PHLEGMONOUS ENTERITIS.

As an independent affection this is excessively rare, even less frequent than its counterpart in the stomach. It is seen occasionally in connection with intussusception, strangulated hernia, and chronic obstruction. Apart from these conditions it occurs most frequently in the duodenum, and leads to suppuration in the submucosa and abscess formation. Except when associated with hernia or intussusception the affection cannot be diagnosed. The symptoms usually resemble those of peritonitis.

MUCOUS COLITIS.

This affection is known by various names, such as *membranous enteritis*, *tubular diarrhœa*, and *mucous colic*. It is a remarkable disease, to which much attention has been paid for several centuries. An exhaustive description of it is given by Woodward, in Vol. II of the Medical and Surgical Reports of the Civil War. It is an affection of the large bowel, characterized by the production of a very tenacious adherent mucus, which may be passed in long strings or as a continuous, tubular membrane. I have twice had opportunities of seeing this membrane *in situ*, closely adherent to the mucosa of the colon, but capable of separation without any lesion of the surface. Judging from the statement of English authors as to its rarity, it would appear to be a more frequent disease in this country. According to W. A. Edwards, 80 per cent of the recorded adult cases have been in women. It occurs occasionally in children. Of 111 cases six were under the age of ten. The cases are almost invariably seen in nervous or hysterical women or in men with neurasthenia. All grades of the affection occur, from the passage of a slimy mucus, like frog-spawn, to large tubular casts a foot or more in length. Microscopically the casts are, as shown by Sir Andrew Clark, not fibrinous, but mucoid, and even the firmest consist of dense, opaque, transformed mucus. It is due to a derangement of the mucous glands of the colon, the nature of which is quite unknown.

Symptoms.—The disease persists for years, varying extremely from time to time, and is characterized by paroxysms of pain in the abdomen, tenderness, occasionally tenesmus, and the passage of flakes or long strings of mucus, sometimes of definite casts of the bowel. The attacks last for a day or, in some instances, for ten days or two weeks. Mental emotions and worry of any sort seem particularly apt to bring on an attack. Occasionally errors in diet or dyspepsia precede an outbreak. Membranes are not passed with every paroxysm, even when the pains and cramps are severe. There are instances in which the morphia habit has been contracted on account of the severity of the pain. There may be marked nervous symptoms, and authors mention hysterical outbreaks, hypochondriasis, and melancholia.

The *diagnosis* is rarely doubtful, but it is important not to mistake the membranes for other substances; thus, the external cuticle of asparagus and undigested portions of meat or sausage-skins sometimes assume forms not unlike mucous casts, but the microscopical examination will quickly differentiate them.

ULCERATIVE ENTERITIS.

In addition to the specific ulcers of tuberculosis, syphilis, and typhoid fever, the following forms of ulceration occur in the bowels:

(*a*) *Follicular Ulceration.*—As previously mentioned, this is met with very commonly in the diarrhœal diseases of children, and also in the secondary or terminal inflammations in many fevers and constitutional disorders. The ulcers are small, punched out, with sharply cut edges, and they are usually limited to the follicles. With this form may be placed the catarrhal ulcers of some writers.

(*b*) *Stercoral Ulcers*, which occur in long-standing cases of constipation. Very remarkable indeed are the cases in which the sacculi of the colon become filled with roundea small scybala, some of which produce distinct ulcers in the mucous membrane. The fæcal masses may have lime salts deposited in them, and thus form little enteroliths.

(*c*) *Simple Ulcerative Colitis.*—This affection, which clinically is characterized by diarrhœa, is often regarded wrongly as a form of dysentery. It is not a very uncommon affection, and is most frequently met with in men above the middle period of life. The ulceration may be very extensive, so that a large proportion of the mucosa is removed. The lumen of the colon is sometimes greatly increased, and the muscular walls hypertrophied. There are instances in which the bowel is contracted. Frequently the remnants of the mucosa are very dark, even black, and there may be polypoid outgrowths between the ulcers.

