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MEMBRANOUS ENTERITIS, WITH A REPORT OF CASES.

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THAT a substance, probably mucous in character, is occasionally voided at stool has been recognized for many years, indeed, by the very fathers of medicine; it is recently, however, that these cases have received careful attention and classification in our nosological tables. The disease seems naturally to divide itself under two headings, (1) cases in which the passage of the membrane is accompanied by all the symptoms and concomitants of enteritis or entero-colitis in their acute or chronic form, and (2) cases in which the passage of the membrane is about the only symptom presented.

With the former series of cases we have little to do in the present paper; suffice it to say that the cases have been noted and observed for many years. To Morgagni, however, is due the credit of first clearly recognizing the fact that such matters in the stools were not portions of the intestinal canal, as then considered, but were occasionally false membranes.

The disease is unfortunate in the fact that it has received many varied and totally different synonyms,[1] thus giving evidence of the chaotic state of medical opinion in regard to the affection.

The *etiology* of membranous enteritis has fared but little better than its nomenclature, as the most varied and opposite etiological factors have been adduced in endeavoring to elucidate the problem. Age is a prominent predisposing factor, as most cases occur in adult life, my own cases following the rule; the decade between thirty and forty is that which presents the greatest number of cases; children are not exempt from the disease, as careful perusal of the literature shows a few cases occurring during the earlier years of life. Clemens[2] reports four cases as occurring in children, Chapin[3] records other cases, as do also J. Lewis Smith[4] and Field,[5] six cases under the age of ten years. Whitehead[6] adds two children to the list. Laget[7] has observed an infant convalescing from diphtheria, who passed a mucous cast nearly eight inches long, and Barrier[8] an example of the disease in a child of five years.

[1] Pellicular colitis; intestinal cast; pseudo-membranous enteritis; intestinal desquamative catarrh; mucous disease; chronic muco-colitis; enterite interstitielle; chronic croup of the intestines; chronic pellicular inflammation of the intestinal mucous membrane; fibrinous diarrhœa; diarrhœa febrilis; follicular, duodenal, and colonic dyspepsia; chronic pseudo-membranous gastro-enteritis; tubular looseness, or diarrhœa tubularis; tubular exudation casts of the intestine; vegetations de la muqueuse de l'intestine gréle; mucous or gelatinous diarrhœa; hypochondriasis pituitosa (quoted by Field); mucous casts, and many others.

[2] Ueber dem Darmkrup der Kinder, Jahrb. für Kinderkrankheiten, 1860, Bd. xxxiv. S. 30.

[3] Arch. Pediatrics, 1884, vol. i. pp. 447–49.

[4] Fourth ed., p. 437.

[5] Fiske Fund Dissertation, No. xxxvii.

[6] Med. and Surg. Rept., Manchester Hosp., 1870.

[7] Bull. Soc. Anat., Paris, 1875, p. 843.

[8] Traité Pratique des Mal. de l'enf., t. îi. p. 36, 2d edit., 1845.

Sex.—Cases of membranous enteritis are generally seen in hysterical women, or hypochondriacal men, a fact well recognized by an early writer, who, as already stated, styled the disease, "hypochondriasis pituitosa." Whitehead tells us that out of one hundred cases only *four* occurred in males; Field notes eighty per cent. of the recorded cases as occurring among females.

When endeavoring to seek the active causative agent of this enteric condition, one is met with such a diversity of opinion as to be almost embarrassed by its richness. We will, however, most usually find the disease occurring apparently as a concomitant or sequela of either disease of the genital or intestinal tract, or of the nervous system. As illustrating the apparent connection between this condition and uterine disorders, we might cite the case reported by Hess,[1] where the patient had had two miscarriages preceding the attack of membranous enteritis, during which she passed pieces of membrane a foot long. Fish[2] observed a woman aged forty, in whom a uterine disorder had preceded the expulsion of the membranes, and F. W. Gross[3] a case in which a similar discharge from the vagina accompanied that from the bowel; all the cases seen by this observer were females, and at or about the middle period of life.

