with cow's milk, and amylaceous broths; children at the breast rarely suffer from flatulence. It follows, that children about to be brought up by hand, who are predisposed to colic, must soon be habituated to meat-soups, which at first should be given slightly sweetened, and but once a day; later, twice daily, and without any sugar. I do not consider it necessary to restrict children to any particular kind of meat—veal and chickens are unnecessary luxuries—the main thing is that the soups are not too concentrated nor salty, and should be freed from oil-globules as much as possible. The best material to give the soup suitable consistence is pulverized wheat bread; rice, groats, and mucilaginous soups are not tolerated long.

During the attack, colic requires a symptomatic, and, subsequently, a causative treatment. The symptomatic treatment consists either in a cautious employment of narcotics, particularly the preparations of opium, of hydrocyanic acid and nux vomica, or in ethereal, aromatic remedies, chamomile, peppermint, or melisa teas, applied per os et anum. Above all, it is necessary to keep the patients warm; this is readily accomplished by wrapping them up in warm clothes, by applying to the abdomen bottles filled with warm water, or bags filled with warm chamomile-flowers; warm drinks are also very beneficial.

The causative treatment has for its object the removal of the different causes:

(1.) Colic produced by anomalous contents of the stomach and alimentary canal. Here, if possible, the stomach should be evacuated by mechanical means, or, if not, by four to eight grains of ipecac. When coarse, indigestible nutriments have once passed beyond the pylorus, they will produce diarrhœa by their own irritation, and there will hardly ever be any occasion to induce it by remedies; on the contrary, it often happens that the diarrhœa has to be arrested by constipating remedies, because it has become too profuse. Worm-colic must be treated first by opium, to palliate the colic; then, however, by proper doses of anthelmintics to expel the worms, a more detailed description of which will follow further on. Vermifuge remedies should never be given to a child suffering from diarrhœa and colic.

(2.) Colic caused by impaction of stagnant alvine masses, owing to their generally rapid digestion and absorption, rarely occurs in children. But fruit-seeds, especially of grapes and cherries, accumulate into large lumps, and the stools, notwithstanding the fruits partaken of, remain hard, and, if a large quantity has been swallowed, intense colic pains, and even symptoms of intestinal stenosis, will follow. As these lumps of fruit-seeds almost always remain in the small intestines, clysters therefore do not suffice to remove them; an augmentation of the intestinal secretion must be obtained, to soften and make

them liquid, for which purpose a few large doses of calomel, of four to five grains, will be found to answer.

(3.) Colics depending upon textural alterations of the alimentary canal only require a symptomatic treatment, as has already been stated above; the treatment of the textural diseases will be given more in detail in connection with their descriptions.

Lead colic, arsenial colic, and all other toxical colics in general, must be treated as in the adult, by the respective antidotes which toxicology prescribes.

(e.) *Diarrhœa* (διάῤῥοια, from *dia*, and ῥέω, I flow).—By diarrhœa we understand a qualitative and quantitative derangement of the excrements. The quality of the excrement evacuated is, aside from the chemical and microscopical properties, subsequently to be elucidated, in so far changed that it no longer possesses the semi-solid, pap-like consistence, but is now a watery liquid alone, or watery liquid in which fecal matter or remnants of food are suspended. The quantity is always increased in diarrhœa, but no very precise amounts can be given, because, in the infantile age the stools cannot be properly collected, and the measurements give therefore only an approximative result; the eye-measurement, however, suffices completely to confirm the statement that a larger quantity of alvine matter is evacuated in diarrhœa than in the normal state. That the anus has to open itself oftener than usual, in order to expel a larger quantity of excrement, requires no further comment. Owing to the irritation which the liquid alkaline intestinal contents exercise upon the sphincters, the defecation takes place oftener even than would be absolutely necessary in conformity with the total quantity of the fæces evacuated.

Various kinds of stools may be distinguished, according to the form, color, and smell; and furthermore, according to the chemical and microscopical properties.

The normal form of the infantile fæces in the first year of life is the pappy; the color is yellow, like that of the yolk of egg; the smell is feebly acid, never putrid, and, only in children who are fed upon a meat-diet, as repulsively pungent as in the adult; in later years they are no longer to be distinguished from those of the adult.