These cases rarely come under observation at the outset, and it is difficult to speak of the mode of origin. They are characterized by diarrhœa of a lienteric rather than of a dysenteric character. There is never blood or pus in the stools. Constipation may alternate with the diarrhœa. There is usually great impairment of nutrition, and the patients get weak and sallow. Perforation occasionally occurs.

The disease may prove fatal, or it may pass on and become chronic. The affection was not very infrequent at the Philadelphia Hospital, and though the disease bears some resemblance to dysentery, it is to be separated from it. Some of the cases which we have learned to recognize as amœbic dysentery resemble this form very closely. An excellent description of it is given by Hale White.*

(*d*) *Ulceration from External Perforation.*—This may result from the

* Guy's Hospital Reports, 1888.

erosion of new growths or, more commonly, from localized peritonitis with abscess formation and perforation of the bowel. This is met with most frequently in tuberculous peritonitis, but it may occur in the abscess which follows perforation of the appendix or suppurative or gangrenous pancreatitis. Fatal hæmorrhage may result from the perforation.

(*e*) *Cancerous Ulcers.*—In very rare instances of multiple cancer or sarcoma the submucous nodules break down and ulcerate. In one case the ileum contained eight or ten sarcomatous ulcers secondary to an extensive sarcoma in the neighborhood of the shoulder-joint.

(*f*) Occasionally a *solitary ulcer* is met with in the cæcum or colon, which may lead to perforation. Two instances of ulcer of the cæcum, both with perforation, have come under my observation, and in one instance a simple ulcer of the colon perforated and led to fatal peritonitis.

Diagnosis of Intestinal Ulcers.—As a rule, diarrhœa is present in all cases, but exceptionally there may be extensive ulceration, particularly in the small bowel, without diarrhœa. Very limited ulceration in the colon may be associated with frequent stools. The character of the dejections is of great importance. Pus, shreds of tissue, and blood are the most valuable indications. Pus occurs most frequently in connection with ulcers in the large intestine, but when the bowel alone is involved the amount is rarely great, and the passage of any quantity of pure pus is an indication that it has come from without, most commonly from the rupture of a pericæcal abscess, or in women an abscess of the broad ligament. Pus may also be present in cancer of the bowel, or it may be due to local disease in the rectum. A purulent mucus may be present in the stools in cases of ulcer, but it has not the same diagnostic value. The swollen, sago-like masses of mucus which are believed by some to indicate follicular ulceration are met with also in mucous colitis. Hæmorrhage is an important and valuable symptom of ulcer of the bowel, particularly if profuse. It occurs under so many conditions that taken alone it may not be specially significant, but with other coexisting circumstances it may be the most important indication of all.

Fragments of tissue are occasionally found in the stools in ulcer, particularly in the extensive and rapid sloughing in dysenteric processes. Definite portions of mucosa, shreds of connective tissue, and even bits of the muscular coat may be found. Pain occurs in many cases, either of a diffuse, colicky character, or sometimes, in the ulcer of the colon, very limited and well defined.

Perforation is an accident liable to happen when the ulcer extends deeply. In the small bowel it leads to a localized or general peritonitis. In the large intestine, too, a fatal peritonitis may result, or if perforation takes place in the posterior wall of the ascending or descending colon, the production of a large abscess cavity in the retro-peritonæum. In a case at the University Hospital, Philadelphia, there was a perforation at

the splenic flexure of the colon with an abscess containing air and pus —a condition of subphrenic pyo-pneumothorax.

Treatment of the Previous Conditions.

(*a*) **Acute Dyspeptic Diarrhœa.**—All solid food should be withheld. If vomiting is present ice may be given, and small quantities of milk and soda water may be taken. If the attack has followed the eating of large quantities of undigestible material, castor oil or calomel is advisable, but is not necessary if the patient has been freely purged. If the pain is severe, twenty drops of laudanum and a drachm of spirits of chloroform may be given, or, if the colic is very intense, a hypodermic of a quarter of a grain of morphia. It is not well to check the diarrhœa unless it is profuse, as it usually stops spontaneously within forty-eight hours. If persistent, the aromatic chalk powder or large doses of bismuth (thirty to forty grains) may be given. A small enema of starch (two ounces) with twenty drops of laudanum, every six hours, is a most valuable remedy.

