

gum-arabic. It may be given also with *mistura cretæ*. Resorcin has been used successfully in the same condition of things requiring carbo-lic acid. Rhubarb, in doses that are merely astringent, with an aromatic (cinnamon) and an alkali (bicarbonate of potassium), is an efficient remedy, especially in this combination. Infusion of rhubarb, tincture of cinnamon, with some bicarbonate of potassium, makes a disagreeable but extremely serviceable prescription in these cases. Oxide of zinc, oxide of silver, nitrate of silver, are useful in those cases characterized by severe watery purging rather than vomiting. When the vomiting is excessive, and other medicines are rejected, calomel is extremely beneficial, and, indeed, in ordinary cases, it has the first position almost as a sedative to the gastro-intestinal mucous membrane. It must be given in very small doses—one twentieth to one tenth of a grain, every half hour or hour. It may be rubbed up with some sugar of milk and dropped on the tongue. When there is much straining, and especially if there be much mucus, and mucus streaked with blood, passed from the bowels, minute doses of arsenic (from one eighth to one fourth drop of Fowler's solution) with a little opium (one fourth to one half of a drop of the deodorized tincture), every three hours, are very serviceable, and, under the same conditions, very small doses of corrosive sublimate ($\frac{1}{10}$ gr.) may do great good. If the discharges are very profuse, watery, and not restrained by the remedies prescribed by the stomach, enemata of starch and laudanum may be used. Counter-irritation by mustard (the skin very little reddened or irritated), or by means of a spice-bag, or, better, a turpentine-stupe, is beneficial, if not carried too far.

When the algid stage approaches, nitro-glycerin, amyl nitrite, and atropine, may be most effective in reviving the failing circulation.

DUODENITIS—CATARRH OF THE DUODENUM.

Definition.—Catarrh of the mucous membrane of the duodenum may be acute or chronic. As the ductus communis choledochus opens into that part of the canal, the catarrhal process extends up by contiguity of tissue, and hence catarrhal jaundice may coexist with duodenitis.

Etiology.—Climatic changes are very influential in setting up a catarrh of the duodenum. External irritation, if severe and prolonged, will cause hyperæmia and structural changes, just as a severe burn will excite ulceration. Probably the most common cause is indigestible aliment, which passes the stomach unchanged, and the excessive use of starchy, saccharine, and fatty foods, which require for their digestion and absorption the action of the intestinal juices, of the bile, and of the pancreatic fluid.

Pathological Anatomy.—The general description already given applies here. Hyperæmia and œdema occur to a more pronounced extent about the orifice of the common bile-duct, which is so swollen as to encroach materially on the lumen. More or less injection and swelling of the mucous lining of the duct exist to a variable extent.

Symptoms.—The anatomical seat of the inflammation influences, to a great extent, the symptoms. In other cases of intestinal catarrh, diarrhœa is a prominent symptom; in duodenitis, diarrhœa is exceptional, and more or less constipation is the rule. Pain and disorders of digestion are usually present, and jaundice is a prominent symptom.

The pain is felt in the right hypochondriac and umbilical regions, and soreness can be developed by deep pressure over the duodenum. The pain is not usually very acute—the sensation is compounded of pain and soreness, but occasionally severe pain occurs in the hepatic plexus. As in catarrh of the stomach there are occasional attacks of gastralgia, so in catarrh of the duodenum there are occasional attacks of hepatalgia. The paroxysms of severe pain come on gradually, and, after some hours, gradually subside. There is no increased soreness during the existence of the pain or subsequently.

