxalgia. (*Trad. de Littre*, tome iv. p. 243.)

Hippocrates appears to have observed in children four varieties in the seat of luxations of the femur, and as in his day the means of reduction were as yet but little known, he compares in these four varieties the consequences of unreduced luxation in children and adults, and considers that generally they are more serious in the former than in the latter. We find in his work the cause of this difference in the prognosis in the old and the young; it is because the thigh-bone does not follow the progress of growth, and remains shorter than that of the sound side (op. cit., p. 235). Not only does the luxated femur not attain its length, but the inferior extremity is affected throughout, becoming atrophied and emaciated much more than in other dislocations, on account of the absolute want of exercise. (Op. cit., p. 253.) On this subject, the divine old man made this admirable reflection: "In a word, all parts of the body which were made for active use, if moderately used and exercised at the labour to which each has been habituated, become healthy, increase in bulk, and bear their age well; but when not used, and when left without exercise, they become diseased, their growth is arrested, and they become old before their time." After having thus laid the rational foundation of gymnastics, he could not fail to make it useful; so he urges several times the good

effects from it, which particularly attend children suffering from unreduced luxations of the thigh.

After Hippocrates, no author appears to have treated of the subject now occupying our attention. Here and there we find a very few scattered facts, and to gather fresh details, we must transport ourselves from the most ancient work to one of the most modern, from that which was at the foundation of the science to that which has given the best *résumé* of it. Thanks to the progress of surgical practice, M. Malgaigne has scarcely been able to study the results of unreduced luxation. Hippocrates, however, left him nothing in this connection to discover; but the erudition of the learned professor would lead him to recognize some cases, and the use that he knows how to make of statistics would reveal to him the relative frequency of the lesion in adults and children. In his *Traité des Luxations*, these predictions are confirmed, for we find mentioned in it the fact of the reduction of a traumatic luxation of the femur by Lisfranc, in a little girl of eighteen months; also cited in it the case of a little patient twelve years of age, of Saint-André, in whom a simple fall produced a sciatic luxation; the history of another of the same age observed by Paletta, referred to here as a luxation of the femur with rotation of the limb outwards, but the seat of the luxated head of the bone was not sought for; and finally, a boy of fourteen years, the subject of an incomplete luxation above the cotyloid cavity, and another, of sixteen years, with a luxation below that cavity. Nevertheless, the statistical labours of M. Malgaigne prove that traumatic dislocation of the femur is extremely uncommon in children, since, in a summary of fifty-one cases made by this professor, in only a single case was the patient under fifteen years of age.

In our own experience, we had met with but a single example of this lesion, when, by one of those coincidences with which pathology is not sparing, two children who were suffering with it came under my treatment at the hospital at only a week's interval. On account of their exceptional character, so far as the question of age was concerned, these two cases deserve to be reported.. It may be interesting also to compare them with one another, and to see how the descriptions agree with those given for the same affection in the adult.

Case I.—Alphonse D., thirteen years old, entered the Hôpital des Enfants, Nov. 1st, 1860, for a traumatic lesion of the left thigh.

He stated that at night, at the time of leaving the theatre, having laid himself down on a bench, he was picked up by the police and conveyed to prison. While seated there, he perceived that the beds, which in these premises are placed one above the other like bookshelves, were about to fall over. He immediately put the left knee on the ground, and curved his back to protect his head. He received the shock on his back, and as the left femur sustained the weight of his body, the luxation was apparently produced by a forced movement of flexion of the trunk on the thigh.

Examined on the 15th, at the morning visit, he was lying on his back, the left thigh slightly flexed on the pelvis, the leg semi-flexed on the thigh, the entire limb adducted and rotated inwards, the thigh and the leg resting on their inner surface, the foot on the corresponding border. The hip was very large, and the hand at once felt the superficial projection formed by the head of the femur, while, on the contrary, there was difficulty in finding the depression of the fold of the groin. The limb appeared to be slightly diminished in length. All spontaneous movement was impossible. That of flexion was produced without pain, but it was impossible to abduct and rotate it outwards.

The patient being put under the influence of chloroform, the method of Despréz rapidly produced reduction with the characteristic sound. The following day, the child moved his leg in the bed. On the 22d, seven days after the reduction, he got up, and made the tour of his bed supported, but could go no farther. On lying down, he still experienced pain, when his limb was subjected to movements of abduction and rotation outwards. On the 25th, he took a few steps unsupported; the next day he walked rapidly, but was still a little lame; on the 3d of December, he walked very well, and only experienced a slight soreness in stooping to tie his shoes; on the 7th, he left the hospital.

Case II.—On the evening of November 22d, was brought to the Hôpital des Enfants, young Victor Marie B., twelve years of age, strong and of good constitution. It was stated that an hour before, this child, employed in a tobacco manufactory, was drawn by the end of his scarf towards a wheel, which was turning horizontally, when a workman, to save him, caught him by the leg and drew him in an opposite direction. He succeeded, but also produced a dislocation of the right femur. The movement thus impressed on the limb seemed to be one of abduction and rotation inwards.

The next day, the child was lying on his back, the right lower extremity slightly flexed and abducted, resting in its whole extent on its inner surface, with a slight curvature of the pelvis, as in coxalgia. The gluteal region was prominent, and, at its external part, the head of the femur was very readily felt rolling under the fingers, when the limb was subjected to movement. The great trochanter appeared to have preserved its normal height; an interval of about four inches separated it from the anterior and superior iliac spine, while on the side unaffected the corresponding interval was nearly five inches. From the iliac spine to the extremity of the external malleolus, the distance was about twenty-eight inches and a half on the affected side, and fifteen inches and a half on the sound side. The measurement repeated several times gave likewise very slight variations. The violent pain prevented us from determining what movements were provoked, which persisted. In addition to this, the child having been very nearly strangled by his scarf, still presented, the next day after the accident, a greatly injected face and ecchymosis of the conjunctiva.

Chloroform was administered, and the reduction attempted; extension was made by two assistants, who drew upon a slip-knot made with a napkin, and placed above the malleoli; counter-extension was made by means of a large cloth passed under the right side of the perineum, and secured to a bedpost. Another cloth, directed transversely, supported the pelvis. After the first traction, reduction was obtained. The next day, the child performed, in his bed, all the movements of the thigh, except those of adduction and flexion, on account of the pain they produced. He could, however, sit down.

On the 28th, all the movements of the thigh were possible, in his bed; on the 3d of December, he was allowed to get up a moment, and walked without limping; on the 5th, he arose and walked without difficulty; and, on the 9th, he left the hospital completely cured.

In a comparison of the two cases, we find a striking resemblance. The lesion was produced in two patients of the same age, both healthy and with good constitutions, who had reached that period of childhood which borders on adolescence. The mechanism differed, it is true; in one, the cause was a forced flexion of the trunk on the thigh; in the other, probably a violent movement of adduction and rotation inwards; but the symptoms were identical, even to the

position of the limb, the deformity in the gluteal region, the prominence of the head of the femur, and the impossibility of the movements of abduction and rotation outwards. Reduction was equally prompt and easy, although obtained by different methods. The results were also happy, and the cure so rapid that in less than fifteen days both little patients could walk without difficulty in the ward. Considering especially the identity of the symptoms, these two luxations evidently belong to the same variety.

But what is this variety? The problem is easy, if we content ourselves with the standard opinion of the day. This luxation, MM. Malgaigne and Vidal denominate the *iliac*, and M. Nélaton the *ilio-ischiatic*, but the name given by Hippocrates, *luxation outwards*, is better, and is thus described:—

"When the head of the femur is dislocated outwards, the limb in these cases, when compared with the other, appears shortened. Inwardly, the thigh about the perineum appears more hollow and flabby, but externally the buttock is more rounded, because the head of the thigh has slipped outwards, but the nates appear to be raised up, owing to the flesh there having yielded to the head of the thigh-bone. The extremity of the thigh-bone at the knee appears to be turned inwards, and the leg and foot in like manner."

But, in the iliac variety, Sir Astley Cooper recognized two sub-varieties, the iliac, properly so called, and the sciatic, distinguished from each other by the symptoms they presented, and by a very decided difference in the reduction, easy for the former, often very difficult for the latter. This distinction has not been recognized by the majority of modern surgeons. Nevertheless, in a recent work, Dr. Chapplain, of Marseilles, has, with some ability, come to the defence of the sciatic luxation of Sir Astley Cooper, and if our two cases are compared with the one he has published, we will be led to admit two sub-varieties—one superficial or iliac, the other deep or sciatic. In fact, in both our patients, the foot of the side affected rested on its inner border, and followed the movements of rotation of the limb. In that of Dr. Chapplain, the foot rested on the heel, and did not follow the thigh in its movement of rotation. In the one case, the great trochanter did not appear to be sensibly depressed; in the other, it visibly descended. In one it was a little closer to the anterior and superior iliac spine, in the other it was more remote. The head of the femur, the position of which was wholly superficial, and its movements perfectly appreciable in our two patients, was

much deeper and could not be clearly distinguished by the Marseilles surgeon.

A difference of much greater importance was the following: the ordinary procedure of traction and counter-extension, and that of M. Després, gave an immediate result in our two cases, but Dr. Chapplain employed them without success, though he attempted the former according to all the rules laid down by Sir Astley Cooper, and the latter at two different times. It was by a method founded on the study of the cadaver that he accomplished reduction. Having decided that he had to overcome two obstacles—on the one hand the position of the head behind the posterior border of the cotyloid cavity, on the other hand the resistance of the pyramidalis and obturator internus muscles—he overcame the first by carrying the limb into a state of forced adduction, and the second by forcing the movement of rotation of the neck by means of the leg flexed and used as a lever, so as to approximate it to the bony surface of the external iliac fossa, thus depressing the head of the femur beneath the two tendons. It is not, moreover, the first time that we have found reduction of luxations of the head of the femur in this region embarrassed by muscular obstacles; an illustration of which was presented to the Société Anatomique by M. Parmentier, in which the head of the femur, situated directly opposite the sciatic notch, was caught in a button-hole formed by the pyramidalis and obturator internus.

M. Malgaigne, it is true, attributes to incomplete luxation the symptoms that Dr. Chapplain refers to sciatic luxation, and especially the position of the foot and the depth of the head of the femur. But, without taking any account of the almost paternal affection of M. Malgaigne for incomplete luxations, and without opposing the authority of Hippocrates, who strictly denied them for spherical surfaces like those of the head of the humerus and femur, has not the former written that incomplete luxations of the femur naturally present less difficulty in reduction than the others? This is certainly not the fact in the case observed by Dr. Chapplain.

We conclude with the remark that it is important to distinguish in iliac luxations two varieties, except that in place of founding this distinction on their relations with the bones, which may present very slight differences in the two cases, and only produce of themselves trifling consequences, it would perhaps be more natural, looking at the symptoms, prognosis, and treatment, to establish one

variety of superficial, and another of deep luxations. In the former, the head of the bone, always superficial and easily felt under the fingers, and not in relation with any muscle which can retain it, is always reduced without difficulty, as Hippocrates has remarked in regard to his luxation outwards, which corresponds perfectly with this (op. cit., p. 305). In the second variety, the head of the femur, deeply situated and not easily felt with the finger, is in relation with the tendinous and muscular portions, which holding it by an adhesion, or imprisoning it in a button-hole, may interfere with its reduction. The two cases we have described in our own practice would then be examples of superficial iliac luxation.

CHAPTER XXVIII.

FOREIGN BODIES IN THE AIR-PASSAGES.

FOREIGN bodies in the air-passages may come from the exterior or the interior of the body, and are met with in the larynx, trachea, and bronchial tubes. They are observed especially in children, and are very different and of many various kinds, as Louis has described in the *Mémoires de l'Académie de Chirurgie.*

Foreign bodies arising from the interior of the body may be worms, which, ascending through the œsophagus, pass into the larynx and sometimes cause sudden death; at other times, pus proceeding from an abscess of the neck, or a tubercular production developed primarily in a ganglion, or in the lung, and penetrating the larynx. There are also foreign bodies passing from the interior, which in the first instance had an external origin, such as arise from wounds of the chest sometimes making a channel into the pulmonary tissue for pieces of the dressing, as charpie, or bits of lint, which thence get into the respiratory passages. Even portions of necrosed bone may penetrate the lung-tissue, to be expelled by the bronchial tubes and trachea. A ball may follow the same course, as the result of a wound of the chest. All these foreign bodies often present themselves without any phenomena indicating their existence; and yet, for abscesses of the neck which find an

outlet into the trachea, for retro-pharyngeal abscesses which threaten to empty into the larynx, and for foreign bodies coming from a penetrating wound of the chest, there are symptoms which put us in the way of a true diagnosis. Nevertheless, we must say that these cases frequently terminate without having been suspected, and several cases of this kind are reported by writers.

This does not apply, however, to foreign bodies from without, which are numerous, and introduced directly by the mouth, whether they be fluid, soluble, soft, or solid. The fluids may be water, wine, spirits, all forms of drink; the soluble bodies may be sugar, pieces of gum, sugar-plums, bits of bonbons of all kinds, pills, &c.; the soft substances, food more or less masticated; and the solid bodies, raw beans, nuts, beads, teeth, plates of several teeth, bones, fish-bones, pieces of money, button moulds, &c.

Symptoms.—The foreign body is either in the larynx or the trachea, and the symptoms are more serious in proportion to the tender age of the child, as both these channels are then much narrower.

If the foreign body is fluid, the phenomena it provokes are a lively irritation, a convulsive and suffocating cough, a kind of stoppage of the breath and a râle, which disappear quite rapidly when the fluid is expelled.

If the foreign body be soluble or soft, it causes almost the same symptoms. Immediately after the accident, there is so much suffocation that the patient may die on the spot; but generally there is a violent, rough, convulsive cough, with threatened suffocation, appreciated both by the patient and the physician, the voice is raucous or extinct, there is anxiety, a feeling of fright on the part of the patient, and pain in the respiratory tract, the locality of which is easily indicated by him, while at other times it is more vague.

If the foreign body is solid, these symptoms persist, and even increase in intensity, but they vary according to the consistence of the body introduced into the air-passage, those substances that are soluble sometimes only producing these symptoms for a short time, for, becoming dissolved, they diminish in size, and are promptly expelled by the efforts of coughing. A piece of sugar, for example, of small volume, is soon expelled, and a piece of gum or barley-sugar, or a bonbon or pill, when dissolved, becomes smaller, and is discharged by the efforts of the child, either whole or in fragments.

The same thing may occur, but more slowly, with pieces of chewed meat, and soft bodies in general. We once saw a child who for several days in succession brought up pieces of chewed meat, and thus was relieved of it in violent fits of coughing, and the same thing occurred in another who had eaten a sugar-plum with the kernel, the pieces of which had entered the larynx and trachea.

The case is quite different with bodies that are really solid, for the symptoms already referred to not only persist, but produce other symptoms. A pin or a fish-bone may settle itself in some part of the larynx and produce very severe inflammation; and bodies of this kind may remain fixed at one point. Round and solid bodies have a tendency to change their position, and they may pass from the larynx into the trachea, or else remain in the ventricles of the larynx when they are small, or even descend into the bronchial tubes. In cases of this kind we may find the foreign bodies moving and becoming displaced, and giving rise to intermissions that induce the persons surrounding the patient to believe that there is no foreign body present, because a perfect calm succeeds most alarming symptoms of cough and suffocation.

When these foreign bodies are in the larynx, the symptoms vary less, because there is no displacement, but when they are in the trachea they may ascend and descend, and on placing the hand in front of the neck there is a sensation of a body rising and falling in the trachea. Sometimes these bodies descend into the bronchial tubes, and do not budge. We had occasion to diagnosticate the presence of a bean in the left bronchial tube of a child, in whom respiration was only heard in the right lung, the respiratory murmur being entirely absent in the left. We may therefore throw light on the case by careful observation of the respiration.

When these foreign bodies are left to themselves, either in the larynx or the trachea, if fluid and soft they are naturally expelled, but not so if they are hard, remaining constantly of the same volume, or increasing in bulk, as is the case with beans, for instance. Under such circumstances the symptoms increase in intensity, and the threatened suffocation is renewed; sometimes the patient is agitated by convulsive movements, the face becomes violet, the eyes are suffused with tears, the veins of the neck dilated, and there is a prominence in the air-tube. The child makes very energetic efforts at expulsion, and in this way produces an accumulation of air in the lungs, which distends their parenchyma; a rupture ensues, the air

penetrating the cellular tissue above the clavicles and through the chest, producing pneumothorax, and death gradually results, but, all things being otherwise equal, more quickly in children than in adults, on account of the smaller dimensions of their organs.

The *diagnosis*, made through the means already indicated, is quite often easy; yet we cannot lay too much stress on all the symptoms detailed. We must also attach the greatest importance to the information furnished by the persons surrounding the child at the moment of the accident, who were witnesses of the first symptoms observed, which are sometimes followed by the expulsion of the foreign body, for then the symptoms that persist may require only a temporizing treatment. It is very important that we should not confound the introduction of a foreign body into the pharynx with the presence of one in the larynx. Usually in the latter the pharynx and œsophagus admit the passage of drinks, which is not possible when the substance is in the pharynx. Nevertheless, a foreign body of large size, such as a portion of an alimentary bolus, may enter the trachea, and compress the œsophagus, and thus obstruct the passage through this canal, so that the patient cannot swallow without regurgitating; in such a case, the trachea being distended by the foreign body, we must ascertain with certainty whether the œsophagus is free, and this can be detected by introducing a catheter which will pass into the alimentary canal. If sometimes we find the alimentary mass in the œsophagus, we should push it into the stomach, when the difficulty will be overcome, and the diagnosis certain. If the contrary occurs, we will find in the œsophagus an obstacle beyond which it is difficult to pass, and which cannot be pushed forward. We then know that there is a distended trachea compressing the alimentary canal, and we discover the cause to be in the air-passage.

Prognosis.—The gravity of these cases varies according to the age of the child, his general condition, the consistence of the foreign body, its volume, and the length of time it has remained in the air-passage. Very small children, a year old, for example, may experience much more serious symptoms, on account of the narrowness of the larynx and the trachea. It is additionally serious if the child's health is impaired. Fluids only produce momentary symptoms; soluble substances are less dangerous than those that are soft, and hard bodies which produce permanent symptoms all present greater or less gravity. Those with smooth surfaces are not

accompanied with the same danger as if they had points or roughnesses. Foreign bodies may, by their bulk, intercept more or less rapidly the passage of air, and lead us to dread an abrupt asphyxia. If foreign bodies remain for any length of time, we have reason to fear that they may produce by their presence inflammatory or other complications, which may be prevented by very early removal of these substances; and yet we are aware that they have remained for months or years in the respiratory passages, and have been expelled by the efforts of nature.

Treatment.—When called to a child having a foreign body in the larynx, if we examine him with the laryngoscope or the speculum of Dr. Labordette, and the body is at the entrance of the larynx, or even between the vocal cords, we may, by the assistance of this last instrument, positively see the foreign body and seize it with a pair of polypus forceps; and this is the best plan to follow. If this method cannot be adopted—and it seems to us of indispensable service in such cases—we should at once turn the child head downward, striking it on the back, and causing it to cough and cry. We have seen bodies expelled in this way, such as beans, pieces of money, &c.

If this fails, we may, but without any great hope of success, employ emetics, sternutatories, and at last, most frequently without delay, resort to laryngotomy, if we think the body is in the larynx, or else to tracheotomy, if in the trachea or the bronchial tubes. For the performance of these operations, we must follow the precepts laid down in the article on "Tracheotomy in Croup" (p. 47) and not forget to use the small cranesbill forceps in seeking for the foreign body, which may be lodged in a bronchial tube. In a case of this kind we were fortunate enough to use this instrument with success, for these bodies do not escape from the bronchial tubes as easily as they do from the trachea. We must decide so much the more promptly in favour of tracheotomy, as we do not have to fear the want of success that attends it in cases of croup, in which we rarely succeed; for, in fact, in tracheotomy performed for the removal of a foreign body, death is the exception, a cure the rule. We have had occasion to perform tracheotomy five times for the extraction of beans from the trachea; four of these recovered, but one, who was operated on eighteen days after the accident, died of pneumonia.

We have always applied a simple dressing to the wound on the

first day, and we have only gradually effected a union. We may endeavour to produce union at once, when the foreign body has escaped, but not when it still remains and we hope that it will be got rid of at a somewhat later period. The edges of the wound may then be kept apart by a canula.

After an operation of this kind the surgeon should apprehend an attack of bronchitis or pneumonia in his patient, and be always on his guard, examining every day the chest, and at once treating the earliest symptoms.

CHAPTER XXIX.

PURULENT OPHTHALMIA OF THE NEW-BORN.

This disease receives its name from a specific inflammation of the oculo-palpebral conjunctiva, met with in children at birth, or some days afterwards. It solely attacks children, and sometimes several at the same time. It may attack one eye or both, and may be epidemic.

The *causes* are often obscure, and there may be several of these. The child may contract this form of ophthalmia at birth, in its passage through the vagina, which may be bathed by a leuco-rhœal discharge, or it may have caught cold soon afterwards What is certain is that this ophthalmia sometimes declares itself under the influence of special conditions of the atmosphere, and is essentially contagious, the child giving the disease to its mother, to its nurse, and to other children. On this subject all authors are agreed.

Symptoms.—The commencement of this disease may be recognized by the following symptoms: In the *first stage*, the third day after birth, the eyelids are found to be adherent by several slight crusts, the upper one being somewhat smaller, and presenting a transverse linear redness. There is tumefaction of the border of the lid, especially on the inner side, with pain and sometimes fever. This tumefaction goes on increasing, the redness extends, and the inner surface has a villous appearance, with an injected condition of the ocular and palpebral conjunctiva. We have difficulty in reversing

the lids, which the patient keeps closed, for the eye is sensitive to light.

In the *second stage*, there forms under the lids a mucous viscous fluid, which clings to them, and soon becomes white and thick, and separates from them when we raise them. The edge of the upper lid tends to pass over that of the lower, the injected condition spreads from the lids over the globe of the eye, and advances towards the cornea, and a swelling of the conjunctiva results, by which the cellular tissue becomes infiltrated and forms a chemosis. The secretion becomes more and more abundant, then ceases to be thick, becomes serous, and trickles over the cheek. The cornea remains transparent, examination of the eye becomes very painful, the orbicularis palpebrarum muscle contracts, and we have to raise the levatores palpebrarum to see the globe of the eye. We should not hesitate to chloroformize our patient under such circumstances, to determine the exact condition of the eye, and we will then find either pus, or granulations, or false membranes, from which we may describe three varieties of this affection, the purulent, granular, and pseudo-membranous or diphtheritic. An ectropion sometimes forms at the moment of examining the eye, which may persist, and then decided granulations are seen on the palpebral conjunctiva, and the matter of the discharge becomes sanious, being mixed with blood. If the disease does not continue to develop, it may terminate without leaving any traces, the granulations cease to be formed, the pus dry up, and the false membrane become detached.

Third Stage.—If the ophthalmia is not arrested, we now find the discharge becoming completely purulent, and there often exists, at this time, a false membrane, but not constantly so in all cases. Usually, the cornea, which had remained transparent, becomes muddy, softened, and infiltrated with pus, followed by abscesses, which open and leave perforating ulcerations of the cornea, which is sometimes destroyed, mortified, and as if strangulated. At other times, before the loss of the cornea, there may be seen, within a twenty-fourth to a twelfth of an inch of the circumference, an annular effusion, more or less complete, followed by a slight cloud spread uniformly over the surface of the membrane. This sometimes extends with great rapidity, and then a general opacity follows, which is due to purulent infiltration. The cornea, softened in its whole extent, soon presents a conical projection; ulcers form upon it, that open and give an outlet to the humours of the eye,

which escape with the crystalline; sometimes there is a hernia of the iris through these ulcerations; at other times, at the moment we endeavour to examine the eye, it ruptures, producing a peculiar sound, and becomes atrophied. We may anticipate this serious termination when we see the annular effusion, already referred to, spread over the whole cornea, and taking a general yellow tint. It is in these cases that the disease is checked; the ring gradually diminishes in width, and circumscribes at the centre of the cornea an opaque spot of varying extent. When it has reached this condition, the disease may remain stationary, or else is subject to relapses, which we should be on the lookout for.

Prognosis.—This is generally grave, unless the symptoms are checked at the outset. At that time the disease may terminate by resolution, but slowly. Under these circumstances, the palpebral swelling diminishes, the discharge ceases, and the photophobia is less marked, and this resolution enables us to separate the lids and bring the eye back to its healthy condition. But if the disease progresses without being checked, it may bring in its train specks, which may remain for a long time, and yet may in time diminish. We have also to fear the occurrence of capsular cataracts, hernia of the iris, staphyloma, leucoma, and the total loss of the eye, which may take place in two or three days.

Treatment.—We may divide this into the local or surgical treatment, and the hygienic and medical, which is especially efficacious at the commencement. The remedy *par excellence* is the nitrate of silver; the treatment by leeches and emollients generally fails, and is even injurious.

1. *Local treatment.*—At the very outset of the disease, we should at once drop into the eye three or four times in the twenty-four hours a weak collyrium of nitrate of silver—a grain and a half of this salt to half an ounce of water. If the disease has already reached its second or third stage, we may act more energetically, and pass between the lids a small brush steeped in a somewhat stronger solution of the same salt. We have often derived advantage from passing the solid stick of nitrate of silver rapidly over the inner surface of the lids, and then causing to trickle into the eye either water acidulated with several drops of chlorohydric acid or salt-water. We thus change at once the excess of the nitrate into the insoluble chloride, which becomes detached from the mucous membrane. In this little operation we have to act rapidly,

and especially take every precaution not to touch the cornea, which is already slightly altered. We sometimes recommend the application of one or two leeches in the neighbourhood of the eye, at the same time that these cauterizations are made, though we have rarely resorted to them. We have derived benefit from employing irrigation of cool water over the eye, as recommended by M. Chassaignac, by means of a large funnel, filled with a quart of simple water, terminated by a capillary tube, which enables us to let fall into the eye a continuous threadlike stream of water. To practise this irrigation, we uncover the head of the child, which had previously been laid across its nurse's knees, and hold the lids apart, the head being inclined backwards, so that the water falls off on each side, and runs into a basin placed behind the head. By means of a sufficiently large piece of isinglass plaster applied around the child's neck, we may establish a gutter, which directs the water into the basin, and thus prevents it from running down the neck and over the shoulders.

After these irrigations, we immediately dry the head, which we cover up lightly, and make continuous applications of compresses steeped in cool water and often renewed over the eye or eyes affected. We have had very good results from these irrigations, repeating them four or six times in the twenty-four hours. When we do not wish to follow this course of treatment, or hesitate to wet the child's head, we obtain benefit from the inunction around the eye, two or three times daily, over the forehead and the temple, and beneath the lower lid, of an ointment composed of corrosive sublimate, glycerine, and extract of belladonna, in proper proportions. We must combine with this, gentle purgatives, syrup of succory for the new-born, and for those that are older a very simple and very efficient prescription. Every hour, or every two hours, we give the child a powder, containing about one-twelfth of a grain of calomel to a grain and a half of powdered sugar. Besides this, we must continue for a greater or less time the collyrium of nitrate of silver, the composition of which must be varied according to the intensity and persistence of the disease. We may also return to cauterization of the lids with nitrate of silver, according to circumstances, being very careful in regard to it, when there is perforation of the cornea. Nevertheless, we need not hesitate to touch with the pencil of nitrate of silver, very lightly, certain ulcerations of the cornea and slight hernias of the iris.

As a result of these cases of ophthalmia, we sometimes find the cloudy cornea covered with vessels, which pass over it from the conjunctiva. Following the example of Prof. Sanson, we have made circular cauterization around the cornea, and have in such cases seen the cornea become again transparent. To perform this operation, we have always chloroformized our patient, and employed either the ring porte-caustique of Sanson, or a pointed pencil carried rapidly over the circumference of the cornea. Independently of chloroform, we must employ elevators for the lids, and have one or two assistants to hold the child properly.

2. *Hygienic and Medical Treatment.*—The hygienic treatment consists in modifying the diet according to the age of the little patient and the condition of the intestinal canal. If there are any febrile symptoms, we must diminish the nourishment; but if there is no frequency of pulse, we must give it the milk of the nurse, if it is still at the breast, and, if accustomed to another kind of nourishment, it is desirable that this should be continued. We must still take the precaution, in moist and cold seasons, to keep the child in an apartment properly warmed, according to the season, and not to take him into the cold air, if it is at all unpleasant. It is better that we should not keep the patient in a room made too bright by the light of the sun or by artificial light. The child should not, on the other hand, be kept in complete darkness, but in a medium light. It is, above all, improper to cover the eyes with thick and tight bandages, a light piece of linen being sufficient, if there is photophobia. In fine weather it will be of service to the child to give it the fresh air, taking the precaution to choose a time when the pain from the disease is least, and carefully covering its head with a light veil.

There frequently remain on the cornea one or two spots, which in time may be diminished, and even when they are of considerable size they sometimes entirely disappear. We have found that by means of insufflation of calomel and sugar-candy into the affected eye, employed after the disappearance of inflammation, once only in the morning, with the dropping of a single drop of laudanum in the evening, we may hasten the resolution of these specks.

CHAPTER XXX.

INCONTINENCE OF URINE.

INCONTINENCE of urine is of frequent occurrence in children, both in girls and boys, being met with in the former quite as often as in the latter. It most generally dates from birth, and sometimes continues until the child is fifteen years or more old. In the earliest period of life the quantity of urine excreted, compared with the fluid drunk, is very considerable; the bladder contracts very often, the urine is very slightly coloured, and there is no difference between that of the day and of the night. In children there is no, or very little, absorption through the bladder, the urine is abundant, and when the child is very young, defecation and urination are accomplished day and night almost without any desire for them. The resistance offered by the neck of the bladder and the sphincter ani is so slight that a single contraction of the bladder and the rectum suffices for the expulsion of the urine and the fecal matters.

At a later period, about the end of ten or twelve months, children have a sensation, which then first leads them to retain the fecal matters. The faculty of retaining the urine is developed somewhat later, after first dentition has been accomplished. It is then that the child, that does not retain its urine, is affected with considerable incontinence, if it also possesses its intellectual faculties. Otherwise, if it is idiotic or attacked with paralysis of the rectum or bladder, there would be symptomatic incontinence of urine, which would demand a treatment of the principal disease.

Causes.—Incontinence of urine in children is sometimes diurnal, at other times nocturnal, and this is the most frequent form. Whichever it may be, the cause may not always be the same, and if, as is often the case, there be weakness, this may be the real cause. In fact, we quite often see strong children, in good health, with nocturnal incontinence of urine. We may at first discover in them no general weakness, and the condition may depend on too frequent and sudden contractions of the bladder, as Desault thought.

In others we find a lymphatic, scrofulous, or rachitic constitution, and the incontinence is then referable to this general cause. In the former, the cause is nervous irritability, and here, with MM. Bretonneau and Trousseau, we recognize a neurosis of the neck of the bladder. According to Dr. Mondière, who has written on this subject, many young boys, apparently of excellent constitutions, are subjects of this affection. We cannot, then, always refer incontinence to the same causes. Nevertheless, we believe that if the lymphatic constitution is often met with in children who urinate in bed, the incontinence would really arise from weakness, while in others, who are strong and robust, we would be induced to believe that profound sleep is a cause that may be invoked; or else the too frequent contraction of the bladder.

This disease, which is easy to recognize, especially presents itself in the impossibility of retaining the urine at night, and is characterized by the discharge of urine several times or only once or twice during the night; and this condition persists, no matter what may be done to prevent it. Even if we make children urinate when they go to bed, or wake them several times in the night for the same purpose, it very often happens that they still pass their water in the bed in spite of all our precautions. In these cases we believe there is want of tone of the bladder, whatever may be the general constitution. This may be combated by the will while the child is awake, but sleep puts the whole muscular apparatus in a state of muscular relaxation.

Reviewing these causes, we consider that incontinence may be due to feebleness of the patient or a bad constitution, nervous irritability of the bladder, and, in some cases, profound sleep.

Prognosis.—This is a very annoying disease, but it is not dangerous; it is only tenacious. Generally it yields, at the latest, at about eight or nine years of age, and yet it is sometimes in exceptional cases met with at the age of puberty. After the employment of different treatments without success, it ceases with time. When it does cease, we must not believe that we have cured it; fever, an eruptive disease, a day of much fatigue or in which the child has perspired a good deal, may momentarily cause the patient to pass a night or two without having involuntary passages of urine, but two or three days afterwards the incontinence reappears. Thus, then, we must believe that there are some circumstances that

may cause intermission of greater or less length. In all cases, if we can make a favourable prognosis in respect to its non-gravity, we can only be sure that the disease will not be tenacious. Very often it demands time for its cure.

Treatment.—We will not speak of the popular remedies, which are numerous, and to which we attach no importance. The treatment may be external or internal. The complaint being very rebellious, of long duration, sometimes only yielding with time, and not to remedies that are advised, it is right that we should employ successively different modes of treatment, and have recourse to both internal and external medication.

1. *External Treatment.*—If we can learn at once the cause producing the incontinence, we may employ one remedy rather than another; but as we cannot easily decide this, we employ successively the following external remedies. We may advise river or sea bathing in warm seasons, applications of cold water over the hypogastrium or to the perineum, cold lotions over the whole body morning and evening, shower-baths, douches of cold water on the loins and the posterior part of the pelvis, and cold immersion baths. In cold seasons, we would give the preference to tepid sulphur, saline, and gelatinous baths, and vinous or aromatic baths. These different remedies have given good results, especially if perseveringly used. The introduction of a catheter for a quarter of an hour, morning and evening, into the canal of the urethra, has been suggested; and cauterization of the neck of the bladder with nitrate of silver two or three times, several days apart, has also been practised. It has been advised that injections of cold water should be thrown into the bladder, and that this be repeated several days in succession. In some cases we may derive advantage from electricity. Compressors of the urethra have also been applied during the night, and by this method, proposed by J. L. Petit, the bladder has been forced to retain the urine. M. Jacquemin has employed them with success in young patients.

2. *Internal Treatment.*—We have used internally for incontinence, as others have done for a long time, tonics, cinchona, iron under different forms, antiscorbutics, preparations of iodine and iron, cubebs, ergotine, and strychnia. To complete this internal treatment, we must add a proper regimen, which should be tonic, principally good roast meats; the patient should drink but little water, but good wine; avoid soup in the evening, at dinner; and

eat but few beans and but little fruit that has a tendency to the urine.

After having resorted to all the external and internal means advised for incontinence of urine in children, we may say that the agents that have succeeded most frequently are cold baths, sea-bathing, sulphurous and shower baths, douches of sulphurous water, or of cold water, combining with it a tonic treatment, cod-liver oil and ferruginous preparations when the children thus affected are delicate, lymphatic, or scrofulous. But when they are not of such a temperament, but rather nervous, sea-bathing, sulphurous baths, and douches, often excite them without any good result following. We must subject such cases to the use of other remedies, either the preparations of belladonna or the employment of strychnia. The belladonna may be given in pills, containing the simple extract combined with the powdered root, in appropriate doses, morning and evening, gradually increased. The strychnia may also be given in pill form in combination with the black oxide of iron, evening and morning.