(*b*) **Chronic Diarrhœa,** including chronic catarrh and ulcerative enteritis. It is important, in the first place, to ascertain, if possible, the cause and whether ulceration is present or not. So much in treatment depends upon the careful examination of the stools—as to the amount of mucus, the presence of pus, the occurrence of parasites, and, above all, the state of digestion of the food—that the practitioner should pay special attention to them. Many cases simply require rest in bed and a restricted diet. Chronic diarrhœa of many months' or even of several years' duration may be sometimes cured by strict confinement to bed and a diet of boiled milk and albumen water.

In that form in which immediately after eating there is a tendency to loose evacuations it is usually found that some one article of diet is at fault. The patient should rest for an hour or more after meals. Sometimes this alone is sufficient to prevent the occurrence of the diarrhœa. In those forms which depend upon abnormal conditions in the small intestine, either too rapid peristalsis or faulty fermentative processes, bismuth is indicated. It must be given in large doses—from half a drachm to a drachm three times a day. The smaller doses are of little use. Naphthalin preparations here do much good, given in doses of from ten to fifteen grains (in capsule) four or five times a day. Larger doses may be needed. Salol and the salicylate of bismuth may be tried.

An extremely obstinate and intractable form is the diarrhœa of hysterical women. A systematic rest cure will be found most advantageous, and if a milk diet is not well borne the patient may be fed exclusively on egg albumen. The condition seems to be associated in some cases with increased peristalsis, and in such the bromides may do good, or preparations of opium may be necessary. There are instances which prove most obstinate and resist all forms of treatment, and the patient may be greatly reduced. A change of air and surroundings may do more than medicines.

In a large group of the chronic diarrhœas the mischief is seated in the

colon and is due to ulceration. Medicines by the mouth are here of little value. The stools should be carefully watched and a diet arranged which shall leave the smallest possible residue. Boiled or peptonized milk may be given, but the stools should be examined to see whether there is an excess of food or of curds. Meat is, as a rule, badly borne in these cases. The diarrhœa is best treated by enemata. The starch and laudanum should be tried, but when ulceration is present it is better to use astringent injections. From two to four pints of warm water containing from half a drachm to a drachm of nitrate of silver may be used. In the chronic diarrhœa which follows dysentery this is particularly advantageous. In giving large injections the patient should be in the dorsal position, with the hips elevated, and it is best to allow the injection to flow in gradually from a siphon bag. In this way the entire colon can be irrigated and the patient can retain the injection for some time. The silver injections may be very painful, but they are invaluable in all forms of ulcerative colitis. Acetate of lead, boracic acid, sulphate of copper, sulphate of zinc, and salicylic acid may be used in one per cent solutions.

In mucous colitis no benefit can be expected from remedies administered by the mouth. The topical applications should be made to the mucous membrane of the colon by the enemata just mentioned, and the general nervous condition should receive appropriate treatment.

In the intense forms of choleraic diarrhœa in adults associated with constant vomiting and frequent watery discharges the patient should be given at once a hypodermic of a quarter of a grain of morphia, which should be repeated in an hour if the pains return or the purging persists. This gives prompt relief, and is often the only medicine needed in the attack. The patient should be given stimulants, and, when the vomiting is allayed by suitable remedies, small quantities of milk and lime water.