There may or may not be present gastric catarrh, as well as duodenitis. The distress caused by the presence of food is felt about three hours after it has been taken, and is usually referred by the patient to the seat of the disease. The starchy and saccharine elements of the food undergo fermentation, and hence, in about three hours after they have been swallowed, the formation of flatus begins, the small intestines become distended with gas, and some pain, due to the stretching of the bowel, is felt about the umbilicus. From the third to the seventh day jaundice appears. It is usually announced by a coated tongue, fetid breath, and yellowness of the conjunctiva, headache, stupor, and hebetude of mind (cholæmia), with depression of spirits. The yellowness extends, and in a short time the jaundice is universal. The absorption of bile is coincident with swelling of the common duct, and entire absence of bile in the intestinal canal. The stools now have a pasty consistence, a slate-color, and fetid odor. Gas, discharged previously, had but little odor; after the jaundice, it has the same fetid character as the stools. The urine is thick from excess of urates, and of a deep-brownish color from presence of bile-pigment. When the jaundice has attained the maximum, there are complete anorexia, nausea, sometimes vomiting of food, mucus, sero-mucus, and constipation, although diarrhœa may occur; but instead of jaundice there may be merely the condition of biliousness. The temperature is slightly elevated—99.5° Fahr. in the morning and 100° to 101° Fahr. in the evening. The pulse corresponds.

Course, Duration, and Termination.—The disease is self-limited, and, if permitted to pursue its course uninterrupted, will last two or three weeks, leaving the patient much debilitated. In malarious districts this malady is exceedingly common, and may be intimately associated with malarial infection. The chronic form of duodenitis is essentially the same in respect to clinical history and characters, except as to duration and violence of the symptoms, as the acute form. The duration of the chronic form may be several months. The late researches of Charcot and Legg have demonstrated that long-continued obstacle to the outflow of bile leads to structural changes in the liver. The termination of uncomplicated duodenitis is in health. The acute is apt to pass into the chronic form, and the latter to affect the hepatic parenchyma in the manner to be hereafter described. Hepatic colic is also one of the results of this disease.

Diagnosis.—Duodenal catarrh may be confounded with gastric catarrh, with hepatic colic, and with diseases of the liver proper, accompanied by jaundice. As respects gastric catarrh, the differentiation is to be made by reference to the seat of pain and soreness, the time when the distress from the presence of food comes on, the occurrence of flatulence with bowel-pain, and especially the appearance of jaundice at a certain time after the beginning of the symptoms. Duodenal catarrh is separated from hepatic colic by the following signs: In the latter, the pain comes on suddenly after some pain and soreness in the region of the gall-bladder, and radiates from this point over the abdomen; the pain is so intense as to produce a cold surface, a weak pulse, great depression, and incessant vomiting; the pain suddenly ceases, and there is complete relief, except some local tenderness; jaundice follows these symptoms, but disappears in a few days, leaving the patient well; and a gall-stone may be found in an evacuation a few days after the attack. Hepatalgia is a neuralgic attack, occurring suddenly, and limited to the hepatic plexus. It ceases suddenly, leaving the patient well, and the only interference with function is during the existence of pain. Its duration is but a few hours.

Treatment.—The first point is regulation of the diet. The diet should be restricted to those substances convertible into peptones in the stomach, as milk, whey, buttermilk, eggs, animal broths, and all saccharine, starchy, and fatty constituents should be avoided. Fresh meats, game, poultry, and fish, without butter or fat, are admissible if the stomach is equal to their digestion. The most rapid progress can be made by adhering to an exclusive diet of milk, and, as there is complete anorexia, this is usually not difficult. The hyperæmia of the duodenal mucous membrane is relieved by saline laxatives, by the Saratoga, Carlsbad, or Vichy waters, by Rochelle salts, but especially

