without any treatment, and there is therefore no necessity to torture the patient with the vesicants and pustulating ointments so much in vogue, by which an additional disease is produced without palliating the original one. At first, two or three injections of tepid water, daily, and stuffing the ear with charpie, is all that is requisite. If the pain is intense, causing sleeplessness, one to four drops of laudanum, according to the age of the child, may be given in the evening. Astringent injections in the first days of the discharge are totally useless, and in most instances they cause intense pains and an augmentation of the discharge, on account of which it is best to confine the treatment for the first eight days to injections of simple warm water. Of all the astringents, I consider a solution of alum (℥ j to water ℥ j) the best and simplest, a few drops of which are dropped into the ear morning and evening, after the ear has been syringed with warm water and wiped dry. This solution is as efficacious an astringent as nitrate of silver, and has the important advantage that it neither stains the linen nor discolors the skin. After several weeks the discharge ceases entirely. If no cerumen appears, a few drops of cod-liver oil with iodine (gr. j to ℥ j) should be dropped into the ear. This will cause some itching for a time, and will be followed by a return of the normal secretion. In scrofulous children, a general treatment with cod-liver oil, iron, baths, gymnastics, etc., may always be instituted with advantage, as will be more minutely discussed in the chapter on scrofula.

(3.) Abscesses in the Meatus (*Otitis Externa Phlegmonosa*).—The symptoms of phlegmonous otitis, with suppuration, are much more violent than those of the previous form. Abscesses can only occur in the anterior and easily-accessible parts; for only this, the cartilaginous portion, contains a layer of cellular tissue, while, in the osseous, the periosteum and lining membrane are intimately united. The pain, at first, is bearable, and nothing but a general redness and slight tumefaction are observed; but, after twenty-four to forty-eight hours, the pain becomes aggravated to an excruciating intensity; the child cries night and day without ceasing, is unable to sleep, and every motion of the lower jaw increases the pain. On this account these patients speak indistinctly, and swallow with the utmost caution. Even young infants, but a few months old, are liable to be attacked by this affection, and indicate to their attendants the site of the disease by frequently pulling at the ear. After these pains have continued for two or three days with uniform severity, they then become throbbing, and can only be alleviated by comparatively large doses of morphine. The meatus, in the mean time, has become completely closed by swelling, and, if examined with a probe, it will be found that the swelling is not uniform, but that one part of the meatus, generally the lower, is elevated into a small fluctuating abscess of the size of a pea. A few drops of pus and blood escape when this abscess is opened, or when it bursts spontaneously, and the pain then instantly subsides, but the little abscess still suppurates for a few days, then becomes completely closed, the adjacent redness and swelling also decline, and the whole disease in a few days entirely disappears, leaving scarcely a trace behind.

I am not aware of any positively certain cause for it. Abscesses of the ear occur as well in healthy as in scrofulous children, but are especially frequent in children who are teething. The prognosis is extremely favorable, a fact that does not always seem probable to the less experienced, on account of the violent symptoms which usher in the affection. Induration or ulceration, with exfoliation of the cartilage and bones, scarcely ever ensues. Periostitis of the external meatus is very rare in young children; on the other hand, however, there are several diseases following, and frequently due to periostitis of the middle ear.

Therapeutics.—The principal object is the speedy mitigation of the extremely torturing pains, which may be accomplished by a cautious administration of opium or morphine, they being the most efficient remedies. It is also very important that the patients should use a firm horse-hair pillow, by means of which the internal ear is less liable to be compressed. Topically, it is best to inject warm water, and conduct the steam from hot chamomile-tea upon the abscess. The application of poultices invariably causes pain, and they do not perceptibly promote suppuration. The only means by which we can afford the patient immediate relief is to open the abscess as early as possible, for which a simple incision suffices. The injections of tepid water should then be continued for a few days, when the whole difficulty will entirely disappear.

(4.) Inflammation of the Middle Ear (*Otitis Interna*).—In inflammation of the middle ear, either that of the mucous membrane alone, or, conjointly with it, of the periosteum and bone, may occur, and, for this reason, we have to discriminate between (1) a catarrhus and (2) a periostitis auris mediæ.

(a.) *Catarrhus Auris Mediæ.*—This disease must be regarded as the most frequent cause of the deafness which attends inflammation of the ear, and because it usually occurs in both ears at the same time. The catarrh is probably propagated from the Eustachian tube to the tympanum, and the mucous membrane of the tympanum, when once inflamed, behaves like other chronically-affected mucous membranes. Hence we see improvement, soon followed by exacerbations. These children suffer most from deafness in damp weather, or when affected

with cold. After hawking, sneezing, or vomiting, tolerably good hearing suddenly ensues, but, after a few hours, again disappears.