Diarrhœa may consist simply of softer, more fluid, but yellow-dyed, and still feculent matters—diarrhœa simplex, stercoralis sive fusa—or undigested articles of food pass off with such constituted stools, a condition that has been called diarrhœa lienterica, lienteria (from λεῖον, smooth, and ἔντερον, intestines, lævitas intestinorum). These occur extremely frequently in artificially-brought-up children; for the careless parents try from time to time whether they might not finally cease preparing extra dishes for the child, and allow it to

eat from the general dish. They give the children meat, vegetables, and fruit. Occasionally, finely-cut pieces of meat are digested; as a rule, however, the children, for want of teeth, swallow larger pieces, which the gastric juice is incapable of dissolving, and these now pass through the whole of the intestinal canal as foreign bodies, and undergo decomposition. Vegetables and raw fruit are generally discharged in an undigested state, and often cause a very profuse, dangerous diarrhœa, sometimes none whatever.

Again, there are diarrhœæ where the bright-yellow evacuations are so thin that they squirt out from the anus as from a syringe, and, like water, soak through the diapers and bedclothes. They occur principally in cholera nostras and asiatica, and in children who have only been just weaned, diarrhœa ablactatorum; they are either totally odorless, or have a putrid but never the physiological acid smell, and never react acid, like the normal stools of children at the breast, but neutral, sometimes even alkaline, from the presence of large quantities of the alkaline carbonates. If they have been collected in a clean vessel, and then poured into a test-tube, they will separate into two strata, after the manner of typhus-fever stools; the upper one is bright, almost perfectly transparent, the lower flocculent, and mixed with small brown feculent lumps; this lower layer is often very small, and forms but a tenth part of the upper. The microscopic examination, besides the undigested remnants of food, such as vegetable cells, amyloid bodies, milk-globules, casein-coagula, etc., reveals nothing but intensely yellow or light-brown-dyed scales, fragments of epithelium-cells, and a number of brown globules of various sizes, without enveloping membranes, as may be readily demonstrated by simply compressing them; entire cylindrical epithelium-cells are rarely seen. In alkaline stools the triple phosphates are also found. Generally these stools do not contain albumen, but when they have a rose or reddish-brown color, usually due to an admixture of small quantities of blood, then albumen may easily be detected by the aid of nitric acid.

The green stools of children are commonly denominated "bilious," but without any correct foundation, for nobody has yet demonstrated that they contain more component parts of bile than yellow or brown stools. The coloring matter of the bile is originally brown, and the normal fæces on that account brown; or, if the children are only fed upon milk, golden yellow. But the normal brown coloring matter of the bile (the biliphæin) can very easily be converted by a number of chemical agents, even by simple contact with air, into the green (biliverdin), and this, in the medication of children, very frequently happens through calomel. The supposition that the green

stools, after small doses of calomel, are due to a mechanical admixture of a substance covered with a black coating of sulphuret of mercury, is erroneous; for (1.) These green-colored stools often last for several days, and are of large quantities, without it being possible to demonstrate the presence of mercury in them after the second day; and (2.) The stools may be diluted with water, and filtered, when the latter will be seen to run through the filter very green in color, proving conclusively that it is not a mechanical coloring.

In young children green stools occur during dentition, and after almost every intestinal catarrh produced by undigested nutriments, and it seems that the augmented secretion of the intestines is sufficient to convert the biliphæin into biliverdin. It also very frequently happens, that the fæces are evacuated perfectly yellow, but turn to a green color when exposed to the air for a few hours. This change of color first begins at the periphery and on the thinner layer of the fecal masses; and not till some time after do the denser, principal lumps become affected, until the whole is seen to be dyed uniformly green. Children with such evacuations usually suffer from slight digestive disturbances.

In still another kind of diarrhœa, admixtures of large quantities of mucus occur, large and small lumps and shreds of which being discharged with the almost liquid intestinal secretion, having the greatest resemblance to the glairy nasal mucus. They may be tolerably well freed from coloring matter by agitating them with water; they lose, however, thereby, in transparency, and under the microscope exhibit mucus-corpuscles, fragments of epithelium, and granular masses. The evacuations of these are attended by pain.

In artificially-reared, slowly-developing children, gray or bright-yellow colored, loamy stools are sometimes met with, which may be smeared like moist clay upon the diapers and with the greatest exertion only are expelled from the anus. This decoloration is due to a deficiency or absence of bile, or at least of the coloring matter of the bile, and, so far as I am aware, has no deleterious effect upon the digestion and development in particular. True, by the aid of the extract, or a few grains of powdered rhubarb, an increased secretion of bile may readily be obtained; the danger, however, is always thereby incurred of inducing an intestinal catarrh, the end of which it is impossible to foresee; consequently more harm may be accomplished by it than good.