by phosphate of soda, which should be given in drachm-doses about four times a day. Other remedies, acting similarly, are sulphate of magnesia and bitartrate of potassa. The general principle is to use remedies which will promote an outward diffusion, and thus relieve the congestion and œdema of the mucous membrane. Small doses of calomel ($\frac{1}{4}$ grain to one grain) may be highly useful as a sedative and anti-ferment, and acting in the same way are bismuth, oxides of silver and zinc, but especially the purified black oxide of manganese. Active cholagogues, as the resin of podophyllin, rhubarb, aloes, etc., are to be avoided on account of the irritation which they induce. Excellent results are had from the benzoates—the benzoates of sodium and ammonium, especially the latter. Benzoate checks fermentation in the duodenum, lessens stasis in the portal system, and promotes elimination by the kidneys. To rouse the liver—a favorite phrase—is out of place here, since the obstacles to the outflow of bile are merely mechanical. When malarial infection coexists, quinine is indispensable to restore health. Without any complication of malaria, quinine has a good effect, and hastens the disappearance of the jaundice. When the bile enters the intestine and the intestinal digestion is restored, the jaundice may still linger. Diuretics and purgatives may then be employed to remove the last traces of bile-pigment.

ILEITIS—ILEO-COLITIS—CATARRH OF THE ILEUM AND OF THE ILEUM AND COLON. ACUTE DIARRHŒA; CHRONIC DIARRHŒA.

Definition.—Ileitis is a catarrh of the ileum, either acute or chronic; ileo-colitis is a catarrh involving both parts—the whole extent of the ileum and the cæcum and ascending colon. This may also be either acute or chronic. The disease is frequently denominated diarrhœa, from a single symptom.

Causes.—The causes already given for other forms of intestinal catarrh are equally true of this form. The two great factors are improper and indigestible food and the summer temperature. An attack may be brought on by exposure to cold and damp air when in a perspiring state. The sudden arrest of cutaneous transpiration precipitates a vicarious duty on the mucous membrane, with the effect to induce a general hyperæmia of the ileum and colon. As respects children, the causes in operation to produce ileo-colitis are the same as those which bring on cholera infantum.

Pathological Anatomy.—In this variety of intestinal catarrh, the morbid anatomy has the special feature of enlargement of the agminated patches, which are most abundant and most highly developed in

the lower ileum. The condition of the epithelium, of the villi, and of the glands, has been described. Sufficient emphasis has, probably, not been put on the tendency of the swollen glands to ulcerate. In the acute cases the orifices of the solitary glands are here and there eroded; but in the chronic cases considerable ulcers form. These changes are different in character and very different in extent from those which take place in typhoid.

Symptoms.—The acute form of ileitis or ileo-colitis sets in with some chilliness and general *malaise*, followed by feverishness. Pain in the abdomen, usually about the umbilicus, is felt, and then loose evacuations begin. The number of stools each day varies with the character of food and the extent of the disease, especially in the colon. It would be a mistake to suppose that the diarrhœa is due solely to an irritation of the affected portions of the mucous membrane by the particles of aliment reaching them. Considerable transudation occurs as one result of the hyperæmia: cast-off epithelium, young cells, and minute sloughs mix with the serum, and constitute no small part of the stools discharged. Besides, the chyle imperfectly prepared for absorption, and hurried down the canal by the increased peristalsis, and the fatty, starchy, and saccharine constituents of the food, fermenting instead of digesting, unite to form the liquid discharges characteristic of ileo-colitis. As might be expected, there is little fecal matter proper, and the stools have a yellow or greenish-yellow color, and, if the evacuations have been very copious, they may be whitish, like the "rice-water" discharges. In children the stools have a somewhat different character, owing to the presence of casein, which presents an appearance of putty, or the casein occurs in small, irregular masses. Very often the stools have a bright-green color, or become green on exposure. Just before the evacuation considerable pain is experienced, and, in children, nausea and vomiting also. The pain is usually increased by pressure, and soreness is developed at any time by deep pressure. As gases are freely generated in food decompositions, the intestines are often suddenly distended, giving rise to pains as of flatulent colic. Borborygmi are more or less present. It is a curious fact that mental depression is a very constant condition in cases of ileo-colitis when there is abundant production of gas. The digestion and assimilation of food being almost arrested, and great waste taking place by the intestinal mucous membrane, it is obvious that the organism must lose ground rapidly. The subcutaneous fat disappears; the muscles shrink and lose their contractile energy; the skin becomes dry, sallow, and wrinkled; the action of the heart is weak, the pulse small and feeble; the urine is acid, high-colored, and burning. Children affected with summer diarrhœa, and having from three to six evacuations a day and vomiting occasionally,

rapidly emaciate, are reduced to a skeleton in fact. In the adult the chronic form is known as "chronic diarrhœa," in which, as is well known, the wasting of the tissues of the body proceeds to the lowest point.