The diagnosis of catarrh of the tympanum in children cannot be as accurately made out as in adults, for the former do not willingly submit to have the Eustachian tube explored. Hence the air-douche, the chief diagnostic test in the disease, cannot be obtained. The inspection of the external meatus, by the aid of a speculum, furnishes negative results, as nothing abnormal can be discovered by it, nor do the feeble changes in the color of the tympanum, upon which some aurists place great value, supply any sufficient diagnostic information. In fact, the principal symptom is a deafness or hardness of hearing, changeable with the weather, and combined with catarrh of the mouth and nose, and a negative state of the external meatus.

The termination is usually a sad one, as good hearing seldom returns in any case of chronic catarrh of the middle ear. The patients, therefore, should be content, if the disease do not become more and more aggravated, and terminate in total deafness. In most instances, the cause is inherited scrofulous cachexia, which, in these children, predisposes to hardness of hearing, and is much less liable to become localized upon other parts, such as the eyes, nose, and skin.

Treatment.—The local treatment should be restricted to the extirpation of the hypertrophied tonsils, abscission of the elongated uvula, and inflations of powdered alum into the fauces, because, as has been already stated, in children, the catheterism of the Eustachian tube and the air-douche can seldom readily be applied. I have treated three cases by keeping up a constant pustular eruption alternately behind the ears and on different parts of the neck, with very good results. I have been led to adopt this treatment from the fact that most of these children, suffering from partial deafness, are more or less scrofulous; and I have also repeatedly observed that they are but seldom, and in a very slight degree, troubled with cutaneous eruptions, and derive benefit from this treatment. Two of the cases above referred to, as treated in this manner, recovered their previous good hearing almost perfectly, and, although the third is not much improved, still the symptoms exhibit no special aggravations. I am in the habit of employing:

℞. Empltr. adhæsiv. flav., ʒiv,
Tartar. stibiat. . . . ʒj,

which is smeared upon a piece of linen, of the size of a silver dollar, and allowed to lie upon the skin for four days, when the spot will be found to be covered with bloody pustules, which are not disposed to heal, but will suppurate for many days. As soon, however, as these have healed, the same process may be repeated on another place.

These children should also be guarded against catarrhs, which is best accomplished by inuring them to the changes of the temperature by the daily cold bath and country air. A general treatment, with iron and cod-liver oil, is also indicated by the scrofulous complication.

(b.) *Inflammation of the Periosteum of the Middle Ear—Periostitis—the Real Otitis Interna.*—Periostitis of the middle ear is the most important and dangerous of all the diseases of the ear, for it not only produces the most intense pains, and most frequently leads to total deafness, but life is also endangered by purulent meningitis of the most intense form, which is apt to supervene. For that reason, also, has it attracted the universal attention of aurists, and its symptoms and terminations are much more minutely described than any other disease of the ear.

Symptoms.—In children the disease almost always begins suddenly, and, fortunately, attacks but one ear, never both at the same time. A rapidly-increasing, boring, lancinating pain comes on in the affected ear, which radiates over the adjacent parts, the temple, back of the head, neck, and jaws, and, in a very short time, becomes so intense as to almost drive the child to distraction. It screams and cries incessantly, and cannot be tranquillized in any manner. Toward evening the pains reach their utmost intensity; they are also aggravated by all movements of the lower jaw, and of the head generally, by swallowing, sneezing, coughing, and particularly by loud noises. Nevertheless, the increased irritability of the nerve of hearing, which manifests itself by greater sensibility to noise, and by constant buzzing in the ears, subsides very soon, and is succeeded by more or less complete deafness. These violent local symptoms, as might be supposed, are not unattended by reflex action upon the general system. Violent fever, very frequent and hard pulse, general *malaise*, cold sweats, and great thirst supervene.

In nurslings, all the symptoms just enumerated cannot always be elicited. They are extremely restless, cry at every noise that is made, frequently pull at their ears, and, when at last they have fallen asleep, will wake at the slightest noise with a cry of pain, and incessantly rub the head to and fro upon the pillow. Pressure upon the affected ear also gives rise to the loudest outcries of pain. When put to the breast, they will suck at it only for a short time, and break off with a cry, because the act of sucking aggravates the pain, and, on the other hand, drinks administered by a spoon are swallowed with avidity. Like all other pains and febrile diseases, so is also this condition capable of causing partial or general convulsions, and then it is very liable to be confounded with other cerebral affections.