Whatever the treatment may be, we must persevere in it a long time—two, three, or six months. M. Trousseau, who has great confidence in the extract of belladonna, as prescribed by Bretonneau of Tours, and advised by Thomas of the same city, and Dr. Blache, recommends that it be given perseveringly, commencing with a moderate dose, and gradually increasing it, for several months in succession. We must not cease the use of belladonna just as soon as we have procured a decided amelioration, but continue it without increasing the dose, and only stop it little by little by diminishing the dose, until we reach that with which we had commenced.

This treatment should be modified according to the effects produced in different patients, either suspending it or abandoning it entirely.

CHAPTER XXXI.

CANCER OF THE EYE.

CANCER of the eye is met with more frequently in children than in adults, and is presented under two principal forms, encephaloid and scirrhus. Melanosis is very uncommon in children; fungus hæmatodes sometimes occurs.

Pathological Anatomy.—Encephaloid is frequently found to commence by a point on the retina, and then to invade successively all the elements of the eye. It does not differ from that met with in other regions, and is a soft tissue of a consistence and colour analogous to softened cerebral tissue. Scirrhus is hard, resisting, and whitish, and when cut resembles fibrous tissue. It begins in the globe of the eye, without our being able to ascertain satisfactorily its point of departure. The melanotic tissue presents itself in the form of a soft bluish-black tumour, and may commence in the interior of the globe, and sometimes in the external parts. These various tissues are met with in the eye, and sometimes spread into the cellular tissue of the orbit, invading the eyelids, and even penetrating through the foramen of the optic nerve into the base of the brain, the structure of which they attack and modify. Even the bony walls of the orbital cavity are sometimes altered to a greater or less extent.

Causes.—These are obscure, as in all cancerous affections; nevertheless, it is established that sometimes this disease follows a contusion, but usually there is at the same time a disposition to a cancerous affection. We must admit two different forms or varieties; one commences through the retina and constitutes encephaloid, the other by attacking the whole globe, constituting scirrhus of the eye.

In the *first stage* of *encephaloid* the eye looks healthy, the sclerotic is white, there is no redness, and the iris has its normal colour and mobility. Children that are not very young complain that they see badly or not at all, but not of any pain at the com-

mencement. Gradually, if the disease progresses, the pupil becomes irregular, and if the light is made to penetrate obliquely into the eye, we notice at the bottom something brilliant, and in the concavity of the globe we discover a spot of a copperish colour on the dark base of the eye. This is of the size of a small bean, then gradually increases, and invades the whole breadth of the retina, and is radiated with red vessels. If the pupil has been previously dilated with atropia, all the symptoms are more easily detected. The tumour compresses the vitreous body, which becomes liquefied, and now enables us to see the encephaloid matter.

In the *second stage*, the inflammatory condition, which did not exist at first, now commences. The tumour becomes prominent in front, and pushes the crystalline against the iris, the eye increases in volume, the sclerotic becomes injected, and there is redness and lachrymation. The iris, pushed forward, becomes joined to the cornea, the irregular pupil becomes immovable, dilated, and discoloured, the diameters of the globe of the eye are augmented in all directions, the conjunctiva becomes infiltrated, and forms a ring around the cornea, and the lids, also infiltrated, are pushed forward by the prominence of the eye. At the same time there are very acute lancinating pains, chiefly at night. Children complain incessantly, and are then attacked with intense and continuous fever, sometimes delirium.

Third Stage.—Up to this time the outer coat has resisted, but soon it breaks, and sometimes the cornea, at other times the sclerotic, becomes torn. The very acute pains caused by the strangulation then partly cease, and this cessation reveals to us that rupture is effected. If the sclerotic is opened, we may not see at once the encephaloid tissue appear, but if the rent extends to the cornea, a reddish sanguinolent fluid makes its appearance, the crystalline escapes, the tumour becomes prominent, diffuses a fetid odour, and is sometimes the seat of hemorrhage. General debility throws the child into a state of coma, and death soon follows.

In *scirrhus* of the eye, the disease invades the entire globe. At its commencement, we recognize all the symptoms of internal ophthalmia, such as lachrymation, photophobia, redness of the eyeball, and injection of the eye, the sight becoming gradually weakened and completely lost. The pain, which becomes more and more acute on the corresponding side of the head, soon becomes continuous, with loss of sleep, diminution of appetite, and at the same time

swelling of the submaxillary and auricular ganglions; the globe of the eye increases in volume, loses its shape, and becomes irregular. The cornea remains for a long time healthy, the iris becomes displaced and is inclined forwards, and the anterior chamber becomes filled with blood. All this progresses slowly, while in encephaloid the development is more rapid; gradually chemosis occurs, the cornea becomes altered in its shape, and the vessels become varicose. The eye projects between the lids, becomes ulcerated at several points, the cellular tissue of the orbit passes into a cancerous condition, as well as the lids, which can no longer be moved, the eyeball likewise remains fixed, and then the disease progresses more rapidly, the child becomes exhausted with continuous fever, and death soon occurs with or without convulsions. Encephaloid progresses rapidly, scirrhus is developed slowly. In either case, the disease is grave, and unhappily always followed by a recurrence after operation.

The only *treatment* consists in the extirpation of the globe of the eye. There are two kinds of operation to perform, whether the eye and the lids are affected, or the lids are healthy and only the globe is involved.

When the eye alone is affected, we may operate in the following manner. Having laid the patient down, with his head supported and resting on a pillow, and then chloroformizing him, we enlarge with a bistoury the external angle of the lids, and seize the eye with the Museux forceps, or a tenaculum, or introduce a curved needle conducting a thread. The operator, holding the forceps, the tenaculum, or the thread in the left hand, or having it held by an assistant, draws the eyeball slightly towards himself while another assistant keeps the lids separated with two elevators. He then introduces a straight bistoury, after the manner of Louis, into the external angle of the orbit and along the bony wall, incising all the soft parts surrounding the globe. He spares the mucous membrane which borders the eyelids, unless these latter should themselves be affected and must be sacrificed. He then divides at a single cut, with curved scissors, the optic nerve and the recti muscles, which retain the eyeball at the bottom of the orbit. No inconvenience results from removing the lachrymal gland, even when it is not affected. Several surgeons, Demours, Sanson, and Lisfranc, recommend this ablation of the gland. We should, in conclusion, make a careful exploration of the fatty tissues

of the orbital cavity, and remove them with the forceps and curved scissors if they are ever so little affected. It is very difficult to make a complete extraction of the affected tissues, for very often they penetrate through the fissures of the base of the skull, and creep into the cavity of the bone; sometimes even the bones are attacked, and the indication is to scrape them.

The dressing should be very simple, such as charpie steeped in cold water, and very gently placed in the orbit. Slight compression might be used if there be hemorrhage; otherwise we must avoid all compression, which may produce symptoms of encephalitis, and these should be very attentively watched. The orbital cavity is filled with granulations, and a transverse cicatrix gradually results. We must acknowledge, however, that too often cancer grows out again, and that granulations of a malignant character appear. The indication is to repress them immediately, but we rarely accomplish their destruction.

During twenty years at the Hôpital des Enfants, in more than thirty or forty patients operated on for this terrible disease, we only obtained cures of very slight duration, even by removing the eye at the commencement, when there as yet existed on the retina but a simple yellowish tumour. We have most frequently met with relapses before the formation of the cicatrix, or at the latest a year or eighteen months afterwards, and these then progress with extreme rapidity. Pain, generally of very great violence, forces from the child continual groans and cries; fetid pus runs over the face; the patient becomes exhausted, and sometimes hemorrhages occur, repeated with greater or less frequency, and finally the patient falls into a state of marasmus.

CHAPTER XXXII.

CLUB-FOOT.

We meet with a deformity in the new-born, to which we apply the term club-foot, characterized by a permanent vicious deviation of the foot. For a long time two varieties of this disease have been distinguished, the congenital and the accidental. The former is of course observed at birth, the latter subsequently, and is only

the consequence of diseases which declare themselves more or less tardily and the cause of which we can appreciate. By the faulty direction of the foot in various directions, we distinguish four principal kinds, talipes equinus, talipes varus, talipes valgus, and talipes talus.

In talipes equinus, the point of the foot is inclined downwards, and the patient walks upon the toes, the sole of the foot and the heel not touching the ground. In varus, the sole of the foot is turned inwards, and the outer edge of the foot bears upon the ground. In valgus, the contrary is the case. In talus, the patient walks on the heel, the sole of the foot looks forwards, and the toes are directed upwards.

The *causes* which produce congenital club-foot have their action in the mother's womb, and cannot be very positive, being rather presumable or conjectured. It is thus that club-foot becomes hereditary, and we meet with children the issue of club-footed parents. Independent of this inherited cause, we must suppose that a child comes into the world with a club-foot either as the result of a primary anomaly, the cause of which exists in the germ, or of an affection seated in the nervous system, convulsions or other diseases of the cerebro-spinal apparatus, which we must admit may become developed in the fœtus as in the new-born child, or by a bad position taken by the child. The mother being questioned and watched, we may sometimes learn by her answers that she herself is very impressible and very nervous, having had convulsions at various times, either before or during her pregnancy, and that thus the child may take from its mother, and have intra-uterine convulsions. Whatever the cause, we are reduced to mere conjecture, but in all cases we find permanent muscular contractions.

Symptoms.—Careful investigation presents us with different symptoms, and we will therefore describe these and the indications for treatment in the four kinds of club-foot.

In *talipes equinus*, which is quite rare, I refer to that which is simple and uncomplicated, the child walks on the point of the foot or the toes; there is forced extension of the tibio-astragaloid joint, the foot is inclined forwards, the heel raised backwards, and the sole of the foot looks backwards. There is another variety, in which there is very considerable extension, the foot is turned in a direction from above downwards, the sole of the foot looks upwards,

and the dorsal surface rests on the ground. The French term "*Enroulement*" has been given to this variety.

In simple talipes equinus, there is, so to speak, only a decided contraction of the tendo Achillis, and consequently the muscles of the calf, the flexor muscles of the foot and of the toes then act like the tendo Achillis, and contribute to this vicious position of more or less decided forced extension of the tibio-astragaloid articulation. In *enroulement*, there is sometimes very powerful contraction of the flexor muscles of the toes, the muscles of the plantar surface, and the aponeurosis.

In *varus*, the foot is strongly adducted, the outer border of the foot rounded and depressed, the inner elevated and concave, and the point and the sole of the foot look inwards, as well as the heel. The child walks on the outer border of the foot, the internal malleolus is effaced, and the external is very prominent. The tibialis anticus and tibialis posticus muscles are shortened and tense, the peroneus brevis is elongated and weakened, and the peroneus longus and extensor digitorum pedis are also elongated. The weight of the body rests on the foot, and distends the ligaments which are already elongated by the vicious position; the skin covering the fifth metatarsal bone, which rests on the ground, is painfully compressed at the point corresponding to the projection of that bone, and becomes covered with corns in patients who walk for any length of time with this deformity.

The varus we have just described is usually complicated with symptoms of talipes equinus; the heel is carried at once inwards and upwards, the astragalus is depressed in front, its pulley becomes exposed under the skin of the dorsal surface of the foot, and we then have a variety, to which the name *varus equinus* has been given. Varus equinus presents still some subvarieties in which there are more or less marked subluxations of the bones of the foot, with displacements of the bones, which M. Rouvier has very carefully described in his lectures at the Hôpital des Enfants. There are also numerous deformities of the bones, also described, involving the astragalus, the scaphoid, the calcaneum, and the cuboid, and more or less marked by reason of the exaggeration of the deformity.

In *valgus*, the foot is contracted outwards, the patient has a tendency to walk on the inner border of the foot, through the action of the peronei muscles and chiefly through the peroneus longus

muscle, which, by its contraction, elevates the outer border of the foot. Valgus is always accompanied with more or less equinus.

Talipes talus is the most uncommon form of club-foot, and is generally congenital. It is characterized by direct flexion of the foot upon the leg. We have had occasion to meet with it in two new-born children, the feet being at an acute angle with the leg. This angle varies according to the case, and may be more decided in some cases than in others, the point of the foot cannot be brought down, extension is limited, and flexion carried beyond the normal state. The tendo Achillis is relaxed and appears prominent, and the tendons of the flexors of the foot contract when we forcibly bring down the foot. It is very rarely that talus is unaccompanied with valgus; in other words, the outer border of the foot is always more or less raised.

Talipes talus may be either hollow or straight; in one the sole of the foot is hollow, in the other it is flat. In the former, the triceps cruris is paralyzed or weakened, the muscles of the sole of the foot and the plantar aponeurosis are shortened and contracted, while in the latter, there is no such paralysis, as M. Duchenne of Boulogne has satisfactorily shown by electricity.

Differential Diagnosis.—The various forms of club-foot are, as already said, congenital and accidental. An examination of the foot and the antecedent history of the case given by the parents enable us to distinguish these two varieties from one another, but it is often difficult to recognize a club-foot at all, when it is not well defined, and the deviation is at its commencement. Sometimes there is great difficulty in distinguishing contraction of the muscles which produce an exaggerated position, but without permanent contraction, and which yields as the result of convulsions, or eclampsia. In these cases we may have difficulty in forming a diagnosis, and we must examine these with scrupulous attention, and resort to electricity. There are also difficulties in the diagnosis, when several varieties of club-foot are complicated together.

Prognosis and Treatment.—This may vary, according as the club-foot is congenital or accidental. If the former, the prognosis may be not at all grave, if the deviation is not considerable. Simple means may easily produce straightening, if the child is very young, for if of long standing there is more resistance to overcome, and after twelve or fifteen years of age there is but slight prospect of success. If the club-foot is accidental, the muscles are frequently

paralyzed, and the case is still more serious. We have several times seen the talus variety at birth easily straightened by applying bandages in a certain way to bring the feet straight, and to keep them in forced extension. In a few months we have brought them to their normal condition.

It is not the same thing, however, in regard to the equinus, varus, and valgus. These three varieties, simple or complicated, present greater resistance and they interfere more with walking. The indication is to endeavour to restore the deformity to the normal state, after having employed simple apparatus, retaining methods by means of bandages, or even mechanical means, or they demand at once both tenotomy and apparatus. We do not hesitate to operate in the first year after birth, if the child is in good health, and the club-foot resists manipulation and apparatus.

1. *Talipes equinus.* In this form of club-foot, in which the point of the foot is depressed and the heel raised, we have the tendo Achillis to contend with. The muscles of the calf are contracted in a permanent manner, and in endeavouring to bring the foot to a right angle, we observe the resistance of the tendo Achillis. Here, as in all the forms of this affection, it was a very long time ago remarked that mechanical means fail to overcome the action of contracted muscles, and that it is necessary, without abandoning such apparatus, to aid them by division of the tendons, this division being made in those days in rather an irregular manner. Delpech, in 1816, performed the first tenotomy, and about twenty-five or thirty years later, in Germany, Stromeyer and Dieffenbach practised it; and afterwards, in France, MM. Bouvier, Duval, and Guérin advocated and regularly performed division of the tendons of contracted muscles in the different forms of club-foot, and from that time the following methods and procedures have been used in our own practice.

To speak here only of the equinus, we will say, in the first place, that in this form of club-foot, as in the others, it is best to give careful attention at once to the deformity at birth. Several means may be adopted, including the use of the hand, simple bandages, mechanical appliances, and tenotomy.

With the hand we may, from a few days after birth, act upon the tendo Achillis, gradually bringing the foot towards a right angle, morning and evening, holding with one hand the lower extremity of the leg near the malleoli, and with the other grasping

the foot. The hand holding the leg should keep it firm; the other should impress on the foot movements of flexion. By means of a simple bandage applied to a new-born child, carrying the foot as much as possible to a right angle, and by daily renewing these manipulations, we may obtain successful results in this form of club-foot; but when the child has become a year old, and no good has been done by these manual efforts to straighten the foot, the indication is to employ more powerful methods, bandages, for instance, made with splints or wooden boards, padded, and of the length of the leg, on which the latter is to rest, and at the extremity of which is a wooden sole with a hinge-joint, which enables us to move the foot in various directions, and chiefly at a right angle, for the equinus. We have found this apparatus, which is particularly easy to make, of good service. We have also successfully employed starched or gutta-percha and even plaster apparatus, moulding these bandages on the feet, which are placed by the hands in a normal position; but we derive more benefit from mechanical boots, contrivances which are made of a more or less improved character at the present day by surgical instrument makers. They are generally designed to replace in a permanent manner the action of the hand employed to straighten the foot. In early childhood, we may produce cures with them.

For the equinus, a mechanical boot, composed of a splint secured to the leg by a strap at the upper part and to the lower extremity by a sole, which enables the foot to be gradually brought to a right angle, being arranged expressly to fit the patient, may sometimes answer the purpose perfectly; but after the child has worn this apparatus for several weeks without any result, we should decide to perform tenotomy, and this operation may be practised even when the child is a year old. In such a case, as in several other forms of club-foot, we will have only the tendo Achillis to divide. For this operation, it is not necessary to chloroformize the patient; we must lay him on his stomach, and have his leg held by an assistant, who with one hand supports it at the lower part above the malleoli, and with the other causes the tendo Achillis to project, by flexing the foot as much as possible. The operator, supporting also the leg with the left hand, performs subcutaneous tenotomy, as advocated by MM. Duval, Bouvier, and J. Guérin, using for the division a straight, very narrow and sharp tenotome. He plunges the point of the instrument flatwise, passing it along the posterior part of the

tendon opposite the malleoli, in the direction of a line from left to right, or from right to left, depending on which side is operated on, but without piercing the skin on the other side. The instrument being then withdrawn, is replaced by a probe-pointed tenotome, introduced at first flatwise; its edge is turned against the tendon, its back portion being behind the skin, and the edge is conducted like a violin bow so as to divide the tendo Achillis from behind forwards very slowly, in such a way as not to cut abruptly the tendon, which lies close to the vessels and nerves on the side of the internal malleolus.

After this division, there is a want of resistance; we detect the space between the ends of the tendon, and we feel its cellular sheath, a portion of which remains at the place of division. This is the point where repair occurs, cicatrization commencing by an inflammatory condition, followed by union. The division being made, the instrument is withdrawn. The little puncture is united with a piece of isinglass plaster, retained with a stirrup bandage, and we apply the apparatus anew two days afterwards, when the wound is united. If suppuration occurs, we retard it. It appears to us important to establish satisfactorily union of the wound before applying apparatus. For want of this precaution, we have detected erysipelatous inflammation around the puncture, and there may even be abscess, but this rarely occurs. The apparatus once in position, we must straighten the foot gradually each day. The use of this boot should be watched every day, to avoid too strong pressure of the apparatus, for this may often cause excoriations or bruises of the skin, which can only be prevented by dint of great care and by not too roughly tightening it. In such cases it is very important to listen to the complaints of patients, which sometimes are without cause, but often also well founded, of the pressure of the apparatus. This may be remedied by taking off the boot, powdering with potato-starch the bruised parts, and especially by loosening the apparatus.

Finally, we make the patient wear this mechanical arrangement for several weeks, the action of which is carried even to exaggeration of the straightening we wish to obtain, and only after some time do we allow him to walk with the apparatus. When we wish to remove it, we must not do so without having previously had boots arranged to permanently overcome the deformity. These may be

worn in the daytime, and taken off at night and replaced at that time by the apparatus previously used. It is only by persevering for several years in these applications that we may successfully overcome abnormal deviations of the foot. A long time after this operation, we have found the cicatrix of the divided tendon firm, gradually extended, and giving greater or less length to the contracted muscle. With all our care, the tendon may remain too short, and the cicatrix may not have been formed with sufficient space, and we are then obliged to perform a new operation.

2. *Varus* is the most common form of club-foot. In this variety the foot is carried inwards, the point as well as the sole of the foot; it is, besides, in extension, consequently more or less equine, and hence the condition is called equinus varus. In walking, the foot rests on the outer edge, the toes are pressed back, sometimes luxated, and there is frequently a tendency to displacement between the two rows of the tarsal bones, but this is not always the case. There are varieties of this form of club-foot that incline towards equinus and valgus. It is rarely that we meet with a totally uncomplicated varus. The older it is, the more likely it is to be complicated with deviation and deformity of the bones of the foot.

3. *Valgus*, which is more uncommon than varus, is still not a simple valgus; the foot is turned outwards, but there is a union of extension, as in equinus, and of abduction, and hence the term equinus valgus or valgus equinus has been given to it. There are varieties of this affection of a more or less decided character, often even accompanied with deformity of the bones, increasing with the age of the patient.

Let us examine successively the varus and valgus forms of club-foot, and the treatment appropriate to each.

In varus, we always find that the tendo Achillis is more or less contracted, and then we must commence by flexing the foot, which is extended, and by simple or mechanical apparatus act at first on the tendo Achillis. But the foot is in a state of adduction from the contraction of the tibialis posticus and the flexors of the toes, which thus produce it; we must overcome these deviations by the arrangement of apparatus and appliances properly made to fulfil the indications opposed to adduction of the foot, and then afterwards by tenotomy, when this becomes necessary. It should be performed on the tendo Achillis, on the tendon of the tibialis pos-

ticus, near its inferior insertion below and on the inside of the scaphoid, and on the tibialis anticus, on its insertion at the posterior extremity of the first metatarsal bone. Tenotomy is performed on the tendo Achillis, as already mentioned for equinus; but it is not always sufficient. If other tendons, after division of the tendo Achillis and the tendon of the tibialis, appear to interpose resistance to the straightening, we must, in making them prominent by extending the foot, divide them also. At the end of two days, when the small wounds of the skin are cicatrized, we should apply mechanical apparatus, using for varus that which we have already referred to for equinus.

For *valgus*, the apparatus should carry the foot inwards, and should combat the action of the peronei muscles; and when, after being worn for a certain time, it does not remedy the deformity, we must resort to tenotomy, which, in this case, should be performed successively, but the same day if possible, on the tendo Achillis and the tendons of the peroneus longus and peroneus brevis, where they appear to be stretched under the skin when the foot is forcibly adducted.

As for *talus*, generally the action of the tendo Achillis is null, and the flexors of the foot or extensors of the toes act alone. This kind of club-foot, which is often complicated with valgus, yields in time to the use of apparatus well and perseveringly applied.

From congenital club-foot we now pass to the accidental form. The majority have for their cause, convulsions, which have produced at the most tender age, or still later, more or less complete paralysis, which affects the lower extremities. Often by medical treatment or in the course of time these paralytic attacks progress towards a cure, but with the re-establishment of movement in certain muscles and not in others. From this, contractions of some of the muscles result, which produce various kinds of club-foot. These secondary club-feet ought not to be treated surgically immediately after their appearance, for by treating the cause of the paralysis with perseverance, or by the assistance of nature, it sometimes happens that we have equilibrium re-established in the muscles, and the deformity more or less abated. But if the paralyzed muscles do not regain their power, we must treat these accidental club-feet like the other forms; we must put on apparatus, and even, in certain cases, practise tenotomy, but it often happens that the muscles remain

paralyzed, and that we are obliged to make the child wear mechanical boots.

To sum up, congenital club-foot may be treated with success sometimes by simple apparatus or mechanical boots, by applying these during the first year of life or later. At the commencement we should apply very light apparatus, and increase the power in proportion to the age and the muscular resistance. When in a few months we do not obtain straightening, we should resort to tenotomy, often of the tendo Achillis alone, and sometimes of other tendons. It is better to leave the patient for two days after the operation with a simple dressing, and only to apply the apparatus at the end of about forty-eight hours. We must, in the first stages after the operation, aid every day or two the straightening by a series of manipulations, which overcome the deviations, by different movements directed for about a quarter of an hour in whatever direction the nature of the deformity may demand. The subsequent application of apparatus should be watched with the greatest care, to avoid very injurious pressure on the limb.

We must prolong for an extended time, sometimes for years, the employment of mechanical means, and often modify them according to circumstances. All things being otherwise equal, we shall have greater chance of success in treating club-foot too soon rather than too late. Very simple and very light apparatus should be used at the commencement of the treatment, and we should employ mechanical means only if other plans fail. Finally, we may operate with benefit about the second year after birth, but greater care and precaution are needed if the child is very young. Up to the age of twelve or fifteen we may hope for success, but after that period, if success follows, it is exceptional.

The remarks here made on congenital club-foot may also apply to the accidental form, except that, in these last cases, before resorting to tenotomy, we must have exhausted such remedies as can attack the cause of the paralysis of the muscles. In these accidental club-feet there is often less chance of success, because the paralysis may resist all the means advised; but as they may sometimes succeed, we should never neglect them, such as gymnastics, shampooing, sulphurous baths, electricity, friction, etc. Unfortunately, all means usually fail, and the children are obliged always to wear apparatus to assist them in walking.

CHAPTER XXXIII.

CANCER OF THE TESTICLE.

CANCER of the testicle is not extremely uncommon in children; many authorities cite examples of it, and we have, for our own part, seen at least ten cases in very young children, even at birth, a year of age, etc.

Pathological Anatomy.—The tumour formed by the degenerated testicle represents, as in the adult, a scirrhous and often encephaloid structure. Sometimes we have met with colloid or fibro-plastic tissue. The examination of a testicle that was removed by us exhibited an organ of more than three times the natural size. It was smooth, soft, and revealed to the eye a firm tissue, white and resisting in certain points, having a lardaceous appearance, while in others it was of a soft encephaloid substance, rosy, nearly diffluent, studded with small bloodvessels, and easily crushed under the fingers. The albugineous covering or tunic appeared to us healthy under the microscope. We discovered the existence of fibro-plastic nuclei, more or less infiltrated, and only here and there, in the midst of the tissue, irregular cellules of a granular form. We noticed some red points formed by extravasated blood, but we did not detect seminiferous vessels. We have not had occasion to see tumours of this kind which had produced ulceration of the scrotum, but others have met with examples of it; neither have we seen chimney-sweeper's cancer, which is more common in England than with us.

At the autopsy of children who have died as the result of a recurrence of the disease, we have found lymphatic ganglions, which have passed into a cancerous state, and sometimes also cancerous lesions in other organs, as the mesenteric ganglions and the liver.

Causes.—In children the causes are perhaps still more obscure than in adults. We have seen cancerous testicles in children whose parents had not had cancer, consequently we cannot say that

this disease recognizes hereditary transmission for its cause in all cases. Sometimes bruising of the organ may give rise to degeneration; therefore, if the testicle of a child becomes cancerous after a contusion, we may admit that this circumstance operates to excite it in an organ already predisposed by an organic cause.

Symptoms.—The commencement of these cancers passes unperceived. Children are frequently brought to us when there is first discovered in the scrotum a development which has already existed for a long time, and we can therefore say, as children do not at the outset suffer, that the disease is at first indolent, and appears under the form of a tumour, which occupies either the right or the left side of the scrotum. Thus, when we examine a child who is suffering from a cancer of the testicle, we discover a tumour of more than double the ordinary size of that organ, with a certain weight and elastic consistence, most frequently without change of colour of the skin, the venous circulation of which appears slightly modified, the scrotum generally sliding over the non-adherent testicle, often without pain. We easily detect the tumour as distinct from the cord; it rests more or less heavily upon it, is well separated from the inguinal ring, and usually presents a rounded shape, sometimes tuberculated. Generally we have not met with this last appearance, but others have done so. When the disease is recent, the glands of the groin are not found to be swollen, and the cord is healthy; and there is usually no fluctuation, unless the affection is complicated with hydrocele. Nevertheless, when the testicle is in an encephaloid condition, there is a softness, which might be confounded with the fluctuation of a fluid, but there is no transparency.

The *diagnosis* is sometimes difficult. If, as an explorative means, we make a puncture, there is little or no fluid, and the instrument is not movable as it is in a bag of fluid. The tumour is distinguished from tubercular tumours, which are met with in children presenting other symptoms of tubercles; in such cases the skin of the scrotum is adherent at the point corresponding to a softened tubercle, and there is a more or less decided prominence, in which we find a real fluctuation formed by pus. We may confound these degenerated testicles with tumours produced by a false conception, sometimes seen in this region; but these tumours are rare. By the touch we detect, in such cases, hard or bony parts, as we have had occasion twice to find. Before removing them, we may be

uncertain from the touch alone, but anatomical examination leaves no doubt.

Inflammatory engorgements of the testicle become developed and progress rapidly, with pain, and this does not occur in cancer, which is indolent for a greater or less length of time. If there be hæmatocele, we may often mistake the disease, and it is only by an operation, when we expose the tumour, that we recognize the lesion. We must then leave the gland untouched, and only remove the hæmatocele, if that be possible.

The *prognosis* of this disease is quite as grave in the child as in the adult, and of six cases operated on by us, one, a patient of eighteen months, was carried off by convulsions, three days after the operation; one we lost sight of, and in the four others we saw or learned of recurrences, either in the glands of the groin or even in the deep abdominal ganglions.

Treatment.—At the commencement, and especially in the doubt as to the diagnosis, we may try the effect of preparations of iodine internally and externally; but in cases in which this treatment succeeds, it is probable that an error has been made as to the diagnosis, and that we have to deal with an engorgement of a scrofulous or tubercular nature. We must always, in these cases of cancer, resort to castration. In fact, if the anti-scrofulous treatment has failed, we must not rely on mercurials as often as in adults, where there are more positive fears of syphilis.

For the performance of this operation, as in adults, it is best to make an incision in the back part of the scrotum, prolonging it as far as its lower part, unless the gland, being adherent to the skin, which may or may not be ulcerated, requires the removal of the covering of the scrotum at any special point, for then we are obliged to remove a portion of oval shape from the coverings of the affected organ. The tissue once exposed, we isolate the cord, which we may cut, and tie the artery separately, or else tie the whole mass of the cord. We must then introduce a double silk thread, and bind together very firmly all the constituent parts of the cord, so as to completely include the nervous filaments. If some of the arteries besides the principal artery are divided, we must tie them and bring out all the threads together through the inferior portion of the wound. They serve to conduct the pus to the most depending portion. We should next apply three or four stitches, surround the scrotum with a fenestrated piece of linen

smeared with cerate, and covered with charpie, and support the whole with a suspensory bandage. To prevent inflammatory symptoms, we must sprinkle the dressing with cool water, taking care not to cease its use abruptly, to avoid reaction, which may induce erysipelas. We find it advantageous to renew the dressing on the next day and the following days, merely leaving the stitches, which should only be withdrawn, one after the other, according to the progress of cicatrization. In those on whom we operated, this result occurred rapidly, and suppuration was of moderate quantity, with no primary accidents; but we always met with a recurrence, except in one case which we lost sight of.

CHAPTER XXXIV.

ENCEPHALOCELE, OR HERNIA CEREBRI.

THE name encephalocele is given to hernia of the cerebrum or cerebellum through the separation of the bones of the skull. Generally this affection is congenital, and is observed at birth. The encephalocele may nevertheless be accidental, as the result of a wound of the cranium with loss of substance. We have observed these two varieties in children, but we chiefly meet with the congenital form. Congenital encephalocele exists especially in connection with the sutures of the cranial bones. We have met with hernia of the cerebellum through the occipital foramen. We believe that all the sutures, even the smallest, may be the seat of it. We have ourselves seen and others have observed encephaloceles making their appearance through the fronto-ethmoidal suture in the inner angle of the orbit. One such case occurred in our own experience, and Moreau, the accoucheur, has also seen one. Accidental encephalocele may occur in all the bones of the cranium.

Causes.—Frequently an arrest of development of the bones takes place in the fœtus and leads to congenital encephalocele; but accidental encephalocele is always produced by a wound or necrosis of the bone.

Symptoms.—The size of encephaloceles is very variable; some of them are no larger than a pea, others are as large as the head of a new-born child. In examining the tumour in the living sub-

ject, we find that it is round, smooth, uniform, more or less circumscribed, sometimes pediculated, and without change of colour of the skin; presenting pulsation, isochronous with the beat of the pulse, and increasing by expiration, coughs, and cries. If we press the tumour we may reduce it partially or entirely, and we may also by such pressure produce cerebral phenomena, as drowsiness or momentary paralysis of some parts of the face. Sometimes the encephalocele is not covered by the integuments, and the tumour appears with the membranes only.

These tumours may be confounded with cephalæmatoma, but the regular pulsations, which are very perceptible and very appreciable, and the border of bone which surrounds the tumour, are very distinctive characteristics of encephalocele. The diagnosis, therefore, can only be difficult where the tumours are very small, or where they appear through very narrow sutures of bones, the fronto-ethmoidal, for example. A tumour of the size of a pea, situated in this region, was mistaken by us and by several members of the Société de Chirurgie, for an erectile tumour, and a ligature was thrown around it, from which a rapid meningitis resulted, carrying off the patient the third day after the application of the thread which strangulated the tumour. Fungus of the dura mater might be confounded with encephalocele, for undoubted instances of such an affection have been observed in children, but in such cases the tumour is not for any length of time covered by the skin, it wears away and destroys the bony wall, is sensitive, the surface is bloody, and the pulsations are not always perceptible—for the fungus comes sometimes from the bony tissue, and is not adherent to the dura mater. In any event, it has often the appearance of an encephaloid cancerous tumour.

The *prognosis* of encephalocele is always grave; all we can hope for is, that the tumour may remain stationary. If it be of small volume, the child may live for a considerable time; but when it has become quite large, the intellectual faculties are more or less impaired, and sometimes the subjects of it are idiotic.

Treatment.—When encephalocele is complicated with effusion, the indication is to puncture it. Cures have been reported, not of the encephalocele, but of the effusion. Otherwise we should confine the treatment to gentle compression with covered leather plates, rather to protect the tumour from external shock than to compress it, for compression would be dangerous in the majority of cases.

These plates may prevent the violent shocks which have often produced immediate death, as has been found in some rare cases in which an attempt has been made to remove them.

CHAPTER XXXV.

CEPHALÆMATOMA.

Some children come into the world with blood tumours, which have been justly distinguished from erectile tumours seated in the thickness of the hairy scalp and the subcutaneous cellular tissue, and from sero-sanguinolent ecchymoses also seated in the subcutaneous cellular tissue of the hairy scalp; but there is a kind of tumour, known under the name of cephalæmatoma—blood tumour of the head—which depends on effusion of blood between the pericranium and the cranium itself. The effusion has sometimes, but rarely, occurred between the dura mater and the cranial bones; hence a division has been made into external and internal cephalæmatoma. The external variety, the only one we have ourselves seen, is a disease which is not very common, for obstetricians of the largest practice only meet with it at rare intervals. Michaelis and Schmaltz say that they are very uncommon, and Dubois reports that he had seen six cases. Three or four have presented themselves in our own experience, at the hospital, or in private practice. These tumours are met with on different parts of the skull; some authors state that they are chiefly seen on the two parietal bones, and quite frequently on but one of them.

The *cause* of this disease is obscure; it may be produced by a material cause, such as pressure on the head at the time of birth, and it may also depend on an anomaly of organization. Naegele, who gave this disease its name, claims that it exists previous to birth. Whatever may be the cause, it is very important that the characters of these tumours should be pointed out.

Anatomical Symptoms.—We meet with these tumours between the bones and the pericranium. The blood which constitutes them is half fluid, half solid. Sometimes the surface of the bone is slightly eroded. Generally the cephalæmatoma occurs in the form of a

colourless, painless, circumscribed, fluctuating or resisting tumour, and is especially apparent from the first to the fourth or fifth day after birth; sometimes it exists at the time of birth. These tumours are seated upon the parietal bones, especially on the right one, on the occiput, or the temporal region. Naegele saw one of these tumours on each parietal bone of the same patient. At the commencement, this tumour is soft to the touch; we may depress the top of it with the finger, and touch the bone on which it rests. A hard circle or a kind of ring sometimes exists at the circumference of the tumour, which may lead us to believe that the external plate of the bone is destroyed. Sometimes, but rarely, a movement of pulsation may be detected, but in the greater number of cases it is wanting.