The apparent connection between irritation or disorders of the intestinal tract and the occurrence of membranous enteritis, is well shown by Willard's[4] case, which occurred in a previously healthy female, aged forty, who some six months before had been poisoned by excessive doses of podophyllin. Most all observers

[1] Med. and Surg. Reporter, 1880, p. 42. [2] Ibid., p. 417.
[3] Boston Med. and Surg. Journ., 1881, pp. 27–55.
[4] Trans. Path. Soc. Phila., 1876–77, vol. vii. p. 37.

report an antecedent dyspepsia and constipation, alternating with diarrhœa. Grantham, as early as 1849, considered the abuse of mercury as productive of the condition under consideration. Abdominal cancer, pyloric obstruction, proctitis, hemorrhoids, typhoid fever, disease of the prostate gland, and enteralgia, have all been considered as causative agents. Patients suffering from erysipelas have passed membranous casts. Muhlenberg[1] has observed the same occurrence in tuberculosis of the intestine.

We must exclude cases of the so-called croupous or diphtheritic enteritis, as it is not the province of the present paper to consider all forms of membranes passed, but simply that which is purely a mucous cast; hence but passing reference will be made to Boyd's[2] case, in which a deposition of membrane occurred all through the colon, especially in its transverse portion, where the adventitious membrane could with difficulty be separated from the bowel, and was quite flaky, it was evidently a croupous exudate: of a similar nature are the cases recorded by Powell and Bartholow, who considered the membrane passed as the process of a down-travelling diphtheritic focus. The specimens and photo-micrographs of the pseudo-membrane of dysentery recorded in Part II. of the *Medical History of the War of the Rebellion*, are also not accorded a place in the present paper. Lastly, to illustrate its association with disorders and disturbances of the nervous system, we have but to recall the fact that many of the cases present a history of hysterical outbreaks, neuralgia, sciatica,

[1] Amer. Journ. Med. Sci., 1878.

[2] Trans. Acad. Med. Ireland, Dublin, 1885, vol. iii. pp. 308–310.

and other nervous troubles; indeed, Da Costa would attribute the true etiology to the nerves presiding over nutrition and secretion, considering the disease as a manifestation of disordered nervous supply, which may be either general or local. Wales considered the ganglionic nerves of the intestine to be primarily at fault.

Symptoms.—In no way, perhaps, can a better understanding be had of the general clinical features of the disease under consideration than by recording the following cases from the writer's practice:

Case I.[1]—S. H., aged thirty-one years, a woman of good physique; weight 150 lbs. Married nine and a half years ago, first and only child born twenty-seven months before coming under the writer's observation. The labor was normal, and the recovery good. No miscarriage or uterine disorder; health has always been good, is neither nervous nor hysterical; no hereditary contamination. All organs apparently healthy. Three years ago, after a severe attack of dyspepsia, she passed an intestinal cast, which was quite fourteen inches in length.

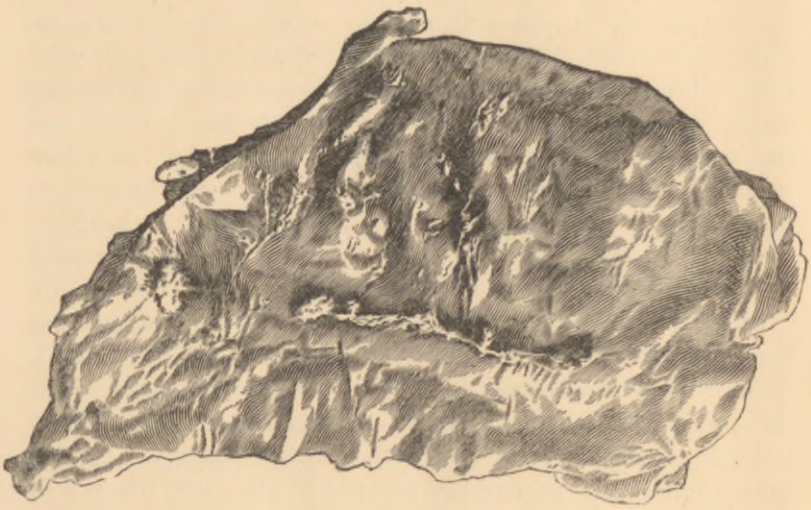
Since the first appearance of the membrane the passage has been frequent, the total quantity would be quite two gallons. A peculiarity in the case, to which we will refer later, is that the patient complains of no colic, tenesmus, or tumefaction, and suffers no pain during or preceding its passage. Bowels constipated. The paroxysmal passage of the casts, marked at first, has given away to their almost constant presence. Blood never occurs in the discharges. The patient's general health is excellent, her periodical functions are performed with regularity and ease, she feels quite well, and were it not for the mental distress that her condition occasions, would consider herself in perfect health.

[1] This case has already been referred to in The Medical News, August 7, 1886, but a synopsis will now be given.