The examination of the external ear in the first days of the disease

furnishes no positive results, and, besides, is extremely painful, particularly when the speculum is used.

These painful phenomena never last longer than five, or at the utmost six days. But, before the expiration of this time, death, in exceptional cases, may take place by convulsions, or under meningitic phenomena. An actual simple resolution of the inflammation, attended by a subsidence of the pains, may indeed also occur, but in this case there is always a suspicion of a diagnostic error. In most instances, the inflammatory pus and the deposited purulent exudation tunnel a passage outwardly in various directions.

The most frequent termination is by perforation of the tympanum, followed by discharge of bloody-streaked, highly-pungent pus. The small bones of the ear, and some pieces of necrosed bone, may escape, followed finally by the cure of the periostitis, with complete deafness of the affected side. Still, it also happens that the small bones of the ear are not discharged, that the perforated tympanum, after the pus escapes, closes up again, and then a slight hardness of hearing only remains.

Some solitary cases are recorded where the pus escaped through the Eustachian tube. They seem, however, to occur but very rarely, and cannot be demonstrated in children, who swallow the pus, not understanding how to remove it by hawking.

Another way in which the pus frequently escapes is into the cells of the mastoid process. An œdematous redness is then observed behind the auricle, the red spot bulges up more and more, fluctuates distinctly, and ultimately, if left to itself, will open. The copious bloody pus which escapes at first likewise has a pungent odor, and carries off with it some particles of bone, and, after a few weeks, becomes mucous and shreddy. If the abscess is explored with a probe, a few exposed spots of rough, denuded bone will almost always be detected; sometimes, however, this is impossible, owing to the curved or angular course of the cavity. The pus is so rich in sulphuretted hydrogen and sulphuret of ammonia, that the silver probe quickly becomes discolored. Ultimately, the fistulous track closes, but not till after many months, and even years, and the contracted cutaneous cicatrix remains consolidated with the bones. Deafness is the most usual termination, and, in the rarer favorable instances, deafness of a lesser degree simply results. When the caries extends to the Fallopian canal, convulsions will take place, and subsequently paralysis of the facial nerve, which runs through this passage. This paralysis is not permanent in all cases; it may disappear again soon after the pus that has exercised the pressure escapes, but, when it has lasted for several months, as a rule, it will be permanent.

The worst event to be dreaded here is the involvement of the labyrinth, and necrosis of the petrous portion of the temporal bone, with consecutive purulent meningitis and encephalitis. The purulent collections in the brain usually communicate with those in the internal ear, and, when the tympanum becomes perforated, may even escape outwardly. But abscesses also occur in the brain without the petrous bone being markedly affected, thus proving that otitis interna, aside from producing a direct mechanical propagation, is also capable of bringing about a concentric cerebritis. These cerebral complications invariably terminate fatally.

Prognostically, the perforation of the tympanum, with discharge of the matter outwardly, when the extremely doubtful resolution is excluded, may be looked upon as a favorable termination, especially if the rare and fortunate event occur of the bones of the internal ear being retained, and the tympanum closing up again.

Much less hopeful and promising is the result in caries of the mastoid process, whereby the deafness usually becomes more marked, the fistulæ remain open for years, and painful contracting cicatrices form. In caries of the petrous portion of the temporal bone, which manifests itself by grave meningitic symptoms, by unilateral convulsions, and, subsequently, paralysis, the prognosis may generally be regarded as fatal. In general, it may be assumed that the children who suffer from otitis interna are scrofulous to a high degree, and that, therefore, tuberculosis of the lung will, with great probability, ensue after the appearance of puberty.

Etiology.—Scrofulosis and tuberculosis furnish the chief predisposing causes of this affection. It either alternates with scrofulous exanthemata, the disease localizing itself, immediately after their rapid desiccation, in the internal ear, without any simultaneous external otorrhœa, or a similarly scrofulous purulent discharge from the meatus auditorius finally causes perforation of the tympanum, and thus gains entrance into the middle ear. This affection also supervenes upon an acute exanthema, and particularly scarlatina. The exciting causes deserving to be mentioned are, foreign bodies in the external ear, those that irritate the tympanum, such as chemical corrosive liquids, which intentionally, with criminal intent, or accidentally, have been poured into the ear, and, lastly, violent injuries and blows in the region of the ear.

