tration, the next best mode is the rectal injection of the tincture of opium. As respects the quantity, the rule above given is proper; it is the degree and constancy of the effect which determine the amount. If the rectal injection is objected to, or the organ is intolerant, opium must be administered by the stomach. The best preparation is the deodorized tincture, and, to secure uniformity in action, the preparation made after an essay of the opium is altogether preferable. This corresponds in strength to laudanum: sixty drops may be the first dose, and twenty drops every two, three, or four hours succeeding, the quantity to be determined by the effects, as already insisted upon. The administration of the opium is to be continued until the bowels are moved spontaneously, or until the inflammatory action—the fever and local tenderness—subsides. The effects may be maintained for several days, for a week or more. As soon as the tenderness subsides, the saline laxative may be then given, in the cautious way already advised—a teaspoonful of Epsom salts in two ounces of water every three hours. With the subsidence of the local tenderness and heat, the quantity of opium can be slowly reduced and the interval between the doses lengthened. If the vomiting be persistent, it may be relieved by milk and lime-water (three parts to one), carbolic acid (gr. ss. in cherry-laurel water), hydrocyanic acid (ɱiij), iced champagne, pellets of ice, etc., but when the hypodermatic injection is practiced vomiting is a much less pronounced symptom. In robust subjects, and in all cases not characterized by great debility, leeches should be applied at the seat of tenderness, and in numbers according to the state of the patient—from two to ten to be allowed to fill and drop off, and the bleeding be then arrested. Good effects are obtained from counter-irritation by mustard, followed by fomentations of turpentine, or turpentine stupes, and hot poultices, when heat applications are useful. According to the author's observation in these cases, the external application of ice—in the form of an ice-bag—is more efficient than warm applications. In the severe cases of typhlitis, when the time has arrived for attempts to remove the impaction, the action of the saline laxative may be aided by irrigation of the bowel. It is now known that by this method the bowel may be filled with fluid up to the ileo-cæcal valve. Accordingly, repeated efforts by enemata of warm soapsuds should be made to soften the masses of hardened fæces which so effectually block the canal. The use of a long rectal tube to convey the fluid beyond the sigmoid flexure facilitates the operation materially. If impaction has existed for several days, care must be used in distending the bowel, for it may yield to the pressure, softened it may be by an inflammatory process involving all the layers. Lately it has been found that irrigation of the stomach, as practised in stomachal diseases, is an effective means of relief in cases of impaction of the intestine.

INFLAMMATION OF THE APPENDIX VERMIFORMIS.—The usual cause of inflammation of the appendix is the lodgment of an intestinal concretion, grape-seed, or other foreign body.* Cases of inflammation, apparently catarrhal, do, however, rarely occur, and very serious symptoms quickly arise by extension of the disease to the peritoneal layer. The symptoms are the same as those of the severe form of typhlitis, with some important exceptions to be presently detailed. The appendix differs from the cæcum in that it has an entire peritoneal investment, and is freely movable except at its point of attachment to the cæcum. In some subjects the appendix is two inches in length, and hence dips down into the iliac region to the pelvis, and reaches almost or quite to the bladder. When, therefore, an inflammatory process occurs in it, the tenderness and pain are felt in the iliac region as low down as Poupart's ligament, and not in the cæcum. When typhlitis exists, the appendix becomes involved, but death may and does frequently follow from disease of the appendix, without the cæcum being implicated. When, therefore, this form of typhlitis occurs, besides the symptoms already set forth, there is pain in the groin, extending down the course of the anterior crural, and through the hip. The tenderness is usually exquisite, and the slightest attempt at palpation gives the patient great dread. The thigh is flexed on the pelvis, and all attempts to extend it cause great suffering. There is no fecal tumor such as is found in typhlitis with impaction, and the bowels are not affected, but all intestinal movements, as the passing of gas through the ilio-cæcal valve, cause pain. Peritonitis, much more readily than in affections of the cæcum, occurs in inflammation of the appendix. It is often entirely local, and, adhesions forming, the morbid action is cut off from the general cavity of the abdomen. This is one of the modes by which fecal abscesses are formed. This subject and peritonitis are properly topics for future consideration.