Course, Duration, and Termination.—In the simplest cases of catarrh of the intestine, due merely to an unusual accumulation of fæces—crapulous diarrhœa—the looseness of the bowels is conservative, an effort of nature to be encouraged rather than restrained. In mild, uncomplicated cases the tendency is to recovery in a few days, but in the severe cases the duration may be several weeks. In the chronic form the duration is indefinite. The acute runs insensibly into the chronic form, and there is no well-marked distinction, except the element of time.

Diagnosis.—The distinctions to be made are between duodenal catarrh and catarrh of the rectum (proctitis). In children, ileo-colitis is to be distinguished from cholera infantum. In duodenal catarrh there is little or no diarrhœa, and jaundice appears in a few days, symptoms entirely different from ileo-colitis. In proctitis the stools may be normal, or occur as scybala. There are straining, heat, and irritation about the rectum, and the discharge of mucus, and mucus and blood. In children, ileo-colitis is frequently mistaken for and called cholera infantum. The latter is a disease of sudden onset, characterized by choleric symptoms and a duration of a few days or few hours only. The character of the discharges is essentially different; in ileo-colitis they contain casein, yellowish or greenish liquid matter, spinach-colored masses; whereas, in cholera infantum, they are serous in character, colorless, like the so-called rice-water evacuations, and do not leave anything but a stain on the napkin.

Prognosis.—In acute diarrhœa, under good hygienic conditions, the prognosis is favorable. In children, summer diarrhœa is amenable to treatment or not, according to the condition in life, and the ability of parents to provide the necessary means. When ileo-colitis has become chronic, and is not readily amenable to the treatment, the prognosis is grave. In adults, for chronic diarrhœa, which has long existed, the prognosis must be guarded.

Treatment.—In simple acute catarrh relief is afforded by a pill of opium and camphor. When the evacuations are numerous and profuse—summer diarrhœa, for example—the most efficient treatment is the combination of a mineral acid (muriatic or sulphuric) with tincture of opium. Carefully managed, the same remedies may be administered to infants. Sometimes alkalies agree better. Sodium bicarbonate can be given with or without bismuth in chalk-mixture. Alkalies, however, merely neutralize acids, but the mineral acids check

the fermentation on which the production of acid depends. When the discharges are greenish ("chopped spinach"), the combination of arsenic and opium is highly efficient—for example, one drop of Fowler's solution, and one drop or less of the deodorized tincture of opium. When there are retained matters, the presence of which excites irritation, an emulsion of castor-oil, with two or three drops of turpentine and some tincture of opium, is very advantageous. In the more chronic cases, or after the acute symptoms have subsided, sulphate of copper with a little opium is an admirable remedy—from one thirtieth to one twelfth of a grain of copper sulphate, and one fortieth to one sixth of a grain of morphine, according to the age of the subject. Other astringents, metallic and vegetable, may be employed under the same circumstances. For children, bismuth is probably the best astringent. Resorcin has been found to be an effective remedy. Ergot has now and then proved a valuable expedient, and in some cases, especially of the more chronic kind, cubeb, eucalyptus, and others of this group, have rendered important aid. Regulation of the diet is even more important than the use of medicines. The starchy, fatty, and saccharine articles of food are highly objectionable, and should be omitted entirely, as already advised. The same plan of diet suggested in previous articles is applicable here, and need not, therefore, be repeated.

TYPHLYTIS.—INFLAMMATION OF THE CÆCUM.—CATARRH OF THE CÆCUM.