Diagnosis.—We must avoid confounding cephalæmatoma with other tumours. It is developed in the bones, while encephalocele is met with in the sutures, and is formed by the substance of the cerebrum or cerebellum. The tumour has pulsations analogous to those of the brain, and may be reduced. The pulsation, which is very rare and scarcely appreciable in cephalæmatoma, is quite different from the regular and always perceptible movement of encephalocele. We cannot confound cephalæmatoma with pneumatocele of the cranium, described recently by Dr. Thomas, of Tours, which is a gaseous elastic tumour. Erectile tumours might be confounded with cephalæmatoma, but they change colour on pressure, and there are movements of expansion, and vessels more or less marked on their surface. Wens are distinguished by their colour and mobility in all directions, and an œdematous tumour produced by a serosanguinolent infiltration is very easily diagnosticated from cephalæmatoma.

Left to itself, this affection is not of a serious character; it generally terminates by resolution, but is a longer time in disappearing than a simple superficial infiltration under the hairy scalp. When patients die of other diseases, and we have the opportunity to dissect these tumours, we find the same alterations as in blood swellings, but they are usually seated under the aponeurosis or on the pericranium; and then sometimes the surface of bone is found to be rugose. A projecting edge of bone is noticed around the affected point, and it is this edge which is perceptible under the fingers during life. These tumours are doughy to the touch and formed of coagulated blood.

The *treatment* consists at first of simple revellents, lead-water, camphorated brandy, and water. Generally, at the end of several days, the tumour disappears; but if such is not the case, we derive very good results from puncture with a lancet. Sometimes there is hemorrhage, and the tumour may give way and not return. If it reappears, as sometimes happens, we repeat the puncture once or even twice, and there is always more or less discharge of blood. Slight compression usually suffices, after the puncture, to bring this affection to an end.

CHAPTER XXXVI.

HYPOSPADIAS AND EPISPADIAS.

HYPOSPADIAS is a malformation of the canal of the urethra observed in some new-born children of the masculine sex. There are several varieties of this affection.

1. *Hypospadias of the Base of the Glans.*—This is the most common form, and the orifice of the canal of the urethra, in place of being at the summit of the glans, is found at its base, at the place where the frænum is attached. In such cases, which are generally considered as obstacles to generation, we have in several instances established the fact that men affected with this form of hypospadias could have children. We have even seen two little brothers, suffering from hypospadias, who were the children of a father like themselves hypospadiac. There is sometimes a very small orifice at the top of the glans, but the principal opening of the canal is found at the spot referred to, and this is what is quite commonly observed. In such a case, the stream of urine branches off, and is discharged chiefly through the orifice at the base of the glans. In the majority of cases there is only one opening, that just mentioned. In this last case there is a very narrow orifice, analogous to the openings of the puncta lacrymalia; at other times it is much larger, and enables us to introduce a child's catheter.

In this malformation, after having attempted, as others have done, to restore the meatus urinarius to the top of the glans to

its usual location, either by making a puncture by means of a trocar, or by an incision from the base of the glans, where the meatus urinarius exists, to the summit of the glans, we have never succeeded, because the portion of the canal which we wished to establish artificially would have a tendency always to become obliterated, and because the orifice which we have freshened, and endeavoured to close up, would always be kept open and only be closed momentarily, to open afresh, in spite of the continued use of catheters. We have also, after several attempts, renounced an operation for the restoration of the canal, in which we have very often failed.

When the meatus urinarius is situated at the base of the glans, we content ourselves with making an incision and enlarging it towards the upper part of the glans. For this little operation, which is attended with difficulties, when the orifice is capillary, and only allows of the introduction of an Anel's stylet, we derive advantage from the use of a small narrow bistoury, slightly curved, and terminated by a small Anel's stylet sufficiently delicate to penetrate the meatus urinarius. In this manner we divide the contraction, but always directing the edge as much as possible towards the summit of the glans, so as to carry the incision towards the normal position of the meatus urinarius. This operation would be useless unless the patient afterwards wears, and for quite a period, the end of a catheter, introduced only to the depth of an inch and a quarter to an inch and a half into the canal, to maintain for a long time the dilatation of the orifice, which has just been enlarged. This end of a catheter or bougie should be furnished at its outer extremity with a wax button, which prevents it from penetrating further than we wish. We may accustom the child's parents to introduce this dilating body a quarter of an hour each day, and it is only on condition that we do so for at least one or two months in succession, that we prevent contraction of the urinary meatus from resulting.

2. *Hypospadias of the Base of the Penis and the Perineum.*—These two forms differ from the preceding; in the former the lesion is opposite the anterior part of the scrotum, in the latter behind it, in more or less proximity to the anus. We find among authors several methods and operative procedures for these two forms of hypospadias, which have not generally been attended with success. Some of these we have attempted, and must acknowledge that we have

failed in them; so that, in such cases, we generally refrain from operating.

Epispadias.—This deformity is, like hypospadias, most generally a malformation consisting in an opening, of greater or less extent, of the canal of the urethra, but at its upper part. Sometimes there exists, at the upper portion of the penis, a solution of continuity surrounding the canal of the urethra. This is often the result of a wound, but the form especially met with, more rarely, however, than hypospadias, is a cleft of the canal of the urethra, of greater or less extent, on the dorsal surface of the penis, a malformation which sometimes exists without extroversion of the bladder, but is often accompanied with this last-mentioned anomaly. In such cases surgery has most generally failed, and if we attempt to pare the edges of the cleft, afterwards uniting the divided portions of the canal over a catheter placed in the urethra, it is still one of those operations which may be attempted without any great hope of success. It has not succeeded in our hands, and we should not again venture to undertake these operations except upon the solicitation of the parents.

When the epispadias, which usually stops at the pubis and consequently at the neck of the bladder, is complicated with extroversion or exstrophy of the bladder, the malformation is still more serious. This anomaly is characterized by a tumour situated over the pubes, with or without separation of those bones. It presents a mucous surface formed by the exposed posterior portion of the bladder. At the bottom of this tumour we distinguish the openings of the ureters, and sometimes at the bottom of the central groove in man the fossa navicularis and verumontanum, and on each side the orifices of the ejaculatory ducts. In the circumference of the whole tumour, the mucous membrane of the bladder is confounded with the skin of the abdomen. The genital organs in man exist; in woman we have often discovered the absence of sexual organs, or else they present anomalies. Such a malformation produces, as we may readily understand, very painful functional troubles.

Until these later days, surgeons restricted themselves to advising the use of bandages, and of apparatus to guide the flow of the urine, to avoid irritating the skin of the neighboring parts. More recently Gerdy at first proposed to pare the edges of the skin, and afterwards unite them by sutures. Roux of Toulon, Nélaton, and Richard had the idea of performing an autoplastic operation, by taking the flaps of the skin from the anterior portion of the abdo-

men, to form the anterior wall of the bladder, and to make also walls for the canal of the urethra, divided with the skin, and a scrotum.

These experimental operations, very painful in the execution and very difficult, have rarely been performed, and have sometimes been followed by death or incomplete results. They do not appear to us worthy of our advocacy, and we can only say that they are not dictated by sound surgery.

CHAPTER XXXVII.

RANULA.

Ranula, in children as well as in adults, is characterized by a tumour of varying volume, fluctuating, and transparent, seated under the tongue or else in its vicinity. It is found, on anatomical examination, to be formed by a delicate transparent covering, opaque at several points, sometimes presenting several small cysts united together, some of them more developed than others—true mucous cysts. In tne interior we find a viscous fluid, which is sometimes purulent. The tumour is over the course of Wharton's duct, usually communicating with it. At other times there is a cyst on the outside of the canal. Breschet found these cysts in the new-born, and we have seen them in children of a year or two of age or older.

The *causes* of ranula or grenouillette are the distension of the ducts of the sublingual salivary glands. The saliva distends the ducts, becomes diffused under the surrounding cellular tissue, and a cyst is formed. The *symptoms* are, a tumour of greater or less volume situated beneath the tongue, sometimes on one side only, at other times on both sides. There is then a double ranula, having the appearance of the abdomen of a frog, from which it derives its name. Ranula is superficial, beneath the buccal mucous membrane, and in contact with the sublingual gland. There is fluctuation, sometimes transparency, the tongue is elevated, and speech is more or less impeded. Left to itself, it sometimes increases very slowly in size, and may then attain the dimensions of a small nut, and salivation will be quite abundant. The tumour causes a prominence,

and has a tendency to escape from the mouth, when the tongue is raised. At other times, instead of occupying the sublingual gland, it exists in the submaxillary gland, and has its seat in the canal of Wharton. It then lies in the submaxillary region, in such a manner that it is not seen so much under the tongue, but more deeply situated beneath the aponeurosis. Under such circumstances, the ranula is not at all of a superficial character. This latter form is met with in adults rather than in children.

Ranula is an affection of but little gravity, which may become inflamed and be spontaneously cured, but in most cases it may remain stationary. Superficial ranula is less serious than that attacking the submaxillary gland; we have observed the former most frequently in children.

Treatment.—We usually have recourse to an operation for the cure of this disease, either incision, dilatation, excision, or the seton. The latter was proposed by Physick, and has been advocated for many years by Prof. Longier. Having employed incision and the peculiar button advised by Dupuytren to maintain a fistulous opening without success, we have decided, in adults and children, to use the seton, made of three or four silk threads, which are passed from before backwards through the largest diameter of the tumour. We secure it by means of two knots, and we leave it in the mouth for at least a month. Generally, this method has been of service in children, and if we have sometimes had a recurrence, we have introduced a fresh seton, which we have left for a long time. We may quite easily perform excision and cauterization with nitrate of silver. As for iodine injections, we have not employed them; and we may say the same in regard to the removal of a flap of the mucous membrane, as suggested by M. Jobert, who, after having exposed the cyst, removes it and unites the flap by means of stitches. The complications of this difficult and especially long operation in children induce us to prefer the seton or excision with cauterization, two procedures which have given us good results.

CHAPTER XXXVIII.

INFLAMMATION OF THE BREASTS.

INFLAMMATION of the breasts, in children, exhibits itself in both sexes and at different ages.

1. *In the New-born.*—The breast of very young children sometimes presents an engorgement to which the name *milky* has been applied, and which often coincides with the appearance of the milk in the mother. The *symptoms* are very evident; swelling of the mammary gland, sensibility to the touch, sometimes redness of the skin, and the oozing of a true milky fluid through the nipple when the gland is pressed upon. M. Donné and all those who have taken up milk as a study, have discovered, on examination by means of chemical reagents, all the elements of milk. Sometimes, but very rarely, these engorgements have been found to terminate in abscess; pus may be formed, and the necessity arise for the surgeon to open it. In robust and healthy children, the abscess once opened, the cure is rapid; while in those that are weakly the abscess may ulcerate and continue to suppurate for some time. Generally, on the contrary, these engorgements terminate by resolution. Emollients, resolvents, belladonna ointment, poultices of potato starch, and lead-water are the remedies to be employed.

2. *In Children at the Age of Puberty.*—Towards the age of twelve or fifteen years in little girls, and from fifteen to sixteen in boys, we sometimes notice a mammary engorgement. This is a prelude to puberty in the boy as it is in the girl. The swelling is either acute or chronic. In the former inflammatory symptoms accompany it, such as heat, pain, sensibility, and sometimes abscess; baths and local emollients are indicated. In the latter there are no symptoms of inflammation, the tumour is more or less hard, and without pain on pressure. We may apply either wadding or wool, and also, as means of cure, dissolvents—ioduretted ointment especially.

If an abscess forms, we must open it; but in the majority of cases

in little girls these engorgements promptly cease to be painful, and we soon discover that they are connected with the normal development of the mammary gland, which gradually increases until it attains its normal condition.

CHAPTER XXXIX.

OSTEITIS.

INFLAMMATION of a bone, to which the name osteitis is applied, is often met with in children, and may attack all the bones of the skeleton.

Anatomical Characters.—An inflamed bone, like one that is fractured, or through which amputation has been performed, when examined in an autopsy at the end of fifteen days from the accident, presents the following alterations. The periosteum of the portion of injured bone is easily detached, and the latter is found to have preserved its polish and its consistence, but we notice little red spots, varying in prominence and in number, and the surface has a rosy tint. If we cut the layers of bone longitudinally, penetrating it more or less deeply, we see notches in which are vessels more developed than in the normal condition. If we saw the bone transversely, we discover a number of rounded orifices, which are the openings of vascular canals more or less gorged with blood and serum.

According to Gerdy, when we observe the enlargement of the vascular orifices, and at the same time the affected portion of bone has lost its weight and has become more friable, we have what is called by the French *ostéite raréfiante.* We have often noticed in children this form of alteration. When we meet with dilatation of the vessels, but with a compact and hard condition, we have *ostéite condensante;* and this is the variety of the disease we have especially found in old people, when we were connected with the surgical service of Bicêtre. In cases of *ostéite ulcérante*, the bony tissue is softened, and very easily cut with the scalpel; it appears to be spongy, and small particles of bone, in the form of little splinters, are bathed by the pus and are crushed or become readily detached.

These alterations are much more easily recognized on the spongy extremities of the bones; they are very perceptible in the bones of children, for, as a general rule, the osseous tissue is much more vascular in them than in adults. We have observed in the former a variety of osteitis, pointed out by Gerdy, of the shape of a bulb or a radish, seen on the fingers of scrofulous subjects. We have also found this form of osteitis to terminate in the discharge of a true sequestrum.

Causes.—Osteitis is generally developed under the influence of local causes, as contusions, wounds, or division of a bone in amputation; but we also see it occurring in scrofulous children, who frequently suffer from an inflammatory swelling of the bones or of their periosteum only. Hence we say that a scrofulous constitution may be the cause of osteitis, as syphilis and gout may be of a specific osteitis. Whatever its cause may be, the disease generally offers in children a certain train of symptoms.

Symptoms.—We find in the tract of a bone pain, increased on pressure, increase of volume, and heat over a more or less circumscribed region. These symptoms may exist with simple periosteitis, or with osteomyelitis, or inflammation of the marrow and its covering. The diagnosis can only be well made out as the disease becomes more developed. Osteitis may terminate by resolution, and then the pain will gradually disappear, and the swelling also diminish, but it may often persist for a long time, as in the case of scrofulous children. Osteitis terminates in suppuration in such cases, in which we meet with extra-osseous or even intra-osseous abscesses. Abscesses in the direct vicinity of a bone may be recognized by the fluctuation, but this is not true of abscesses of the interior of the bones, in the medullary canal or in the tissue. In such cases, there is very sharp pain, with increase of the volume of the bone. The abscesses may show themselves at the affected point, and often at a distance from it, and are then congestive or symptomatic abscesses.

Osteitis may pass into a chronic state, presenting no other symptoms than increase of volume, usually without giving rise to pain; or, if at all, only at long intervals. This termination is met with in scrofula and syphilis. Finally, osteitis may end either in caries or necrosis.

Treatment.—At the commencement, in the acute state of osteitis, we may employ emollients, cataplasms, baths, and sometimes, but

rarely, apply leeches. In scrofulous children, inunction with ointment of mercury and belladonna has succeeded in our hands. Sometimes the application of elastic collodion is sufficient to allay it. In scrofulous children, these local agents answer our purpose. As a palliative, we must also employ an anti-scrofulous treatment, provided the osteitis is not due wholly to a traumatic cause.

CHAPTER XL.

CARIES.

CARIES is an alteration of the osseous tissue characterized by a greater or less amount of vascularization, with friability and softening of the tissue, presenting fungosities and granulations developed and bathed in a sanious and purulent humour.

Causes.—In children, external violence and scrofula are the causes. We have seen hereditary syphilis also give rise in them to caries of the bones of the face, and of the bones of the nose and the vault of the palate. We have not, in such cases, detected tubercles as a complication of this form of caries. We cannot say that masturbation is positively a cause of this affection, as we have no positive facts to support such an opinion, and we have not absolutely seen children who were very much addicted to this practice attacked with caries of the vertebræ, but we have met with cases of vertebral caries, requiring the patient to remain in bed, which have led to masturbation.

Physiological Alterations.—These anatomical lesions are observed in the spongy portions of the bones; the substance of this tissue has its cellules enlarged and dilated, and is more vascular, rarefied, light, softened, friable under pressure of the finger, reddish, violet, and impregnated with sanious blood or fetid pus having a specific odour.

Symptoms.—In children, the beginning of the disease often remains unperceived; there is at first an indolent swelling, and for a while the little patients do not complain of pain, though after some time it gradually becomes more acute and continuous. If the caries is developed in a bone that is subcutaneous, we recognize it by the swelling being sometimes not well circumscribed, hard

and painful on pressure. The neighbouring soft parts gradually become inflamed, and abscesses are developed in the affected part; or further off, at variable distances, cold abscesses form, which, in course of time, open. These openings become enlarged, and sanious pus is discharged; sometimes small pieces of bone brought away by the pus appear in the midst of the suppuration; fistulas are established, and, by introducing through the openings a resisting metallic stylet, we may feel a hard, rugose, irregular, sharp surface. If we push the stylet, we discover that it penetrates a tissue that is diseased, soft and yet rugose, and at the same time a variable quantity of blood is discharged and sometimes small portions of bone.

It is evident that, when caries attacks the vicinity of a joint, symptoms of arthritis will become developed. If it occurs in the neighbourhood of the great thoracic or abdominal cavities, symptoms are noticed, which are developed in the viscera contained in them. If caries is seated in the bones of the cranium, it produces cerebral symptoms. Finally, it may be the cause of paralysis of the upper or lower extremities, if it attacks different points in the vertebral column.

The progress of this disease is sometimes very slow. If it occupies a circumscribed situation, it may terminate by the elimination of small particles or minute fragments, and the detached portion be covered with granulations and a cicatrix. If it involves a considerable extent of bone, it may induce grave symptoms, the loss of a portion of the foot, the hand, etc. Sometimes it may give rise to an abundant fetid suppuration, slow fever, marasmus, and death.

Diagnosis.—If this is sometimes difficult at the commencement, we cannot make any mistake in the advanced stages of caries, especially when the abscesses are opened, and we are enabled to make an exploration with a metallic stylet. Caries is always more or less grave, according to the extent involved. It is less serious if superficial, but it is always dangerous if developed very deeply in the vertebral column, in the bones of the pelvis, or those of the foot or the hand, as we very often meet with it in scrofulous children.

Treatment.—This serious disease requires a general treatment, when the cause which gives rise to it depends on a constitutional affection. Thus, scrofula and syphilis should be treated, when they

are the cause of the caries. We must also employ a local treatment, especially if the disease has a traumatic cause. Pain, for instance, may be sometimes, but rarely, overcome, by the application of leeches, emollients, fomentations, poultices, and inunction with dissolvent ointments, as mercurial or iodine ointment; but these remedies are only palliative. For caries in children, we have returned to the use of the cautery, heated needles, and transcurrent cauterization, to arrest the progress of the disease; but these methods have not given us good results.

When abscesses are developed, we must open them, even if they are of the congestive form. When the abscesses remain open, we derive benefit from the application of tonic solutions, such as infusion of walnut leaves, aromatic wine, or solution of iodine, and even from injection of one part of tincture of iodine to two parts of simple water. These injections may be successfully practised in congestive abscesses at a distance from the affected bone, and in abscesses symptomatic of caries of the vertebræ, or of coxalgia. When the carious spot is superficial, we may sometimes carry the red-hot iron over the diseased bone, and thus produce a sequestrum, which may become detached. The caries may be sometimes so extensive and so deep, occupying several bones, as in the hand or the foot, that we are often obliged to perform either extraction or resection, and sometimes amputation, when the local disease produces general symptoms, which so greatly debilitate the patient, that we cannot wait for the separation of the diseased part and its elimination by the efforts of nature alone.

CHAPTER XLI.

NECROSIS.

Necrosis—partial or entire mortification of a bone—is often seen in children, and may result from either traumatic or internal causes. Wounds, injuries, and especially scrofula, sometimes syphilis, are the causes of this disease during childhood. The vascular arrangement of the periosteum and the medullary membrane, which is very remarkable in young people, much more than in adults, will explain how necrosis occurs from lesions of each of

these structures, and of the bone itself. The latter, deprived of its periosteum or its medullary membrane from any cause, only living by the vascularity of these membranes, must become mortified, and, being deprived of the circulation, comes to form a dead portion, called a sequestrum, which tends to become detached, as a slough is separated from the soft parts. The sequestrum presents considerable differences: sometimes it is very small and very circumscribed, and at other times occupies a large portion or the whole extent of a bone; it is recognized in childhood, as in adults and old people, by its tarnished or dull white colour; and percussion gives a clearer sound, as if cracked. The sequestrum is variable in appearance, sometimes in the form of delicate irregular plates, at other times in angular fragments representing a portion of bone involving a greater or less extent, and when this sequestrum is of long standing it loses in time the dimensions it formerly had. If a sequestrum is treated by chemical agents, we find that it has lost its organic tissue; left to itself, the elimination is effected in children as in adults, perhaps more promptly in the former than at other periods of life.

In young subjects we recognize three stages: exfoliation, elimination, and absorption.

1. *Exfoliation*, or the expulsion of small, more or less circumscribed bony plates, is developed either spontaneously as the result of an abscess from a general cause, or after a wound or contusion, or an erosion of the skin over a bone that is more or less subcutaneous, as on the skull, the face, the jaw, the tibia, etc. There is at first inflammation of varying duration, sometimes very acute, at other times slow; and an abscess is formed and opens spontaneously, or is opened by the hand of the surgeon. The mortified portion of bone is uncovered, and generally becomes detached in mass in the form of a plate or small fragment, sometimes of the most minute kind. At other times, if of small extent, it may be absorbed or escape the eye of the observer. The periosteum which covered this bony portion has been destroyed, but the periosteum which exists around it on the sound portion of bone remains intact, and soon extends and fills up the denuded part.

2. *Elimination.*—It is not always an extensive lamella that is detached, but a portion of necrosed bone of variable size; it is the true sequestrum, which cannot be discharged by exfoliation, but by total or partial elimination. This bone, the vitality of which

is lost, remains more or less enveloped in its periosteum; the other, which is inflamed, is developed slowly, and moulded on the diseased portion with very little definite shape, and constitutes the new bone. The sequestrum is enveloped in mass by the bone which offers, at certain points, openings of different shapes, narrow, circular, and oval, through which the necrosed portion may be felt and seen. This constitutes an invaginated sequestrum which floats in pus, and is sometimes more or less in contact with the tubercular substance which we have at times met with in the extremities of bones or chiefly in the short bones. Left to itself, this portion surrounded with pus tends to become gradually detached from the healthy portions, and it may be separated by the efforts of nature alone, after long suppurations which discharge through fistulas made in the bone and in the skin, in the course of the disease. Time and nature, constantly aiding the escape of this portion of diseased structure, sometimes suffice to produce its expulsion.

3. *Absorption* is a slow termination by the dissolution of the sequestrum; it is rarely met with, but we have seen the latter waste away and be destroyed gradually in an insensible manner, becoming reduced to the most simple expression.

The *causes* of all these disorders in children are, as we have said, traumatic lesions, and, in the majority of cases, scrofula. The *symptoms* are at first tumefaction, swelling without great pain in the situation of the necrosis, and, in some cases, sensibility and erysipelatous redness, but usually inflammation of slow progress. When we have extensive necrosis to deal with, as in the jaw or the limbs, there may be acute, very intense inflammation, with rapid tumefaction, fever, and the formation of deep abscesses, which are sometimes sub-periosteal. In such cases there may be general disturbance, delirium, in fact all the phenomena of phlegmonous inflammation. When the necrosis is of small extent, circumscribed and superficial, there is only a local trouble without general reaction; an abscess occurs with a spontaneous opening, and a fistula. In extensive necrosis, however, the general symptoms are grave, and the suppuration abundant and deeply situated. If the child does not sink under these symptoms, considerable time elapses before the pus makes its appearance on the surface, and often not until after becoming diffused, as in cases of congestive abscess of the vertebral column and of the pelvis. Frequently the abscess does

not open till after some months, and forms inexhaustible fistulas up to the time of the elimination of the necrosed portions of bone.

Prognosis.—As a general rule, all things being otherwise equal, the prognosis is more or less serious, and the disease usually of long duration. If it is not of marked intensity, and but a small extent of bone is involved, the disease may terminate in fistula, and the escape of sequestra of small size; but, if it implicates a large portion or the whole of a bone, it will most likely prove fatal. In any event we must be very cautious in our prognosis, and always bear in mind that the smallest portions of necrosed bone often take months to work their way out, and suppuration ceases and the fistulas become closed only when these mortified parts are removed. Children are generally cured of circumscribed necrosis, and, even when this is of considerable extent, it quite frequently happens that they are finally cured if they pass the period of suppuration without being too much exhausted.

Its progress, as may be seen from a glance at the symptoms, is most frequently slow, but is perhaps a little more rapid if the case is one of necrosis from traumatic causes. When we have to treat necrosis due to a scrofulous cause,—and these unhappily are the cases most often met with,—this is not the case. We have seen them persist five or six years or more.

Situation.—Necrosis, which is of very common occurrence in young people, is observed in all the bones, long, short, and flat, independently of the form of the disease developed on the alveolar border. In children who are met with in places where they manufacture sulphur, we find the upper or lower jaws necrosed. Under the influence of a scrofulous constitution, it sometimes involves only a very small surface, the border of an alveolus, for example. At other times, and generally after inflammation of the gums, and more or less decided stomatitis, often of a gangrenous nature, we find the necrosis affecting the alveolar border in one portion, and sometimes nearly the whole of the upper or lower jaw. The enormous sequestra which follow these necroses, for a very long time retained, and surrounded with abundant suppuration, give an intensely fetid character to the mouth, and produce fever and all the symptoms of absorption. They are expelled by the efforts of nature or are extracted by the surgeon. We have had occasion to remove sequestra several times, representing the upper or lower jaw almost in its entire extent. Children are cured rapidly, and as if by enchantment, after the

extraction of these diseased portions. New jaws, formed by the development of the periosteum, most generally without teeth, may replace the old ones.

We see in children a number of partial necroses, usually of the bones of the face, the borders of the orbits to a greater or less extent, the proper bones of the nose, etc. and of the vault of the palate, as in syphilis. All these forms of necrosis terminate generally by exfoliation; after having been attended at first with swelling, sometimes with abscess, afterwards with fistulas, which persist, and require time, and the use of general rather than local remedies. They usually terminate by a cicatrix of the soft parts adherent to the portion of diseased bone. Frequently, these adhesions cease with time, and the skin becomes movable.

Necroses of the ribs or of the sternum are rare; those of the vertebræ are unfortunately very common, and, so to speak, a disease peculiar to childhood, and are sometimes tuberculous. We have but rarely discovered the true tubercular substance in the vertebræ.

Necrosis very frequently occurs in the limbs and in the long bones, as the humerus, radius, ulna, femur, tibia, and fibula. We find in these different cases in children more or less circumscribed engorgements at a point on one of the bones, which progress with extreme slowness, and are only accompanied with dull pain. At other times, there are all the symptoms of a profound phlegmonous inflammation, with fever and even delirium. We have met with this several times in periostitis of the femur, which begins with fever and delirium, and often runs its course very rapidly, speedily terminating in deep abscesses. These throw the children into a grave condition, that can never be checked by the most active antiphlogistic treatment, which is more injurious than useful. In such cases, applications of the mercurial ointment around the affected limb, and, internally, the administration of the preparations of cinchona, are the remedies to be employed. Finally, when the pus is formed, even before there is very decided fluctuation, it will be advisable to make free incisions, which give relief even if there should be no such collections of pus present.

If the indication is to subject the child to active surgical treatment, the object will be to quiet acute pain, and the general symptoms that complicate the local affection; but after such active treatment, we have only to employ expectant surgery, such as emollients,

baths, poultices, sometimes drainage, emollient and detersive injections, and then simple dressings. Fistulas become established, and through them may be felt, sooner or later, the sequestrum, which at first is not at all movable, and only becomes so in time. We always find that the more extensive the sequestrum the greater length of time it requires to become movable. In a child ten or eleven years of age, we found a sequestrum occupying the whole of the body of the femur, only movable seven years after the commencement of the disease, and we successfully extracted it.

Necrosis of the short bones is also met with in children, chiefly of the phalanges of the fingers, and then the latter have a peculiar shape, and the swelling is fusiform, sometimes in the form of a radish. In this kind of necrosis, the children may lose one or several phalanges. The bones of the foot may also be attacked, as the astragalus or os calcis, the sequestra from which are only movable several months and even several years afterwards.

Treatment.—In children, as in the majority of cases in which necrosis is developed under the influence of a scrofulous or lymphatic constitution, the antiscrofulous treatment should be resorted to from the commencement to the end of the disease. It should not be modified or suspended except when accompanied with violent inflammations and fevers, which must be combated by local and general means. Otherwise, and when the necrosis remains stationary, we must employ locally tonic lotions and general tonic baths; in certain cases, emollients alone, and waiting for the efforts of nature, which tend either sometimes to the absorption of the sequestrum, or, most frequently, to its expulsion and to the formation of a new portion of bone to replace the old.

The duty of the surgeon is limited to waiting for the mobility of the sequestrum. During this time, he may, nevertheless, keep a watch over the patient, and, especially when a long bone of the limbs is involved, endeavour by position or bandages to prevent the newly-formed bone, which for a long time is of a soft consistence, from being curved, as sometimes occurs either in the upper or lower limbs. Immobility of the limb is absolutely necessary in all cases in which the sequestrum is of small extent, for movement may cause inflammation or erysipelas. We must watch these intercurrent affections, which will demand different treatment, according to the nature of the case. Usually we must be satisfied, for a long time, to exercise a good deal of caution in regard to the moving of

the sequestra, when situated in such a way as to be capable of extraction. There are some cases in which we must abstain from touching them, as in necrosis of the vertebræ, for example. But, when after more or less time he can be assured, by sounding the fistulous spots, that the sequestrum is movable in different directions, the surgeon should interfere, and either seize the portions which can be extracted with the forceps, or divide the fistulous parts. Under certain circumstances, as in sequestra of the scapula, the humerus, the femur, etc., we must not only divide the soft parts, but also enlarge the openings of the new bone to extract the sequestra. We do not hesitate in these cases, in our little patients, to trepan them, using a gouge and mallet to facilitate such extractions. This we have done in several instances. When we have to detach the sequestrum, we may be compelled to divide it before extracting it.

After these operations, which are often very laborious and very long, we may apply very light dressings, and gently tampon if there be hemorrhage, afterwards sprinkling carefully with cold water. It is also beneficial, after these operations, to support afresh the limb operated on in its normal position. We must carefully watch the cicatrization, and make it as regular as possible. We must not forget that, in the limbs, the bones of the new formation are not at first solid, and that it is prudent not to allow of movements, walking especially, for some time after the extraction of the sequestrum; otherwise we may have the limbs remaining curved, and not properly shaped.

CHAPTER XLII.

OCULO-PALPEBRAL CONJUNCTIVITIS.

INFLAMMATION of the oculo-palpebral conjunctiva is as frequent in children as in adults. This disease is often met with at birth, and is then known under the name of ophthalmia of the new-born. Of this disease we have already spoken. It is also observed in children at all ages. Sometimes the ocular conjunctiva is alone affected; at other times the disease extends to the eyelids, and may invade the other parts of the eye, and constitute as many

special diseases,—keratitis, iritis, etc.,—which are complications of the conjunctivitis.

Causes.—In children, as in adults, the causes may be either external or internal. The external causes are draughts of air, wounds, punctures, burns, turning in of the lashes, the presence of foreign bodies of all kinds, prolonged fatigue of the eye, especially a bright light, etc. The chief internal cause is often in childhood the scrofulous taint, giving rise to scrofulous ophthalmia. This cause is often the only one that can be discovered in certain children; nevertheless, in some of them, the causes are connected with other individual conditions, as rheumatism, intestinal obstruction, abrupt suppression of transpiration by cold, or certain eruptions. Sometimes the conjunctivitis appears under the influence of measles or variola, and is even a prodromic symptom of those diseases.

The symptoms are either anatomical or physiological.

Anatomical Symptoms.—We notice redness over the whole of the conjunctiva, or over a circumscribed spot, which is more or less decided according to the intensity of the inflammation, and is characterized by injected vessels, which creep in a tortuous way through the sub-mucous cellular tissue. These are, at first, visible on the inner aspect of the lids, and gradually spread to the globe of the eye, and sometimes extend even over the transparent cornea. The swelling of the mucous membrane is at first seen in a slight augmentation of thickness different from the infiltration of the submucous tissue, which is met with somewhat later. If in this pathological condition we interrogate the children, we find that they experience annoyance as if from the presence of a foreign body in the eye. At the beginning there is not yet photophobia, which occurs only when the cornea is invaded, or inflammation of the deep membranes commences. It is then no longer simple conjunctivitis, which generally lasts only ten or twelve days when it is limited, but some other disease of the eye, the duration of which is very variable.

In children suffering from affections of the skin, measles or smallpox, it is transient; but, when connected with a scrofulous taint, it may remain simple but tenacious. In this condition, however, we must fear, as in ophthalmia of the new-born, the complication of conjunctivitis with pustules, granulations, chemosis, keratitis, iritis, internal ophthalmia, purulent dissolution of the eye, and atrophy of the eyeball. All these diseases should be studied separately;

and, in this article, after having examined simple conjunctivitis, we will confine ourselves to the description of the most common complications.

Physiological Symptoms.—Simple conjunctivitis does not usually present very grave general symptoms: there is only sensibility to a bright light, and rather soreness than great pain; but, as soon as complications arise, the local disease may be accompanied with fever, loss of appetite, constipation, and very acute pain. The progress of the disease is variable according to its nature. It may terminate in ten or twelve days if a simple uncomplicated case, but if otherwise it may be retarded. We should then be very reserved in our prognosis, for conjunctivitis may assume a chronic form, with spots upon the cornea, ulcerations, etc.

Treatment.—This may be local or general, and vary according to the complications. To institute a local treatment, we must first examine into the condition of the eye, sometimes a difficult task with children. For this purpose, we must reverse the lids or raise them with elevators. It is important sometimes to make the examination during sleep, as this will prevent the child from struggling. When simple conjunctivitis is occasioned by a draught of air, washing with cool water may generally be the sole treatment required; and this is true also of that form of the disease which is produced by the introduction of a foreign body into the eye, sometimes after its extraction if it can be removed. Thus, grains of dust or metal filings should be first of all sought for carefully by reversing the lids, using the magnifying glass, the ophthalmoscope, etc. These foreign bodies, which we have several times found in the eyes of children, may be extracted, when they are movable, by the aid of a simple brush or a curette. Others, which are incrusted, can only be extracted by means of the point of a cataract needle, in cases in which a steel or other filing is fixed upon the cornea, for example, or the sclerotic coat. In these various cases, it may suffice, the extraction being made, to use lotions, to apply cool water, and to keep patients away from too bright a light.

In conjunctivitis produced by irritating liquids, we have derived benefit from irrigations of simple water, made every three hours, either by means of a funnel or an irrigator. For such applications we must employ, with either apparatus, a very small canula, that the jet of water may be made quite delicate. But if the conjunctivitis from a traumatic cause is accompanied with intense in-

flammation, with very great injection and violent pain, as in some cases where it has been impossible to extract the foreign body (for often surgical prudence demands that it shall be left alone, as when a shot is buried in the eye), we have always found it best to adopt an energetic antiphlogistic treatment, associating with it resolvent and calmative remedies. We must say in advance, however, that these means are especially attended with successful results, when the conjunctivitis is not accompanied with the presence of foreign bodies which we have been unable to extract. The treatment consists in local depletion by leeches behind the ear or to the temple, sometimes by cups; we rarely resort to general bloodletting, at least in children. We must often give purgatives, then apply resolvent and calmative ointments around the eye, the mercurial ointment, belladonna, or atropia in solution dropped on the eyeball.