PERITYPHLITIS.—As the term indicates, this is an inflammation of the tissue about the cæcum—really, of the connective tissue in which the cæcum is in part imbedded. This may arise spontaneously—an inflammation of the connective tissue—by the ordinary causes of such inflammation, especially trauma. It may be caused by the extension of inflammation from the cæcum, by perforation of the cæcum. Its special tendency is to suppuration. When well developed there is a hard, brawny swelling felt above the crest of the ilium, extending back into the lumbar region. There is not usually acute pain, but a

* See cases reported by the author in his paper on typhlitis, in the "American Journal of Medical Sciences," October, 1866, p. 351.

feeling of weight, soreness, with paroxysms of subacute pain, extending into the hip, thigh, and abdomen. There is no necessary interference with the bowel, unless typhlitis and perityphlitis coexist. The development of the swelling is comparatively slow, but it attains considerable dimensions. Suppuration is preceded by an increase of the local distress ; when it has actually taken place, the tension and throbbing diminish for a time, to increase again as the pus nears the surface. The formation of matter is attended by the usual constitutional symptoms.

The treatment of perityphlitis is the same as that of typhlitis, except as regards the special attention given to the bowels, and entirely the same if the two maladies coexist. When pus forms in perityphlitis, and when a sero-purulent collection is formed by a limiting inflammation, in inflammation or perforation of the appendix, there arises the surgical question of an operation for the evacuation of the matter. By the use of the aspirator, the question of suppuration may be early determined. It is no doubt sound practice to pursue the method of Buck, and procure the evacuation of pus by a sufficient opening for free drainage.*

CATARRH OF THE RECTUM.—PROCTITIS AND PERIPROCTITIS.

Definition.—Catarrh of the rectum is known as proctitis. In the mild form it is the simplest kind of dysentery. In the severe form, as in the cæcum, there may be impaction of the colon at and above the sigmoid flexure. The two forms correspond to the same conditions in the cæcum. The analogy becomes the more complete by reason of periproctitis—an inflammation of the connective tissue about the rectum.

Causes.—Proctitis arises chiefly from constipation. Prolonged retention of hardened fæces sets up an irritation for their expulsion. It is also caused by cold and dampness combined, especially sitting on the ground while in a perspiring state. Distention of the hæmorrhoidal vessels, by obstructive disease of the liver, as in cirrhosis, is an occasional cause, but the disease then is quite masked by the more important results of the cirrhosis. The habitual use of stimulating enemata and of aloetic purgatives is a fruitful source of proctitis.

Pathological Anatomy.—The alterations of structure are the same as those already described.

Symptoms.—There are an acute and chronic form, the symptoms of which differ in degree merely. The acute variety exists in two forms,

* "New York Medical Journal," vol. ii, p. 38. Numerous cases have been reported of some foreign body discharged by a fecal abscess. Hence, the need of a free opening.