Case II.—E. P., aged seventy-one years, admitted to Dr. Osler's wards in the Philadelphia Hospital, to whose courtesy I am indebted for the privilege of publishing the case. The man was under observation for about six weeks, but was unconscious, and no history could be elicited.

Autopsy twenty-four hours after death.—A very complete and exhaustive examination was made, but, for our purpose, we will consider the intestinal condition alone. The man died of chronic nephritis and purulent basic meningitis.

Intestines.—Small: show distinct Peyer's glands without ulceration. Large: the ascending portion of the colon pre-



sents membranous casts and flakes, closely adherent, yellowish-white in color; small pieces of semi-translucent membrane and some solid roundish cords, which run into a clear colorless jelly, which is almost structureless, is handled only with the greatest difficulty, and when placed in water becomes hardly visible. The appearance is well illustrated by the accompanying photograph, which represents a segment of the colon with the membrane *in situ*.

The point of special interest for us in this case is, of course, the condition of the gut, which, excepting the presence of the membrane, was absolutely normal. No evidence of past or present colitis was to be noted, the small gut and stomach were in a similar healthy condition, and contained no membrane. Judging from the post-mortem evidence the man's digestion and assimilation were as good, if not better, than in most persons at his advanced period of life.

We were unable in any way to connect the existence of the membrane with the patient's condition just preceding death, and can but conclude that it was simply without clinical manifestation, except the passage of membrane in the stools.

The passage of the casts is usually paroxysmal, accompanied by abdominal pain, tenesmus, and nervous disturbances, and is preceded or followed by digestive troubles. Abdominal tenderness almost always exists, and is generally relieved by the passage of the membranes; blood may be present in the discharges;[1] at this time the bladder will usually present some symptoms, more particularly should the disease occur in a female, when manifestations of uterine disorders will be almost invariably present. Patients who are the subjects of membranous enteritis, while they do not lose the normal contour of the body, still present some evidences of malnutrition: they are apt to have eruptions of furuncles and carbuncles, sore mouth or herpes of the genitals, and an irritable nervous system.

Emaciation is rarely a marked symptom, it is indeed worth noting that this almost entire lack of emaciation

[1] Hutchinson: Trans. Lond. Path. Soc., vol. ix. p. 188, with Plate.

persists throughout the cases, notwithstanding the amount of matter passed.

The number of paroxysms and the duration of the attacks are very variable, and may be preceded by certain premonitory symptoms, as Da Costa has observed a patient who was able, with absolute certainty, to foretell an attack by a sense of chilliness, blueness of the nails, and tingling or pain at the finger-tips. Patients may suffer but one attack in a year, one a month, or, on the other hand, the paroxysms may be continuous, as in our first case; the duration of these attacks is also very irregular, they have been reported as short as twenty-four hours, and as long as two weeks; the difficulty in precisely limiting the attack will be appreciated when we remember that in the more chronic cases there is an almost constant sequence of symptoms; we must also bear in mind that the patients are usually dyspeptic, and suffer more or less from constipation and abdominal distress, which sometimes amounts to severe pain referred to the umbilical region;[1] indeed this train of symptoms usually precedes for some time the expulsion of the membranes.

Hess[2] has recorded an interesting case in which the patient appeared to know when the pieces became loose, as she could feel them moving their entire course through the intestinal canal.

Membranes are not found in each stool during a paroxysm, as a rule, but a single accumulation is generally passed accompanied by pain and tenesmus—indeed, some cases only discharge the membrane about

[1] New York Medical Record, 1882, ii. pp. 33–36.

[2] Med. and Surg. Reporter, 1880, p. 42.

once a week; on the other hand, patients may have ten or a dozen membranous stools in twenty-four hours.

Pain, tenderness, and tenesmus are complained of in varying degrees by different patients; the most usual manifestation is abdominal pain, which may be simply a sense of uneasiness or severe agonizing pain[1] which is generally relieved by the passage of the membrane; tenderness may exist over the entire abdomen or be localized and only developed by firm pressure.

Hemorrhoids, prolapse of the rectum, diarrhœa, jaundice, extreme thirst, coated, anæmic, and fissured tongue, aphthous ulcer of the mouth, and tonsillar phagedena have all been noted in the symptomatology of the disease.

The nervous system presents many and varied manifestations. To some of these neuroses we have already called attention, particularly the hysterical derangements, which are the most frequent of all the functional disturbances; this applies both to males and females affected by membranous enteritis. The following symptoms have been noted: neuralgia, hyperæsthesia, irregular muscular tremors, paresis, hysterical tetanus, coma, and convulsions. Transient defects in vision, tinnitus aurium, and disordered sense of taste are all among the recorded symptoms.