When the conjunctivitis is produced by internal causes, and chiefly by the scrofulous taint in children—and this is a very frequent cause—we must have recourse to antiscrofulous remedies, which should always constitute the internal treatment, but be suspended during the progress of very intense conjunctivitis. We must, in young lymphatic children, be cautious of the use of bloodletting, and we have most frequently obtained good results from more or less astringent collyria, as those made with sulphate of zinc or nitrate of silver:—

℞. Zinci sulphat. gr. iij.
Aquæ destillat. f℥iiss. M.

Or,

℞. Argent. nitrat. gr. v–x.
Aquæ destillat. f℥iiss. M.

Revellents to the lower extremity, in the shape of foot-baths of salt water or mustard foot-baths, often give good results. We have not used the concentrated solution of nitrate of silver, applied in light layers on the external surface of the lids, after the manner of M. Serres d' Elzès, who borrowed it from the German oculists; but it has the advantage of not being painful for children, as collyria in the eyes are. We should also employ belladonna in the manner already indicated in traumatic conjunctivitis. Purgatives are of the greatest necessity in many cases; castor oil, solution of citrate of magnesia, and small doses of calomel for the youngest children, have generally rendered us good service. By means of

these different remedies, we often see the disease terminating by resolution more or less rapidly.

Certain very common complications induce us to adopt other modes of treatment. Thus, in chemosis—in other words, infiltration of the sub-mucous cellular tissue in the form of a circular ring, soft and slightly painful around the cornea—which may extend over the whole eyeball, giving the cornea a sunken appearance, an energetic treatment must be resorted to, consisting in deep scarifications over the ring, either with a lancet, or, better still, with scissors and forceps. After incising it, we apply lotions of warm water, and after six or eight such applications the chemosis will be found to disappear. A few purgatives may be needed to put an end to this complication, which very often involves the cornea, but this treatment is not always sufficient. We must carry the pencil of nitrate of silver over the mucous ring, and then bathe the affected eye with cold water to which hydrochloric acid has been added, in the proportion of twenty drops to half a pint of water; this mixture being used as a wash for the eye every two or three hours during the first twenty-four. Blisters behind the ears, which were formerly advised, have not succeeded in our hands; they appeared to excite unnecessary irritation.

When the conjunctivitis is complicated with pustules, the patient complains of having a foreign body in the eye. If we examine it carefully, we discover, in lymphatic children more frequently than in others, a certain number of vessels forming on the eyeball a triangular group, the base of which comes from the oculo-palpebral cul-de-sac. These vessels, when united, form the summit of the triangle, which passes as far as the border of the cornea, where there is a pustule, generally of the volume of a millet seed or a little larger. Sometimes this pustule is flattened, and bright yellow; at other times it is purulent, and more or less prominent. It sometimes exists alone, or there may be two, three, or four others, always around the cornea, having their triangles of vessels arranged in the same manner. As long as they are confined to the conjunctiva of the ball, the case is not of much gravity; but if they invade the cornea, ulceration may occur at the points corresponding to them. Such cases are frequently accompanied with photophobia. When these pustules do not involve the cornea, they may be absorbed or leave a slight ulceration, which terminates by resolution conjointly with the vascular injection.

This complication may be treated with lotions of cold water, or applications of compresses steeped in water, and these often answer the purpose. I have found advantage result from touching the pustules very gently and very rapidly at the commencement, with the point of a pencil of nitrate of silver or the lapis divinus, and especially by carrying it over the vessels which form the point of the triangle. But we may generally derive benefit from, and should chiefly content ourselves with, simple water or the borax collyrium of M. Desmarres:—

℞. Sodæ borat. gr. iij.
Aquæ lauro-cerasi destillat. f℥vj.
Aquæ f℥iv. M.

The child should be kept in an apartment dimly lighted. If there be photophobia, advantage will be derived from dropping into the eye, two or three times daily, a drop of a mixture containing a grain and a half of the neutral sulphate of atropia to half an ounce of distilled water. We must also persevere in the use of purgatives, and, for the time, suspend the use of tonic or antiscrofulous remedies.

Conjunctivitis may be complicated with granulations, with the secretion of a puriform fluid, and the development on the inner surface of the lids of a multitude of small projections like the papillæ of the tongue. Sometimes the inflammation interferes with the movement of the eyelids, and there is itching on the inflamed surfaces and chiefly towards the large angle of the eye. Gradually the redness becomes more intense, the sub-mucous cellular tissue becomes infiltrated, and the granulations increase in volume. There is an exacerbation of the symptoms in the evening and morning, and the edges of the lids are gummed together by the secretion of desiccated mucus. These granulations may terminate by resolution, but they may also be complicated with serous chemosis. They may occur in an epidemic form, and we have seen several children of the same family attacked with this affection together or successively. This has been seen in our surgical wards at the hospital, and has also been noticed in children who are taken to asylums in the different *arrondissements* of Paris.

Whatever the cause of the development of these granulations may be, cold, contagion, etc., we must chiefly rely upon light applications of the pencil of nitrate of silver, or, better still, the lapis

divinus, on the inner surface of the lids, which should be reversed, and the pencil passed gently and rapidly over them. Combined with this, may be used the slightly astringent collyrium of M. Desmarres:—

℞. Acid. tannic. pur. gr. xv.
Aquæ lauro-cerasi destillat. ʒj.
Aquæ destillat. ʒiv. M.

This should be dropped several times in the day between the eyelids. If the granular affection passes into a chronic state, we must employ a slightly stimulating ointment between the lids, such as crystallized nitrate of silver combined with fresh washed butter, or red precipitate combined with washed butter, in proper proportions.

Conjunctivitis may be complicated with ulcerations of the cornea, which are often attended with photophobia, and require the use of solution of atropia. Collyria of sulphate of zinc or nitrate of silver may be sufficient to overcome them. We have sometimes treated them successfully by touching the ulcerations very gently with the point of a pencil of nitrate of silver.

We often find on the cornea, in cases of conjunctivitis, spots, which are nothing more than the consequence of superficial keratitis, followed by effusion between the layers of the cornea, or of ulcerations that are cicatrizing. Many of these spots may be absorbed, and are consequently only a transient obstacle to vision. We have seen some of these of very large size in very young children disappear as they advanced in age. They must, however, be subjected to treatment, but of this we shall have more to say under the head of Keratitis (Chap. LII.).

CHAPTER XLIII.

TRAUMATIC LESIONS OF THE CORNEA.

Wounds of the cornea may be produced from a number of circumstances, more frequently in children than in adults. Contusions, punctures, cuts, foreign bodies, burns and perforations, are so many traumatic lesions which may be observed on the cornea. All these

wounds may be very slight and easily cured, or be very serious and involve the loss of the eye.

Contusions of the cornea are met with quite frequently in children, because they receive a cuff or a lash either in playing, as when they mount behind vehicles, or a foreign body is thrown against the eye. Under such circumstances, the cornea may be bruised or even torn; and, as a result of the contusion, the pupil may be dilated, its shape altered, vision momentarily disturbed and afterwards re-established. The cornea may be lacerated with the discharge of the fluid of the anterior chamber, which may last for several days; and there is redness of the conjunctiva covering the cornea, sometimes sanguineous suffusion of the anterior chamber. If the lesion is not very considerable, the contusion and even the laceration terminate in a favourable manner.

The treatment consists in applications of cool water; often by the single precaution of keeping the eye closed by applying over the lid compresses steeped in simple water, or lead-water with laudanum in it, the wound will become cicatrized. In some cases in which the pain and inflammation are marked, an application of leeches to the temple appears to be indicated, but we must only apply two or three of these, according to the age of the child, and only let them flow for an hour after they are detached.

Punctures and cuts of the cornea are quite frequent, but if they do not penetrate deeply into the eye and only involve the thickness of the cornea, they are of but little gravity, and tend to cicatrize under the influence of applications of cold water, and especially with the precaution of keeping the upper lid depressed without compressing it with a tight band, for the pressure does more harm than good. When the punctures or the cuts give issue to almost the whole of the humours of the eye, the case is then very serious; we must not hesitate to deplete. We must, when the wound has allowed of the discharge of the fluids, keep the child in bed on his back, and not let him turn his head either to the right or the left, for this position greatly facilitates cicatrization. If union does not take place by the first intention, there is then suppuration, which greatly compromises the safety of the eye, unless we treat the little patient energetically. We must act as we would in the gravest forms of ophthalmia, returning to bloodletting, the applications of ointment, as mercurial ointment and belladonna,

around the eye, and also employing drops of a solution of atropia, and continue the use of repeated purgatives.

Foreign bodies, which produce lesions of the cornea, give rise to different symptoms, according to the depth to which they penetrate. Generally, the indication is to extract them. Left in the wound, they produce all the gravest symptoms. For the extraction, if that be possible, we must place the child before a window, after having seated him in such a manner that an assistant holds his head firmly and raises the upper lid; then, by means of a brush or a stylet, or very fine forceps, we may relieve the child. In other cases, when the foreign bodies are encrusted in the cornea, we must use a cataract needle or a lancet; sometimes we must even incise the cornea if the foreign bodies are in the anterior chamber. The foreign body once removed, we must continue the applications of cool water, and a more or less active antiphlogistic treatment, which may be discontinued if the symptoms should justify it.

Burns of the cornea are all more or less serious, the slightest of these sometimes producing a very circumscribed and superficial wound. Others destroy the whole of the cornea, and hence we have in each case a very different prognosis. As for the treatment, whatever be the nature of the burn, washes of cold water, and applications of compresses steeped in soothing solutions may be employed. There may remain, as a result of the treatment, ulcers or fistulas of the cornea, and we may fear the occurrence of softening and gangrene; but to prevent all accidents, we must, at the commencement, resort to an energetic antiphlogistic treatment.

Perforation of the Cornea.—This accident succeeds traumatic lesions of the cornea or the various forms of ophthalmia, and especially those developed in scrofulous subjects. They are even observed at the commencement of scrofula. Perforations are noticed at the centre or the circumference of the cornea, at first in the shape of very minute depressions, like the very small head of a pin; they are sometimes developed with very great rapidity, and the perforation may make its appearance the next day, the iris sometimes making a hernia. It is of the highest importance to resist this rapid progress. We must, while using the collyrium of nitrate of silver conjointly with antiphlogistics, also employ belladonna; but, as in these cases the vitality of the iris is considerably increased, it is important to combine with it the use of ice. We therefore suggest the following treatment: keep the patient lying on his back,

with his head immovable and thrown slightly backwards; then apply over the eye, the upper lid being closed, compresses steeped in an infusion of belladonna leaves, an ounce and a half of the leaves infused in a quart of water passed through, filtered, and kept in ice. The compresses should be frequently changed; and three or four times in the day, and three or four times in the night, there should be dropped between the lids a drop of a solution of atropia, containing a grain and a half of the salt of atropia to three ounces of distilled water. We may, by this means, prevent a perforation of the cornea; if it takes place, the fluid of the anterior chamber flows out. The iris is not always carried forward producing a hernia; but if the iris is involved, we may reduce it by pressure of the lid on the eye, keeping it closed by a headband. If the iris has been involved but a short time, we will succeed, but when the hernia exists for some days, we may fear that we shall have a failure, and then we must have recourse to cauterization with ni trate of silver once or several times at a day's interval.

CHAPTER XLIV.

CHILBLAIN.

THIS affection consists in a swelling or engorgement of the subcutaneous cellular tissue, often indolent, sometimes burning and painful, having a light purplish tint. As a general rule, we meet with chilblain in children, and sometimes in old people, in the fingers, toes, nose, and ears. There are usually several of them at a time, and they are most frequently met with in weak lymphatic children.

Causes.—The lymphatic diathesis is the usual predisposing cause; cold, moisture, and bad shoes which keep the feet wet, are its exciting causes.

Symptoms.—This disease, which manifests itself towards the end of autumn or in winter, is characterized by swelling on one of the regions already referred to,—the fingers, toes, nose, or ears. There is a light purplish redness,—quite circumscribed, and disappearing on pressure of the finger, like erysipelas,—and itching,—especially when the affected part is exposed to heat,—pain on pressure, and in the movements. The violaceous tint becomes bluish, sometimes

with ulceration, the skin becomes gangrenous, and we have seen tendons, bones, and joints denuded, and even toes become detached. Sometimes this disease is complicated with erysipelas, which may invade the whole of a limb. It often happens that the chilblains, whether ulcerated or not, are complicated with angeioleucitis, either in the ham or in the groin.

Diagnosis.—Chilblain should not be confounded with erysipelas; the latter does not invade a circumscribed part, such as a phalanx. Chilblain tends to remain on the situation affected by it; erysipelas usually, on the contrary, has a tendency to travel to a greater or less distance.

Prognosis.—In the majority of cases it is favourable, for chilblain, as a general rule, has a tendency to terminate by resolution, without following the serious course we have previously pointed out; but it habitually appears in children on the return of winter.

Termination.—Chilblain nearly always diminishes in intensity, and terminates by resolution, when the mild season arrives and the cold weather is at an end; but it frequently disappears not to return until the age of puberty. This fact, which is quite general, is far from being always constant, for we still see adults attacked with chilblains. Besides, old people, who have had chilblains in their younger days, sometimes have it, which present in them the same characters as in childhood.

Treatment.—It is important that the treatment should be distinguished into prophylactic and curative. We may sometimes save children from chilblains, at first by giving tone to the constitution if it is lymphatic; all the general internal antiscrofulous remedies may modify this predisposition to chilblains, and without at all neglecting these various remedies, the treatment by tonic baths appears to us to be very beneficial, such as cold baths, sea-bathing, and sulphurous baths. Independently of these baths, which act at one and the same time on the general and local condition, we have derived good results from tonic foot-baths, such as those made with slightly warm coarse wine, or infusion of walnut leaves, or baths of soap and water, or water with the addition of camphorated brandy, lavender brandy or water, with a small quantity of Labarraque's solution of chlorinated soda. These local baths should be taken nearly cool; they will act injuriously if they are too warm. The curative treatment consists of either lotions or baths,—which may still be employed with success, when the chilblains are

severe, as when they are accompanied with heat, redness, and pain,—to be combined with the agents last mentioned as preservative remedies. Frequently, however, emollients are useful, as baths of marshmallow water or gelatinous water, and sometimes applications of emollient poultices; but if the pain is very acute, the indication is to employ them at a cool rather than a warm temperature.

When phlyctenæ are formed, and when ulcers appear, we must apply simple dressings with fenestrated linen smeared with cerate, and covered with charpie. After several days of this simple dressing, we must at once apply tonic dressings, by steeping the charpie in heavy aromatic wine or water, slightly chlorinated. If the ulcers have a grayish look, we must employ a simple digestive of a more or less stimulant character; if granulations spring up, we must repress them with nitrate of silver. Sulphurous waters at this period are often indicated, but we may sometimes modify them with simple water or bran water. We should be cautious in the use of warm water, which might soften the flesh, and do more harm than good. If there be fetor, powdered cinchona or dressings with permanganate of potash may be of service, in the proportion of two drachms and a half of that salt to four ounces of water; two spoonfuls of this solution in a glass of water in which the charpie used in the dressings may be steeped. In a word, at all periods of the disease, chilblain requires, as prophylactic or as curative treatment, the use of tonics in all forms, unless the inflammation be very intense. The ointment advised by Dr. Carreau appears to be of service at all periods of this affection:—

℞. Potassii iodid. ʒj.
Tincturæ iodinii ♏xx.
Adipis ℥j. M.

CHAPTER XLV.

TRAUMATIC DISLOCATIONS.

Traumatic dislocations, or permanent displacements abruptly produced by external violence in the articulations, are more uncommon in children than in adults, and yet we have met with all the traumatic luxations in young subjects. The most frequent are

those of the elbow and ulna at its upper portion, those of the radius at its upper part, and, separately, that of the clavicle from the humerus. We have also met with luxation of the inferior extremity of the ulna, of the first metacarpal bone, and the phalanges of the fingers. We have seen luxations of the coxo-femoral articulation, of the patella, of the toes, and of the inferior maxillary, and even of the cervical vertebræ.

All these dislocations are produced by the same causes, which are usually falls or blows. They are attended with the same symptoms and require the same treatment as in adults. After reduction, we must watch children for a longer time, on account of their lymphatic constitution, which predisposes them to chronic arthritis and white swellings. We therefore, after reduction, which is more easy on account of the less powerful muscular action, and is effected with or without chloroform, believe it to be necessary to employ resolvents, and especially to prolong the immobility of the articulation by simple position, or by the application of an apparatus during fifteen or twenty five days, as if we had a fracture to deal with.

If we wished to speak of all the dislocations met with in children, we would only have to repeat, in all respects, the descriptions of the same lesions in adults given by standard authorities (Boyer, Malgaigne, Richerand, Vidal, etc.). We will only add, that while they may be reduced much more easily, even when they are of two or even three months' standing, the surgeon should be cautious in his efforts to reduce certain old dislocations, by the fear of breaking the epiphyses, which are not yet solid. We have found also that dislocations in children are often complicated with fractures of the articular extremities without displacement; at other times, separations of the epiphyses, which are not always very easy to recognize, because they may likewise exist without displacement, and for this reason it is always much better, even where there is a doubt, to keep for quite a long time the dislocated articulations in apparatus, even when the conformation tells us that there is no deformity, and that the articular surfaces are in proper relation to each other.

There are some dislocations which cannot be reduced, or if reduced cannot be kept so without difficulty; dislocations of the elbow for instance, which are more frequent in children than in adults, always result either as a consequence of a direct fall on the

elbow or the hand, or by jerking the forearm. We very often, in practice, meet with children suffering from traumatic lesions of the elbow; frequently there is simple contusion, sometimes articular twitching, complete or incomplete dislocation and fracture. Observed at the very moment of the accident, the injured elbow may be free from tumefaction, and in such cases the deformity or non-deformity of the articulation is sometimes very readily recognized, enabling us to detect certain simple or complicated dislocations, and often, if complicated with fracture, crepitation is present, and assists in the diagnosis. But without tumefaction, and especially with it, there is sometimes great difficulty in making a positive diagnosis. Crepitation certainly enables us to decide generally that there is a fracture, but fractures often occur in which we are unable to produce movement in the part in order to discover it, and hence difficulty arises in saying, whether there is or is not fracture, and especially what is its direction. Uncertainty must exist also when the fracture is unattended with displacement and appreciable crepitation.

There are some dislocations in which the articular prominences are so easily detected, and certain movements so impossible, that they cannot fail to be recognized; but, although the surgeon may be thoroughly versed in the study of these dislocations, so well described by modern writers, such as Malgaigne, Vidal, Bonnet, Nélaton, and especially in the excellent memoir of M. Denucé, it is very often next to impossible to detect several of these varieties of dislocations, for, being attended with slight displacement, they escape observation in the same way that certain fractures do. Thus, in a large number of children that we have seen, we have perfectly recognized, and always easily detected, complete dislocations of the elbow backwards, forwards, inwards, and outwards, and of the radius by rotation forwards and inwards; but we have often failed to recognize incomplete dislocations, such as subluxations with or without swelling of the soft parts. Besides, these incomplete dislocations, so well described by M. Denucé, are frequently imperceptible in the living subject, so slightly marked are they, especially in the child when there is swelling.

All the easily detected dislocations we have found in children are produced by the causes usually described for adults, and the principal symptoms pointed out for dislocations of the elbow in the latter are always observed in children, and the methods of reduc-

tion advised have always succeeded when the dislocations were recent. But there are some dislocations, the symptoms of which are but slightly marked, or, being incomplete, often escape notice, and are reduced by simple flexion of the forearm at a right angle. As for late reductions, we have succeeded in children, after the lapse of a month or six weeks, in reducing dislocations of the elbow backwards, but we have frequently failed in the three forms of dislocation forwards, backwards, and outwards of the upper extremity of the radius, even when these were not at all old. If we have sometimes brought the articular surfaces in relation, we have not been able to properly maintain them so. In these luxations of the upper extremity of the radius, and even in all those of the elbow, whether unreduced or reduced incompletely, time has done much to re-establish the movements, and, by gentle and continuous pressure, we have been able to restore the head of the radius gradually to its proper place, and the deformity has, in time, become much less considerable, and the movements have been preserved.

We have very often seen dislocations of the elbow backwards, chiefly the ulna alone, rarely both bones. We found one case of dislocation of the humerus forwards easily reduced, and we have generally seen dislocation of the upper extremity of the radius very often incomplete, and then we have been able to reduce it and keep it reduced, and this does not usually occur in complete dislocations. In regard to the after-treatment of all reductions of the elbow, we have always put the forearm in a state of flexion on the arm, keeping the forearm either in supination or pronation, according to the nature of the dislocation, whether it be backwards or forwards. We have several times been in doubt as to whether certain dislocations were simple or complicated with fracture, and in all cases, even in the doubt, we have kept the limb flexed; and we believe that this is advisable except in cases of dislocation with fracture of the olecranon, when semi-flexion rather than complete extension will be indicated. We always remove our apparatus at first at the end of twelve or fifteen days, in order to institute a slight movement in the articulation, and we re-apply a new bandage for a longer or shorter period, according to the necessities of the case. If there are any complications of fracture, we do not hesitate to apply an immovable dextrine apparatus, or else we place the limb in a grooved elbow splint, every twelve or fifteen days taking the precaution to institute movements in the elbow, to avoid anchylosis.

A mode of treatment which we have adopted for a long time when there is much tumefaction about the joint is, before or after the reduction of the dislocation the application of leeches and cataplasms around the elbow, with the view of preventing subsequent arthritis; but we now only employ cataplasms, and an application consisting of mercurial ointment and belladonna for several days, for we have noticed that arthritis consequent on external violence in children is much more uncommon than is generally supposed; and besides, the use of immovable bandages, the articulation being surrounded with wadding or not, with the precaution to watch the bandage, is the true prophylactic method in arthritis, particularly in scrofulous children. We still sometimes apply leeches in children of strong constitutions, and chiefly when the dislocation is complicated with fracture or serious contusion. In children as in adults, if we have often easily reduced dislocations of the fingers and of the phalanges, we have sometimes been obliged to make subcutaneous section of the ligament, to reduce in both cases dislocations of the phalanx, and have sometimes easily reduced dislocation of the first metacarpal bone, but once in a child of twelve years old we failed, as did our master, M. Velpeau. The child finally in time made good use of its thumb.

In concluding this notice of dislocations of the elbow in children, we may observe that the special indication in these cases is to employ methods of graduated extension with mechanical apparatus, in cases of incomplete anchylosis of the elbow, resulting from too long-continued immobility of the articulation from various causes, fractures, or dislocations. The use of these forms of apparatus requires at first the preparation of the articulation by baths, delicate handling, etc., and we must then proceed slowly, keeping a constant and attentive watch over it if we wish to avoid accidents.

CHAPTER XLVI.

ERYSIPELAS.

ERYSIPELAS, a superficial inflammation of the skin essentially spreading, is often met with in children and the new-born.

Causes.—These are either general or local, as the result of opera-

tions, of external injuries, wounds, hurts, vaccinations, simple excoriations, blisters, inflammation of the umbilicus, eczema of the hairy scalp, erosions of the genital organs, nates, etc. In the newborn, want of care is the principal cause of erysipelas, a serious affection at that age.

Symptoms.—A redness of the skin of greater or less intensity, often circumscribed, will be noticed, which disappears on pressure, and returns afterwards. This redness is more or less painful, and sometimes indolent. Very often these local symptoms are accompanied with swelling of the neighbouring ganglions, and of the lymphatic vessels of the affected region, in the form of reddish lines starting from the erysipelas, and directed toward the ganglions. Erysipelas is sometimes limited, and this is more appreciable to the touch than sight, and there is a very feeble ring forming the circumscribing boundary. When the erysipelas is seated in the eyelids, in the scrotum, or in the vulva, it is accompanied with infiltration of the subcutaneous cellular tissue. All these symptoms are preceded by chills, fever, and general disturbance; in some children there is even precursory delirium with vomiting. The symptoms of this disease gradually increase in intensity: there is heat of skin, fever, and great thirst, and besides, the skin being distended, the epidermis is modified, becoming elevated with the formation of vesicles full of serum; generally the erysipelas terminates by resolution, rarely by suppuration or gangrene.

This affection is sometimes epidemic, and even contagious, according to the opinion of the English surgeons, Arnott, Gibson, Lauveau, and of the French physicians, Alibert, Rayer, Chomel, and Costallat. We have not had occasion to establish its contagious character at the Hôpital des Enfants; nor have we had any more reason to believe in its positively epidemic character in our surgical wards at this hospital. This partly explains the more common success of operations in childhood.

Diagnosis.—This is easy, and to any one who has seen measles, scarlet fever, or urticaria in children, no confusion can exist in the diagnosis between these diseases and erysipelas. Erythema might be confounded with it, but this affection is free from tumefaction and pain, and is, so to speak, fugacious, and usually unaccompanied with general symptoms.

Prognosis.—As a general rule, this is as grave in children as in adults. Nevertheless, if we refer to our own experience, we will

say that this disease frequently follows a course more or less gradual, lasting ten or twelve days, and being cured without treatment by resolution. The redness, heat, and swelling diminish, and desquamation occurs; but this favorable prognosis is not exempt from exceptions, and should be especially modified for erysipelas in the new-born, which we will separately describe. Erysipelas should be considered as of a very grave character when it is not purely local, and is complicated with purulent absorption, characterized by prolongation of the general symptoms; chills, fever, vomiting, with rapid transition of the redness from one point to another, or when the disease is ambulant, as it is called. It is also grave when complicated with phlegmon, or inflammation of the subcutaneous and deep cellular tissue.

The treatment may be divided into general and local.

Local Treatment.—We do not agree with some authors, that local treatment is useless. If, in many cases in which the erysipelas arises from some general influence, we should abstain from local remedies, it is not the same thing in regard to the form of the disease arising from traumatic causes. When the erysipelas is due to a general cause, the treatment may be confined either to lotions more or less often repeated, with infusion of elder leaves or bran-water, inunction with lard, or, better still (for we are not at all partial to washes, especially those that are emollient and warm) powdering the affected part with potato starch or rice flour. In erysipelas occurring as the result of a wound, a slight hurt or an operation, if there is intense fever, very great heat, and a tendency to the extension of the disease, it has appeared to us that in some cases the inunction with mercurial ointment has succeeded, and the ointment of the sulphate of iron has given us some good results. Following the example of Dupuytren in certain ambulant cases attended with fever, delirium, etc., a blister placed in the centre of the part affected has put an end to all the symptoms, even in very young children. Having often employed these local remedies, I am satisfied that leeches over the lymphatic ganglions above the seat of mischief are sometimes very useful, but the application of collodion especially, according to the formula of Robert Latour, has given us in children the best results in traumatic cases. As for leeches, if there be heat and fever, we follow the example of Blandin in traumatic erysipelas, and apply them over the ganglions of the axilla for an erysipelas of the arm or forearm, if the gan-

glions are tumefied and painful; and over the region of the groin for erysipelas of the lower extremity.

General Treatment.—The indication always is, in erysipelas from general causes, to prescribe purgatives, emetics, diluent and laxative drinks, whey, lemonade, and herb broths, which are useful, according to the nature of the case. But, after operations when we fear the occurrence of purulent absorption, the alcoholic tincture of aconite, in appropriate doses in a julep, should be prescribed for our young patients, and repeated each day. Cinchona in coffee, given in the dose of fifteen to thirty grains of the soft extract of cinchona in black coffee, once daily, has appeared to us to be very useful in cases of purulent absorption, even in very young children.

Erysipelas of the New-born requires separate mention. It is observed within a few days after birth, and may be fixed or wandering, like that met with at all other periods of life; but its characteristic feature is, that it becomes developed in the earliest infancy, and has its seat most frequently around the umbilicus or about the genital organs, on the cirumference of the anus or the nates.

Causes.—The smallest excoriation may be the principal cause of it. Cracks of the thighs or the scrotum, and frequently the inflammation that accompanies the descent of the umbilical cord, may produce the disease, and vaccine pustules may be its point of departure. Sometimes there is an epidemic cause, as is seen from time to time in lying-in hospitals when there exist epidemics of puerperal fever. The cause may also be found in the bad conditions under which children of the labouring classes live.

Symptoms.—As a general rule, there are few prodromic symptoms, although sometimes the infant has fever, vomiting, convulsions, and jaundice. The coloration of the skin now declares itself, and at one of the points indicated there is heat, with restlessness, insomnia and continuous frequency of the pulse; the redness, at first of slight extent, progresses, becomes painful and more or less diffused, sometimes taking the character of erysipelas, and overrunning all parts of the body. There is always more or less tumefaction, with infiltration of the subcutaneous cellular tissue. If the disease terminates by resolution, the symptoms referred to gradually diminish; but, on the contrary, and unfortunately, the child very often becomes enfeebled, and refuses to take the breast, diarrhœa and vomiting take place, and the affected part becomes of a more in-

tense red, and even the skin becomes gangrenous. When the sloughs become detached, the wounds resulting should be dressed with powder rather than with cerate, and the suppuration may only cease very slowly. We frequently notice also symptoms of peritonitis, and at the autopsy we discover pus in the spaces of the cellular tissue of the walls of the abdomen, and also false membranes on the intestines, and pus in the abdominal cavity.

Prognosis.—This disease is very grave, often mortal. The chances of saving children are so much greater in proportion to their age; but nearly all those only a few days old are carried off, no matter what may be done for them.

Treatment.—Internally we may prescribe laxatives, or calomel in fractional doses, and enemas if there should be constipation. We should not stop completely the milk of the nurse, if it is of the proper quality. We have not adopted the suggestion of English writers, and given two drops of the tincture of the chloride of iron every two hours in sugared water. Externally we may employ a few body baths of bran-water of short duration, and, as a general rule, few or no cataplasms; but what has succeeded best in our hands, is powder of potato or rice starch, but especially the application of elastic collodion repeated several days in succession, graduated in quantities according to the extent of surface involved; and we must, so to speak, pursue the disease with the collodion, changing very frequently the linen of our little patient, so that it may not become too moist. Every time that it is changed we should reapply the collodion. When the skin becomes gangrenous, applications of digestives may be sometimes useful to facilitate the separation of the sloughs; and this being effected, we must use simple dressings, still preferring starch mixed with tonic powders, renewed frequently and carefully. By such means we avoid fresh attacks of erysipelas, which are too often provoked by the fat substances, preparations of lard, of glycerine, etc., suggested in these cases. We have had some success, but very rarely, in the use of dressings with the powders only.

CHAPTER XLVII.

SPRAINS.

In children as in adults, a sprain is an abrupt articular distension, with or without laceration of the ligaments and the soft parts surrounding the articulation. This is generally met with in the tibio-tarsal articulation, but also in all the articulations, and chiefly in children in those of the forearm and wrist. It may be said in advance, that all the disorders which are produced in children who are lifted by the arms are sprains, in all cases in which this traction produces neither dislocation nor fracture.

Causes.—The suppleness of the articulations in children appears to us to be a cause which predisposes them to sprains less frequently than adults. The usual causes are falls, contusions, and strong tractions which exaggerate the movements beyond the normal state, and give rise to distension and laceration of the articular ligaments.

Pathological Alterations.—It is only by experiments on the cadaver that we are able to estimate properly, as Bonnet of Lyons did, the lesions produced by sprains; for we very rarely have the opportunity of observing at an autopsy a recent sprain. In the few rare cases that we may meet with in those who have died after sprains, and especially experiments on the cadaver, we discover in very slight sprains scarcely any distension of the ligaments, with slight sanguineous exudation; at other times when distension is observed in the articulations which have experienced violent and forced movements, the subcutaneous and intermuscular cellular tissue, and that around the joint, is lacerated to a greater or less extent, and the small bloodvessels are torn, producing ecchymoses; the aponeurotic fibres, the muscular fibres, and the tendinous sheaths are also sometimes lacerated, resulting in serous infiltration around the articulation.

Physiological Symptoms.—These are infinitely variable, according to the intensity; they may be transient and momentary, or protracted to a greater length of time. A distension of the

joint may cause a rapid and transient pain; there is suffering if the ligaments have been injured, and in an individual who has made a misstep by turning his foot abruptly in one direction or another, sometimes five or six minutes elapse before he can again rest his foot on the ground. Sometimes, however, it may produce pain of longer duration, and may then present the following symptoms: around the affected joint the patient may suffer more or less acute pain which impedes the movements, and when the sprain is seated in the foot, may prevent him from walking. This pain, caused by the distension of the nervous filaments, of the synovial membrane and of the soft parts surrounding the articulation, may last for a longer or shorter time, or cease almost immediately. Generally very soon after the accident, or some little time afterwards, the soft parts become swollen, ecchymoses appear, the pain increases, and the patient feels that it is necessary that he should not move his limb. In the simplest cases, the inflammation is of short duration, and the effusions of blood or other fluid become absorbed, and there remains a slight stiffness, which disappears in a few days. If the case is one of greater intensity, and the lacerations more extensive; if the constitution of the child is lymphatic, or if we do not at once make the articulation immovable, an acute inflammation occurs, which becomes chronic and may degenerate into white swelling.

The *diagnosis* is quite easy. In children a dislocation can hardly be confounded with a sprain, the deformity of the joint being very different. In the articulation of the foot, by instituting lateral movements of the foot in such a manner as to press alternately on the two malleoli, it is difficult not to recognize fracture of the fibula; and yet we may remain in doubt if the swelling is considerable, and only at the end of a few days can the diagnosis be made out with certainty. We cannot always at once appreciate the extent of the mischief, and in such a case it is better to abstain from making too long and painful an exploration.

The *prognosis* cannot then be made in all cases, especially if there is acute pain and considerable swelling, for the degree of the sprain may be infinitely variable, and we cannot affirm that the cure will be prompt, especially in lymphatic children.

Treatment.—This may consist, for cases of little gravity, either in the application of wadding around the articulation, secured with a retaining bandage, or else in *massage*, practised at once or in the

earliest hours after the accident, but only when there is tumefaction or infiltration of the soft parts, such cases being the only ones in which we can obtain a good result from this mode of treatment, employed at the commencement, and even later, taking the precaution to follow it with a retaining bandage, wet with a resolvent and soothing liquid, water, camphorated brandy, and a few drops of extract of lead.

Massage or shampooing may be especially practised on the foot, or the knee, or the wrist, and in the following manner: we must grease the hands with a fat substance, lard, for example, and exert gentle pressure very slowly and prolonged from below upwards, in order to cause the fluids effused around the articulation to ascend. We must carefully institute movements, as advised by Bonnet, of Lyons, and repeat them at different times and more or less frequently, according to the intensity of the sprain. We know that sometimes, after one or two such operations, the patient can walk. This has been observed several times by Dr. Lebatard, and has also occurred in our hands, in cases of slight sprains. We must continue the massage for several days when the sprain is not of much gravity.