Treatment.—The extraordinary severity of the pain at the commencement of the disease induces the relations of the child to covet as speedy a relief as possible, which, however, cannot be satisfied in most instances as rapidly as is desired. The most effectual of all pain-assuaging remedies, opium, ought not to be given to infants,

especially to those who have not passed the first dentition, because sopor, followed by cerebral irritation, may be produced, and thus the effects of the opium, and the morbid process which is being propagated to the brain, will not be distinguishable. Cautious experiments with opium may, it is true, be instituted, even in young children, for these dreadful consecutive effects do not ensue in all cases; but we have to limit ourselves to such small doses, that the desired pain-assuaging effects have not usually been realized.

Much better effects have been obtained, in young children, from bitter-almond water and extract of belladonna. Topical abstraction of blood, whose pain-alleviating effects certainly cannot be denied, should be very sparingly practised, as almost all children affected by this disease are scrofulous, and have already been sufficiently reduced by the pain and fever attending it.

Leeches should never be applied in greater numbers than the number of years of the child's age. General abstraction of blood should be avoided entirely.

Most children tolerate nothing in the external meatus nor upon the auricle, and the pain is best borne when the ear is entirely free, and not in contact with any thing. If, in a few days, the pains become throbbing, and the parts in the vicinity of the mastoid process reddened, warm vapors of chamomile-tea may be advantageously conducted into the meatus, and the parts behind the ear may be poulticed. As soon as the pus bursts through the tympanum, or externally through the mastoid process, all pain suddenly ceases, and it is now principally a question of properly keeping up the discharge. For this purpose it is absolutely necessary to provide the relatives with a good metallic (not glass) syringe, and to instruct them thoroughly in its use. Injections of warm water, regularly repeated every two or three hours, afford the only guarantee that the matter escapes without pain and without interruption. The meatus should never be wiped out with the twisted corner of a pocket-handkerchief, for the greatest amount of irritation is produced by the practice, and it should be entirely discarded. But, if it is totally impossible to remove the secretion, crusts will form, especially on the mastoid process; the pus is then prevented from escaping, and increased pain will be the result. In this case, the use of sweet-oil may be of some benefit. If the inflammatory stadium has already expired, astringent injections may be commenced, and a solution of alum (ʒ j to water ℥ j) will be found to answer the purpose best. In caries of the mastoid process, *Rau* recommends a solution of sulphate of copper (gr. ii—xii to water ℥ j) to be injected into the cancelli of the bone.

Internally, during the inflammatory stage, up to the bursting of

the abscess, small doses of calomel are generally given, by which the bowels are kept open, and the intensity of fever diminished. The termination in suppuration, however, is not by any means prevented by it. The children subsequently require a tonic and anti-scrofulous treatment, with cod-liver oil, iron, cinchona, ale, wine, meat diet, sea-baths, and country air, etc.

Referring the student, for descriptions of the rarer forms of inflammation of the *internal ear*, and of otalgia and nervous deafness, to the special works of *Rau*, *Kramer*, and *Erhardt*, we will now proceed to make a few remarks upon—

(5.) Foreign Bodies in the Ear.—There is a great natural propensity in the child—proceeding, perhaps, from curiosity—to perform various experiments on its body, and to examine more minutely the cavities which open upon its surface. Hence the particular disposition to push small objects into the apertures, and then to await their effects. In most instances the objects pushed into the meatus are readily recognized when a ray of sunlight is allowed to fall upon them; but, when tumefaction, as a result of irritation, has already supervened, the examination will be much more difficult. Probes should only be used with the utmost caution, for with them the extraneous bodies are readily thrust still farther in.

The symptoms which are induced by a foreign body in the ear vary very much according to its nature and form. Smooth, round objects, which do not swell up in the ear, often produce no symptoms at all for a long time, but, when rough, long, or swollen, the meatus always suffers, and painful otorrhœa ensues. The tympanum is liable to be perforated by the otorrhœa, and in particular by the unsuccessful attempts at extraction, and all the symptoms of otitis interna, described in the preceding section, are renewed. The objects most frequently introduced are: cherry-stones, grape-seeds, peas, beans, lentils, pebbles, glass beads, balls of paper, and pieces of confectionary. The lumps of indurated cerumen, cotton, wool, and filth, and concretions, the so-called otolithes, so frequently met with in aged people, are scarcely ever observed in children. Living animalcula, it is true, at first produce very unpleasant sensations; soon, however, they adhere to the cerumen, and perish quickly, or may be killed by a few drops of water or diluted spirits of wine. The ear-worm (forficula auricula), so much dreaded by people, occasions no special danger, but behaves in the ear in as harmless a manner as all other living animalcula of that calibre.