Whitehead notes chorea and paralysis in children, and Copeland has observed a cataleptic condition follow an hysterical outbreak.

Cerebral symptoms have occasionally appeared, for instance amnesic aphasia has been recorded; mental depression, faulty memory, hypochondriasis, and melan-

[1] Hutchinson: Ibid.

cholia may be exhibited for a time, to be followed possibly by increased mental activity.

The association of this disease with uterine disorders has already been noted, as has also the fact that a simultaneous discharge may take place from the bladder and the bowel; cystitis, strangury, and frequent micturition may cause bitter complaint. The urine does not present any alteration that can be associated with the disease under consideration. The temperature is rarely above normal, except possibly during the height of a paroxysm which is accompanied by much pain; it may, however, be affected by an intercurrent disease, as phthisis.

Macroscopic and microscopic characters of the membrane.—The gross appearances of these casts are well shown by the accompanying illustration. They are for the most part made up of opaque, white solid masses, rounded or flattened, and small flocculent pieces of semi-translucent membrane; the membranes are delicate and are handled only with the greatest difficulty, out of water.

Microscopically the membranes in our cases corresponded somewhat closely to those of Goodhart.[1] Under a two inch objective their surface was seen to be composed of opaque and translucent parts, the former apparent as rounded ridges marking off the latter into regularly arranged hexagonal or polygonal crypts. Under a higher power these crypts are still visible, although much less defined. These appearances are best seen in the small flakes of membrane, less distinctly

[1] James F. Goodhart: Trans. Path. Soc. Lond., 1872, xxii. p. 98, plates iii.

in the larger masses, and not at all in the finer networks[1] that are sometimes passed.

These masses appear to be due to the formation of mucous and epithelial matter either upon the surface of or in contact with some follicular mucous membrane. This view is further evidenced by the nomenclature of the Pathological Society of Philadelphia, which, for example, considers the membranes to be the product of an "interstitial desquamative catarrh." On comparison of these membranes which are moulded by the gut with the healthy mucous membrane, certain differences are at once apparent; the mouths of the pseudo-follicles on the surface of the cast are much larger than those in the normal intestine, they approach closer to each other and may run one into the other; the cells present in the membrane have no definite arrangement and are not placed upon a basement membrane, which is entirely absent in the mucous formations. The cells have undergone a fatty and disintegrating process.

Drs. Wilks and Andrew Clark, reporting upon the microscopic examination of Hutchinson's case to the London Pathological Society, make some interesting observations. Upon laying open the cast and examining its inner surface under forty diameters a gelatinous membrane-formed matrix was observed, traversed by a coarse network of opaque yellow lines, and studded at their points of intersection by similarly colored roundish masses; from the large network proceeded a smaller network and in its meshes were found at close and regular intervals, well-defined oval or round openings, with elevated margins, resembling in appearance the

[1] Case of Griffiths.

mouths of the follicles in the large bowel. Under 350 diameters the matrix was transparent, structureless, elastic, and everywhere free from fibrillation. Embedded in it were granules, free nuclei, cells, crystals, and particles of undigested food. The opaque yellow lines were seen to be composed of foreign matters, as bile-pigment, earthy and fatty granules, portions of husks of seeds, gritty tissue of pear, a peculiar form of elastic tissue, stellate vegetable hairs, and a mucedinous fungus.

The cells in the matrix were either spherical or cylindrical, in some portions lying without obvious order, in other parts they were arranged in layers. Generally the membranes have consisted of a single layer of matrix with cells, but in some places several layers of matrix could be noted.

Dr. Andrew Clark, in a supplementary note, takes exception to the above report. After citing several propositions to prove his hypothesis, he concludes that he is justified in stating that the casts or membranes are not fibrinous, that they are not the product of inflammation in the sense defined (chronic inflammatory action of the mucous membrane and subsequent exudation), and that the abnormal cell products have arisen in some other way—*i. e.*, metamorphosis—than by free development of an exuded blastema. He also makes this further observation, which is of extreme interest in the present study—the product of diseased action in mucous membranes occurs in three varieties: first, a clear, jelly-like, and imperfectly membranous substance; second, yellowish, semi-opaque, flaky, and usually membranous; third, yellowish-white, dense, opaque, dis-

tinctly membranous, tough, and rather adherent to the subjacent surface.