The odor of the diarrhœic fæces will always be of the greatest importance in judging the disease of the mucous membrane, and particularly for the prognosis. Of a number of stools, having the same appearance and the same degree of fluidity, some will have scarcely

any odor, others will smell simply fecal, and still others *fetid* and *putrid*. These last are always symptomatic of a grave disease, of enteritis folliculosa, which in most instances terminates in death. The odor is difficult to be described, but may be best compared to sulphuretted hydrogen; it is often so offensively pungent, that the care of such children can only be properly carried out by great sacrifices on the part of the attendant, the rest of the occupants of the room in which the child is confined being obliged to vacate it. These stools are also evacuated with pain, and redden the anus and its adjacent parts. Most frequently they are met with as accompaniments of thrush, in which the anus, genitals, inner part of the thighs, and heels, appear intensely reddened, and, in parts, also eroded. Microscopically and chemically, I could detect no special distinguishing characteristics in these stools, and, with the exception of the odor, know no pathognomonic peculiarity to mention.

Pus probably never occurs in the stools of small children; in those of larger ones it may sometimes be seen after dysentery has been arrested. Most tubercular ulcers of the bowels are situated in the small intestines, and their discharges are not so copious that whole streaks of pus, for these only are meant, can be found in the stools.

(f.) *Obstipation* (*Obstructio Alvi*), *Constipation.*—When otherwise healthy children, under one year of age, have not two evacuations, and those from one to three years at least one stool a day, the consistence of the fæces becomes hard, and a condition results that has been called obstructio alvi. Artificially-reared infants are mainly subject to it; still it is also sometimes seen in children at the breast, especially in those whose wet-nurses suffer from this evil. The chemical investigation of the milk of such wet-nurses leads to negative results.

The *causes* of constipation are found in the following conditions:

(1.) Deficient or too tenacious intestinal mucus. The constipation of most febrile affections is mainly due to this condition, or to augmented perspiratory and urinary secretions.

(2.) The nutriments, especially the amylaceous class, soups containing meal, rice, sago, etc. In older children the various dishes consisting of beans, peas, and the like. Again, all nutriments and medicines containing astringents, red-wine, the preparations of lead, alum, iron, bismuth, chalk, nitrate of silver, and vegetable remedies containing tannin; all these may produce constipation, which will last for some time.

(3.) Too slight peristaltic movement of the alimentary tube, which is scarcely ever observed as a primary but mostly as a secondary condition, the effect of disease in other organs. Here belongs the obstinate constipation of acute hydrocephalus, in which, notwithstanding its long duration, the abdomen always remains depressed. In atrophied children, in ultimo stadio, besides the diminution of the intestinal secretions, atrophy of the muscular coat of the bowels becomes superadded, and then constipation ensues through a double cause, and finally a peripheral paralytic state of the bowels also occurs, especially in mechanical or perforative peritonitis.

(4.) Mechanical obstructions, incarcerated herniæ, intussusceptions, tortions, complete occlusion of the calibre of the gut by firm, dry stercoraceous masses, etc., occur extremely rarely in children. In new-born children, imperforatio ani, a description of which will follow further on, must be taken into consideration.

The description of the symptoms is almost exhausted by the definition of the malady. The abdomen is distended, but, in simple constipation, not painful to the touch. The sparsely-evacuated fæces lay dry in the diapers, like those of the goat or sheep. When the evil is of long standing and intense degree, the tympanitis increases so much as to push the liver upward; the spleen cannot be detected by percussion, and the whole abdomen feels as tense as the head of a drum, on account of which, it will naturally be painful to the touch. Then the children leave off eating, are very restless, attacked by eructations, and finally by vomiting, some fetid intestinal gas passes off, with slight temporary relief, but all the symptoms disappear at once, if one or more copious evacuations have been produced.

When the disease is of long duration, the tympanitis becomes chronic. Owing to the protracted anorexia the patients become very much reduced, and, as a result of the continuous compression of the abdominal veins, a marked collateral venous circulation forms beneath the abdominal integument.

In every serious constipation it is advisable to examine the anus and rectum with the finger, because we may thereby often dispense with the internal treatment. Hernia is frequently the effect of this evil; and convulsions in small children. If no mechanical insurmountable hinderances, as those enumerated in sec. 4, are present, the prognosis may be regarded as favorable.