the mild and severe. In the mild form of proctitis, the patient experiences a sense of uneasiness in the rectum—a burning, with desire to go to stool. There is much straining, and only mucus passes. The sphincter ani is in a constant state of spasm. Immediately after the passage of some mucus, there is felt considerable burning pain, and a sensation as if something remained, so that the patient returns again and again to the close-stool, and as before passes only some mucus or mucus mixed with blood. This condition is called *tenesmus*. The pain radiates from the rectum to the hips and back, and a feeling of depression and anxiety, and often of nausea, accompanies it. The colon is distended above the sigmoid flexure, but only some hard, roundish masses of fæces, known as scybala, descend occasionally. In the severe form all of these symptoms are intensified, the pain is very acute, intensely burning, and widely diffused. The straining is violent, and prolapse of the mucous membrane takes place, the sphincter ani closes over it spasmodically and the protruding portion becomes excessively painful, purplish, and bleeding. The mucus discharged is mixed with blood, and sometimes considerable hæmorrhage occurs in consequence of the yielding of a vessel. The colon above is impacted with hardened fæces, and its outlines can be distinctly traced by palpation. In the severe form of proctitis there is usually some constitutional disturbance—some feverishness, headache, and general muscular soreness. The neighboring organs sympathize with the rectum. In the female, the menstrual flow may occur, and, in both male and female, strangury comes on, and with the straining at stool there is simultaneous straining at the passage of urine. The long-continued distention of the colon induces an irritation of the mucous membrane ; a catarrhal process is set up for the expulsion of the accumulated fæces, but the muscular layer, over-distended, becomes paretic and is incapable of any energetic action ; the inflammation extends and ultimately the peritoneum becomes involved. The progress of these structural changes is manifested objectively by an increasing tenderness along the track of the descending colon, and finally by an extension of the inflammation to the adjacent connective tissue, the formation of a tumor, terminating in an abscess. In the cavity of the pelvis a similar process may take place, the inflammation of the mucous membrane extending by contiguity to the layers of the bowel successively, and at length involving the neighboring connective tissue. The chronic form of proctitis presents nearly the same features. There are usually accumulations of scybala in the sacculated periphery of the colon, but the bowels may be confined or relaxed. The relaxed stools contain a good deal of mucus, and are highly offensive by reason of the decompositions which have ensued in the descent along the colon, and the scybala are coated with mucus. Instead of ordinary mucus, the matter now discharged contains purulent elements—muco-pus—and ultimately becomes en-

tirely purulent in the rectum. Ulcerations ensue, sloughs separate, and hence the stools contain the *débris*. The nerves become somewhat accustomed to the irritation of their terminal filaments in the mucous membrane, and therefore the reflex incitement to tenesmus is much less. There are, therefore, less straining, less acute pain, but the stools are more unhealthy.

Course, Duration, and Termination.—The mild form of catarrh of the rectum has a natural tendency to cure in from four to eight days. The bowels act freely, the colon is emptied, and the tenesmus ceases. In the more severe cases, although a spontaneous cure may result, yet there is great danger of peritonitis, or periproctitis and abscess. When the latter forms, it tends to discharge alongside the rectum, resulting in fistula usually, or into the vagina or neighboring organs, forming various kinds of fistulæ. The duration of the severe form is determined largely by the character of the treatment. The chronic form is obstinate, and pursues a uniform course leading to extensive ulceration, sometimes perforation and peritonitis, or cicatrization and permanent encroachment on the lumen of the bowel. Thrombosis of the inferior hæmorrhoidal veins, with subsequent formation of hepatic abscess by deposit of emboli, is a not uncommon result. These changes are all promoted by the fermentations occurring in the rectum, the products of which are highly irritating and offensive.

Diagnosis.—The symptoms of acute proctitis are so distinctive that the diagnosis is made by them. In women, irritation of the rectum and tenesmus are produced by retroversion, especially of the gravid uterus. A vaginal exploration may be necessary to determine the position of the womb : if the symptoms persist after the malposition is rectified, then it may be justly assumed that disease exists in the rectum. In women, the eversion of the rectum through the sphincter ani is so readily performed that the nature of the case may be determined by ocular inspection. Exploration of the rectum may be necessary to differentiate between ulcer of the rectum and chronic proctitis. Many of the symptoms may be due to hæmorrhoids ; an examination should be instituted whenever doubt exists. The author has known of two instances in which fecal accumulation and catarrh of the rectum were mistaken for scirrhus, and an unfavorable prognosis given.

Prognosis.—A favorable termination may be predicted in every case of acute proctitis, unless implication of the peritoneum, perforation, or periproctitis has occurred. When peritonitis has arisen, the prognosis is extremely unfavorable if it is general, especially if from perforation, but is less gloomy when limited by adhesions. In the suppuration which then ensues, the resources of the organism are severely tried ; in suppuration from periproctitis low down, although the strength may be much reduced, a fatal result is very rare ; but in these cases the local condition may be a mere expression of a dyscrasia, as tuberculosis, and they are to be estimated accordingly. In chronic

proctitis the gravity of the case is increased by accidental and consequential complications. The existence of cirrhosis is unfavorable, as it keeps up a constant over-fullness of the inferior hæmorrhoidal veins. Obstructive cardiac and pulmonary diseases act in the same way, though not so directly. The more changed the mucous membrane is in structure, the more extensive and deep the ulcerations, and the greater the hypertrophy of the muscular layer, the more serious the case. A very important complication is thrombosis of a hæmorrhoidal vein, with detached emboli, and subsequent multiple abscess of the liver. When this condition of things exists, the gravity of the case is vastly increased.