(*c*) **The Diarrhœa of Children.**—*Hygienic management* is of the first importance. The effect of a change from the hot, stifling atmosphere of a town to the mountains or the sea is often seen at once in a reduction in the number of stools and a rapid improvement in the physical condition. Even in cities much may be done by sending the child into the parks or for daily excursions on the water. However extreme the condition, fresh air is indicated. The child should not be too thickly clad. Many mothers, even in the warm weather, clothe their children too heavily. Bathing is of value in infantile diarrhœa, and when the fever rises above 102·5° the child should be placed in a warm bath, the temperature of which may be gradually reduced, or the child is kept in the bath for twenty minutes, by which time the water is sufficiently cooled. Much relief is obtained by the application of ice-cold cloths or of the ice-cap to the head. Irrigation of the colon with ice-cold water is sometimes favorable, but it has not the advantage of the general bath, the beneficial effect of which is seen, not only in the reduction of the temperature, but in a general stimulation of the nervous system of the child.

Dietetic Treatment.—In the case of a hand-fed child it is important, if possible, to get a wet-nurse. While fever is present, digestion is sure to be much disturbed, and the amount of food should be restricted. If water or barley water be given the child will not feel the deprivation of food so much. When the vomiting is incessant it is much better not to attempt to give milk or other articles of food, but let the child take the water whenever it will.

In the dyspeptic diarrhœas of infants, practically the whole treatment is a matter of artificial feeding, and there is no subject in medicine on which it is more difficult to lay down satisfactory rules. No doubt within a few years the study of the bacterial processes going on in the intestines of the child will give us most important suggestions. From his observations Escherich lays down the following rules, recognizing two well-defined forms of intestinal fermentation—the acid and the alkaline: If there is much decomposition, with foul, offensive stools, the albuminous articles should be withheld from the diet and the carbohydrates given, such as dextrin foods, sugar, and milk, which, on account of its sugar, ranks with the carbohydrates. If there is acid fermentation, with sour but not fetid stools, an albuminous diet is given, such as broths and egg albumen. It is, however, by no means certain whether the reaction of the stools, upon which this author relies, is a sufficient test of the nature of the intestinal fermentation. In the dyspeptic diarrhœas of artificially fed infants it is best, as a rule, to withhold milk and to feed the child, for the time at least, on egg albumen, broths, and beef juices. To prepare the egg albumen, the whites of two or three eggs may be stirred in a pint of water and a teaspoonful of brandy and a little salt mixed with it. The child will usually take this freely, and it is both stimulating and nourishing. It is sometimes remarkable with what rapidity a child which has been fed on artificial food and milk will pick up and improve on this diet alone. Beef-juice is obtained by pressing with a lemon-squeezer fresh steak, previously minced and either uncooked or slightly broiled. This may be given alternately with the egg albumen or it may be given alone. Mutton or chicken broth will be found equally serviceable, but it is prepared with greater difficulty and contains more fat. In the preparation, a pound of mutton, chicken, or beef, carefully freed from fat, is minced and placed in a pint of cold water and allowed to stand in a glass jar on ice for three or four hours. It should then be cooked over a slow fire for at least three hours, then strained, allowed to cool, the fat skimmed off, sufficient salt added, and it may then be given either warm or cold. These naturally prepared albumen foods are very much to be preferred to the various artificial substances. There is no form of nourishment so readily assimilated and apt to cause so little disturbance as egg albumen or the simple beef juices. The child should be fed every two hours, and in the intervals water may be freely given. It cannot be expected that, with the digestion seriously impaired, as much food can be taken as in health,

and in many instances we see the diarrhœa aggravated by persistent overfeeding. When the child's stomach is quieted and the diarrhœa checked there may be a gradual return to the milk diet. The milk should be sterilized, and in institutions and in cities this simple prophylactic measure is of the very first importance and is readily carried out by means of the Arnold steam sterilizer. The milk should be at first freely diluted—four parts of water to one of milk, which is perhaps the preferable way—or it may be peptonized. The stools should be examined daily, as important indications may be obtained from them. Milk-whey and forms of fermented milk are sometimes useful and may be employed when the stomach is very irritable. These general directions as to food also hold good in cholera infantum.