The most serious symptoms are those occasioned by corrosive substances, nitrate of silver, caustic potassa, and the mineral acids, by which the tympanum is destroyed in a very short time, and the whole

train of terrible symptoms of otitis interna is set going. Of all the extraneous non-corrosive substances, those of an organic character are the worst; the moisture and warmth of the meatus cause them to swell up; this is especially applicable to peas, beans, and lentils; in a lesser degree also to all fruit-kernels. Small pebbles and glass beads are tolerated for a long time without any serious effects, if they have not been too firmly wedged in by forcible attempts at extraction. The condition is most favorable in confectionary articles; they soon soften and liquefy, a result much accelerated by a few drops of water.

Treatment.—The only and chief indication, the removal of the foreign body, cannot always be quickly enough carried out, for the tumefaction of the meatus and pain often render this impossible. These symptoms should first be palliated by leeches, cataplasms, dropping in of oil, and injections with warm water. There are various methods of removing the foreign substance, some of which, however, are laborious and adventurous. The forcible injection of a stream of tepid water is undoubtedly the safest and simplest means of setting it afloat. It is hardly ever of precisely the same form as the meatus; the water, therefore, gets behind it, and gradually sets it afloat, and it soon after makes its appearance at the verge of the meatus, and can thence easily be picked out. If this measure has failed to remove it, we may resort to elevators. These may be made at any time, by bending the blunt end of a fine hair-pin toward the flat surface. The end, thus curved, is carefully insinuated behind the foreign body, which is easily brought out. In desperate cases, small blunt hooks may also be resorted to; these should be introduced flat-wise, and then turned so as to come against the object from behind. The utmost caution, however, should be exercised in their use, for the points of the hook may break off, and, if the patient is at all restless, the tympanum is liable to be ruptured. Forceps, if the bodies are round, such as peas, beans, pebbles, beads, etc., are totally useless and even injurious, for two branches require more space than the foreign body, in order to embrace it at its largest diameter, and therefore rarely grasp it. They almost always slip off, and thereby push the article still farther inward.

A third method, which, to be sure, is very mild, as well as often ineffectual, consists in extraction by the aid of some tenacious substance which has previously been brought in connection with the extraneous substance. For this purpose, a quill, cut off smooth at both ends, is introduced into the ear, and through this a piece of tape soaked in glue pushed down upon the foreign body. After a few hours the tape will be found to adhere pretty firmly to the article, and then it is sometimes very successfully and agreeably pulled out. But, when

the pebbles, etc., are firmly wedged, the piece of tape will come out alone, and the entire procedure will have been a failure.

All these methods of extraction require the utmost tranquillity and steadiness on the part of the patient, which cannot be expected, especially from a child. Hence, chloroform will have to be employed in most cases, and will be found to immensely facilitate the manipulations. Otitis and otorrhœa, which result from this accident, must be treated according to the principles already prescribed, but they also subside, even without any treatment, much more rapidly than the cachectic otorrhœa.

CHAPTER VI.

DISEASES OF THE GENITO-URINARY ORGANS.

A.—*KIDNEY.*

(1.) Malformation of the Kidneys.—The kidneys are never totally absent; even in the most incomplete abortions they may be detected in some form. One kidney only is to be found in some cases, in which condition *Rokitansky* makes a distinction between the *single* and the *simple*. In the former, a single kidney is found at the normal place, to the right or left side of the vertebral column, differing in shape but little from the ordinary kidney, while on the opposite side there is no trace of a gland. The simple kidney, on the other hand, is an abnormal fusion of two kidneys, the most common form of which is the horse-shoe kidney (*ren unguiformis*). In this case two separated glands of normal shape are united at the lower end by means of a flat bridge of renal substance. The more limited this connection becomes, the more distinct the form of the *simple* kidney appears. Finally, also, the two hila fuse together, forming a single hilum on the anterior surface. The simple kidney is always situated lower in the abdomen than the normal gland, and, as a rule, lies in the vicinity of the promontory of the sacrum; seldom, like the single kidney, external to the median line.

Besides this condition, various other minor deviations in form also occur, and in this connection it may be observed that the kidney of the new-born child, in the normal state, has a slightly uneven surface, and is nearer spherical in form than in the adult, and tapers somewhat toward the upper end.

(2.) Uric-Acid Infarction of the New-born (*Infarctus Renalis*).—Uric-acid infarction is a recent discovery, the merit of which