Treatment.—Unless impaction is complete, and the peritoneal layer of the bowel implicated, the first duty to be done is to empty the colon of its retained fæces. It is a most serious mistake in treating acute catarrh of the rectum (dysentery), and one frequently made, to employ astringents and anodynes with a view to quiet the straining at stool. When the bowels are freely evacuated, little remains to be done in the ordinary cases. As already indicated, under similar conditions, there is no laxative so safe and efficient as Epsom salts. It should be given in solution with dilute sulphuric acid—℥ ij of sulphate of magnesia and ♏ xx of dilute sulphuric acid in two ounces of water every two hours until the bowel is emptied. The straining at stool and the pain may be then promptly arrested by the hypodermatic injection of morphia, or by enemata of tincture of opium in starch-mixture, or by opium in some form by the stomach. In the severe cases, the action of Epsom salts may be aided by irrigation of the bowel. A considerable quantity of warm water should be slowly injected, and retained as long as possible to soften the hardened fæces, and successive injections should be practiced at short intervals. These lavements are useful in allaying the excessive irritability of the mucous membrane. Other salines may be used, but none are so effective as the Epsom for this particular purpose. Enemata of emollients may be used instead of hot water—for example, infusion of flaxseed, of elm, of camomile, etc.—but they are really less efficient, because they are less solvent of the fæces. Various purgatives, notably castor-oil, have been used to dislodge the impacted fæces, but they do not establish an outward diffusion to diminish congestion of the mucous membrane, which is the important action of the salines. In the severe form of proctitis, in robust subjects, and even in the weakly, leeches should be carefully applied around the margin of the anus. If there be much tenderness, an ice-bag should be applied over the descending colon, or warm fomentations, as already advised, for corresponding states. In chronic catarrh of the rectum, the diseased membrane can be reached directly, and the treatment should, therefore, be largely topical. Solutions of tannin (℈ j—℥ iv), of fluid extracts of hydrastis and rhatany, and of other vegetable astringents, are effective local

applications if there are no solutions of continuity, but, if ulcerations exist, the most efficient topical application is nitrate-of-silver solution—four grains to a scruple, to an ounce of water. This should be injected through a tube carried up to the sigmoid flexure. Next to silver nitrate is the sulphate of copper, but this must be used very cautiously. It is important in these cases to maintain a soluble state of the bowels. When constipation occurs, the congestion of the mucous membrane is increased, and *vice versa*. Hardened fæces irritate in passing the inflamed membrane. As fermentation, producing most unhealthy products, takes place in the rectum, morning and evening enemata of hot water should be regularly used. They give great comfort, and contribute materially to the cure. The wasting caused by chronic catarrh of the rectum demands the use of the most nutritious food. Cod-liver oil is highly serviceable as food and medicine. If the digestion is feeble, it should be aided by the mineral acids and pepsin, and by nux vomica. Although medicines by the stomach occupy an inferior position in the treatment of this malady, excellent results are obtained from the use of minute doses of corrosive sublimate (one fortieth grain *ter in die*), of arsenic (two drops of Fowler's solution *ter in die*), or of sulphate of copper (one sixteenth grain *ter in die*) ; and when there is much mucus produced, cubeb, eucalyptus, and hydrastis act favorably.

CROUPOUS OR MEMBRANOUS ENTERITIS.

Definition.—By this term is meant an inflammation, subacute or chronic, occurring periodically, and characterized by the formation and discharge of membranous shreds or casts.