Definition.—The term typhlytis is restricted to an inflammation of the cæcum and its appendix. Perityphlytis is an inflammation taking place in the loose connective tissue on which the cæcum rests. Although the seat of the lesion and its nature are very different, it is necessary, because of their intimate relations, to consider them together.

Causes.—Besides the causes of catarrh of the intestines already sufficiently set forth, there are special conditions affecting the cæcum. The anatomical position of this organ as a receptacle for the small intestine, the arrangement of its muscular elements, the abundant folds of mucous membrane when empty, and its immense capacity when filled, are properties necessary to its function, but at the same time causes of disease.

Pathological Anatomy.—Catarrh of the cæcum may exist as a mere catarrhal affection of the mucous membrane, with the changes in the epithelium, in the solitary glands, and in the vessels already described; or as a localized inflammation, usually from the presence of a foreign

body, terminating in ulceration; or as an inflammation of the cæcum in general, with a more intense action about the ileo-cæcal valve, and implication with thickening of the submucous connective tissue, causing stenosis. The second or ulcerative form of catarrh of the cæcum will be described hereafter under ulcers of the intestinal canal. The last-named variety remains for consideration. The ileo-cæcal valve being more exposed to injury than any other part of the cæcum, owing to its position and office, is more liable to be invaded by disease. When a catarrh of the cæcum exists, especially the chronic form, the hyperæmia and swelling are more decided in the neighborhood of the orifice. An extension of the inflammation to the submucous layer occasionally takes place, the connective tissue undergoes hyperplasia, a permanent increase of thickness results, and stenosis is an ultimate effect of the changes. It is only in the chronic form that such thickening and stenosis can occur.

Symptoms.—There are two forms of catarrh of the cæcum—the acute and chronic. Of the acute variety there are various grades in the severity of the cases, but two are sufficiently defined to require attention—the mild and the severe. In the mild cases, uneasiness, followed by pain and soreness, is felt in the right iliac region, extending up along the course of the ascending colon. On palpation, tenderness is found to exist in this region, and laterally just above the crest of the ilium. The more decided the pressure, the more distinct the pain. Early, and before the inflammation has extended beyond the mucous layer of the cæcum, the decubitus and the sitting posture are characteristic—the body is turned toward the right side, and is flexed somewhat to relax the muscles on the right lateral plane. Additional soreness is experienced when the body is held erect, or straightened out in bed. With the first symptoms there may be some accumulation of fæces, and the cæcum and ascending colon may be distinctly bulging and prominent, so that they may be recognized on inspection; but in the mild cases there is no impaction, properly speaking, but on careful palpation the outline of the bowel can be made out, feeling rather soft and dough-like. The bowels are usually constipated, for catarrh of the cæcum seems to affect the muscularis, impairing its contractile energy, or there may be an appearance of relaxation by reason of an accumulation in the sacculated periphery of the bowel—leaving a central cavity along which the liquid contents of the small intestines may pass. The author has seen several examples of this, and so important is the recognition of the condition that he now desires to emphasize the fact. During the development of these local symptoms, the system partakes in the disturbance. The attack sets in with general *malaise*, some feverishness, a coated tongue, loss of appetite, nausea, and not unfrequently vomiting. In the severe cases the symptoms

are increased in severity in all directions. The local pain, tenderness, and swelling are greater, there are impaction of fæces and no movement. There are decided fever, considerable restlessness, nausea, and vomiting. The vomited matters consist at first of the contents of the stomach, then of the duodenum with much bilious matter, and ultimately, if the impaction persist, of matter that has somewhat the odor of fæces. With the development of the case there occurs great depression of the powers of life, the face becomes pinched and anxious, the skin covered by a clammy sweat, the pulse small and rapid, the action of the heart weak. Peritonitis is finally developed by contiguity of tissue, or by the bowel giving way at some point, weakened by ulceration. The subsequent history is then the history of peritonitis.