Another treatment, employed for a long time, and still used by surgeons, and by us especially, particularly for grave cases, consists in the application of leeches, when there is considerable swelling and extreme pain. We may be satisfied merely to apply compresses wet with cold water, and to sprinkle the dressing either with cold water, or with a mixture of lead-water. I have derived benefit from continuous irrigations on the affected part. At the end of several days, we apply a gently retaining bandage, and place the affected part on a pillow arranged in the form of an inclined plane, in such a manner that the foot may be more elevated than the knee. When there is no longer swelling, we apply an immovable bandage, which may be left on for some time, fifteen days, a month, or longer. When we remove this apparatus, there remains in the joint nothing more than a stiffness, which disappears gradually when the joint is subjected to movements. If the sprain passes into a chronic arthritis the case is grave, for then we have to deal with a white swelling.

Sprains of the Forearm deserve a special mention. These accidents, produced in children who are roughly lifted by the arm, are, in our experience, with the exception of fractures and dislocations

which may arise in this manner, the most frequent of true slight sprains. These sprains take place in the various joints of the forearm, according to the nature of the movement impressed on the limb. In such cases—and we have seen a large number of them—the children have been lifted roughly by the arm, either to make them dance, or to jump over a gutter, or to prevent them from stumbling. Some of them had fallen, but nearly all had been taken by the hand, some by the wrist, others by the forearm; and in all cases the limb had been turned more or less abruptly, either in supination or pronation. Under these various circumstances, it is evident by observation, reasoning, and physiological examination, that the distension or pulling may involve several articulations. Thus, when the child is roughly lifted by the wrist or forearm, the movement of pronation or supination may take place either in the articulation of the superior extremity of the radius, or in the wrist. Either the lower extremity of the radius or that of the ulna may then be carried forward or backward, and the distension takes place in the ulno-radial or the radio-carpal articulation.

When these children are brought to the surgeon—and we have seen quite a large number—very few present fractures of the ulna or the radius, or dislocations either of the upper extremity of the radius or the lower extremity of the ulna; the majority, on the contrary, are not attended with any of these grave symptoms, though they nevertheless present features which especially alarm the parents, and sometimes even the physicians, on account of the cries and complaints of the children. In any event we find in children symptoms which are nearly always the same; thus, they cry and complain a good deal when the limb is moved, either extended or flexed, or movements of rotation or supination are impressed on it, and we do not observe any appreciable deformity. We sometimes hear, during the movements that are executed, a sound, without noticing the point from which it is produced, and we are induced to ascribe it to a gliding of the articular surfaces over one another. All at once, when these movements are once produced, a child ceases to complain, and without our being able to say that we have done much to cure it, we see him move the limb as he did before the accident. At other times this is not the case, and the pain persists; sometimes there exists sensibility over the superior articulation of the radius, sometimes the inferior articulation, and inferior ulnar articulation.

In our own experience we are generally far from being able to make out a precise diagnosis in all cases. We believe when we detect neither fracture nor dislocation of the upper extremity of the radius, nor displacement of the carpal extremity of the ulna, that there has occurred a sprain, generally of a slight character; that is to say, slipping of the articular surfaces and distension of the ligaments, or at least a tendency to a dislocation which has not been effected. We do not believe that these accidents are produced always at the elbow or wrist joint, but, on the contrary, at several situations in the articulation of the forearm. Sometimes this lesion, when not of much gravity, passes into the wrist-joint, as our confrère M. Goyrand observed it in several cases, but we do not pretend, like him, that it is always at this point. We think we have heard, as he did, the peculiar noise over this articulation, but we have often detected it in the superior articulation of the radius.

In all cases, the prognosis being only grave if there are several recurrences, we content ourselves with putting the forearm in a state of flexion at a right angle, by placing the hand in supination or pronation, according as the patient prefers one position or the other, and in nearly all cases this position is excellent for the patients, who no longer complain, and as a general rule are cured in three or four days. If the pain persists at the end of that time, our advice would be to put on an immovable bandage for eight or ten days, placing the limb in the position indicated.

CHAPTER XLVIII.

OZÆNA.

THE name ozæna is given to a symptom produced by deep ulcerations of the nose, from which exhales so strong an odour that we cannot speak to children who are affected with it, without at once finding that the air they expire is charged with a peculiar fetor.

It exists in the interior of the nasal fossæ and the frontal and maxillary sinuses. In these deep situations, which cannot be seen on the living subject, we notice, as may also be detected on parts less deeply seated, at the entrance of the nasal fossæ, ulceration of

the mucous membrane at one or several points, but sometimes nothing can be seen.

Causes.—In adults, syphilis is frequently the cause of this affection. In the child, it is due to scrofula and often caries of some portion of the bones of the nasal fossæ. Sometimes very robust and healthy children, without any appreciable constitutional affection, are attacked with this disease. We have met with it in those who had narrow flat noses.

Pathological Lesions.—These are often true ulcerations at different points in the nasal mucous membrane, sometimes modification in the thickness of that membrane; at other times, ulcerations at the entrance of the nasal fossæ, but most frequently very deep in the anfractuosities of the turbinated bones and of the ethmoid.

Symptoms.—These are, abundant secretions in the nasal fossæ, of a purulent and sanguinolent character, forming crusts in the nose and chiefly exhaling a fetid odour, a cadaveric odour peculiar to caries, which has been compared to that of bed-bugs, and hence the term *punais* (punaise, a bug) has been applied to those thus affected. Ozæna is developed without anything announcing its approach; sometimes it commences in an obstinate stoppage of the nose, with local sensibility; at other times, headache, the expulsion of purulent mucus, and even of crusts. Very often there is loss or diminution of the sense of smell.

Prognosis.—As a general rule, ozæna is a tenacious affection; it is, nevertheless, of a less serious nature in children than in adults, for it often depends on a scrofulous vice, which may become modified as the child grows older; and the disease, therefore, yields sometimes in children at the period of puberty. It is modified also by the appropriate treatment. The general health is not usually influenced by this disease, which is often incurable, but which does not interfere with the healthy appearance of its victim.

Treatment.—In children we place in the first rank the varied anti-scrofulous general treatment, and at the same time deem it very important to combine with it good diet, the use of general tonic, saline, gelatinous, sulphurous baths, artificial baths during the winter, taken especially at the sulphur springs themselves, or sea-bathing, at the proper seasons. Benefit will also be derived from letting the child walk in the open air.

Although we do not place the same value on local remedies, regarding it as of the first importance, before everything else, to

modify the constitution, we nevertheless prescribe in succession powders to be snuffed up and injections. The powders we have used are those composed of tannin and alum, of one part of white precipitate to fifteen of powdered marshmallow root, or two parts of calomel and fifteen parts of tannin or cinchona. All these powders are snuffed up, or insufflated, several times daily. As injections, we have employed successively infusions of walnut leaves repeated morning and evening, sulphurous injections, Enghien water mixed with barley-water, the mineral waters of Bonnes, solution of bichloride of mercury (Van Swieten's solution) two spoonfuls in a glass of milk, injected morning and evening, the injection of chlorinated water, etc. A form of injection which has succeeded best with us consists of two spoonfuls of the following solution in a glass of water:—

℞. Potassæ permanganat. ʒijss.
Aquæ fʒiv. M.

It must be acknowledged that many of these remedies are employed without success for a long time, and as the child's constitution changes a cure may follow in some cases. In an excellent treatise on this subject, produced by M. Cazenave of Bordeaux, he states that he has used nitrate of silver with good results, applying it by means of a *porte caustique* contrived by himself.

We must not confound with ozæna the fetid emanations exhaled from the nasal fossæ as the result of caries or necrosis of the bones, as the vomer or the turbinated bones. When the ozæna depends on these causes, it will always yield more or less promptly after the expulsion of the diseased portions of bone, as we have ourselves observed in several children.

CHAPTER XLIX.

LACHRYMAL FISTULA.

Lachrymal fistula presents itself at the inner angle of the eye in the form of a small ulceration, which gives passage to the tears We will confine our remarks to what we have observed in children. This affection is quite frequent, and is attributable to a lesion of the lachrymal canals causing swelling of the mucous membrane of

the lachrymal apparatus. The cause is often the lymphatic or scrofulous vice, and then it is a general cause; but it is sometimes local, a foreign body coming from without, or a concretion formed in the lachrymal canals, or else compression over the nasal canal by tumours of different nature in the neighbourhood of the lachrymal apparatus.

We have seen, in very young children, very minute openings over the inner angle of the lids, beneath the tendon of the orbicularis palpebrarum, scarcely allowing the introduction of an Anel's stylet, and giving an outlet at long intervals to a few drops of transparent fluid, especially when the inner angle of the eye is compressed; and yet we cannot really assert that the lachrymal sac was distended and formed a tumour. In some cases these little fistulas were congenital, while others occurred, without any known cause, after birth. We have seen several of these little fistulas, in young children, cured under the influence of astringent lotions, or by injections with infusion of walnut leaves; and we have seen them persist, no matter what was done for them. But the form we have generally observed has been true engorgement in the inner angle of the eye beneath the tendon of the orbicularis palpebrarum.

There are two forms of this affection. One of these, a true abscess, opens and results in suppuration, followed by ulcerations which cicatrize more or less slowly under the influence of general antiscrofulous remedies, or even of very simple local means, and have no communication with the lachrymal passages. The other form is a lachrymal tumour, presented in the shape of a small swelling, quite hard, and at first without change of colour of the skin. It is accompanied with epiphora, the eye is suffused, and on touching the tumour it becomes depressed. Tears may be made to flow, and may even be purulent, through the lachrymal puncta or through the inferior orifice of the canal through the nose. This kind of engorgement may remain for a long time stationary, and may sometimes be cured by injections made through the lachrymal puncta or the lower part of the canal. Generally the engorgement becomes inflamed, and ulceration is established; and we detect a fistulous point which communicates with the lachrymal passages, and gives an outlet to the tears.

In scrofulous children, the fistula may be cured under the influence of a general antiscrofulous treatment, prolonged for a considerable time, combined with the local treatment by means of

lotions of decoctions of walnut leaves, repeated for years, morning and evening, with perseverance. But there are cases in which the remedies we have suggested are not followed with any result, and in which, after being well assured that there is no necrosis of the bones, no foreign body or polypus, we have operated with success with the canula of Dupuytren; but we have been obliged to abandon it on account of accidents which require the more or less prompt extraction of this canula. We have seen it worn for several years, and afterwards those operated on blew out their canula and were cured. Recently we have decided upon the employment of butter of antimony for the cauterization of the nasal canal. After having met with numerous accidents, the slowness of the other methods adopted, and especially numerous recurrences, after such remedies as dilatation, setons, canulas, etc., we now resort to obliteration of the canal.

Dr. Magne has lately published several observations, and we have ourselves had several cases, which militate in favour of this procedure. Besides, nature has pointed out this method of treatment, since lachrymal fistulas are sometimes cured by the obliteration of the canal without an operation. After such obliteration, there is, at first, lachrymation, which gradually diminishes, and finally disappears. Hannoni opened the sac under the tendon of the orbicularis palpebrarum, filled it with charpie, and on the next day, after the pain had ceased, he cauterized the sac with a mixture of alum and precipitate. Dr. Magne cauterizes the sac with butter of antimony. We ourselves operate as follows: we first open the sac beneath the tendon of the orbicularis, and, after washing out the cavity, separate the lips of the wound with a small bivalve dilator introduced into the orifice of the canal, carrying to the bottom of the sac a small sponge, firmly secured on a stylet, impregnated with butter of antimony, and sufficiently small to penetrate easily. In these cases we have also employed general anæsthesia.

Swelling may occur, the cauterized part may suppurate, the canal become obliterated, for several days there may be lachrymation, and the wound slowly cicatrize. We are sometimes obliged to practise a second cauterization, but, as a general rule, it may be sufficient, after cauterization with butter of antimony, to touch the wound with nitrate of silver, and cicatrization thus terminates.

We have seen patients cured after a single application of butter of antimony, who, several years after the operation, had no recurrence of the disease.

CHAPTER L.

ANÆSTHESIA.

General and local anæsthesia may be, and should be, resorted to in certain cases, in children as in adults. We have employed it in those of only a few months of age, and have never had any accidents. We believe that even in childhood we may, by the prevention of acute pain, obviate the occurrence of convulsions, which certain very painful operations might otherwise induce. It may, indeed, serve to facilitate the performance of several delicate operations.

General anæsthesia is indicated in children in all operations which require any length of time, such as lithotomy, lithotrity, amputation, operations for hernia, and even simple reduction of strangulated hernia, extirpation of a tumour of greater or less volume, the reduction of certain old dislocations, ligation of a principal artery, as the brachial, the femoral, the carotid, etc. Local anæsthesia is reserved for operations which are rapidly executed, as the opening of abscesses, phimosis, extraction of a nail, extirpation of a small tumour, or cauterization of erectile tumours with red-hot iron.

General Anæsthesia.—In all cases in which we employ it, we use either pure chloroform, or, better still, equal parts of chloroform and ether. We administer it to the patient fasting, or at least three hours after eating, the child being in a recumbent, not in a sitting, position. We use a conical sponge, shaped like a mushroom, having an opening at the top and bottom of it, placing the sponge in a horn made with a compress or a handkerchief, the point of the horn being permeable to air. We pour the liquid upon it in such a way as to soak the sponge moderately, and we place the base of this apparatus in front of the mouth and the nose, keeping it at a certain distance without touching the lips of the patient. We cause him to breathe as freely as possible, carefully watching the pulse and the respiration. When the former becomes more feeble and less frequent, we suspend the inhalation, resuming it if

necessary. When the skin is insensible to a pinch, when the pupil is dilated, and the patient is not excited, the time has arrived to operate.

If the respiration and circulation diminish, we must not keep up the inhalation, but carefully put the child in a sitting posture, keeping him lying on his back, with the head slightly inclined downwards. If the respiration continues to diminish, or takes place in an incomplete manner, we must depress the tongue rapidly, in order to force the child to take a full inspiration, and throw cool water over the face, and at the same time excite movements in the chest to increase the activity of respiration. We must place both hands on the lateral portions of the child's chest, and thus embrace the thoracic cavity, making with both hands movements from above downwards, to successively elevate and depress the ribs, and thus produce artificial respiration. This method has always been of service in our little patients, and we have never met with any difficulty in making the respiration persist.

Local Anæsthesia.—When we cannot employ general anæsthesia, we must resort to methods for rendering insensible the part on which we have to operate. This we have often done with success. To fulfil this indication, we make an application either of ice or of the vapour of ether. We pulverize the ice and mix it, as Arnott suggested, with a third part of gray salt, and place this mixture either in a little gauze bag, or in gold beater's skin, and apply this bag over the part we wish to render insensible, a result which follows at the end of three or four minutes. To apply the vapour of ether, we have used Richardson's apparatus, constructed by M. Galante, on the suggestions of M. Salles-Girons, the object of which is to project pulverized ether on the point where the bistoury is to be used, so great a coldness being produced that we can make an incision without the patient experiencing any acute pain. The sensation of very painful cold, which impresses them, makes some children cry.

In any event, this agent may be resorted to with advantage, as may ice also, and either of these can be employed with children, to obtain local anæsthesia, when general anæsthesia cannot be used; but we have found that patients bear ice better than ether. We must repeat that this local anæsthesia can only be employed when we have to operate in a circumscribed situation. Otherwise we should prefer general anæsthesia.

CHAPTER LI.

PHLEGMON.

In children, as in adults, phlegmon, which consists in inflammation of the cellular tissue, is met with in the new-born as well as in children more advanced in years. We find it either circumscribed or spread, superficial or deep.

Causes.—Frequently the causes are traumatic, and sometimes spontaneous in children, chiefly as the result of certain diseases, as measles, scarlet fever, smallpox, etc.; and we see phlegmons that are, so to speak, critical. The traumatic causes are numerous; contusions, wounds, excoriations, the presence of foreign bodies, splinters, needles, shot, etc., may give origin to phlegmon, and these are its most frequent causes. Different operations are also very often followed by erysipelas, which is complicated with serious phlegmons of greater or less extent, superficial or deep. Affections of the bones and of the periosteum may be causes of phlegmon.

Local Symptoms.—The affected part is tumefied, with redness that does not disappear on pressure, more or less hardness and resistance, acute pain with pricking or pulsation, and heat. There is swelling which is not circumscribed, and extends more or less deeply under the aponeuroses through the tendinous sheaths. The movements are painful, and the disease may progress very rapidly or very slowly, either towards resolution, or towards suppuration or gangrene. Sometimes resolution may occur in a few days, and the heat, pain, and tumefaction will diminish rapidly, and the affection be cured. If suppuration declares itself, it may be developed in two or three days; if the phlegmon is superficial, the skin becomes elevated, attenuated and soft, and fluctuating at one point, proving that the abscess is about to open, destroying the skin. But if the phlegmon is deep, the pus, instead of endeavouring to find an outlet through the skin, becomes more deeply diffused, detaches the muscles, passes alongside the tendinous sheaths, sepa-

rates the periosteum, and reaches even the bones which it denudes, and then spontaneous openings slowly appear on the skin, and the pus makes its appearance externally through the fistulous orifices. If the inflammation terminates in mortification, the skin is seen to become gangrenous, and the aponeuroses, muscles, and tendons are exposed and bathed in pus. The gangrene may act on the deep parts in the small pelvis, in those surrounding the rectum, etc., for example, or on the excretory ducts in the vicinity of the purulent collection.

General Symptoms.—When the phlegmon is not very deep, the general symptoms are sometimes almost null, but there is, nevertheless, always more or less acute pain; but if the inflammation is more deeply seated, there may exist at first a precursory chill, even before any local phenomena are observed. In children, we have met with chill, fever, delirium, convulsions, and even vomiting; we have seen the most circumscribed phlegmon produce convulsive movements, which presented themselves before the appearance of the inflammation, and which ceased as soon as it was well marked, like that which takes place in certain diseases of the skin.

As a general rule, at the commencement of the local symptoms, the fever is very intense, but it frequently diminishes, without disappearing, at the time of the development of suppuration, to persist sometimes for a considerable time. When the pus makes its appearance externally, in circumscribed phlegmon, the fever ceases completely; but in cases in which it occupies a vast extent, when it is diffused and the suppuration abundant and occurring in a well-supplied part of the cellular tissue, the fever then continues, and becomes augmented, and the patient may become marasmic and sometimes die with symptoms of purulent absorption. On a post-mortem examination, we often find the evidence of very serious mischief; the muscles, tendons, vessels, and nerves are as if dissected and deprived of their cellular tissue; the denuded bones are bathed in pus, and very often, in scrofulous children, the bones are necrosed, and become the point of departure of the phlegmon.

Diagnosis.—This is easy for superficial subcutaneous phlegmon, but difficult for deep phlegmons, of the thigh, for example, and neighbouring parts of the pelvis. We must call both sight and touch into requisition to establish the diagnosis, and we must, by the assistance of the fingers, discover the engorgement of the soft parts and distinguish the pus by the appreciation of the fluctuation,

which is detected by placing the fingers on one side of the swelling, and pressing with the fingers of the other hand on the opposite side. We thus feel the wave by the movement given to the pus, which does not take place in engorgement occurring at any other time than in this purulent condition.

Prognosis.—This varies with the location and extent of the phlegmon: when the latter is circumscribed, it may be favourable; when diffused and occupying a large surface, it may be very grave, especially in cases of deep phlegmon.

Treatment.—As a general rule, we should administer internally soothing drinks, restricted diet, or at least a light course of food of milk, broth, mild soups, and cooked fruits. Externally in the local treatment at the commencement, if the cause is the presence of a foreign body, we must extract it, if possible. If it be due to any other cause, we must, in children as in adults, commence with emollients in the form of baths or cataplasms, being cautious in regard to the use of bloodletting. If, nevertheless, the disease is observed in a strong and vigorous child, with much fever, we may in phlegmons involving a large surface and of a very intense character, arising from a traumatic cause over the whole of a limb, for example, obtain resolution rather by general bloodletting than from the application of leeches. It has, in fact, the advantage over leeching, that we can extract the quantity of blood the child is to lose, while by leeching we may not be certain of this quantity. This treatment, however, which we regard as very useful in phlegmon arising from a local cause, appears to us to be injurious, if the cause is a general one, which is often not appreciable. We, therefore, in the greatest number of cases, rather than debilitate the child by loss of blood, prefer at first to prescribe a gentle purgative, with a proper position of the limb, which should be elevated and placed on an inclined plane, with applications of cataplasms.

Frequently, compression well exerted over the whole limb, following the plan of Bretonneau, has succeeded. In these cases, the application of blisters has not been attended with favourable results, and we greatly prefer, at first, to employ the treatment of Serres d'Uzès, which consists in making large inunctions, repeated three times in the twenty-four hours, with pure mercurial ointment, combined with extract of belladonna, if there be acute pain. The elastic collodion of M. Robert Latour has not succeeded as it has

in erysipelas; and yet it is of service in some phlegmons, and we do not, therefore, ignore it in all cases.

These remedies, employed from the commencement, and one after the other, have been of positive advantage in obtaining resolution; but if, in twenty-four or thirty-six hours, the phlegmon does not show any signs of diminution, we at once, in children as in adults, make early incisions, more or less numerous and deep, according to circumstances, and even before the establishment of fluctuation. This method of treatment is also beneficial in extensive phlegmons, as it is for whitlow, which is really only a phlegmon of the finger, and requires prompt division. Even by a single incision only, we prevent very grave symptoms, and it is especially by means of two, three, or more, which we may often prolong under the aponeuroses, that we obviate purulent collections and gangrene. Following the example of our colleague, M. Chassaignac, we have sometimes derived great benefit, in very extensive abscesses, from establishing drainage with caoutchouc tubes riddled with holes, which might serve as a means of introducing emollient or detersive injections, according to circumstances. Injections without the drainage are also useful.

As in certain cases of absorption, so also in these cases of deep suppuration, we may administer internally alcoholic tincture of aconite and cinchona. The patient should be strengthened, and simple and often tonic and modifying dressings be carefully applied. We have very rarely had phlegmons to treat that were so severe as to demand amputation, which is only indicated in these cases, when the child's general health allows of it, and when all other methods of treatment are inapplicable.

CHAPTER LII.

CERATITIS.

CERATITIS, or inflammation of the cornea, is often met with in scrofulous children. This disease, which was observed many years ago, but especially studied by Wardrop, Travers, and later still by M. Velpeau and all the oculists, may be divided into several varie-

ties, the superficial, interstitial, and deep. The first attacks the most external layer, the second the tissue of the cornea, and the third the membrane bordering the concave surface, the membrane of Descemet.

Causes.—These are the same as those enumerated for ophthalmia or oculo-palpebral conjunctivitis, and in addition to these the scrofulous diathesis is often the special cause.

Symptoms.—Superficial ceratitis, which is observed on the external surface of the transparent cornea, is most frequently an extension from the conjunctiva. The external layer loses its brilliancy, becomes dull, and even as if deprived of its polish through a greater or less extent, and the conjunctiva in these cases becomes of a violet red; the vessels are spread over the cornea, or isolated and forming very fine threads, or else arranged in a semilunar or triangular patch. Sometimes there is a little pustule at the apex of the triangle, which is directed from the circumference to the centre. Often the conjunctiva forms a ring around the cornea, not as prominent as chemosis. If the ceratitis travels further and is not checked in its course, the outer membrane may be raised and form a kind of phlyctena. Interstitial ceratitis is thus developed. In such a case, the sight, which was at first merely obscured, is now effected only through a very thick mist; the colour of the cornea is notably changed, and it is cloudy. There is, in the interstices of the cornea, either lymph or pus, and if the morbid products are spread over the whole cornea, vision is lost. As long as there is no solution of continuity in the anterior membrane, the patient bears the light, but the smallest ulceration of the cornea produces photophobia. We sometimes find pus formed between the layers escape externally or become very slowly absorbed.

Inflammation of the cornea, when it reaches the internal membrane, constitutes deep ceratitis, and the name *keratite ponctuée* has also been given it by the French. It very often happens then that there is cloudiness in the anterior chamber, situated in front of the iris; this is plastic lymph mixed with the aqueous humour.

The three varieties of ceratitis are not always met with separately; that which is seated in the anterior membrane is the most easily distinguished, and most frequently the different varieties succeed each other in the same eye. When the ceratitis is in the acute state, it may be resolved, or terminate in specks formed of plastic lymph, or may give rise to pus, ulceration, or even become softened.

These various forms of ceratitis may terminate in the chronic state, invading the cornea totally or partially; in such cases the membrane, which in the normal state is transparent, at first becomes pale, and loses its transparency; there is a slight cloudiness, then small points followed by spots that are sometimes very minute; there is neither photophobia nor lachrymation, the cornea has lost its polish, gradually assuming a milky, opaline appearance, and if the chronic ceratitis commences at the circumference, we notice there a peculiar vascularization, and sometimes vessels starting from the circumference and going towards the centre. This chronic state is very often the cause of loss of sight, yet, in children, time, aided by antiscrofulous remedies, sometimes brings back the transparency.

Treatment.—This may be both local and general; in children, it is usually that advised for scrofula. Under some rare circumstances, if there exist much pain and very active inflammation, we may have recourse to the application of leeches to the temple or behind the ear, but we must be cautious in their use. Advantage will also be derived from the use of the various purgatives.

The local treatment directed to the cornea should be composed chiefly of preparations containing the nitrate of silver. If there be superficial ulceration, and the cornea has lost its polish, collyria of nitrate of silver are of great service, but they should be employed with prudence. As ceratitis is always accompanied with iritis, the preparations of atropia are indispensable in the form of collyrium or ointment. Mercurial ointment often appears to us to be indicated, either over the temples, or on the cutaneous surface of the lids. A light layer of tincture of iodine, spread by means of a brush over the external surface of the lids every two days only, has been of advantage in our hands.

When the ceratitis is characterized by a vascular condition, in which the bloodvessels spread from the circumference to the centre, cauterization around the circumference of the cornea is beneficial. The circumscribed ulcerations often improve under a light cauterization with a pencil of nitrate of silver, according to Sanson's method. When the ceratitis is deep, and invades all three layers of the cornea, topical applications are almost valueless, and so also is even scarification of the conjunctival swelling, though sometimes it is practised with useful results. Blisters over the eyelids, advised by M. Velpeau, have often appeared to be attended with success, except in certain cases of ceratitis with chemosis. When the three

membranes are opaque, topical means are then useless, and we must resort slowly to abrasion of the cornea, and yet this operation, which is very delicate and very serious, may only offer a hope of success if the internal membrane is intact, a condition which is difficult to distinguish. We have never performed it, and the indications for this operation do not seem to us sufficiently positive for us to advise it.

All the various spots which are seen upon the cornea as the result of ceratitis are difficult to distinguish in their shades, to decide with certainty on the various operations proposed for their destruction. A superficial spot, depending on plastic effusion under the external layer of the cornea, may be touched with nitrate of silver, and in this case we substitute an acute for a chronic inflammation, which may sometimes be followed by successful results.

CHAPTER LIII.

STRABISMUS.

THIS name is given to permanent deviation of the eye, which is, as a general rule, observed in young people. It may affect one eye or both. In the former case, there is want of harmony or a peculiar convergence between the two visual axes; and if the sound eye be closed, the other becomes straight and directs itself towards the object presented to it. When the deviation exists in both eyes, there is divergence or convergence. Strabismus may be transient or permanent; thus, during a convulsion, the eyes may deviate, and not continue so afterwards.

There are four principal varieties of the direction of the strabismus; it may be internal or convergent, external or divergent, and upwards or downwards, ascending or descending. Strabismus may be fixed and remain as it is, or pass from one eye to the other, and then it is the alternative form. We may find in these deviations more or less intensity; thus, sometimes there is a first stage, in which the axes of the eyes are well directed when viewed from a distance, while they look inwards when viewed more closely. This is called the *false line of vision*. There is a second stage, in which there is

an open deviation of the eye, and the cornea is half concealed under the lid; and a third stage, in which there is so much deviation, that nothing more than the white of the cornea is visible.

The *causes* of strabismus are either alterations of vision arising in different manners, or mechanical obstacles, as an orbital tumour, paralysis or retraction of the muscle. One of the chief causes, especially in tender infancy, is the bad habit of using only one eye, as the position given to a new-born child in relation to the light causes it to direct only one of its eyes towards it, and hence produces strabismus. Several cases of this kind are cited in works upon this subject, and in such cases the children have been cured by changing the position and exercising the affected eye. There are certain occupations in which only one eye is used, in using a magnifying glass, for example, and this practice may cause strabismus, even in individuals already advanced in years. Certain injuries of the retina, and opacity of the crystalline, existing on only one side, are also the cause of strabismus. The central spots, resulting from ceratitis in children, are also the cause of the deviation of the affected eye. There are cases of transient strabismus, such as those occurring during convulsions, and sometimes these may become permanent. We must also remember that if moral emotions, as chagrin, anger, etc., are not causes of strabismus, they may momentarily increase its intensity. Certain lesions of the cerebral substance, whether acute or chronic, may gradually or suddenly produce strabismus.

Symptoms.—In referring to the varieties of this affection, we have made known the principal symptoms, and as a general rule it is easy to recognize them. There is always want of harmony between the axes of the eyes, but the sound eye is frequently the only one which preserves the faculty of vision, and yet the contrary may be the case. Nevertheless, the affected eye is always the weakest, and may as a result even become amaurotic. We notice that usually the affected eye has a normal direction, if we close the sound one. In some children, we have found the strabismus to be only appreciable when they looked at distant objects, and no longer existed when they examined those nearer at hand. The affected eye does not present, in its different membranes, any alteration, unless the strabismus succeeds an amaurosis, a cataract, etc.

Frequently strabismus is produced by a paralysis of the sixth or the third pair of nerves. In the former case, the deviation is in-

wards, and there is nothing special about the pupil; in the latter, the eye is drawn outwards. We often find dilatation of the pupil, and besides but little action in the upper lid.

Treatment.—To overcome the strabismus, we must employ varied means, according to the causes. Thus cerebral affections and paralysis should be combated, if they cause the strabismus. When specks or amaurosis or cataract are the causes, these are the affections we have to treat; and so also lesions of the retina, which may be detected by the ophthalmoscope, must be treated according to the nature of the case.

We should commence to treat the strabismus by means of certain exercises, with the view of restoring the devious eyes, consisting in directing the sight in different directions,—inwards, outwards, and upwards. We may, with much patience, by means of bandages, glasses, goggles, or lateral reading, as advised by Rognetta, obtain some good results. These different means may be usefully employed in strabismus of a single eye, even when complicated with myopia, spots on the cornea, and weakness of the muscles, and even in cases attended with contraction of the latter. But, as all these means just mentioned usually fail, the indication is to resort to division of one or several muscles of the eye. Stromeyer advised ocular tenotomy, and a year afterwards Dieffenbach put it into operation. It was soon practised widely by numerous surgeons, perhaps too much so, by Amussat, Baudens, Bouvier, Guérin, etc. In 1841, we performed this operation about sixty times, chiefly in adults, in young subjects fourteen or fifteen years of age, and in some under seven or eight years, but more rarely.

The division should be made on the contracted muscle; thus, in divergent strabismus, we should practise myotomy of the external rectus; in the convergent form, the internal rectus; in ascending strabismus, the elevator muscle; and in the descending form, the inferior rectus. The division of one muscle is generally sufficient, and yet, in certain cases, we must divide the oblique muscles. In any event, let us point out the plan of operating. We have, as a general rule, performed Dieffenbach's operation.

We have generally operated without chloroformizing our patient, but we do not hesitate to administer by inhalation a mixture of equal parts of chloroform and ether. We keep the child in a recumbent position, with the head elevated on a pillow, an assistant holding the head thus supported, or we may operate with the child

in a sitting posture. The instruments necessary for the operation are an elevator for the upper lid, a depressor for the lower, two small sharp-pointed hooks for fixing the eye, a blunt hook, a pair of scissors with curved blade and pointed. Three assistants are absolutely sufficient, yet, when operating on a child, it is well to have a fourth to support the limbs. If we do not administer chloroform, we may keep the child seated, with the head resting on the back of a chair, or else on the breast of an assistant, who holds the child on his knees. The first assistant is charged with the duty of holding the head, and he places himself over the head of the bed or behind the chair. The operator, having placed the bed before a window, places himself to the left or the right of the patient, according to the eye to be operated upon. It is the duty of a second assistant to keep the upper eyelid raised with the elevator, which the operator has himself previously placed in position. A third assistant keeps the lower lid depressed.

The surgeon, having applied a bandage over the eye on which he does not operate, should proceed in the following manner. If the patient is seated, the operator likewise takes a seat in front of him. If chloroform is to be administered, we must hold the child on the bed, and then the surgeon will require the two assistants holding the lids to preserve perfect immobility in them. The operator is armed with the two small sharp-pointed hooks in one hand, the left, if he operates on the right eye in convergent strabismus. Having told the patient to look outwards, he introduces a small simple sharp hook in the conjunctiva, at the distance of two-fifths of an inch from the caruncula lacrymalis. After having properly introduced it as far as the sclerotic, he may then draw the eyeball outwards and keep it in that position. With the right hand he introduces a second hook at a distance of a fourth to a fifth of an inch to the inner side of the first one, nearer the caruncle. He raises the conjunctiva by forming a fold transverse to the eyeball, and, causing the assistant who supports the lower lid to hold this last hook, he retains the former in his left hand. Then, having the right hand free, the surgeon takes the scissors, divides in the middle of the fold the whole thickness of the conjunctiva perpendicularly to the direction of the muscle, exposes the subconjunctival fibrous layer, incises it, and lays bare the muscle which it covers.

Then, while the assistant holds the other hook, he takes with his left hand the blunt hook, and passes it under the muscle, which he

raises, and carefully divides the aponeurotic sheath, but not too freely as otherwise the eye would no longer be satisfactorily held in place, and exophthalmia would occur as the result of the operation. When the muscle is plainly visible, it may be divided at a single cut with the scissors, or else the surgeon may follow, as we have done, the plan of Dr. Philips, which consists in making an excision of the attachment of the muscle. In operating thus, the contracted muscle is grafted farther back on the ball; we then remove some very minute portions of the muscle by means of a second cut of the scissors on the side of its attachment to the sclerotica. If any muscular fibres escape, we must repeat the division, and, if after this the eye is carried upwards or downwards, the indication is to carry the blunt hook either upwards or downwards, to divide the contractions which might interfere with the straightening of the eye. We must, in such case, act with deliberation, and not divide too much, and yet enough.

In cases of divergent strabismus, and likewise in the ascending and descending forms, we also make a division of the muscle which, by its contraction, causes the deformity. In ocular myotomy, requiring two assistants, the operator must, before commencing, secure by means of a piece of thread, a small sponge, held by the ring and little finger. This does not prevent him from holding the scissors, and enables him to wash out the wound during the progress of the operation. As a general rule, there is but little hemorrhage, and sometimes there is no necessity to use the sponge.

The operation over, the eye must be washed with cool water, and kept closed, and for twenty-four or forty-eight hours lotions of water applied. A compress of soft linen should be left on the eye, and it is prudent to let the patient remain for two or three days with the room moderately lighted. There are even many cases in which these precautions are not taken, and in which acute inflammation does not occur, nor any bad symptom, even when the child continues to go out. In fact, in more than seventy cases of strabismus on which we have operated, only one has been, as the result of imprudence, attacked with violent inflammation, the others having all been followed by good results. Some of them have had the eye made perfectly straight, others have only had a slight improvement, while three or four remained after the operation as they were before it.