Causes.—This is a disease of adult life chiefly ; it is rare in childhood, and does not appear after forty-five. The female sex is more liable than the male ; and nervous, hysterical, and hypochondriacal subjects are more subject to it than are other types. A peculiar state of the nervous system seems necessary to its production. Membranous enteritis occurs by extension of the diphtheritic process downward, and false membrane also forms in infective dysentery, but the disease under consideration is a distinct affection. It has been attributed to the ordinary causes of catarrh of the intestines—especially to irritants, as drastic purgatives, coarse food, etc.—but such agencies can act only as exciting causes.

Pathological Anatomy.—Besides the exudation of diphtheria and of infective dysentery, deposits of a white or grayish-white color, flaky or membranous, and firmly adherent, have been found on the mucous membrane of the ilium and colon. Occurring first in isolated patches, the membrane extends laterally along the mucous folds in the small intestine, and in the colon upon the ileo-cæcal valve and the folds of the sigmoid flexure (Leube). In other cases (Sir James Simpson) papular and white vesicular eruptions have been found, but no flaky membrane or casts adherent to the mucous membrane.

The membrane as passed has been carefully examined microscopically and chemically by Da Costa,* whose memoir on this disease is by far the most important contribution which has been made to our knowledge of the subject. The shreds, casts, or membranous masses, consist of "a transparent, amorphous, basement substance, here and there indistinctly fibrillated, and having imbedded in it granules, free nuclei, and small, shriveled, irregular, and rather granular cells." Chemically, this material has the same reactions as mucus (Da Costa) —a fact which might *a priori* be expected, since this false membrane is nothing more than solidified mucus, the granules, free nuclei, and granular cells found in it being remains of mucus-cells which escaped entire destruction in the process of solidification. The mucous membrane of the rectum, in a case examined by Da Costa, was intensely injected.

Symptoms.—The attacks are announced by a feeling of soreness and distention of the abdomen, and constipation. There is no fever, the hands and feet are cold and moist, and the general condition that of depression, in which the mind participates. Before, indeed, any local manifestations of disease, there are apt to be attacks of hysteria or hypochondriasis, and the subjects of this disease are nervous, excitable, neuralgic. The pains have the colicky character, are felt around the umbilicus chiefly, and are exceedingly severe and depressing. They continue for a half hour, for an hour or two, and even longer, and, after a variable interval of some hours' duration, occur again. Thus, during the twenty-four hours, there may be six or more paroxysms. The distress does not cease with the subsidence of the acute pain : a feeling of rawness and soreness remains, and the abdomen is so sensitive to pressure that peritonitis may be suspected. Very considerable tenesmus exists, and more or less mucus, with or without blood, is passed, as in acute catarrh of the rectum. There may be several loose evacuations a day, or the bowels may be confined. After several days of suffering, there will be discharged, with great pain and tenesmus, shreds of membrane or cylindrical casts of the bowel. Great relief is experienced. The soreness subsides, the distention lessens at once, and the tenderness diminishes. The patient is left in a condition of great debility and much emaciated, for during the paroxysm there is complete anorexia, and sometimes vomiting, so that but little food is taken. The paroxysms are rarely single ; in a week or two, or after several months, there is a renewal of the same experiences. In one of the author's cases there were paroxysms several times a week for three weeks, the patient passing an almost in-

* "The American Journal of the Medical Sciences," October, 1871, p. 321, *et seq.*

credible quantity of false membrane. The same woman, in an attack three years before, had a succession of paroxysms for six weeks, and was so reduced that her life was despaired of. During the interval of three years there were no paroxysms, but she suffered from constant troubles of digestion. In the cases related by Da Costa, disorders of digestion continued and were very persistent. Acidity, ulcers of the mouth, red, tender, and coated tongue, were marked features. Disorders of the nervous system, also, were very pronounced. Hysteria, hypochondriasis, headache, impaired memory, and defects of the special senses, are mentioned by Da Costa in the first rank as symptoms. In women, too, the menstruation was deranged, and various diseases of the sexual system were present. In one of the author's cases membranous dysmenorrhœa had existed for some years. As regards the intestinal symptoms, including the passage of pseudo-membrane, variations from the description above given have been noted. The pain may continue during the interval between the paroxysms, although it is much less severe, and the membrane may be present in all the discharges occurring during months or years.