Action with reagents.—H. B. Hare states that pharyngeal mucus, for example, will exhibit chemical reactions similar to those of the membranous discharges, and states further that the discharges consist essentially of mucin, with possibly a trace of albumen and no fibrin, thus expressing our own views on the subject, and agreeing, for the most part, with all other observers.

Strong acids and alkaline solutions of moderate strength will dissolve the casts. Their albuminous nature is shown by acting on these solutions with the usual tests for albumen—heat and nitric or acetic acid. Some observers (Clark) have noted the absence of albumen in the membranes. According to Goodhart, after the solution has been precipitated it cannot be reprecipitated by acetic acid, ferrocyanide of potassium, alcohol, ether, or perchloride of mercury. The casts stain readily but irregularly with carmine.

Pathology.—As we have before stated, it is not within the province of this communication to consider the membranes which are the product of croupous or diphtheritic inflammation, but rather, as Field defines it, a "non-febrile disease of the intestines, characterized by irregularly recurring paroxysms of abdominal pain, which is relieved by the discharge of the membranous shreds or tubes composed chiefly of mucin."

Da Costa is of the opinion that the affection is not originally an inflammation, but considers the inflammatory element as the result rather than the cause. This observer would attribute the true etiology to the nerves presiding over nutrition, considering the disease as a manifestation of disordered nervous supply, which

may be either general or local. Clark held that the membranes were not the product of inflammatory action because they contained no fibrin, a view not tenable at the present day, because we know that fibrin is not an essential component of an exudate. Our own views are in accord with the general consensus of opinion that if inflammation is present at all it is in a very mild form. Siredey, Wales, and Whitehead all practically agree that the pathogenesis of the affection is to be looked for in the nervous system; indeed, as Da Costa most aptly remarks, "The association often with similar discharges from other outlets, points to a deeper, more general cause than enteritis, or morbid condition of the intestinal mucous follicles."

The colon seems to be generally the selective site of the disease; this, however, is not always the case, as the small intestine may be invaded, either in conjunction with the colonic deposit or entirely independent of it. Young adult females, or those in the middle period of life, seem to offer, as far as age and sex are concerned, the most favorable subjects.

Upon referring to the literature of the subject one is at once struck with the extreme paucity of post-mortem records of the disease, and, if we exclude all cases of croupous or diphtheritic deposit, the number becomes small indeed.

Simpson says that Abercrombie saw a case in which the mucous membrane of the colon was covered by an immense number of clear white spots, which were small vesicles, that, when punctured, discharged a small quantity of clear fluid; the patient during life had passed a large quantity of membranous casts or

tubes. The small intestine was healthy. The girl died of phthisis.

Wright's case presented the mucous membrane of the colon and lower portion of the small intestine studded with a thickly set papular eruption. Barrier (ibid.) noted alteration in the follicular apparatus of the intestine, and Laboulbène[1] states that the membranous discharge first makes its appearance in the summits of the intestinal folds, and there spreads, being slightly adherent to the mucous membrane.

In view of the meagre post-mortem literature of the subject how interesting do the records of our cases become. Here the membranous deposit was confined to the colon entirely, and was extremely adherent to the gut, giving place to a colorless, structureless jelly, which was handled only with the greatest difficulty.

Diagnosis.—The diagnosis of this condition presents but few, if any, difficulties. If mistakes arise they are, in all probability, due more to the carelessness of the observer than to any obscurity in the manifestations of the usual clinical phenomena of the disease. In the writer's experience the membranes have been considered to be ascaris lumbricoides, the resemblance, in some cases, was close indeed, but readily distinguished by the most casual examination; again, the white, shining, detached pieces have been mistaken for segments of the tænia mediocanellata, tænia solium, and the bothriocephalus latus; but, as above stated, the failure correctly to recognize the nature of the case is not on account of its atypical manifestation. It has also been

[1] Recherches sur les affections pseudo-membraneuses, p. 516, Paris, 1851, quoted by Field.

mistaken for fatty discharges, and the lionteric discharges of dysentery. Anal fissure may cause a hypersecretion of mucus.

In cholera a fibrinous or gelatinous matter has been noticed in the small intestine; in occasional cases this has taken the form of a croupous deposit. In puerperal fever, scarlatina, pyæmia, and in tubercular disease a membrane occasionally forms and is cast off. That patients may inadvertently be misled, and thus mislead their medical adviser in relating the history of their complaint, is proven by the experience of Queckett, quoted by Richard Quain, who records the case of a woman, who, at intervals of two or three weeks, had severe abdominal pain, occurring in paroxysms, always relieved by the passage of a mass, sometimes as large or larger than an orange, made up of membranous matters and tubes. The mass represented the undigested portion of mutton chops upon which the patient had been living.