In the chronic cases, which may succeed to the mild acute, or, as is much more common, develop slowly by the operation of the ordinary causes of intestinal catarrh, the symptoms are those of intestinal indigestion. There is uneasiness in the region of the ileo-cæcal valve, flatus is felt passing the orifice, and the patient is often conscious of the difference in density, whether gas, liquid, or solid, of the materials passing the orifice. The bowels are confined and rather difficult to move. When the actions are free, semi-solid, and unirritating, the patient has a keen sense of relief. Rarely, on careful palpation, induration, not hard like that of scirrhus, but doughy, can be made out. A comparatively empty state of the large intestine and distention of the small intestines can usually be ascertained; in that event the lateral portions of the abdomen are rather flat, and the central part around the umbilicus is prominent.

Course, Duration, and Termination.—The mild form of acute catarrh of the cæcum, if properly managed, is readily cured in a week or two. The severe form may terminate by acute peritonitis within a week, or be relieved, and all pain and tenderness subside, within two or three weeks. Very frequently entire recovery does not ensue, but the case passes into chronic catarrh, the duration of which is very indefinite; or, associated with perityphlitis, a chronic abscess may continue in a torpid state for some time, or a fistulous communication be established with the exterior. Abscess of the liver is a frequent result of catarrhal inflammation and ulceration of the cæcum.

Diagnosis.—It is often extremely difficult to distinguish typhlitis from perityphlitis or from occlusion of the bowel by other kinds of obstruction. The points of difference between typhlitis and perityphlitis can be better understood after the study of the latter, and are therefore reserved. Typhlitis in the mild form is distinguished from other affections of the bowel by the local pain and soreness, by the fullness without impaction; in the severe form, the symptoms of

obstruction are the same as in other kinds of occlusion, but the local pain and the distinct enlargement of the bowel indicate the existence of an inflammation and fecal obstruction of the cæcum. In these affections, the decubitus of the patient is an important aid to diagnosis. Chronic catarrh of the cæcum is recognized by the locality of the distress. As cancer of the cæcum behaves in the same way in the early stage of its formation, there may be no means of differentiating; but, in the progress of the case, the growth of a nodulated tumor, the progressive increase in the pain and obstruction, and the development of a cachexia, are sufficient to indicate the nature of the affection.

Prognosis.—In the simple form the prognosis is favorable; in the severe form it is grave, although recovery will ensue in a large proportion of the cases if the management is judicious. In the chronic form, when the connective tissue has become thickened, the prognosis as to cure is unfavorable.

Treatment.—In the treatment of acute typhlitis all active purgatives must be avoided. If there is but little feverishness, and the local tenderness is slight, saline laxatives may be administered from the beginning, in small doses at short intervals, to induce liquefaction of the contents of the bowel. The hyperæmia is lessened by the same means. When free discharges are obtained in this way, the canal should be kept quiet with opium for a few days. The most efficient and, at the same time, safe laxative is sulphate of magnesia. It is a curious fact that this salt will be retained when other salines are rejected by vomiting. Rochelle salts may be used as a substitute when Epsom salts is not suitable. Different management is required in cases of typhlitis with impaction and arrest of the intestinal movement. If there be fever and much tenderness, no attempt should be made to relieve the bowels by purgatives of any kind. It is in this condition of affairs that opium in some form, especially in the form of the hypodermatic injection of morphine, is so serviceable. The patient should be kept thoroughly under the influence of the narcotic. It is better to combine atropine with the morphine, for greater security and increased therapeutical power. No absolute rule for quantity can be laid down, but the decided effects of morphine, as shown in the state of the pupil, the pulse, the respirations, and the somnolence, should be steadily maintained. The fullest curative power of morphine is obtained from a quantity strictly within the limits of safety, and hence no risk need be had to obtain the best results. As a guide to the administration, it may be stated that one fourth of a grain of morphine and $\frac{1}{120}$ grain of atropine is enough for the first dose in an adult, and subsequently one eighth of a grain of morphine and $\frac{1}{240}$ grain of atropine may be given every four, six, or eight hours, according to the effect. If there be any reason, moral or physical, which prevents the hypodermatic adminis-