In many of our cases, we have had to cut out a granulation, which

was developed on the wound; sometimes we have seen it disappear without any interference on our part or by touching it with nitrate of silver; generally we have been obliged to practise excision, but not until eight or ten days after the operation. After performing a large number of operations, we have come to know that we must quite frequently resort to strabotomy, and that this operation appears to us to be indicated in almost all cases in which, before we close the good eye, we find the affected one become straight, and in cases of double strabismus, when one of the eyes returns to its normal condition of straightness when the other is closed.

We may absolutely practise this operation at all ages, but too tender infancy is a contraindication, for we may obtain modification of the strabismus with time and the means previously suggested. We would consider it more reasonable to wait until about the age of twelve or fifteen for the performance of this operation. In re-establishing the straight position of the eyes, there is sometimes advantage in giving strength to an eye which has not been used, and to enable a useless eye to be employed. Accidents being rare, a surgeon is not rash to attempt the operation, except in certain cases of strabismus resulting from an injury, in which we have seen it performed without success, and in which we have once failed, and in cases of paralysis, the result of acute or chronic cerebral lesions.

CHAPTER LIV.

CYNANCHE PAROTIDÆA.

THIS disease is characterized by a swelling situated in the parotid region, on the outside of the parotid gland, and is observed in children and in youth. We have certainly seen this affection in young children, most frequently in those in the second stage of childhood, but we are far from having been able to detect many things that are referred to in the authorities on the subject of these engorgements, which have been confounded with inflammation of the parotid gland, a disease of a much more serious character, that we have sometimes met with in scrofulous cases. The parotid glands are not involved in cynanche parotidæa, which attacks the cellular tissue external to these salivary glands.

Causes.—As stated in all the standard authorities, we have found moist and cold weather, draughts of air, and abrupt changes of temperature acting as causes of this affection, while sometimes we have been unable to ascribe it to any very evident causes. We have found the disease epidemic in variable seasons.

Symptoms.—It has appeared to us to commence always with a general condition of fever preceded with chills, followed with soreness and pain in the parotid region, with swelling, rather of an œdematous than of an inflammatory character, which may extend over the lateral portions of the neck and the face, so as to singularly enlarge their transverse diameter. There is pain, but little change of colour of the skin, sometimes heat, and the skin becomes tense, rosy, and smooth; and these phenomena are accompanied with trouble in deglutition, the patient opens his mouth with difficulty, the submaxillary ganglia are engorged, and there is salivation. Frequently the two sides are developed at the same time, and yet one may be of larger size than the other.

As a general rule, we have obtained a termination of the affection by resolution, the general and local symptoms gradually diminishing; the fever, of which there is more or less, rapidly subsiding, as well as the tumefaction of the engorgements. We have, however, seen, but rarely, suppuration occurring, and have then detected subcutaneous abscesses. We have also seen these engorgements diminish in volume and disappear quite rapidly, and engorgement of the testicle appear as a result, by metastasis. Prof. Grisolle cites an atrophy of the testicle resulting from the rapid termination of this disease by resolution. We have not met with such a case at the Hôpital des Enfants.

This kind of engorgement has not been of a very grave nature in the cases we have seen, and has not been followed by serious results. It is quite otherwise with parotitis, which must not be confounded with the disease in question, for true inflammation of the parotid gland is usually accompanied with very grave general symptoms, terminates in a deep suppuration, and is often fatal. Cynanche parotidæa, as presented to us in children, is of a benign intensity, has a duration of eight or ten days, and sometimes a little longer.

Treatment.—Most frequently, we have employed only a simple method of treatment; no general or local bloodletting, a few mild purgatives, the application of resolvents and emollients over the

engorgements, and, better still, no moist applications, but by preference wool or wadding; in case of suppuration, a few poultices, and when a collection of pus is formed, instead of an incision, the introduction of a seton thread which may be left in for several days, and which, by puncture with needles, allows the pus to discharge without leaving afterwards visible scars on the face.

CHAPTER LV.

SPINA BIFIDA.

SPINA BIFIDA is quite a rare malformation. It consists in an arrest of development of the spine and especially of the laminæ, involving one or several vertebræ, which allows the membranes of the cord to produce a hernia.

Causes.—As in the majority of malformations, the cause is far from being positively known.

Symptoms.—These are a fluctuating tumour on the posterior portion of the vertebral column, more common in the lumbar region, more rare in the sacral region, and still more so in the cervical. The tumour is often without change of colour of the skin, sometimes reddish, because it threatens to break through. Children may come into the world with a gangrenous or even a fistulous point. As a general rule, we see only a tumour, with or without hydrocephalus; sometimes several exist on the same subject. The tumour is hard and resisting when the patient is placed in an upright position. If we keep the child lying on its stomach, the tumour is of less size, more or less soft, especially if the head is held back and lower than the trunk. Inspiration and expiration produce movements of subsidence or of distension in the tumour. It may be wholly reduced by pressure or only partially so.

When there is hydrocephalus, by pressing on the head we may cause the liquid to reflow into the vertebral tumour, or *vice versâ*. By the compression of this tumour we may produce cerebral symptoms, sometimes coma; we provoke cries in the child, and even paraplegia may occur. We very often find other malformations in those affected with spina bifida.

Prognosis.—This vice of conformation is essentially grave, when

the tumour is of large size; nature is in the great majority of cases impotent, and surgery of but little service. Spontaneous rupture before or after birth leaves little hope of cure, though it often occurs. Nevertheless, when the tumour is small and exists alone, it is not always completely incurable. In the majority of cases, the serious influence of this tumour is felt upon the general health, especially if it opens and produces a fistula. Very often it occasions wasting, and the nearer the tumour is to the cervical region the more rapidly is the child debilitated.

Those who live usually present symptoms connected with the nervous centres; they become paraplegic, if they are not so at birth; always, or at least very often, there is a general condition of languor, emaciation, incontinence of urine and of fecal matters, sometimes convulsions. Some children live for a very short time, dying of cerebro-spinal meningitis, but at times, however, their existence is prolonged for several years, twenty to twenty-five years or more.

Pathological Alterations.—One vertebra alone may be divided, at other times several. Usually there is a separation of the vertebral arches, or else the lateral arches are destroyed. An opening is consequently seen, of variable length and width, like a button hole, in the vertebral column. In examining the liquid which bathes the spinal marrow, we find it to be the cerebral fluid; it is more or less abundant, according to the size of the tumour, which is variable. This fluid is limpid, insipid or saline; sometimes containing flakes, in which is pus or blood, especially after the operations, which are considered beneficial in these cases. In carefully dissecting the marrow, we have several times seen the two lateral halves of the spinal cord separate and distinct, the cord then appearing flat and enlarged. The spinal marrow may also be longer; it may be atrophied and softened, or it may be deficient sometimes opposite the vertebral hiatus. The spinal nerves are lost in the thickness of the walls of the tumour, or these nerves float in the cavity of the sac.

Treatment.—It has seemed to us wholly impossible to cure the spina bifida in a radical manner; in fact, whatever we may do, we can never fill up the portion of bone, which is deficient in the spinal canal. We may, however, hope for a palliative cure, which will put children that are born with this malformation in a better condition. The means to be employed should produce adhesion of the walls of the sac, that it may no longer be distended with the spinal fluid.

Compression.—The first and most simple method consists in compression, either by means of cushions or bandages, a procedure which Sir Astley Cooper practised with success, employing compression alone or combined with punctures. We have performed it successfully two or three times; those operated on have lived, but we lost them from sight, as they came to us from the provinces, being brought to us for consultation. One case died of another disease; we had it under observation for two years, but we did not succeed in getting an autopsy. As a general rule, we have made a capillary puncture, and afterwards compression with disks of agaric and a circular flannel bandage. At the end of eight or ten days, the tumour filling up again, we made a fresh puncture. Two patients treated in this manner died of spinal meningitis.

Suture of the Sac.—We owe this method to Dr. Dubourg, who published two successful cases. An elliptical incision was made over the tumour, and the finger at once placed over the opening to prevent the entrance of air, and the wound united by the twisted suture. We have had occasion to perform this operation three times in the lumbar region, using the quilled suture, and three times our patients died of spinal meningitis, with pus and flakes in the vertebral canal. We adopted a plan which consisted in pinching the sac in a vertical direction by means of two pieces of catheter placed laterally and strongly tightened at their extremities, but the result was inflammation and death, on the next day, from spinal meningitis. Following the example of M. Dubois, we passed two pins into the base of the tumour; and beneath their extremity we passed the ends of catheters firmly secured together. Two days afterwards, ulceration of the tumour occurred, with inflammation of the sac, cerebral symptoms and death.

The injections proposed by Dr. Brainard of the United States were at first made with distilled water, four ounces; iodine one-fiftieth of a grain; and iodide of potassium, one-fifteenth of a grain. The strength of the solution was gradually increased. He reported several successful cases from this plan of treatment. Each time he took the precaution of only injecting into the sac, and used sufficient compression to prevent the fluid from entering the vertebral cavity. MM. Velpeau and Chassaignac have employed these injections with tincture of iodine diluted with water, as if for hydrocele; and the latter exhibited to us one successful case. We have not employed this method. We have been partial

to the use of punctures and compression, as advised by Abernethy and Sir Astley Cooper, making very small punctures with a needle, and only in cases in which the tumours are not of large size, are not painful, inflamed or fistulous, and especially if they are small and pediculated.

In these cases, and when the fluid is easily reduced by pressure, there are some very rare chances of success, and by continuing compression for a long time, we find the tumour subside and remain in the condition of an empty sac. Sometimes the tumour becomes buried, and presents a kind of umbilical depression. By this means we have seen several patients live to twenty and twenty-five years of age.

CHAPTER LVI.

TONGUE-TIE.

THE term filet or frænum of the tongue is given to the mucous fold, which extends from the inferior surface of the tongue over the genian process. This fold is vertical, and more delicate above than below and behind; it is triangular, and its anterior border becomes prominent when the tip of the tongue is carried to the palate, and its inferior border is fastened on the floor of the mouth. When the frænum is of the normal dimensions, it serves to retain the tongue, but in such a manner as to allow it to be moved and to apply itself on the arch of the palate, and to escape from the mouth sufficiently to be able to project the tip of that organ in front of the lips, and to carry itself to the right and left in the cavity of the mouth, and to move itself on the inner surface of the cheeks inside and outside the dental arches with facility.

When all these movements are practicable, the frænum is in its normal condition, but when the child comes into the world with a frænum which does not allow of these different movements, there is a malformation, which is sometimes met with, but much more rarely than is generally supposed. Usually, we find the tongue carried with difficulty to the palate, so that the child cannot embrace the nipple with it, and sucking is difficult of accomplishment. We may assure ourselves of this difficulty by placing

the little finger on the dorsal surface of the tongue; then, if the latter can advance, it embraces the finger, and will make efforts at suction, which show that the child can take the breast. Otherwise we may fear that the frænum is not properly formed, and then, by endeavouring to pass the finger under the tongue we discover that it is retained by this contracted band. If we raise the tip of the tongue, we discover that it is fixed over the floor of the mouth, because the frænum is scarcely prominent, and it retains the tongue below, and is confounded with the floor of the mouth. In such a case, the mucous membrane is not formed in such a way as to make this sublingual fold, and prevents or impedes the movements of the tongue. Hence arises the necessity of making a division of the frænum, especially if in addition the nurse is in good health, and her nipple well developed.

The operation for division of the frænum, which is very simple, should then be performed. We notice, in raising the tongue, a fold formed by the arrangement of the two layers of mucous membrane of the floor of the mouth, which advance towards the inferior surface of the tongue to form a delicate transparent fold, but this is not carried sufficiently close to the tip of the tongue to allow of the different movements of that organ. Under these circumstances, we employ two fingers to hold the tongue up, and we make a division of the frænum engaged between the two fingers which, by pressing upwards, separate it from the vessels of the floor of the mouth, or else we engage the frænum in the fenestrated plate of the grooved director, so as to stretch the frænum while isolating the vessels. A single cut of blunt-pointed scissors, directed backwards and on this mucous band, will divide it. We must also protect the veins and arteries, visible likewise under the mucous membrane of this region.

There is another case in which the frænum is not at all visible, and it appears that the tongue is not detached from the floor of the mouth. In such a case, we must, while having the child's head held by an assistant, introduce the plate of the grooved director under the tip of the tongue, in such a manner as slightly to engage the mucous membrane corresponding to the inferior surface of the tongue. Then, in place of a single cut of the scissors, we must make a small incision and others in succession, gradually raising and slowly dissecting the inferior surface of the tongue, especially endeavouring

to see the vessels, which may be exposed as we prolong backwards the cuts of the scissors.

This operation of the division of the frænum of the tongue, which should not be made in the normal state, should be most often performed at birth to facilitate suckling. We have operated on children at the age of two years who spoke imperfectly, without however stammering, and who have been benefited by the operation. I do not confound these two operations with those which I have practised, unfortunately without success, in children who were really stammerers; in them I even cut the genio-glossi muscles without any result, several surgeons hoping, by this procedure, to cure the stammering. But we abandoned this kind of operation, when we found after practising it for eight or ten times, that it did not give the result hoped for, and that, besides, we once or twice had serious hemorrhage, which we have reported in the journals.

As a general rule, the division of the frænum is performed without any accidents, and with scarcely any hemorrhage. Nevertheless, we have sometimes met with recurrences, retraction of the tongue, and hemorrhage.

1. *Recurrence.*—To prevent this accident, we suggest, and we never fail to have recourse to it, the passing morning and evening, for two or three days after the operation, of the little finger beneath the tongue to prevent adhesions after the division. This is sufficient in ordinary cases, but if the frænum is thick, and cicatrization tends to approximate the lips of the wound, it will be well the next day, or the day after, to touch the angle of the wound with a pencil of nitrate of silver, as suggested by M. Hervez de Chegoin.

2. *Retraction of the tongue.*—J. L. Petit cites cases of suffocation produced by the tongue being carried abruptly over the pharynx after division of the frænum; but we have not seen any such cases. Petit refers to several in which the tongue was brought into place with the finger, it having been pulled backwards, making a valve over the orifice of the larnyx. He retained it by means of a bandage after having restored the tongue to its position. When this was removed, the accident again occurred, and the child died as if it had been strangled. In a like case, it would be of the greatest importance to retain the tongue in place by a thread passed through the thickness of that organ, and this must be secured

outside of the buccal cavity by means of a thread secured to the child's cap.

Petit cites the case of a child in which without division of the frænum, the tongue tended to be carried backwards; it fell several times in an hour attacked with suffocation. In such a case, which is perhaps but seldom met with, it will be advisable to secure the tongue rather with a thread than with a bandage, as advised by J. L. Petit. The use of the thread, prolonged for twenty-four or forty-eight hours, would give more security.

3. *Hemorrhage.*—This accident is rare, and yet it has been known for a very long time, and many methods have been devised for arresting it. Although generally of a serious character, and yet but little feared by surgeons, and indeed but little to be feared, it has nevertheless been the cause of death. There are examples of it in the older authors, and on this subject a treatise on division of the frænum by M. Ferdinand Teissier, offered at Paris in June, 1866, may be consulted with advantage. A recent death from this operation in a hospital only confirms the fact that the accident may occur even to men of skill.

To prevent these hemorrhages, which are doubtless met with in children predisposed to them, it would be very desirable if we could distinguish at birth those children who are naturally disposed to hemorrhage. We have observed several such cases, but at a more advanced age. In the new-born, when we fear the occurrence of hemorrhage, we must postpone the division of the frænum. In any event, to prevent this accident, we must, in the division of the frænum, redouble our precaution and not look upon this operation as one of trifling importance. We cannot, therefore, repeat too often, that we must hold the child securely, the head especially; with the left hand hold the grooved director, elevating the tongue, engaging the frænum completely in the opening designed for this purpose; it should, when pressed from below upwards under the inferior surface of the tongue, cause the frænum to project, and protect the vessels which are distributed under it. It is very important to cut the frænum, as we have already said, by directing the point of the scissors downwards. If the hemorrhage is slight, it ceases, as do the child's cries, when it is given the breast, but if it continues, we may pinch the point from which the blood comes by means of a small spring forceps, which may be kept for some time in place, or else, as practised by M. Verneuil, use a

strong serrefine retained by a thread passed through the ring. But we prefer placing under the tongue, and keeping it compressed with the finger for several minutes, a piece of agaric steeped in lemon juice, or better still perchloride of iron diluted with water. If these remedies do not succeed, we must, without using styptics, powders, or nitrate of silver, so difficult to apply properly and with which we lose so much time, raise the tongue as at the moment of operating with the plate of the grooved director, have the head held very immovable, endeavour to distinguish the point from which the blood flows, and boldly apply a stylet heated to a white heat, with the extreme and indispensable precaution of keeping the lower lip depressed with a soft linen compress or a spatula.

CHAPTER LVII.

PROLAPSUS OF THE URETHRA.

SURGICAL works, even those which treat specially of the urinary passages, have little or nothing at all to say of prolapsus of the urethra, and yet it is not a very uncommon affection in little girls. I have seen at least a dozen or fifteen cases of it, from the age of two to twelve, in twenty years of hospital and private practice.

Causes.—The causes we have been able to discover are repeated efforts, either of coughing, as in the violent paroxysms of hooping-cough, or chronic bronchitis with frequent cough, or constipation necessitating violent and repeated efforts of defecation, or general debility. We have also found instances of this procidentia of the mucous membrane of the urethra in small girls debilitated from various causes, principally in cases of very long convalescence, as the result of acute diseases, and often in chronic affections.

Symptoms.—Children, as a general rule, do not complain much of this affection; nevertheless, they have frequent desire to make water, and they experience a sensation of heat during the discharge of urine. As this disease does not always cause pain, and the children do not complain, a long time may elapse before we examine the vulva, and only by inspection of this part can an accurate diagnosis be established. Then, if we separate the labia, we

generally find the vulva with more colour than usual. If we examine the meatus urinarius, we observe a small, rosy, mucous tumour, which appears to escape from the interior of the canal, and is not at first very considerable. It presents in its centre an opening, in which a catheter may be introduced; but we find that we enter the centre of a ring of variable size, formed by the mucous membrane of the canal of the urethra. If we push the catheter further, we soon penetrate the bladder and the urine escapes.

This condition may last a long time stationary without becoming aggravated; but at other times the tumour is developed slowly, with an exudation of blood, and soon afterwards purulent serum. It increases in size and is irritated on its surface, which becomes gangrenous superficially, inflaming the neighbouring parts, and producing vulvitis. The discharge may increase without causing great pain, but there is heat and smarting when the patient urinates. We have not seen any of these tumours that had been left to themselves for a very long time; but we think they might gradually become either wholly or partially gangrenous, and keep up a sero-purulent discharge.

We may confound these tumours, formed by the prolapsus of urethral mucous membrane, with polypus of the urethra, but by carefully examining it, we find that the polypus appears under the form of a small tumour, with more or less pedicle, the latter penetrating into the canal, whilst prolapsus is presented in the aspect of a very small ring surrounding the urinary meatus, and resembling, on a small scale, prolapsus of the mucous membrane of the rectum.

This affection, which is not serious, may occasion inflammation of the vulva; and may lead children to handle the parts frequently on account of the itching.

Treatment.—It is advisable to relieve little girls of this affection, and by excision restore them speedily to their normal condition. Other means, such as ligation or cauterization, only enable us very slowly to destroy the prolapsus. To perform this excision, there is no necessity to chloroformize the patient; nevertheless, as little girls are often timid and quite hard to hold, we derive benefit from giving chloroform. We place the child on the edge of a bed, keeping its thighs flexed and separated; the greater labia being then held in such a way as to let us clearly see the tumour, we

seize it with a portion of thread, which allows us to draw it out gently, and curved scissors carried behind it enable us to remove it at a single cut. We may also with the left hand, armed with a tenaculum, draw it forwards, without employing the thread, and then cut it from behind.

There will be a little hemorrhage, which the application of cool water may check, and which may be arrested with the perchloride of iron diluted with water, or else by a small tampon of agaric steeped in this mixture, and applied for several minutes on the wound resulting from this excision. Washes of cool water, and a few applications of a pencil of nitrate of silver suffice to procure cicatrization of the wound. The little patients suffer for a few days in urinating, but this does not last. In one of our cases, a hemorrhage occurred which we could not arrest with the perchloride, and we had, therefore, for twenty-four hours to keep a bladder, filled with ice, over the hypogastric region, and in front of the vulva. This last method succeeded perfectly. In this little girl, ten years of age, the tumour dated from about the age of four, and was raw before the operation.

CHAPTER LVIII.

PEMPHIGUS.

THIS is a cutaneous affection, characterized by one or several rounded bullæ, about a third of an inch in diameter, more or less distended by a fluid, which is at first transparent, but gradually becomes cloudy. It occurs in children as well as in adults, being seen quite often in the new-born, and exists either in the acute or the chronic state.

Causes.—It may be developed in children of imperfect nourishment, kept in an unclean condition, but more frequently in those under the influence of hereditary syphilis. This is the opinion of M. P. Dubois and some others, and it is shared by MM. Ricord and Cazenave.

Symptoms.—This affection is generally situated in the palms of the hand or the soles of the feet in children, and is presented in the

form of bullæ or pustules, which vary in number, are surrounded with a violet aureola of very variable diameter, and contain a sero-purulent fluid ; there is pain and sensibility to the touch, the epidermis becomes raised and the derma may be ulcerated and sometimes covered with a plastic membranous deposit, and suppuration may also occur. The edges are sometimes rounded and in relief.

If the pemphigus is simple, the bullæ are distended with a clear or opaline serous fluid, and are followed with desquamation, the epidermis dries off in delicate lamellæ, the pain ceases, and in a few days the disease terminates. We do not meet with ulcerations, and there is no other phenomenon on the skin; but in syphilitic pemphigus, the bullæ are filled with a well-formed yellowish pus, and ulcerations follow. The child also presents other syphilitic symptoms, as spots, specific roseola, a general condition of emaciation and decay, and alteration of the countenance, which becomes pale and thin, with the appearance of old age, and remarkable wasting.

The *prognosis* is of very little gravity in the simple form of pemphigus, but, on the contrary, serious in the syphilitic variety, for this localized phenomenon on the skin may sometimes be complicated with syphilitic lesions of internal organs. When the disease is simple, it may last for several days or for several months, and sometimes there are prodromic symptoms, as in certain acute diseases, measles, scarlet fever, etc. It may indeed pass into a chronic condition and terminate in a serious manner, while sometimes it is of no gravity. In syphilitic pemphigus, however, this disease, which is often congenital, is met with in children born of syphilitic parents. In addition to this, there are several known cases of pregnant syphilitic women who had pemphigus, and were placed on an antisyphilitic treatment after a first delivery, and afterwards gave birth to children who were free from pemphigus, thus proving satisfactorily the syphilitic nature with which the mother was affected at the first delivery, and was cured at the second.

Treatment.—If the pemphigus is not of the syphilitic form, a very simple local treatment answers the purpose. Thus, for simple pemphigus, it is often sufficient to content ourselves with attention to cleanliness, bran baths, or application of powder of starch or rice flour over the bullæ, good nourishment, and placing in a pure air those in whom the affection has been developed through want of care. In such cases the bullæ are only a local disease.

If, on the contrary, the affection is of a syphilitic nature, or the bullæ are only a local symptom of a constitutional disease, it is a very grave medical affection, the true treatment of which lies in the employment of general antisyphilitic remedies. If the mother herself nurses the child, we must put her on antisyphilitic treatment, using either the liquor of Van Swieten or the bichloride of mercury ; if the child derives its sustenance from a nurse, she should be forewarned of the chances which threaten her, and she should be put under treatment. When it does not get its milk from the breast, we should put the child itself under treatment, administering five, six, or eight drops in the day, in divided doses, of Van Swieten's solution, in a small spoonful of milk, and, in addition to this, baths medicated with this solution, a drachm or more of it being added to the bath of a new-born child. The child may also take for nourishment iodized milk, either from a cow or from a goat treated according to the plan of our confrère M. Labourdette, especially if we believe there are syphilitic lesions of internal organs.

CHAPTER LIX.

THORACENTESIS.

We have not had traumatic cases requiring in children thoracentesis, an operation which consists in opening the chest to give outlet to fluid effused in the pleural cavity. We have almost always found effusions consequent on contusions of the chest or fractures of the ribs easily absorbed. Nevertheless, in young subjects, as in adults, effusions consequent on pleurisy may require puncture of the chest, in acute as in chronic cases.

As a general rule, this operation is indicated in children, when medical means have not been sufficiently powerful to obtain resolution of the effusion, or even when, from the commencement, there is a threatening of asphyxia. Two cases then present themselves: either the fluid is circumscribed at one point, which rarely occurs, or else the space between the pleura costalis and pleura pulmonalis is completely filled up. If the effusion is circumscribed, it is the situation in which we detect dulness and the absence of respiration

which will be chosen for the operation; but when the effusion is general through the right or left cavity, we must then operate at the point of election.

Operation.—As this is not very painful, we do not entertain the question of employing chloroform, but content ourselves with having the child well held. We are far from rejecting certain well known trocars, those with a spout, the trocars of M. Guérin or M. Barth. They have undoubted advantages, but as a general rule we use either an ordinary trocar or a small curved one, having the form of a tracheotomy canula, except that it has a diameter of an eighth of an inch, and a length of an inch and a half; this enables us to penetrate as far as the fluid, without any risk of touching the lung. It should be furnished with a little goldbeater's skin sac, securely fastened behind the pavilion of the canula, and capable of falling over the outer orifice. We must also, after the example of M. Barth, who has suggested them, have tubes of vulcanized India-rubber, which can fit into the canula. We should also have at our disposal a syringe capable of being well adjusted either to the canula or to the caoutchouc tube, if we think proper to make injections.

The child being laid on its back, and held securely in this position, the surgeon takes the trocar with his right hand, presenting its convexity upwards and its concavity downwards; grasps the skin with the finger of the left hand, in order to prevent the cutaneous wound from being parallel with the deep opening, and plunges at a single cut above the upper border of the left third rib, and the fifth on the right side, counting the ribs from below upwards. The gold-beater's skin previously moistened surrounding the handle, he will choose, as the point of election, the union of the posterior third with the two anterior thirds of the intercostal space, taking care to approximate the upper border of the lower rib, so as to separate the point of the trocar from the lower border of the rib above, where the artery is situated. By means of our curved trocar, he easily turns around the lower rib and directs the point downwards; in this way, if there is but slight space between the bony frame and the lung, he does not risk wounding that organ.

The puncture once made, the surgeon should conduct himself differently according to circumstances. If the effusion is serous, a simple puncture is sufficient to give exit to the fluid, without allowing the air to enter the canula,—thanks to the gold-beater's

skin. As the cavity which contains the fluid contains nothing else, we withdraw the canula, and close up the little wound, which unites by the first intention. In chronic cases, when the effusion is no longer serous, but purulent, we must, after a first puncture, make several others in succession, at several days' interval; and it appears to be well, as M. Barth points out, to wash the surface bathed with pus, to obtain adhesion more easily. Besides, if the pus is fetid, there may be an indication to inject modifying fluids, as tincture of iodine diluted with water or chlorine; and often a single injection does not suffice, and several are required. In such cases, a permanent opening is necessary. The canula with which the puncture was made may therefore be left in place, and for this reason we had our small curved canula made with little flanges like the one used in tracheotomy; and it may, by means of tapes, be fastened around the body, as the tracheotomy canula is secured around the neck.

We prefer to substitute, as rapidly as possible, a vulcanized rubber tube for the metallic canula, for its pliability removes all danger of irritating the pleura, and the tube does not enlarge the wound as the metallic canula does. It may also be subjected to all positions in the thoracic cavity and around the chest; it may be very readily passed into the canula, but before using it we should take the precaution to supply ourselves with tubes of such a diameter that they can pass into the canula of the trocar. We introduce the tube alone, or furnished with a whalebone punch into the canula, which may be withdrawn as we bury the tube more and more deeply. We must fasten, at the outer extremity of the tube, a gold-beater's skin sac, tied at its opening, so that the fluid which escapes through the tube may discharge into the cul-de-sac formed by this skin; it may, otherwise, be enveloped in a linen pouch suspended at the patient's neck.

When he wishes to make an injection, the surgeon pinches the tube at a short distance from its outer extremity; an assistant removes the gold-beater's skin pouch, and he then introduces the beak of the syringe into the end of the tube and gently throws in the injection. When the quantity of fluid introduced appears to be sufficient, he pinches the tube anew, and then, to discharge the injection, he takes the precaution to put the extremity of the tube in a vessel of water, so that the air cannot penetrate; when he has finished, he withdraws the extremity of the tube from the water,

compressing it again, and fastens it in the gold-beater's skin pouch. When the collection of pus is diminished, this pouch or reservoir may be omitted, and the surgeon content himself with a small plug to close up the tube. This should be secured firmly over the walls of the chest by means of several strips of isinglass plaster or adhesive plaster, the chest being then surrounded with a light body bandage, or a bandage to secure the tube around the chest, so as to prevent its escaping from the thoracic cavity or from entering too far.

When the tube is in the chest, the interior portion must not be too long; it would irritate and might prevent the gradual approximation of the surfaces, and thus retard the cure. It should not be too short, for it would not then penetrate deeply enough to give exit to the fluid. In order to know how much of it is in the chest, we should, as advised by M. Barth, measure the tube before introducing it, and remember its length, so that we may know exactly how much of the tube is inside or outside of the chest. At first, two or three inches of it may be left in the chest, but as the morbid cavity diminishes in extent—a condition which is recognized by the smaller quantity of pus discharged at each dressing, and the amount of fluid which may be injected without effort—we should diminish the length of the tube by withdrawing some of it from the chest each day. When everything goes on favorably, the fluid becomes more and more clear, and diminishes in quantity, and at last a time comes in which only a few drops of pus escape, when we can remove the tube.

By this mode of operating, we have had much success, which follows as a general rule, when the pulmonary tissue is sound or but little diseased. If any tubercular affection exists, the cure is an exception or at least very uncommon.

CHAPTER LX.

ECTROPION.

Ectropion, or turning of the eyelids outwards, occurs on both lids with many children. Several causes may produce it, some of which are seated in the conjunctiva, as acute or chronic conjunctivitis, others in the skin, or in the nervous system, such as paralysis, or spasm of the orbicularis muscle. In children we have several times found an ectropion the result of tumours of the orbit, and at other times of necrosis of the orbital border at a more or less circumscribed spot. Exophthalmia may also give rise to ectropion. Very often it is caused by a burn cicatrizing with contraction of the lid. Whatever the cause, it presents general characters which cannot be misunderstood.

Symptoms.—These are more or less marked, according to the stage of this affection. At first there is seen a slight separation of the lower lid. Usually the border of the lid is carried forward, and tears escape over the cheek, the lid not being able to retain them. It is often only the commencement of blepharitis. But soon the lid becomes further depressed, tears course the cheeks, the conjunctiva, already reversed and at first healthy, soon becomes inflamed, thickened, and tumefied; the secretion of the tears diminishes, and the cornea becomes more vascular, sharing the inflammation and sometimes becoming gradually ulcerated. This corneal inflammation is due to exposure to the air and the diminution of the tears. Finally, the mucous membrane of the lid, becoming more and more reversed, is covered with granulations. When this disease depends on a burn, the lid is attached to the cheek by the contraction of the cicatrix.

The *diagnosis* is easy, after the symptoms just mentioned, but we should not at once form any *prognosis*, which must be variable, until we become thoroughly acquainted with the cause. Sometimes it is the commencement of a blepharitis or even of an intense conjunctivitis, and is often a phenomenon of purulent ophthal-

mia. The prognosis will, in the latter case, be of considerable gravity, while if we have only to deal with a slight conjunctivitis, the ectropion will yield with the disease which is its cause.

Treatment.—This should be varied according to the cause producing the ectropion. In cases of simple blepharitis or ophthalmia, we must combat them, as we will also have to do with paralysis or tumours of the orbit, which last may require removal.

Two forms of ectropion require a special, and surgical treatment.

Acute Ectropion, with Swelling of the Palpebral Conjunctiva.—This affection, as often met with in childhood, is a condition following upon intense ophthalmia or rather very acute blepharitis. In such cases we must, if the disease does not yield to the treatment advised in blepharitis, make repeated scarifications over the mucous swelling, either with the lancet or with the scissors, while endeavouring to raise the lid, and thus reduce the swelling and the ectropion. We must then keep the lid raised with a bandage.

Chronic Ectropion.—In certain cases the mucous membrane, which is constantly puffed up, is an excrescence, a real foreign body which pushes the lid back and keeps it reversed. It becomes hypertrophied out of all proportion, and can only be reduced by a surgical operation. After having employed different remedies, as nitrate of silver, sulphate of zinc, and calomel, frequently without success, we must adopt the following treatment:—

1. *Cauterization* with nitrate of silver applied directly to the mucous swelling, protecting the eyeball by placing within the swelling a small cylinder of wadding. We may also, after each cauterization, let fall into the conjunctival notch, water very slightly acidulated with hydrochloric acid; and then at the end of an hour remove the small roll of wadding, and apply oil over the part whitened by the nitrate. We next let the lid be raised, and apply repeated lotions of cool water over the eye. At the end of one or two days after the separation of the slough, cicatrization of the submucous tissue commences, and the contraction of the mucous membrane gradually corrects the position of the lid. We may sometimes make a second application, but we must make a proper estimate, before doing so, as to what we have gained, for we should hesitate to produce too rapidly a new cicatrization which would straighten the eyelid too much. If, by means of these cauterizations, which may be several times repeated, the desired result is

not obtained, we must resort to excision, and this we have performed on several children.

2. *Excision of the Mucous Swelling.*—When this remains of considerable size, and becomes covered with granulations, cauterization fails, and excision of this mucous fold may be performed with advantage. There are several methods we may adopt, but, in children, we have confined ourselves to the removal of the exuberant portion of the conjunctiva, having previously administered chloroform. We seize the swelling with a tenaculum or with grasping forceps, and by means of curved scissors remove a portion of it. More or less hemorrhage occurs, and we close the eye in its normal condition, and apply compresses steeped in cool water and held in place by a bandage lightly applied to keep the eye closed.

There is a form of ectropion occasioned by caries of the border of the orbit, which we have often met with in scrofulous children as the result of abscess symptomatic of partial caries of the orbital edge, and the inferior part of the lid is drawn into the diseased part, and becomes fixed there by adhesion, and thus involves the lid, often turning it outwards. In these cases we have performed an operation described in the work of M. Desmarres, and which this oculist regards as being the method of Ammon. It consists in detaching the adherent part by a semicircular incision, following the curve of the orbit, and dissecting the skin in such a manner that it will be movable on the bone; the lower lip of the wound must be brought up towards the upper, and be kept in place by strips, which serve then to retain the skin and to prevent it from sliding towards the point where it is adherent.

There are some cases in which we ought to practise blepharoplasty. When, after a burn, there is adhesion of the lid with or without ectropion, but either the upper or lower lid is incapable of being closed, the eyeball is exposed, and, as may be conceived, this infirmity is repulsive, and exposes the eye to a number of causes of inflammation. We must then perform an operation which has been known for a long time, practised at first by Graefe and still later by many foreign and French surgeons. Following the example of Velpeau, Blandin, and Desmarres, we have had occasion to perform this operation in several children. If we have had two or three successful results, we have also performed it without deriving any such advantage. We have operated either on the lower or on the upper lid, and we have adopted three

methods of operation, according as one or another appeared most applicable to the case, either by extension of the flap, or by inclination or torsion.