Queckett further states that he has observed nine cases of a similar character. Schubler[1] gives a plate illustrating peculiar branching tubes passed per rectum, which were also probably the arteries and ligaments derived from the meat diet of the patient; similar cases are reported by Elsaesser and Uhl. In other cases the membranes appear to be made up entirely of yellow elastic tissue, which, according to Corrigan,[2] resembles closely the ligamentum nuchæ of sheep.

In conclusion, portions of the gut itself,[3] or of its

[1] Jahrbücher d. deutschen Med. v. Chir., Bd. iii., Heft i. S. 65, Nürnberg, 1813.

[2] Dublin Hospital Gazette, 1854–55, vol. i. p. 38.

[3] Ziemssen's Cyclop., Boehm, vol. i. p. 332.

necrosed mucous membrane, may be voided by stool, but the history of the case, the constitutional condition of the patient, together with the concomitants and the appearance of the matter passed, should quickly elucidate the nature of the disease.

Prognosis.—The prognosis, in relation to cure, is essentially bad; most cases run a prolonged and tedious course, in many extending over the largest part of their adult life; as, for example, the patient of Gross, in whom the disease lasted nineteen years, and Da Costa's case of twenty years' duration; on the other hand, the disease, of itself uncomplicated, rarely proves fatal, the recorded causes of death are totally independent of the membranous affection.

Treatment.—We may consider the treatment under two headings: the prophylactic and the active, or that which is appropriate during an interval or remission, and that which we will resort to during an exacerbation.

It is during the remissions or intermissions that we can hope to do more for our patient's permanent good than during an actual attack; it is at this time that diet, regimen, and hygiene are indeed the sheet-anchors. A careful supervision must be had of the patient's daily life, all sources of irritation are to be removed, as hemorrhoids or uterine disease. Easily digested or even pre-digested food should be supplied, and care should be taken that undigested particles of food are not irritating the intestinal canal. As constipation usually exists, sometimes to a most stubborn degree, mild saline laxatives are usually most efficacious, or enemata may be resorted to.

Exercise for those who can stand it is of paramount importance; this, if possible, should be out of doors.

Dr. Fowler most aptly says, he who stints himself in the drinking of water is dirty inside, and he also tells us that we must drink between seventy and seventy-five ounces of water per day in order to make up for the amount which is excreted by the lungs, skin, and kidneys, amounting to ninety ounces a day; with the solid food we get about fifteen ounces. Very few persons at home drink as much as that, but should they go to any of the numerous springs in which our country is so peculiarly rich, drink five pints of water per day, lead a regular outdoor existence, breathe pure air, as many of our springs are situated in most beautiful mountain regions, where the life spent out of doors is most beneficial, the patient will be improved in health, independently of any mineral agent whatever in the water. Unfortunately, however, all of our cases will be unable to avail themselves of a course of treatment at the springs, but as there is no doubt that most of the natural mineral waters preserve their value for a long time, we can put patients through a thorough course at their own homes with the additional advantage of having the case under our own supervision.

During the acuteness of an attack opium will often be found necessary to afford relief, and possibly to check excessive secretion or hemorrhage. Belladonna in the form of the extract, Dover's powder, subnitrate and subcarbonate of bismuth, together with local counter-irritation, all tend to abort the paroxysm, or, at least, to shorten its duration. The following remedies have been suggested: arsenic, copaiba, bromide of potassium, nitromuriatic acid, henbane, vegetable infusions, prolonged counter-irritation, electricity, turpentine, iron, cod-liver oil, oxide or nitrate of silver by mouth or by

high injections, chloride of ammonium, sulphate of zinc, bichloride of mercury, chlorate of potassium, oxide of zinc, blisters, warm water enemata, nux vomica, ergot.

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References marked with an asterisk are taken from Field's Prize Essay on Membranous Enteritis, 1887. I have omitted all references that are to be found in the Medical and Surgical History of the War of the Rebellion, Part ii., Med. Vol., pp. 363 to 368, as the publication is so generally accessible that those specially interested can consult it in the original.

Specimens of the membranes are preserved in several museums, to which I have referred in an earlier communication (Med. News, Aug. 7, 1886).