Medicinal Treatment.—The first indication in the dyspeptic diarrhœa of children is to get rid of the decomposing matter in the stomach and intestines. The diarrhœa and vomiting partially effect this, but it may be more thoroughly accomplished, so far as the stomach is concerned, by irrigation. It may seem a harsh procedure in the case of young infants, but in reality, with a large-sized soft-rubber catheter, it is practised without any difficulty. By means of a funnel, lukewarm water is allowed to pass in and out until it comes away quite clear. I can speak in the very warmest manner of the good results obtained by this simple procedure in cases of the most obstinate gastro-intestinal catarrh in children. In most cases the warm water is sufficient. In some hands this method has probably been carried to excess, but that does not detract from its great value in suitable cases. To remove the fermenting substances from the intestines, doses of calomel or gray powder may be administered. The castor oil is equally efficacious, but is more apt to be vomited. Irrigation of the large bowel is useful, and not only thoroughly removes fermenting substances, but cleanses the mucosa. The child should be placed on the back with the hips elevated. A flexible catheter is passed for from six to eight inches and from a pint to two pints of water allowed to flow in from a fountain syringe. A pint will thoroughly irrigate the colon of a child of six months and a quart that of a child of two years. The water may be lukewarm, but when there is high fever ice-cold water may be used. In cases of entero-colitis there may be injections with borax, a drachm to the pint, or dilute nitrate of silver, which may be either given in large injections, as in the adult, or in injections of three or four ounces with three grains of nitrate of silver to the ounce. These often cause very great pain, and it is well in such cases to follow the silver injection with irrigations of salt solution, a drachm to a pint.

We are still without a reliable intestinal antiseptic. Neither naphthalin, salol, resorcin, the salicylates, nor mercury meets the indications. As in the diarrhœa of adults, bismuth in large doses is often very effective, but practitioners are in the habit of giving it in doses which are quite insufficient. To be of any service it must be used in large doses, so that an

infant a year old will take as much as two drachms in the day. The gray powder has long been a favorite in this condition and may be given in half-grain doses every hour. It is perhaps preferable to calomel, which may be used in small doses of from one tenth to one fourth of a grain every hour at the onset of the trouble. The sodium salicylate (in doses of two or three grains every two hours to a child a year old) has been recommended.

In cholera infantum serious symptoms may develop with great rapidity, and here the incessant vomiting and the frequent purging render the administration of remedies extremely difficult. Irrigation of the stomach and large bowel is of great service, and when the fever is high ice-water injections may be used or a graduated bath. As in the acute choleraic diarrhœa of adults, morphia hypodermically is the remedy which gives greatest relief, and in the conditions of extreme vomiting and purging, with restlessness and collapse symptoms, this drug alone commands the situation. A child of one year may be given from $\frac{1}{100}$ to $\frac{1}{80}$ of a grain, to be repeated in an hour, and again if not better. When the vomiting is allayed, attempts may be made to give gray powder in half-grain doses with $\frac{1}{10}$ of Dover's powder. Starch (ʒ ij) and laudanum (♏ij–iij) injections, if retained, are soothing and beneficial. The combination of bismuth with Dover's powder will also be found beneficial. No attempt should be made to give food. Water may be allowed freely, even when ejected at once by vomiting. Small doses of brandy or champagne, frequently repeated and given cold, are sometimes retained. When the collapse is extreme, hypodermic injections of one per cent saline solution may be used as recommended in Asiatic cholera, and hypodermic injections of ether and brandy may be tried. The convalescence requires very careful management, as many cases pass on into the condition of entero-colitis. When the intense symptoms have subsided, the food should be gradually given, beginning with teaspoonful doses of egg albumen or beef-juice. It is best to withhold milk for several days, and when used it should be at first completely peptonized or diluted with gruel. A teaspoonful of raw, scraped meat three or four times a day is often well borne.

II. MISCELLANEOUS AFFECTIONS OF THE BOWELS.

Dilatation of the Colon.—This may be general or localized to the sigmoid flexure.

It occurs not infrequently as a transient condition, and in many cases it has an important influence, inasmuch as the distention may be extreme, pushing up the diaphragm and seriously impairing the action of the heart and lungs. H. Fenwick has called attention to this as occasionally a cause of sudden heart-failure.