Therapeutics.—The treatment must fathom the cause; therefore, the diet is, first of all, to be tested and regulated. A slight modification of the nutrition often suffices to relieve the evil, as, for instance, meal food is to be allowed only once instead of three times a day to the child, and more milk given than heretofore, or the very constipating mucilaginous soups are substituted by thin beef broths with some wheat bread, which is made to form the staple of the daily nutriment. In somewhat older children the stools may be readily

augmented by allowing them boiled and also raw fruits, grapes, apples, pears, etc.; next by a plentiful supply of cold water, and it is especially advisable to try to remedy the constipation by a change of diet, before aperient remedies, of whatever kind they may be, are resorted to. If no success has attended this simple method of subjugating the evil, one or two teaspoonfuls of ℞. rhei aquosa should be given, as it is always the best and least injurious. Calomel should never be resorted to for the mere purpose of promoting the stools, when no other indication for it exists, for the very reason that mercury cannot be cleared of the suspicion that it tends, in many cases, to retard the development of the child, and promotes caries of the teeth. A small suppository of common soap introduced into the rectum will frequently relieve the constipation. Clysters of cold water or of soap-water have the double effect of softening the hard fecal contents of the rectum, and, by consensual irritation, of stimulating the whole intestines into increased peristaltic action, and of augmenting the secretions thereof. But when the fecal masses are very compact, it will not be possible to employ clysters, for the water will flow out again even during the injection, and we have no other alternative but to remove them by mechanical means, by the aid of a hair-pin, scoop, or the like. Constipation accompanying febrile diseases, and that originating as an effect of acute hydrocephalus and of peritonitis, very seldom become objects of special treatment, and will be spoken of in the relative sections.

(2.) Catarrh of the Gastric Mucous Membrane (*Catarrhus Ventriculi*).—Catarrh of the mucous membrane of the stomach, or gastritis catarrhalis, is met with in the autopsies of many children, who, during life, exhibited no signs whatever of disturbed digestion. When we bear in mind that a bright-red color of the gastric mucous membrane is a *physiological condition* in the new-born, it will not be possible to lay very great stress upon the frequently-described injections, and still more of the ecchymosis of that mucous membrane, especially as we have no guide whether any, and, if any, what symptoms are produced thereby. Only when a blennorrhœa of the gastric mucous membrane has developed itself, and the profusely-secreted mucus is vomited several times a day, are we justified, from a clinical point of view, to diagnose a gastric catarrh. The causes of this affection are as numerous as those which have been enumerated in the previous sections for dyspepsia, vomiting, flatulence, etc.

Symptoms.—The symptoms of such a gastric blennorrhœa are fixed, continuous stomach-ache, increased on pressure, permanent distention of the epigastric region, perceptibly increased temperature of the same, and an accumulation of gas within the stomach. Warm or

solid nutriments and warm drinks, introduced into the stomach, aggravate the pains; cold drinks, particularly cold milk, relieve them. True, the food is frequently thrown up, but upon that alone the diagnosis of gastric catarrh cannot be based; an emesis of pure, opaque, glairy, or greenish mucus, without much retching, must take place before or some hours after the meal. The nutrition of the child is not much interfered with at first, because, as has been already observed, the food is not regularly thrown up, and the intestinal mucous membrane is still capable of absorption. But in the course of time emaciation comes on. In the cadaver the gastric mucous membrane is found hypertrophied, covered with a thick layer of mucus, its upper surface uneven and warty, a condition that has been called *état mamelonné* by the French; but it is only necessary to observe here, that, before a mucous membrane can be called mammellonated, the contracted stomach should have been stretched out to its fullest capacity, for, in the strongly-contracted stomach, every mucous membrane, even the healthiest, will assume a warty appearance. The rest of the symptoms enumerated in text-books, those regarding the pulse, the general condition, the stools, the urine, etc., are not sufficiently characteristic to deserve a place here.

Therapeutics.—The chief object of the treatment is to regulate the diet, and nothing but cold milk should be allowed for several days. Against the profuse secretion of the mucus, nitrate of silver has proved to be a sovereign remedy. To small children under one year and up to two years of age, I give a solution containing nitrate of silver, gr. ss. to water ℥ iij, without syrup, or any mucilaginous addition. To children several years old who are adepts at swallowing pills, $\frac{1}{6}$ gr. nitrate of silver each will be found to act better than the solution. I recollect but a single instance, that of a boy eight years old, in whom I was unable to accomplish any satisfactory results with this method of treatment. For ten days he took four to six nitrate-of-silver pills without any effect, whereupon I ordered him five drops of creosote in five ounces of mucilaginous vehicle, and, to my great surprise, the vomiting of mucus was suddenly arrested by it. Nitrate of silver, cæteris paribus, will always be preferable to the creosote, owing to the unpleasant odor and disagreeable taste of the latter. Compare the treatment of vomiting, page 130.

(3.) Toxic Inflammation of the Stomach.—All children are lickerish, and junket whenever they get a chance, and thus it not unfrequently happens that children from one to five years of age, especially in manufacturing cities, where a great deal of strong acids and caustic alkalies are used, hurriedly swallow large quantities of sulphuric or nitric acid, caustic alkali, caustic lime, common lye or car-