In two cases of burns with vicious cicatrices of the upper lid, we performed autoplasty, taking a flap over the temple, twisting the pedicle, and bringing it back over the upper lid, after having made a dissection, which removed the narrow cicatrix that kept the lid elevated and reversed upwards as far as the lash. We twisted the pedicle of our flap, which was near the outer angle of the eye, and made several stitches to fasten this flap on the eyelid, which was still provided with subcutaneous cellular tissue and a part of the orbicularis palpebrarum. We found the flap healing up, and were able to divide the twisted pedicle at the end of eight days, and the stitches on the following days. The first operation, which we performed on a girl of nine or ten years, did not succeed; there was no erysipelas, which we especially feared, but the flap became gangrenous and the patient remained as before. A second, operated on in the same manner by torsion, succeeded in our hands, and the eye, which was always inflamed before the operation, on account of the impossibility of covering it, soon returned to its normal condition.

We have only had unsuccessful operations in cases of ectropion after burns; but though the operations failed, there were no serious after-symptoms. After our various operations, we always used cold water during at least seven or eight days in succession, and we checked a few cases of erysipelas at the commencement by the use of elastic collodion.

CHAPTER LXI.

ENTROPION.

When the edges of the lids are turned inwards, with the ciliary border in relation with the eyeball, we have a case of entropion. This affection, which is not repulsive like ectropion, is of a nature greatly to irritate the eyeball, and to produce almost continual ophthalmia.

The *causes* of entropion are numerous; they may be reduced to relaxation of the skin of the lid, contraction of the mucous membrane, a faulty arrangement of the tarsal cartilages, a spasmodic state of the orbicularis, atrophy of the eyeball, and also certain tumours developed in the eyelids or their vicinity.

The *symptoms* are noticed either on a part of the free border of the lid, or on its whole extent, or even on both lids, but most frequently on the lower one only, and chiefly on its outer side. The lashes are turned inwards with incurvation of the tarsus, and the lid is rolled on itself. The vertical diameter between the lids is often enlarged, the conjunctiva of the eyeball red and to a variable extent often thickened. This inflammation extends to the cornea. The patient complains of severe pain in the eye, and experiences inconvenience in looking at objects. If the entropion is partial or of slight extent, it may remain stationary, but if it is very marked through the whole extent of the lid, it may give rise to inflammatory symptoms of a grave and profound character.

Treatment.—This should vary according to the exciting causes. In children we have especially found intense ophthalmia, a spasmodic condition of the orbicularis muscle, relaxation of the skin, and sometimes the presence of certain tumours of the eyelids.

We must treat the ophthalmia, and especially the photophobia which is its true cause; and in such cases, we cannot obtain in children that which M. Desmarres advises for adults, the constant straightening of the lid every moment with the finger, by looking into a mirror. Antispasmodics are indispensable, and are the only means to be used in childhood, mild purgatives being afterwards administered, to be repeated if necessary; and if there be inflammation, we should at once prescribe, for the straightening of the eyelids, either the use of mercurial ointment, combined with extract of belladonna, equal parts of each, by friction, repeated two or three times a day around the orbit; or else the dropping into the eye, two or three times a day, of a drop of solution of atropia, in the proportion of a grain and a half of neutral salt of atropia to three ounces of distilled water. We have derived no benefit from compression or adhesive strips, at least in children.

We have not thought it worth while to employ fly blisters around the orbit. In permanent contraction of the orbicularis, we have not performed subcutaneous division of the muscle as

suggested by MM. Cunier, Philips and Pétrequin. We have not followed the plan of Janson, which consists in transverse excision of the muscle, nor the vertical section likewise proposed by Janson.

In relaxation of the skin of the lid, the treatment should be purely surgical, and, as a general rule in children, we have been satisfied with cauterization or excision. We have employed for cauterization, after chloroformizing the patient to prevent movement, either the actual cautery or Vienna caustic, applied by means of a piece of fenestrated plaster at the spot where the caustic paste should be spread. We have, in these cases, endeavoured to produce a transverse slough at the distance of an inch and a quarter to an inch and a half from the free border of the lid, in the form of an elongated melon-seed, more or less narrow at the centre, according to the extent of the reversal of the lid. We allow the slough to become detached naturally, and the cicatrix, being formed beneath, corrects the position of the edge of the lid generally in a satisfactory manner.

By excision, according to the plan of Celsus, as a general rule, after having put the child under the influence of chloroform, and having previously estimated the amount of skin of the lid to be removed, we seize a fold of skin of the shape referred to in the application of the caustic. This fold, of the shape of an elongated melon-seed, which we may seize with a convex spring forceps, or else raise up, either with forceps or with a double tenaculum, is excised by a single cut with the curved scissors.

We have had afterwards the same result as with caustic, and we can, immediately after excision, apply two stitches, and union will take place very rapidly. We will do well, if we take excessive care, in this little operation, before operating, to trace with ink the extent and shape of the portion of skin we wish to remove, to guide the action of the scissors. We have also followed the method of M. Velpeau; we raise with the fingers or the forceps a transverse fold, piercing the base of this fold with three needles, at about two-fifths of an inch distant, each furnished with a long thread, and excise with the scissors the fold, a short distance in front of the threads, taking care not to cut them. In this manner, after the excision, we have to concern ourselves with three stitches. Immediately after the operation, we must apply compresses steeped in cool water and frequently renew them. We have had success in

this mode of operating, and we have often had benefit derived after excision, from the closing of the eye, applying a soft compress retained by a bandage in such a way as to keep the lips of the wound united without using stitches, which may sometimes produce erysipelas of the face.

We have also derived benefit from the use of three serres-fines instead of three stitches, applied for the purpose of approximating the lips of the wound of the lid.

CHAPTER LXII.

TRICHIASIS.

This disease, characterized by reversal of the eyelashes, is sometimes observed in children. The lashes are brought into contact with the conjunctiva and even the cornea; the tarsal cartilage is not turned around, and yet the trichiasis, like the entropion, is often met with in the lower lid, and may produce ophthalmia. Sometimes this turning in is only observed in a few lashes, at other times in all the lashes of the affected lid.

The *causes* are glandular blepharitis, inflammation of the glands of Meibomius, burns, and relaxation of the skin, and in children ophthalmia very often repeated, complicated with photophobia. We sometimes also find a second row of lashes acting as an exciting cause, but this is seen in adults rather than in children.

The *symptoms* are nearly always those of entropion; trichiasis may produce inflammation of the mucous membrane of the eye, keratitis, even ulceration of the cornea, opacity, or pannus, caused by the development of vessels extending in the form of a pencil over the cornea. Children suffering from trichiasis have a vicious position of the head, which is curved forward on the neck, and this is produced by the habit they have of inclining the head while looking at objects. The diagnosis is easy; the prognosis quite grave, for trichiasis produces, as we have already said, serious affections of the eyeball.

Treatment.—The treatment includes the reduction of the lashes; and of all the agents proposed, we prefer the use of serres-fines

with or without sharp points, which only pinch up a transverse fold of the lid, in such a way as to reverse the border of the latter, at first for twenty-four hours, and then a longer period, if necessary, but allowing the child to repose for a greater or less time, and recurring to them several times at intervals. Plucking out of the lashes has been advised, but this is troublesome and painful to accomplish. It may be done with blunt non-cutting forceps, which enable us to seize the lids without breaking or cutting them. This method, however, only relieves the deviation for the time being, and should be frequently repeated.

Without referring to several plans which we have not followed, such as extirpation of the free border of the lid, or a portion of its extent, or cauterization of the bulbs of the lashes, we may reduce the operations for the cure of these devious lashes to the following: plucking them out, when two or three of the lashes are reversed; excision of the partial fold, or of the whole fold of the anterior portion of the skin of the eyelid, as in entropion; or extirpation of the bulbs of the devious lashes, according to the method of Vacca. We may make a fold of the skin of the lid involved with the devious lashes, and excise this fold as far as the orbicularis muscle, afterwards dissecting the bulbs with a pair of forceps. In such cases, we must support the lid by means of fenestrated forceps, held firmly by an assistant. With children we must use chloroform.

After these operations, a dressing by means of compresses steeped in cool water should be frequently renewed, until the cicatrization of the little wounds occurs.

CHAPTER LXIII.

NASO-PHARYNGEAL POLYPUS.

In attending the surgical service in a children's hospital, we are struck with the fact that we never, or scarcely ever, meet with mucous polypus in the nasal fossæ. They present, however, the same symptoms, and require the same treatment as in adults. In children, we sometimes see fibrous polypus, but usually only in

those of ten or twelve years of age, the smallest children being, as a general rule, exempt from it. These polypi, of a more or less considerable consistence, firm, sometimes bleeding, present varying prolongations, and rarely have a pedicle. They generally take their origin at the base of the cranium, over the basilar process to the inner side of the pterygoid processes.

The *causes* are obscure, as they always are in abnormal productions.

Symptoms.—These polypous growths exist in a latent state at the commencement, which may last for some time, and they become developed slowly. Gradually they acquire sometimes considerable dimensions, and invade the nasal fossæ, becoming developed from behind forwards. They produce irritation of the nasal mucous membrane, and affect the smell and the voice, as well as the secretion of the tears, audition, respiration, deglutition, and even mastication. Some of them become developed from above, and raise up the floor of the orbit in such a way as to push the eye forwards. Sometimes when this is observed on both sides, the eyes project like those of the batrachia. A polypus has been found to elevate the upper wall of the orbit, compressing the brain and producing cerebral symptoms. When they acquire a development backwards, they depress the velum palati, and may descend into the pharynx, and compress the Eustachian tube. If they spread outwards, they penetrate the maxillary sinus, pressing down the arch of the palate. The bone then becomes thinner; the portions of bone involved are destroyed, the cavities are dilated, and give way before the development of the polypus. When these tumours grow over the larynx, there are attacks of cough and suffocation.

The *diagnosis*, at first difficult when the affection is at its commencement, admits of no doubt as to its character as it grows, and the disease is not difficult to recognize, especially when, independently of the symptoms referred to, it reaches the opening of the nasal fossæ or the pharynx. By the sight and touch we can then easily recognize it.

Treatment.—This affection may, in certain cases, produce serious symptoms, and the indication is to relieve the child of it, as we would the adult. We have resorted in them to evulsion and to ligation and excision, sometimes without preliminary operation, at

other times preceding the excision with preliminary operations, and sometimes cauterization to make the operation complete.

Evulsion has always seemed to us to be indicated in very rare cases of fibrous polypi appearing in the nasal fossæ, springing from the base of the cranium, and not having any prolongations to retain them too strongly. We have been able to remove them, and every time they thus present themselves, we believe we should content ourselves with plucking them out by means of various forms of straight or curved forceps. If the polypous growths have a pedicle, and we can circumscribe it, the indication appears to be to ligate it by the aid of different serre-nœuds, and chiefly those of a chaplet shape. We should, whenever we can, through the opening of the nasal fossæ or the mouth, direct scissors with blunt points over the pedicle of the polypus, prefer excision to ligature, which latter has the inconvenience of only slowly relieving the patient of the tumour, leaving him for perhaps a long time with a strangulated polypus, that may become fetid and give rise to other symptoms.

But frequently we must resort to several preliminary operations to facilitate the execution of measures for the removal by a cutting instrument, and the destruction by cauterization, of the point of insertion of the polypus. We should sometimes be contented with dividing the nostril; we may even divide the nose, separating the proper bones of that organ, and whenever we can, while thus operating, should resort to these methods, which may be effected more easily in children than in adults. At other times, we may practise section of the velum palati only, and by this incision, we may, as M. Guérin advises, by introducing one finger, and even two, in the mouth, carry the instrument over the point of insertion of the polypus. Then, with a straight rasp, introduced through the nasal fossa as far as the insertion of the polypus, and guided by the finger introduced through the mouth, we may scrape the portion of bone in which the polypus is inserted. In admitting that this method may be employed in the adult, we doubt its applicability to a child.

In concluding our remarks on these grave operations, we may speak of those disfiguring operations on the face, which have been advised, and which we have practised, for the extraction of these naso-pharyngeal polypi. As all surgeons have been able to convince themselves, the principal insertion of these tumours is at

the base of the brain; the other points of insertion are really only secondary, and not at all firm and resisting like that from which the tumour takes its rise.

Let us now examine rapidly the previous operations which should be performed for the purpose of exposing the base of the tumour, so that we can properly attack it. We may, and should, in certain cases, confine ourselves to dividing, more or less boldly, the velum palati, by which incision we may sometimes introduce curved forceps, seize the polypus, and tear it out, twisting the pedicle, and with the finger carried deeply through the nostril aiding the removal of the polypus from the interior of the nasal fossæ.

In other cases, we may cut the velum palati, and make a resection of the bony portion of the arch of the palate, as suggested by M. Nélaton, which may be done by at first perforating the arch of the palate right and left with a punch, and cutting the intermediate portion of bone with a Liston forceps. We thus remove the middle part of the bony arch, and a part of the septum. In this way we may see the base of the skull, and feel the insertion of the polypus without disfiguring the face. For this operation, we must take the precaution to have the hot cautery, either to arrest hemorrhage, or to cauterize the point of insertion of the polypus after having excised it. Resection of the lower jaw may be performed when the polypus is of large size, and it has several branches in the pharynx, the nasal fossæ, and the maxillary sinus. It has been suggested (Flaubert, Jr., Dupuytren, Robert, Maisonneuve, Lisfranc) to remove, as a preliminary operation, the superior maxillary bone. This operation has been systematized, and it is described in all the treatises on surgery. We had occasion to perform this on a child twelve years of age, and we had a favourable result at the time, but there was a rapid relapse after several cauterizations, either with the red-hot iron, or with the *caustique Filhos*. At the end of two years, he was operated on again by one of our professional brethren.

Any operation that may be adopted, that requires the gouge, mallet, shears, and chain saw, is tedious and laborious, and jars the patient's head very much. Whichever plan be adopted, either that of Gensoul or of Velpeau, or others modified subsequently, we must, after this preliminary operation, always act on the point of insertion of the polypus, either with iron heated to a white heat, or with the variety of Vienna caustic, known as *caustique Filhos*,

even after having excised and scraped the point where the polypus has taken root. The operation of M. Nélaton, which consists simply in the resection of the arch of the palate, enables us to expose sufficiently well the point of insertion. It should often be preferred as being a less frightful operation. Finally, if we wish to obtain definite results in these operations, we must not delay cauterizing for any length of time the point of insertion. Otherwise a recurrence is infallible.

CHAPTER LXIV.

ONYCHIA.

ONYCHIA is an inflammation of the matrix of the nail. It is met with, in children as in adults, in the great toe; it is seldom seen in the other toes and quite rarely in the fingers.

Causes.—These are sometimes scarcely appreciable; and we may regard this affection as produced by the lymphatic constitution. Usually, however, there is a puncture or pressure at one point of the matrix of the nail, chiefly on the internal border of the great toe, and this happens from cutting the nail in such a manner that a point of the nail punctures the ungueal matrix, or when the under part of the nail is punctured either with the points of the scissors or with a corn-cutter, or even with a pin. We have seen, in children, punctures with a pin under the nail produce inflammation of the matrix, or at least an inflammation under the nail followed by vegetations analogous to those of onychia. Most frequently very tight shoes, which press upon the great toe, cause this affection.

Symptoms.—At the commencement, there is slight pain in walking, and gradually redness over the inner angle of the nail, with ulceration of the skin which is pressed upon by the edge of the nail. A fungous vegetation is developed, which is very sensitive; then the pain is such, that the patient walks with difficulty when he puts the heel on the ground. He may cut the corner of the nail which is buried in the proud flesh, and in this manner experience momentary relief, but the pain soon reappears, the

granulations cover in the form of a swelling the internal edge of the nail, and produce angeioleucitis on the inside of the leg and the thigh, and frequently adenitis in the region of the groin. The disease gradually extends, and the nail becomes movable; there is an oozing of sanious matter, which becomes more and more abundant and fetid, and then the pain increases in intensity. We have seen analogous vegetations become developed more rarely in the fingers, but producing symptoms like those met with so often in the great toe.

The presence of the nail being the cause which, by its pressure on the ulceration, keeps up the mischief, we must operate on the nail, either by correcting its position, or destroying it by caustics, or extracting it. Nevertheless, when the disease is at its commencement, before resorting to operations, we derive benefit from preventing the children from walking. Emollients must be applied at first, if there be pain, but we must also employ, as speedily as possible, tonic foot-baths; at the same time urging the importance of the patient wearing properly-fitting shoes, which do not press on the toes. When the disease is more advanced, and ulceration occurs, we must adopt some mode of modifying the position of the nail,—caustics, and even extraction.

Modifying the Position of the Nail.—This method, which prevents the edge of the nail from compressing the granulations, which sprout from the ulceration, consists in raising the ungual border with the extremity of a spatula or the point of a scissors, or with some other firm substance; but we must then either push charpie under the nail, repeating this every morning, or introduce a small metallic malleable plate of tin or pewter (Desault's method) and secure it with a bandage. Besides these modes of treatment, which are very painful, and should be employed for a long time and daily, we must also excise the fungous growths or repress them with nitrate of silver. This last method is an excellent palliative, and sometimes produces a cure.

Cauterization of the Granulations.—We prefer this plan, which has quite often succeeded in our hands, to the one just mentioned. It is painful, but we may anæsthetize the toe on which we operate, by surrounding it with a little sacket of pounded ice; the pain is then less acute, and we may, almost without producing any, excise the granulation, or cauterize it with the nitrate of silver or powdered alum. To obtain a good result from these cauterizations, which

should be repeated several times, at three or four days' interval, we must carry the pointed extremity of the pencil even under the nail, always using ice to prevent the pain, which is very acute.

With this mode of treatment, we have noticed that emollient baths and applications were more injurious than useful. We therefore prefer slightly warm foot-baths in tonic liquids, as infusion of walnut leaves, wine and water, water slightly alcoholized at first, and afterwards still more so; and we may conclude the treatment with sulphurous baths diluted with simple water. We have thus perfected several cures, by especially advising, after this treatment, the use of broad shoes, keeping the toes well separated from each other.

We have also practised cauterization, as already suggested, with Vienna caustic on the swelling formed by the fungous growths and on the portion of the nail which enters into the flesh. In this manner the slough invades the portion of ingrown nail and the fungous growth. When the cauterized portions become detached, there remains a wound which cicatrizes slowly, and which may be directed in such a way that the portion of nail which grows out passes above the cicatrix which is formed.

Extraction of the Nail.—This method, by Dupuytren, is the most certain, and has often succeeded in our hands. It is very painful if we do not employ general or local anæsthesia, but it gives a very expeditious and often very effective result. We prefer it to other methods, and have often used it in children, either administering chloroform or applying ice over the affected toe. In this manner we produce but little pain, and if we then carefully apply simple dressings, we find a nail of new formation covering well, but slowly, the ungual surface. This gives time to the ulcerated part, dressed with tonic fluids, to cicatrize firmly, and besides, as a general rule, does not allow the nail to grow in anew. We consider this method preferable for children; it causes, it is true, acute pain, which may be avoided by anæsthesia, but we thus especially avoid subjecting them to those painful dressings required by the other methods previously detailed.

As a general rule, we follow in this operation the plan of Dupuytren. We pass under the middle portion of the free border of the nail the point of a branch of straight scissors, which we introduce rapidly flatwise as far as the root of the nail, turning the edge upwards, and with a single cut dividing the nail into two

parts. We seize the ingrown part with strong dissecting forceps, and forcibly extract it, rolling it on itself from within outwards. We often remove the other portion of the nail in the same manner.

We may, without thus extracting the nail, as Raymond of Toulon has advised, cauterize deeply with red-hot iron the whole of the skin sorrounding the base of the nail, and thus have the nail detached with the slough produced by this method. The nail is less likely to grow out again, for we destroy the matrix, which does not occur in the operation for extraction.

After these different operations, it is important to dress the wound with cold water, and to wait until the cicatrization of the ungual surface is firm and it no longer suppurates, to enable the subject of our operation to walk. Time is always needed for the new nail to be complete; or, if the nail does not return, the exposed part offers a perfect and solid cicatrization.

CHAPTER LXV.

ABNORMAL CICATRICES.

WITHOUT speaking of malformations, congenital imperforations of natural openings, as of the nostrils, the labia, the anus, etc., or adhesions of the fingers and toes, we find in children many vicious cicatrices, characterized by the existence of a fibrous tissue, called by Delpech the inodular tissue. They may be prominent, adherent, depressed, or obliterating.

The *causes* are, as a general rule, wounds, scrofulous ulcerations, and burns, so frequent in children.

Abnormal Cicatrization after Wounds.—In children, as in adults, wounds may be followed by cicatrices of a more or less vicious character, and this often depends on the nature of the wounds, sometimes on the manner in which they are attended to from the beginning, and the circumstances which may complicate the treatment. Vicious cicatrices may be especially met with in wounds attended with loss of substance, in which nature always tends to approximate the edges. Thus, in a wound where a portion of the skin or of the subjacent soft parts is carried away, the cicatrix, left to itself, will

be more or less contracted, and will bind down the part on which it is seated, in such a manner as to impede the movements, either in extension or flexion. Thus, in connection with the ginglymoid articulations of the knee, of the elbow and the phalanges, we may observe wounds of this kind. We have seen children with a wound on the anterior part of the knee, incapable, especially if there be loss of substance, of exerting movements of flexion without constantly tearing the cicatrix; and when the wound was on the opposite side, of executing extension.

The method of preventing vicious cicatrices, which we must practice in advance, consists in the mode of treatment of the wounds themselves. By keeping the limbs as a general rule in continuous extension, or in a state of flexion, we may avoid abnormal contractions, or difficult or almost impossible movement. When these cicatrices, the results of wounds, are firm, we may hope that they will stretch in time, and that there will be no necessity to perform operations to re-establish the movements in the normal condition. In such cases the movements of extension or flexion made gradually may slowly overcome these vicious cicatrices. Finally, at the end of quite a long time, we may under some circumstances be compelled, for a flexed limb, which cannot be extended, to perform operations, as in the case of contractions from burns connected with the ginglymoid joints. Small wounds of the face are often met with, which have recovered with a vicious cicatrix, consisting only of a black tint through the whole extent or a portion of the cicatrix, as in powder wounds from cannon. We must not forget that the colour of these cicatrices often results from having dressed the wounds with court plaster of a black colour, and that the preventive means consist in only using colourless plaster to promote union of wounds of the face.

Abnormal Cicatrices following Scrofulous Ulceration or Abscess.— We often meet with this kind of cicatrix in children. In them scrofulous ulcers of greater or less extent may destroy a large portion of the skin, on the face or on the neck, and produce loss of substance. These ulcerations are then like burns, and when they cicatrize, if their progress is not attentively watched, contractions occur, which reverse the lids, draw the lip down on the chin, sometimes the chin on the neck, the neck on the chest, etc. To prevent these abnormal scars, we should do everything to obtain broad cicatrices by combating the contractility of the cicatricial tissue, by extending the affected parts in dressings, and by opposing the

efforts of nature, which endeavours always to supply by the cicatrix the loss of substance. When we have been unable to prevent these contractions, they become similar to the contractions after burns, and often require operations analogous to those resorted to in such cases.

We also find in children cicatrices consequent upon spontaneous opening of abscesses, in the form of a swelling of greater or less length and prominence which rises above the level of the skin. These occur especially in the neck, and may be successfully treated by several methods, such as compression with leaden plates or pieces of agaric, excision with scissors and bistoury, and by caustics. Vienna caustic has been especially efficacious, applied carefully over these prominent cicatrices, and in swellings rising above the level of the surface of the skin.

Whatever plan may be employed in these cases, we produce wounds which must be watched with great care to prevent a recurrence. We must compress the new wound so that it may not become prominent, powdering it with alum, calomel, etc., frequently touching the granulations with nitrate of silver. We must do everything to prevent a recurrence, and one of the conditions of success is especially, as suggested by Dupuytren, not to be in haste to operate, the more so as in time these cicatrices occasionally disappear.

Abnormal Cicatrices after Burns.—We find that burns most frequently produce this inodular tissue, which is contractile and has been ably studied by Delpech and Dupuytren. Cicatrices from burns may be observed in all regions. We may counteract these contractions, which are of such frequent occurrence and chiefly in children, by dressings properly applied, by position, by the assistance of bandages and apparatus suitably adjusted, or by opposing the contraction of the wounds; but, in spite of the greatest care, we meet with a large number of burns which terminate with various contractions. Thus we often see inversion of the lids, obliterations of the auditory canal or the nostrils, adhesions or inversions of the lips, inclinations of the neck in different directions, approximation of the arm to the trunk, flexion of the forearm on the arm, turning in of the hand, adhesions of the fingers, adhesions keeping the abdomen closely applied to the chest, the thighs flexed on the abdomen, the penis adherent to the pubis or the scrotum, the greater labia more or less approximated, and abnormal cicatrices in the lower limbs similar to those in the upper.

All these cicatrices are prominent, adherent, depressed, or oblite-

rating. As all of them give rise to difficulty in the movements and vicious positions, and prevent, in children, the development of the parts or movements, the indication is to operate, to prevent atrophy of the limbs in children, and especially to re-establish the functions, remedy obliterations, etc. We repeat, however, that Dupuytren advised that we should not operate too soon, and that we should wait until the cicatrices were firm.

We must often resort to operations which are unavoidable, and which we have had occasion to perform in children. These include transverse incisions and graduated extension or dilatation kept up for a long time, even after perfect cicatrization; the removal of the cicatrix; sliding of the flap, and autoplasty.

Whenever the cicatrices keep the fingers flexed, the hand flexed or extended on the forearm, the forearm flexed on the arm, the internal surface of the arm applied to the body, or the head flexed backwards or forwards on the chest, benefit may be derived from making over these prominent cicatrices, according to the method of Dupuytren, incisions through the contractions, either transversely or obliquely or V-shaped, then stretching the cicatrices thus cut in order to widen the incisions, but making the incision very slowly, more or less deeply, at the same time carefully avoiding the tendons, nerves, and great vessels. We must, as a dressing, employ apparatus and bandages to keep the wound separated during the whole duration of the new cicatrization. This demands a good deal of time and care, and often requires incision of fresh contractions which may be formed.

The method of Delpech, which consists in removing the cicatricial tissue as far as the healthy tissue, is sometimes and even frequently preferable, when we are able to thoroughly circumscribe the whole of the vicious cicatrix, and to approximate the edges of the healthy skin in the opposite direction to the contraction formed by the vicious cicatrix. We have often employed this method when this has been possible, but we have abandoned it in all cases in which we could hardly cover completely the loss of substance, which is to be filled up by following this plan. When we can approximate them we should do so, either by separated stitches, serres-fines or adhesive strips. Whichever method we adopt, that of Dupuytren or Delpech, we have always derived a great deal of benefit from keeping the wounds covered with fenestrated linen and charpie, and finally from constantly subjecting them to continuous irrigation,

only refraining from the use of cold water gradually, and not abruptly.

When, in certain forms of vicious cicatrices, we can make a flap with the cicatrix, and by sliding this we can obtain the proper extension, this method has sometimes succeeded in our hands, by combining with it several transverse incisions through the parts which we could not raise with the flaps.

In vicious cicatrices which obliterate a natural opening, we have always employed multiple incisions; or, by means of the neighbouring skin, we have sometimes made a hem with the skin united to the mucous membrane—the commissure of the lips, for instance. As for incisions, we have made them in the contracted orifices of the auditory canal, the nostrils, meatus urinarius vulva, and anus, always taking the precaution to employ tents, catheters, and canulas, the use of which may be prolonged for a considerable time. As for autoplasty for the treatment of vicious cicatrices, it should be especially reserved for those of the face and for cases of contractions of the lids.

We have had occasion, in some cases, to treat cicatrices that were depressed and adherent over a bone, in partial osteitis of the frontal and the cheek bone,—in a word, subcutaneous bones. We have then operated with a tenotome introduced under the skin as far as the adhesion, which we divided transversely. By drawing on the skin, we destroyed the parallelism of the adhesion to the bone. In this manner the skin cicatrizes more thoroughly, and no longer presents its former appearance, that is to say, the depression.

There is another form of abnormal cicatrix which is observed quite as frequently in children, a cicatricial contraction of the jaws, usually consequent on burns, gangrene of the mouth, etc. Formerly all the methods consisting in the division of the contractions causing the adhesion of the cheeks to the lower jaw, combined with the introduction of foreign bodies of various kinds into the mouth to prevent a recurrence, failed with us as with our predecessors. All other surgeons, as well as ourselves, have had very incomplete results from excision of cicatrices in the mouth, as proposed by Delpech, incisions as practised by Serres, of Montpellier, or wooden wedges between the jaws, suggested by Gensoul after excision of the contractions. The plan of Essmarck, which laid down the principle of the resection of the anterior portion of the jaw, and which I have not practised, appears to me of very little advantage, if I may judge

of it, not by the results of several foreign surgeons who claim to have been successful with it, but by the attempts made by some of my colleagues of the Société de Chirurgie, who have had nothing but failure or partial success not of a kind to encourage them to repeat them. Nevertheless, if called to a patient who had his jaws so tightly pressed together that he could only take fluids, if he was wasting away on account of his nourishment being restricted to liquid or feculent substances, and desired an operation to enable him to pass between his jaws solid substances, meat, etc., I would decide to resect a part of the middle portion of the lower jaw, according to the plan of Essmarck. I believe it, however, to be prudent, before this resection, to attempt to divide the contractions, to introduce wedges between the jaws for a long time and frequently repeated, and, after excision of the bands, plates between the internal surface of the cheek and jaw, worn as long as possible.

CHAPTER LXVI.

DISEASES OF THE UMBILICUS.

INDEPENDENTLY of umbilical hernia, of which we have spoken, we may refer to several pathological lesions which are met with in children in the umbilical region.

Hemorrhage.—Usually, the umbilical cord shrinks up from the first to the third day after birth, and on the fourth or fifth day the cord dries up, then separates with more or less suppuration, leaving beneath it a cicatrix, which is the umbilicus. In children who die at birth, this drying up of the cord is not observed; the child must live two or three days before this vital phenomenon takes place. Sometimes this work of nature is interfered with by hemorrhage. In the progress of labour, violent tractions on the cord, or the descent of the child suspended by the placenta, drag it or tear it from the cord at its point of insertion to the umbilicus. This dragging has been found to take place, but rarely, as a consequence of the parturient efforts, when the cord was extremely short. The child has also, in such malformations, died as the result of hemorrhage seen at birth, which is most frequently,

however, met with at the period of the separation of the cord, six, seven, or even more days after birth. The blood then flows in an intermittent dribbling manner, and not by jets. The hemorrhage sometimes takes place because the ligature is not tight enough; it is sufficient then to apply a fresh ligature more tightly above the other one.

This hemorrhage may be observed in children suffering from purpura hæmorrhagica. If we find petechiæ on the body, the diagnosis is not in doubt. At other times, we cannot discover the cause. The hemorrhage may be considerable and the cause of death, if not immediately relieved. If it is only slight, it may be easily arrested, but in many cases we must act energetically. The remedies suggested have been alum, colophony, ice, nitrate of silver, and even the red hot iron; but we should prefer to all of these either a suitable application of perchloride of iron or ligation in mass. In using the former, we have derived benefit, under two or three circumstances, from at first making compression of the entire umbilicus between the index finger and the thumb of the left hand; and, after having clearly seen the point from which the blood comes, having stopped the compression for a moment, to renew it afterwards still more effectively, we apply on the spot from which the blood flows a small ball of hard charpie, held between the dressing-forceps and previously impregnated with the perchloride, and kept there by compressing it for four or five minutes, and continuing it by means of disks of agaric applied over the charpie, the whole of it being secured by a body bandage. A still more certain means consists in the ligation of the whole umbilical mass. To make this ligation, we must pass a pin through the base of the umbilical tubercle, and pass beneath the pin a thread, turning it several times to make it very tight. This method has appeared to us, as well as to other surgeons, the most efficacious. If, however, we discover a general cause, such as purpura hæmorrhagica, we must prescribe astringents internally, and chiefly with two drops of perchloride of iron given diluted with coffee-water, followed by a spoonful of milk, and repeated according to the result.

Umbilical Vegetation.—We have often, in new-born children, met with a vegetation in the depression of the umbilicus. In the first weeks after birth, sometimes even at the end of three or four months, it resembles a small red polypus of the size of a grain of wheat or a pea. It is pediculated, allows a small amount of bloody

serum to discharge, and sometimes produces inflammation. Frequently, in time, it is detached, but it irritates the umbilicus. It is easy to produce separation with a thread placed around the pedicle. It is nothing more than a granulation, taking on the appearance of a small polypus.

Phlegmon of the Umbilicus.—It sometimes happens that the separation of the umbilical cord is accompanied with a circumscribed inflammation, which occupies the umbilicus and sometimes the vein and artery. This grave disease presents, at the autopsy, consecutive pathological alterations, as detected several times by Dr. Maynet, who has written on this subject. The alterations, which we have twice seen, are, as a general rule, rapid putrefaction, the epidermis of the abdomen being elevated, macerated, with a black discoloration around the umbilicus, depressed abdomen, the cellular tissue around the umbilicus infiltrated with purulent serum, but not a collection of pus, usually a circumscribed redness in the peritoneum around the umbilicus, sometimes general peritonitis, or inflammation of the umbilical vein alone, at other times inflammation of the vein and artery.

These grave pathological lesions, recognized many years ago and still more lately by MM. Baron, Trousseau, and others, have the following causes and symptoms.

Causes.—These are sometimes traumatic, ligation of the cord badly accomplished, irritating ointments applied over the umbilicus, or want of cleanliness; at other times general, as improper diet or poor nourishment to the new-born, or, as established by Maynet and Bouchut, the influence of puerperal peritonitis in the mother.

Symptoms.—These are at first constitutional, and may interfere with our at once recognizing the disease, which often occurs in the earliest days after birth, on the eighth after delivery. The child is constantly fretting and crying, there is frequency of pulse, with weakness, diarrhœa or constipation, sometimes with aphthæ, and the child refuses the breast. We discover around the umbilicus an inflammation which accompanies the separation of the cord, and soon an ulceration which retards this separation, added to which is an erysipelatous redness, more and more pronounced around the umbilicus, and tumefaction in the form of a ring. The ulceration becomes still deeper, the edges inverted, the surface covered with a grayish membrane, and the pus fetid. The erysipelatous circle, more and more swollen, is covered with phlyctenæ

filled with serum, and the tumefaction invades the whole surface of the abdomen, the wound soon taking the characters of hospital putrefaction.

This disease, the progress of which is quite rapid, sometimes lasts two or three days, is, as a general rule, grave, and terminates in death. If, in some very rare cases, a cure results, it is but very slow; the ulceration does not then extend, the false membrane becomes detached, granulations are developed, the pus is arrested, becomes of a better character, and the general symptoms diminish; the child again takes the breast and drinks what is offered it.

Treatment.—Internally, we must combat the constipation, which is of very frequent occurrence, giving calomel in fractional doses. Externally, emollients should be used at first, but as speedily as practicable, and this plan has succeeded in two of our cases; in the first, applications of mercurial ointment with belladonna, then, as soon as possible, elastic collodion. In case of ulceration, powdered tannin and cinchona should be employed, the abdomen being covered with wadding. We have not used cauterization externally, according to the advice of M. Maynet, with a paste of chloride of zinc, nor perchloride of iron, according to Dr. Valette of Lyons, who has employed it both internally and externally.

CHAPTER LXVII.

EPIPHYSEAL SEPARATIONS.