Course, Duration, and Termination. — The course of membranous enteritis is irregular, and the duration indefinite. It may occur in paroxysms of a very acute character in quick succession, lasting two or three weeks or more, and followed by an interval of comparative health, to be succeeded after months or years by the same succession of symptoms. Or the cases may be less acute, and continue for months or even years.

Diagnosis.—The distinction is to be made between membranous enteritis, dysentery, and tape-worm. The passage of shreds and casts of false membrane separates this malady from dysentery, unless there occurs separation or desquamation of the epithelium in the latter, when the aid of the microscope must be invoked. The smallest shreds of false membrane may be confounded with the strobila of a tape-worm colony, but, as the latter has a perfectly well-defined structure, and has the power of independent movement for a short time, only ignorance could possibly hesitate.

Treatment.—The suffering which attends this malady requires relief, and the preparations of opium must be used. The most effective anodyne treatment is the hypodermatic injection of morphine. Next to this are enemata of starch and laudanum. No specific treatment has been proposed, and only symptoms are to be prescribed for. In the author's experience, minute doses of corrosive sublimate, of copper sulphate, and of arsenic persistently used, are the most effective remedies for the more chronic cases; for the acute, an emulsion of almond-oil, or castor-oil and turpentine when there is constipation. The author has had good results from tincture of nux vomica and tincture of physostigma, fifteen to twenty drops of each *ter in die*, for

the subacute and chronic cases, and the persistent use of hydrastis, eucalyptus, cubeb (fiuid extracts), and other remedies acting similarly, is strongly advised.

DYSENTERY.

Definition.—In common language dysentery is known as "flux"; sometimes as "bloody flux"; in technical, as ulcerative colitis. It is a disease characterized by tormina, tenesmus, mucus, and mucus-and-blood stools, burning pain, with more or less constitutional disturbance. It occurs in the sporadic, endemic, or epidemic form, and in the latter seems to be propagated by a specific virus.

Causes.—It occurs in both sexes and at all ages. Sudden arrest of perspiration by exposure to cold, and especially to cold and dampness combined, is one of the most common causes. Climatic influences are very important factors in its production. It is a disease of those parts of the year in which the change of temperature from night to day is greatest, as in the later summer and autumn, and in warm rather than in cold climates. It is especially prevalent in malarious regions, doubtless because of the congestion of the portal circulation induced by paroxysms of ague. Agents, whether of food or medicine, producing irritation of the mucous membrane, may cause a dysenteric attack. Is there a specific virus? Although during an epidemic the mode of propagation would indicate the existence of a specific infective material—a microbe—it is probable that this is nothing more than the dysenteric discharges themselves acquiring increased virulence by the aggregation of numbers of sick under unfavorable hygienic conditions. The dysenteric excreta undergo certain fermentative changes, probably, by which their infective property receives additional strength. They are admitted to the ground-water in the dried state; finely divided they are distributed by the air, and in many ways, by the atmosphere, food, and drink, they reach the intestinal canal of man, and there induce the characteristic disturbances and structural alterations of dysentery. On the other hand, the virus or infective material of epidemic dysentery may be a ptomaine, produced in great quantity when the *materies morbi* reaches the intestinal canal. As an epidemic, dysentery is a prevalent disease in armies, in jails, in tenement-houses—wherever, indeed, numbers of human beings are crowded together under unfavorable hygienic conditions. Indeed, it seems almost certain that ileo-colitis and ulcerative colitis may be induced by the emanations from fecal accumulations and by the gaseous products of animal decomposition. Unlike contagious and other infective diseases, one attack of dysentery does not confer immunity; in fact, the tendency is increased with the number of attacks.

Pathological Anatomy.—The structural alterations of dysentery may be comprehended in two groups, catarrhal or sero-purulent, and croupous or fibrinous.