The epiphyses are only consolidated at a certain period of life. Up to that time, they are separated from the bones by a cartilaginous portion. Traumatic separation of the epiphyses, which was described a great many years ago, can only take place before complete solidification, and is consequently met with in children between four and sixteen years of age. Nevertheless, there are cases in which the union is delayed, from which results traumatic rupture in those between eighteen and twenty years and more. Epiphysary separations are not very common. During twenty years of practice at the Hôpital des Enfants, it has often, perhaps,

happened that I failed to recognize them, for I have seen very few cases of this affection. Sometimes I have had occasion to detect it in the extremities of the humerus, then in the inferior extremity of the radius.

Causes.—We may admit, as predisposing causes, rickets, constitutional syphilis and scrofula, which put children in proper condition for epiphysary separation, without referring to the deep affections of the articulations, which may also make us fear the prolongation of arthritis to the connection of the epiphyses, in this way producing the separation; but the traumatic causes are those especially which may produce the separation of the epiphyses from the shaft. Thus falls and blows, striking in the vicinity of articulations, may disunite one or several epiphyses. Epiphysary separations may occur in certain stages of the process of labour.

The *symptoms* of these lesions are those of fractures in the neighbourhood of the joints; mobility between the separated parts, and sometimes crepitation, so that we have often remained in doubt whether the case was one of epiphysary separation or fracture. The age of the patient has sometimes led us to say that there was epiphysary separation rather than fracture. Crepitation, less marked than in fractures, may again induce us to think that the case is one of forcible rupture of the epiphysis.

The *prognosis* is not more grave than that of simple fracture. As a general rule, the *treatment* is that of fractures in the vicinity of the joints. We must especially resort to immobility of the neighbouring articulation.

CHAPTER LXVIII.

CUTANEOUS TUMOURS.

THE follicles, the derma, and epidermis may form superficial tumours on the skin. They are often met with in children, and require the same care as in adults.

Acne is an affection characterized by small tumours formed by hypertrophied sebaceous follicles, containing an accumulation of a varying amount of fatty substance. They are chiefly seen on

the nose, the cheeks, sometimes near the nipple, on the sternum, etc. When pressed between the fingers, these little tumours may be squeezed out, and there will be discharged, through the orifice of the follicle, a whitish substance of vermicular form; and this constitutes the whole treatment.

Follicular Cysts.—These are encysted tumours which take their origin in a cutaneous follicle. The envelope is cellulo-fibrous in the thickness of the skin, which distinguishes them from wens, properly called, which are in the subcutaneous cellular tissue. The membrane of these follicular cysts is smooth, even, soft, and often filled with villous prolongations on its internal surface. It is not susceptible of degeneration, as the other cysts are. We find, in the interior, either a sebaceous matter, or an unctuous and ropy substance; this is atheroma, or else a substance having the consistence of honey, and hence called meliceris.

These cysts are met with in the hairy scalp in the thickness of the skin, are developed and may acquire a certain volume without causing pain. They are not sensitive to the touch, are of variable size, increase slowly, and do not terminate by resolution, but remain for a long time stationary. They sometimes become inflamed, and may open externally; the cyst is thrown out externally with suppuration, but it may remain and be filled up afresh. In some cases, we find that, the cyst being opened and emptied, there remains a fistulous spot, and fungous vegetations spring from its interior.

These follicular cysts, which may sometimes be taken for cold abscesses or lipoma, are, as a general rule, of little gravity. Nevertheless, if they acquire a certain volume and inconvenience the patient, the indication is to relieve him of them.

The *treatment*, in children as in adults, demands removal, not with the bistoury, but with caustic. We for a long time knew that by the use of the bistoury we could very promptly relieve our patients, and that very often we could produce a rapid cure, but for a long time also we had the opportunity of knowing that most frequently, as the result of this removal, very severe erysipelas resulted. We are in favour of employing Vienna caustic, as we do, as a general rule, for all subcutaneous cysts. This method is much longer than when a cutting instrument is used; it may leave a more decided cicatrix, but it obviates mortal symptoms, and we should, as a matter of good surgery, give it the preference. We have already,

in Chapter IX. (page 79) referred to the method of applying the Vienna caustic.

Spots of different colours, circumscribed, brown, yellow, prominent or not, developed on the skin, known under the name of *lentilles*, or commonly nævi, of variable size, may remain stationary during the whole of life, but they may increase in time both in width and thickness, and at a certain period they give origin to hairs. Under such circumstances, these spots, which, when of small dimensions, may be looked on as beauty spots, have a disagreeable appearance. It appears to us that the indication, when they are too large, is to remove them in young people, and we know no better method than the application of a slight layer of Vienna caustic covering the surface of the spot.

Warts, whitish-yellow rugous excrescences, are developed on the hands, chiefly on the dorsal surface. They are usually multiple, rarely solitary, are elevated above the cutaneous surface, and are of various shapes, rounded, granular, angry-looking, more or less consistent, sometimes pediculated. They are formed by the epidermis, having a tissue of variable density, traversed by little vessels, especially appreciable at their base when they are cut transversely. The true treatment consists in excision with a bistoury or scissors, and in caustics, either nitrate of silver applied immediately after excision has been made of the wart as far as the point where the blood appears by the little vessels cut at the base, or a drop of nitric acid applied over the cut. Usually, this little operation may be performed two or three times, two or three days apart, on certain warts. In timid persons, we may, before resorting to this method, try to surround the affected fingers several times daily, and several days in succession, with compresses of linen steeped in acetic acid. This method has succeeded with us, in timid little girls, who dreaded the use of the scissors or the bistoury.

Corns are hard, callous, flat protuberances formed by the epidermis, and are met with on the toes, in children as well as adults, although they are much more uncommon in the former. We have, nevertheless, seen them in young children four or five years of age. Anatomically, the corn is composed of two portions; one superficial, dry, shaped like the head of a nail, formed of several layers of epidermis, sometimes quite easy to separate, and having no appearance of organization; the other, deeper, of a horny character, semi-transparent, springing from the centre of the former, and

penetrating through the derma as far as the tendons, the ligaments, and even the bones. This portion is painful on pressure, and when cut into several vessels are seen, even by the naked eye. In the centre of the corn we find a depression or cavity of a gray colour, surrounded with a ring of cartilaginous appearance.

We must distinguish callosities from corns; the former are only formed by the thickening of the epidermis, are seen in the heel, over the head of the first metatarsal bone, and do not present that portion of a conical shape situated in the middle of the corn, which is buried over the deep parts. The use of proper shoes is the prophylactic means; they should not be too tight, but they should not be too large.

Treatment.—We may, by rest, emollients, and cataplasms, palliate the pain produced by corns; and baths, especially sulphurous baths, employed when the inflammation is not too acute, are excellent palliatives. The remedy *par excellence*, however, is to cut the corns, confining ourselves to the removal of the callous portions as far as the sensitive parts, refraining from going further. Finally, the curative method is extirpation by the bistoury, a delicate operation performed with fine forceps and a bistoury, with which we slowly and carefully accomplish the removal of the corn as far as the root. This little operation is very difficult, and, for prudence sake, we cannot completely extirpate it. As for caustics, they are very difficult to handle. We see too many accidents consequent on their use, to advise them in all cases indiscriminately, and we should prefer the palliative methods to which we are often compelled to resort, but without danger.

We may meet with *bony growths* in children as in adults. We have had occasion to observe them on the toes, and chiefly under the nail of the great toe. They require excision with a strong bistoury.

CHAPTER LXIX.

CRUSHED FINGERS.

We have had occasion, both in hospital and private practice, to observe many cases of crushed fingers in children. The worst of

these were under treatment in the hospital, for, in private practice, though we may sometimes meet with severe injuries of the fingers and even of the hand, the cases are, as a general rule, less serious and limited to one or several fingers, and usually to one or two phalanges, especially the ungual phalanx.

Causes.—In printing offices or workshops in which machinery worked by steam is used, young workmen or apprentices get their fingers caught in the gearing, and these are the most fatal causes met with, producing very serious wounds, which sometimes involve all the fingers or the entire hand, sometimes the arm, and even the patient's life. There is hardly a month in which we do not have cases of this kind to treat in the Hôpital in the Rue de Sèvres, and still more frequently in the Hôpital Sainte Eugénie, on account of its proximity to the manufactories in the quartier Saint Antoine, where many children are employed as apprentices. Other less serious causes occur, especially in civil practice, from windows, doors, drawers, etc. in which one or two fingers become pinched and sometimes badly crushed.

Symptoms.—We meet with cases of but little gravity, and sometimes of the most serious injuries, in children who have had the extremity of one or several fingers pinched in a door or in such tables as have a part movable and raised at will. We then notice simple pressure with wounds or contusions of the soft parts, without fracture of the phalanges. At other times there is fracture with flattening of the phalanx; and in certain cases, nothing like fracture appreciable. Sometimes, especially when the hand has been caught in a machine, the lesions are of much greater extent; portions of fingers are carried away, sometimes one or several; there is laceration of the soft parts of the tendons, the wounds extend as far as the dorsal surface of the hand, and the metacarpal bones are fractured or denuded. All these fractures are comminuted.

These several lesions, which are very different from each other, the most circumscribed as well as the most extensive, present numerous varieties, and may all give rise to nervous symptoms, phlegmon, erysipelas, or purulent infiltration, or require amputation. On account of these serious complications, amputation of the phalanges of the fingers has been performed for a long time, and even of whole hands which appeared to be so thoroughly crushed, that it was hoped that, by substituting a simple wound for a very

complicated one, all the consequences just detailed might be obviated. In the early days of our practice at the Hôpital des Enfants, we made quite a large number of amputations of greater or less importance, from the phalanges to the forearm. For a certain number of years, however, encouraged by the proper use of cold water, we have almost entirely abandoned all these operations, except in cases attended with very considerable mutilation ; for example, in complete comminution of the soft parts and of the bones. Otherwise, when the phalanges, the fingers, and even the hands are fractured with contusions and lacerated wounds, we may and should attempt to preserve the part, even in very serious lesions, or in certain almost total separations of a finger.

We employ continuous irrigation with cold water in warm seasons, and water moderately warm in cold seasons, taking care not to cease its use abruptly, but at the end of three days diminishing gradually. As for the dressings that we make in such cases, we confine ourselves to surrounding the affected parts with fenestrated linen spread with cerate and covered with charpie, the whole lightly supported with a bandage, and we place the hand under continuous irrigation, or else we place it on a mat surrounded with a piece of isinglass plaster, and we advise that the affected part shall be frequently wet without removing the dressing, if this be not oftener done than every two or three days. We take good care in all cases not to employ such agents as may press the fingers together, such as strips of plaster, which we look upon as injurious in the greater number of cases. We prefer to support lightly the parts which appear to be separated or even almost entirely detached. Immobility of the wounded parts is indispensable, and the hand and the fingers should be placed on a wooden splint covered with linen, retained by bandages lightly applied.

Continuous irrigation prevents accidents which might occur. At the end of three or four days we should commence to support more firmly the parts which have a tendency to be separated. We thus avoid the pain and tumefaction of the injured parts. We must only gradually employ retentive methods. We often find, in this mode of treatment, that the most mutilated portions tend to become detached naturally. In cases of crushing of the extremity of a finger with fracture of the phalanx, the nail becomes lost. Sometimes portions of soft parts and even of bone become detached, but we also see parts that are very severely contused that do not become gan-

grenous but regain all their vitality. We have seen flaps of the skin, which could scarcely be retained with fenestrated linen and charpie, becoming approximated, and articulations of the phalanges which were opened, not becoming inflamed, and even closed. Thus we see the fingers or portions of fingers preserved, which have been on the point of being sacrificed.

As the inflammation becomes extinguished, and the gangrenous parts are naturally detached, and the hand of the surgeon has promoted the separation of the slough, we must make the dressings more retentive, so as to maintain as much as possible the normal shape of the parts. There is nothing then to oppose our applying strips made moderately and gradually tighter at each dressing. Tonic liquids, such as alcohol, or spirits of camphor more or less diluted with water or glycerine, or aromatic wine, are employed with benefit. When, in crushing of the fingers, the wounds are closed, we derive advantage from placing the ends of the fingers in a kind of thimble of bone covered with wadding, which should come up on the fingers to a distance corresponding to the extent of fracture, whether one or several phalanges be broken. This serves also as a protector as long as the extremities of the fingers are not sensitive. These thimbles should be held with a finger-stall of skin or cloth, secured at the wrist by tapes. It is the completion of a treatment of the most useful kind for children, which is especially indicated in cases in which the nail is lost and requires a good deal of time to grow again.

Sometimes granulations occur, which should be repressed with alum, especially in the place which will be covered by the nail.

CHAPTER LXX.

LANCING OF THE GUMS.

In former times, and also at the present day, many diseases of childhood have been attributed to dentition. It is especially the want of familiarity with diseases of children, which is the cause of this opinion, too generally diffused, even among physicians. The child is subject, from its birth, to various diseases observed at all

ages. It may be attacked with a number of these during first dentition, and we should be able to recognize them. The irregularity of the process of dentition may nevertheless interfere with the development; they may be cut either too rapidly or too slowly.

By the eruption of the first teeth, which do not appear for several months after birth, we at first notice ptyalism a long time before the tooth makes its exit from the alveolus. This flow of saliva is a salutary phenomenon; it prepares and renders supple the tissue of the gums. The salivary glands become engorged, and there is a peculiar sensation which leads the child and the young animal to bite the substance which it seizes. This pressure of the gum is useful, and consequently favourable for promoting the separation which occurs between the two layers of bone to gradually open the alveolus. At this period corals are useful, but somewhat later, when the gums become sensitive and the point of the tooth commences to press on the swollen tissue, it is much better to give children, instead of hard substances, marshmallow or liquorice roots—in a word, bodies easy to soften with the saliva. Children frequently accomplish their first dentition without having any bad symptoms, but sometimes the tissue of the gum becomes tense and swollen; there is even thirst, fever, and redness of the cheeks. This is the fever of dentition. At this period we must pay careful attention to the child, and learn if these symptoms positively depend on swelling of the gums alone or on any other disease, such as aphthæ, diphtheritic affections, or convulsions, which may manifest themselves under the influence of dentition, as a result of the congestion, which this process may develop in that region of the head.

We should at first employ in these cases only emollients, fomentations over the gums with the finger impregnated with a soothing solution, borax, honey of roses, etc.; slight derivatives acting through the intestinal canal; pediluvia, the use of wadding boots covered with isinglass plaster, secured by tapes to the legs, to prolong a heat which produces transpiration in the lower extremities. When these simple means, which most frequently succeed, fail, we may sometimes resort to incision of the gum, which appears red and distended by pressure of the tooth. This little operation is especially indicated if convulsions are produced by the pain.

To perform this operation, it is necessary that an assistant shall hold the child's head firmly; the operator then separates its cheek

with a finger of his left hand, holding in his right a bistoury, the blade of which is wrapped in linen in two-thirds of its extent, in such a way that the point is only uncovered for rather less than half an inch. At first one incision should be made transversely, then another, which will produce a crucial incision. It is still better to remove at a single cut a flap of the gum, without making any previous incision. The swelling is more easily reduced in this way, with the advantage of not having the wound closing up on the very next day. We should introduce the extremity of the finger into the wound, to assure ourselves if we can detect the tooth, and if the alveolus is not too tightly pressed, and does not require an incision, which can be readily done with scissors. We must not too frequently perform this operation, which, however, is a harmless one; we must particularly reserve it for the molar teeth, the tubercles of which oppose more resistance to the tissue of the gums. We must also urge the importance of relaxant and calming agents, before deciding to operate. We have obtained successful results, but we have observed that by making the incision too soon, we may have sometimes retarded the escape of the tooth, because we may open the dental capsule before the tooth has reached its degree of perfect ossification; it then makes its appearance very slowly. It is often then more prudent to refrain from it.

CHAPTER LXXI.

ABSCESS OF THE NASAL SEPTUM.

Children have very often been sent to us who were supposed to be suffering from nasal polypus, and we have discovered, as a general rule, these supposed polypous tumours to be purulent collections seated under the mucous membrane covering the vomer.

Causes.—These abscesses seated in the nasal septum are most frequently developed under the influence of falls or blows on the nose; sometimes they are occasioned by a disease of the vomer, as caries or necrosis, often from a scrofulous cause. It has been among lymphatic children that we have met with this affection.

Symptoms.—When these abscesses are developed as the result of a fall on the nose, or a blow on this region, there are pain, swelling

and sensibility to the touch, and the patient experiences difficulty in respiration through the nose. In examining the interior of the nostrils, it appears sometimes that the nasal septum is inclined to one side or the other, or presents on both sides tumefaction, with sensitiveness to the touch, and fluctuation easily recognized by introducing the little finger, feeling the projecting part with the pulp of the finger, and compressing the nose on the other side. These abscesses have not at all the appearance of the mucous polypous tumours which we have scarcely had the opportunity of observing in children, and which, besides, are movable and pediculated; such is not the case in these abscesses. Left to themselves, the latter may open naturally, but this takes place slowly; the patient sometimes suffers for a long time, and is always more or less embarrassed in respiration.

In acute cases, it is necessary to give issue to the pus just as soon as it is appreciable. In chronic cases, which are developed more slowly without great pain, there is less soreness, and we may postpone it. In any event, emollient injections and fumigations may be employed, but the true curative method consists in puncture performed with the point of a bistoury, which must be guarded with a strip of linen to within about half an inch of its extremity. In this way, when we introduce it into the nose, we avoid wounding the border, if the patient should happen to move. It is also essential, in this little operation, that the patient should be held firmly, with his head supported on the chest of an assistant, with his face turned to the light. When the incision has been made, pus flows out freely, and its discharge may be encouraged by pressing the nose, and causing the patient to blow.

The next day, if the wound has a tendency to close, we may introduce into it the end of a catheter to separate the edges of the wound, and by pressure may cause the freshly formed pus to be discharged. We may also use injections, which will vary according to the case, being emollient at first, and afterwards detersive, if such is the indication. As a general rule, such children are easily cured, and we have always had success in many cases in which physicians have misunderstood these abscesses, and have even employed several remedies uselessly.

It may be, that, if these abscesses are occasioned by a disease of the vomer, the indication will be to subject the child to a general anti-scrofulous treatment, for in these cases there may exist more or

less extensive necrosis of the nasal septum, which is only cured after the separation of a portion of necrosed bone, and this sometimes requires a long time.

CHAPTER LXXII.

CONGENITAL LUXATIONS.

Articular displacements existing in children at birth have received the name of congenital luxations. Since the last investigations of M. Guérin on this subject, they have been very numerous, some of which are quite rare. Having only had occasion to meet with a small number of these luxations, if we except club-foot, congenital luxations of the thigh, a few cases of luxation of the clavicle, and luxation of the head of the radius, we cannot speak in a practical manner on this subject, and we shall have but little to say on the cases which we have seen. Several of these luxations, however, were pointed out a very long time since, but lately a greater number have been described. The list of congenital luxations observed on the living subject and on the cadaver by M. J. Guérin, is as follows: 1. Occipito-atloid luxations; 2. Luxations in various parts of the vertebral column; 3. Complete luxation of the jaw in the zygomatic fossa; 4. Luxations of the clavicle on the sternum inward, forward, and backward; 5. Luxations of the scapular extremity of the clavicle upward and outward; 6. Scapulo-humeral luxations downward, inward, upward, and outward; 7. Ulno-humeral luxation backward; 8. Luxation of the head of the radius upward and forward; 9. Luxation of the wrist forward, backward and upward, and backward and outward; 10. Sacro-iliac luxation upward and backward, diastasis of the pubes; 11. Coxo-femoral luxations, upward and outward, directly upward, forward and upward, backward and upward; 12. Incomplete luxation of the knee forward, incomplete backward, incomplete inward and backward, and backward and outward; 13. Luxations of the foot, incomplete tibio-astragaloid, incomplete calcaneo-astragaloid, astragalo-scaphoid, calcaneo-cuboid, and metatarso-phalangeal. Several of these congenital luxations have been met with in anencephalous monstrosities, others in children at birth, or in children of four, eight, ten, and fifteen years of age, and even older. Speaking in a

general way, congenital luxations are quite rare, are often multiple, and sometimes seen on two congenerous limbs, and are observed with other anomalies, which are frequently the causes of non-viability.

Post-mortem examination of these luxations presents variations, according to the period of life at which it is made; and great differences are observed in the fœtus, the child, and the adult. Dissection of the fœtus gives us ligaments, articular ligaments, relaxed, not lacerated, as M. Guérin remarked; there is not complete luxation, but we can separate very easily the articular surfaces, as cannot be done in the normal articulation. As the patient becomes older, two years or four years or more, we may detect much more readily the precise nature of these different deformities. Thus we find extremities of bones without definite shape, articular cavities becoming filled up and disappearing, new ones formed in their vicinity, new ligaments developed, all the alterations, indeed, that are met with in unreduced traumatic luxations. The limb may become diminished and shorter, the muscles retracted, and, in addition to this, atrophied on account of the small amount of move ment it undergoes, this being always more limited than in cases in which the limb is in its normal condition.

The *causes* of these congenital luxations are very obscure, for as in club-foot we are unable to make direct observations, we must supply the deficiency with theories. According to the views of some, congenital luxations are original; others claim that they are hereditary, and cases have been cited to prove it. Diseases of the nervous system may be the cause of these luxations; convulsions, for instance, according to M. Guérin; so also arrest of development, perhaps also malformations of surfaces. Articular diseases may also be developed in the womb of the mother, and then these luxations have for their cause an arthritis occurring at different periods of pregnancy, hydrarthrosis, etc., according to the opinion of Malgaigne of Paris. Mechanical injuries operating on the uterus during pregnancy have also been supposed to produce these luxations. It may also happen that in a natural labour the child may produce a luxation, and with much more reason in a tedious labour requiring manipulation and the use of instruments. Which ever cause of all those mentioned may be the real one, we find these luxations at birth, or some time afterwards, with symptoms analogous to traumatic luxation.

To refer only to congenital luxations which we have had occasion to observe, we may remark that, 1. In luxation of the clavicle, we have found the symptoms of this dislocation of the sternal extremity forwards; at birth, as at a later period, the bandages which must be applied to support this luxation, which is quite easily reduced, irritate the child's breast, and cannot be continued. Besides, no bandage gives proper support to the luxation, and none can prevent the reduction from being very incomplete. 2. Of luxation of the head of the radius forwards, which we have seen two or three times, the same may be said as in luxation of the clavicle, it not being very decided at birth, but becoming in time more appreciable. Reduction was quite easy, but could not be maintained. 3. Cases of congenital luxation of the coxo-femoral articulation, which we have more often seen, we have found to be more frequent in girls than in boys, and, as a general rule, we have noticed the following symptoms. Usually we have met with the luxation upwards and outwards, often on both sides symmetrically; sometimes, however, we have seen both femurs differently luxated on the right and left sides.

As the attention of parents is not generally awakened until the child commences to walk, it is only at the age of a year at the earliest, that we have had occasion to see these cases. We have not had the opportunity to observe them at birth, as M. Verneuil had, who had the advantage of examining a dead fœtus which had scarcely breathed. This little subject presented a luxation of the left side, which was incomplete, the hip of that side being more elevated, the thigh being flexed one-fourth on the pelvis. In decided adduction combined with a movement of rotation inwards, the upper portion of the femur formed a considerable prominence backwards, outwards, and upwards, the articular movements were impeded, flexion and rotation outwards were restricted, extension was but slightly practicable, and abduction was impossible. Only when the child has attained the age of one or two years have we observed these phenomena, which constitute luxation on the living subject. When the luxation is only on one side, there is a remarkable difference in the length of the two limbs, and the amount of their shortening varies according to the degree to which the head of the femur ascends in bilateral luxation. They are out of all proportion to the trunk; the thighs appear short relatively to the legs; the great trochanter is more or less approximated to the iliac crest, and

is projected outwards and thrown backwards; there is separation of the great trochanter from the median axis of the body; the nates present a rounded prominence formed by the head of the femur more or less appreciable when the head is buried in a new cavity of reception, or it may be made more apparent by rotating the limb inwards and flexing it. As remarked by M. Bouvier, we should seek the head of the femur forwards, near the iliac spine, by instituting in the extended limb movements of rotation inwards and then outwards.

The femur is oblique inwards; and in double luxation, the patient being in a standing position, the two knees are seen to touch. The thigh is of large size above, and small below; there is a depression in the groin, and when movements of rotation are instituted by placing the fingers in this depression, we cannot feel the head of the femur turn. This is, however, what is often remarked in many cases in which there is no luxation. On the luxated side the nates are flattened, and enlarged transversely, and the fold of the nates is more elevated.

In double luxation, if the patient is in an upright position, the pelvis is thrown forwards, and the anterior iliac spines are brought nearer to the axilla. There results a very decided concavity in the lumbar region, the patient looking as if he was saddle-backed. In unilateral luxations, the pelvis is inclined laterally, and the lumbar region and the spine describe an entire curve, with the convexity turned on the side of the luxated limb. In luxation of one side progression is made by the trunk being at first flexed on the luxated limb, the hip of that side being alternately depressed and elevated in such a way that there is a balancing of the whole body. In double luxation, the patient is raised on tiptoe and can only with an effort raise his feet successively from the ground to put one before the other, so that he walks with his body bent, and oscillating right and left.

Pathological Anatomy of Congenital Luxations of the Coxo-femoral Articulation.—The few autopsies we have made in these cases have exhibited to us cotyloid cavities of greater or less extent on the part on which the head of the femur glided. In one case we observed that the cotyloid cavity was higher than in the normal state; in another, we found it of very small depth and narrower than usual; we also found the head of the femur luxated upward, resting on the worn cotyloid edge, which looked as if it was trodden

down. The capsule was elongated and distended. We also had occasion to find the head of the femur atrophied, worn away, and deprived of cartilage.

Treatment.—We have abstained from treatment, not having been persuaded of the utility of extension, which, according to their accounts, gave cures to Drs. Humbert, and Jacquier, Pravaz, Bonnet of Lyons, and M. Guérin. Like M. Bouvier, we are in doubt in regard to these successes which have been pointed out as cases of cure. We have not employed apparatus for extension, and have been content with making the patient wear a belt surrounding the pelvis, and compressing the two trochanters, as advised by Dupuytren. We believe that we can displace the head of the luxated femur, but we cannot maintain it in position, and it constantly slips on the point in which it rested, before attempts were perseveringly made, and prolonged for a considerable time, whatever may be the apparatus employed.

CHAPTER LXXIII.

FOREIGN BODIES IN THE ŒSOPHAGUS.

We most frequently meet with foreign bodies in the œsophagus in children and old people. In the latter, it is due especially to the want of teeth, which does not allow of complete mastication, and besides, in some of them, to feebleness of the muscles which act in deglutition, and are attacked with more or less marked paralysis. In children it is often the want of teeth in the youngest of them, but is rather inattention and gluttony, or the desire to speak while holding a foreign body in the mouth, which cause these accidents. Most commonly, these substances are fishbones, pins, small fragments of wood, fruit stones, sugar-plums, sugar, sometimes portions of bone, and even small entire bones, patellas, vertebræ of winged animals, phalanges, morsels of bread or meat not well masticated, fruit swallowed whole, olives, pennies, chestnuts, sometimes pieces of money, buttons, etc.

All these foreign bodies act differently, according to their shape; they may dissolve, as sugar-plums and bonbons, and thus diminish

in size and pass onwards without stopping long. But insoluble substances may reach the thoracic portion of the œsophagus, more or less rapidly when they are not rough or of too large size; or else they are arrested by being of too considerable a volume, and at other times retained by the roughnesses on their surface, such as a piece of bone, or because they are pointed, as needles, pins, fish-bones, etc. They may become implanted lengthwise or obliquely, or crosswise in the mucous membrane of the pharynx, the pillars of the velum palati or the œsophagus. If the foreign body is of a certain volume, as a piece of money, a fruit stone, etc., it is arrested at the inferior orifice of the pharynx, and is then compressed by the contractions of the canal of the œsophagus. The muscular fibres, when they act, prevent it from either descending or ascending, and by its presence it produces convulsive movements of deglutition or vomiting, which wedge it in more tightly.

Frequently, if it descends lower, it penetrates the pectoral portion of the œsophagus more easily, and is less obstructed after having passed a spot corresponding to the upper portion of the sternum and the trachea. At last it arrives towards the lower portion of the œsophagus which enters into the diaphragmatic orifice. If the foreign body is of a certain size, there is difficulty in its passing through the cardia, and this causes great distress and a painful sensation all the time that it takes to pass into the stomach. Once passed, relief is experienced and the trouble is over.

Symptoms.—These are, continual or remittent pain in the region of the neck, violent and convulsive efforts of vomiting, with more or less difficult deglutition of solids; and the respiration may be embarrassed, if there is a body of any size pressing on the opening of the larynx before it arrives in the pharynx. If the substance reaches the pharynx or the œsophagus, it may still interfere with respiration by lateral compression of the trachea. If the foreign substance is arrested and remains, inflammatory symptoms arise, even when it is very small; a fishbone or a pin, may, even when it has passed through the stomach or been expelled by the mouth, leave a sensation of pain, which causes the patient often to believe that he has not been relieved, although he may have been so. If the foreign body is expelled, the slight local irritation ceases of itself; but, if the body remains, suppuration may be developed around it where it is attached to the mucous membrane. Sometimes it may be expelled by coughing, preceded by vomiting of blood mixed

more or less rapidly with pus, or pass into the stomach, carrying with it the foreign body.

More serious symptoms may be developed, as tumefaction of the face, obstruction of the respiration, and in the course of the neck sometimes a tumour appreciable to the sight and touch, which announces the presence of the foreign body, and frequently an abscess. In these cases, we must perform catheterization, holding the child seated on an assistant, who will support it with its chest on his own, securing its arms, while another assistant supports the head carried backwards. Then, armed with a properly proportioned œsophageal sound, the surgeon directs the instrument through the nasal fossæ, which is more easy in children who are unwilling to open the mouth, and who likewise bite the sound. We must conduct the instrument through one nostril, as far as the posterior wall of the pharynx, which we must closely follow, to avoid passing into the larynx. Then, if there is neither anxiety nor rancous cough, we may continue to push the sound and recognize the presence of the foreign body, which is met with at one point or another.

Treatment.—When such a child presents himself, and this frequently occurs, he complains of having swallowed a foreign body. If he experiences pain in the throat or the pharynx, examination with a tongue-depressor may often detect a fishbone, a pin, or a small portion of bone implanted at a point within sight, and then the foreign body may be extracted with a pair of forceps. In these easy cases we should not think of employing œsophageal catheterization, but when we can see nothing, and we presume that the foreign body is further on, we must not forget, before making an examination, that foreign bodies conduct themselves differently according to their nature. They may be expelled by efforts of coughing or vomiting; they may be swallowed and pass into the stomach, sometimes a short time after their introduction, by the efforts of deglutition, or a little later, after a suppuration is formed around the foreign body imbedded in the mucous membrane. In these cases nature has taken the trouble and surgery has nothing to do.

Arrived in the stomach, the foreign body may be expelled through the intestinal canal. Thus, in children, we have seen pebbles, buttons, pieces of money, fruit stones, and even pointed substances, such as a needle, after passing through the entire intestine, discharged more or less promptly by the anus. Nevertheless, we must not always count on so favourable a termination.

It has been found that the foreign body may open a passage and make an outlet for itself by ulceration; or it will tend to escape through the cervical region of the œsophagus, producing, as we have said, an abscess; or it may descend through the digestive passages and become engaged in another canal, as the biliary canals, or the appendix cæci; or it may ulcerate the trachea, and pass into the great vessels, etc., and cause subsequent mortal symptoms. In good practical surgery, being familiar with the formidable accidents that may happen, and without forgetting the successful results often observed, or being too rash, we must act according to the indications.

1. There are cases in which we can operate through the mouth and make extraction by means of forceps of different shapes and of various dimensions, as polypus forceps or cranesbill forceps. As a general rule, we have found these means very useful, either to extract bones engaged in the pharynx or in the upper part of the œsophagus, or to seize a penny that a small girl had swallowed, and which was arrested in the passage of the pharynx and the œsophagus. Generally, after having explored at first with the eyes, then with the finger or with the œsophageal sound, the indication is to perform certain extractions with the œsophageal forceps. When the foreign body is appreciable to the touch in the cervical region, we should hold the portion of the neck in which the substance is felt with the fingers of the left hand, which support it and prevent it thus from being pushed forwards with the forceps, which is directed with the right hand. This precaution is indispensable for the ready seizing of the body we wish to extract.

2. Sometimes we must, before removing the foreign body, unhook it; otherwise, we may thrust it further in. When, for example, a hook has been swallowed, which has occurred many times, the extraction should be made in the following manner: a steel ball is pierced at its centre, through which the thread is passed which holds the hook, and the ball is made to slide over the thread; then, using a reed, the knots of which are perforated, this last is conducted by means of the thread as far as the ball. We draw gently on the reed, and thus we may detach the hook, and in drawing on the thread cause the ball, the hook, and the reed to come up.

Another method that has been suggested is as follows: we endeavour to have a hook like that which has been swallowed, and we procure a leaden ball of a diameter double that of the hook

swallowed. This is pierced with a hole in which we engage the thread holding the hook; the weight of the ball which slides on the thread as far as the hook may unfasten it, and the whole may be withdrawn together.

Both of these plans, which resemble each other, have been resorted to successfully. Hooks have also been used; the double ring-hook of Graefe being the most effective. It represents a kind of small metallic bivalve hoop, in the centre of which is fixed a piece of whalebone, in such a manner that the two valves may be movable, and may be carried by the slightest pressure either to one side or the other. This instrument, of a volume which enables it to pass through the pharynx and into the œsophagus, is introduced deeply, going beyond the foreign body; then, in withdrawing it, the movable valves, on one side or the other, catch the foreign body, which may thus be extracted. It has done good service to Dupuytren, Blondin, Bérard, and others, chiefly for the removal of pieces of money.

We may also use a sponge fastened on a whalebone, which may be introduced without being moistened, between the walls of the œsophagus and the foreign body. The sponge is left several minutes beneath the foreign body we wish to extract; it thus increases in volume, and when withdrawn the foreign body is brought away with it.

3. When we cannot succeed by these various means of extraction, or the indication is not to employ them, we must resort to methods of pushing the foreign body into the stomach. In fact we may often, without great inconvenience, do this with a badly masticated morsel of meat, a fruit stone of greater or less size, etc. To push down these foreign bodies, we may successfully employ a large quantity of fluid, or of maccaroni, of marmalades, or of pea soup, which may carry along the foreign body downwards. We had occasion, in a patient who had swallowed a needle while eating vermicelli, after having failed with emetics, which may sometimes be employed, to advise that he should drink every night gum-water, and take enemas; he had several alvine evacuations, in one of which, the next day, they found the needle. To carry the foreign body onward, we may make the patient eat prunes and panada, or else use leeks, as suggested by Paré. Finally, it is often of advantage to push forward the foreign body with a sponge fastened on a whalebone, etc.

4. If all these methods fail, and the foreign body is not dislodged, we must act in two ways: cutting into the œsophagus, either in the cervical portion, using as a guide the foreign body, which may be felt at some point or other; or else, if we cannot be guided by this foreign body, and it is lower down, we must, in recalling thoroughly the anatomical relation of the cervical region on the left side, perform œsophagotomy as described in the works on surgery. We may sometimes, if the foreign body is at a point corresponding to the larynx and the patient is suffocating, be obliged before everything else to perform tracheotomy, if we cannot at once extract it. We thus prevent death by asphyxia, and may then make up our mind afterwards as regards the removal of the foreign body.

INDEX.

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