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DISEASES OF METABOLISM
AND NUTRITION

VON NOORDEN

No. III.
MEMBRANOUS CATARRH
OF THE INTESTINES

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MEMBRANOUS
CATARRH OF THE INTESTINES.

DISEASES OF
METABOLISM
AND NUTRITION.

A SERIES OF MONOGRAPHS

BY PROF. DR. CARL VON NOORDEN,
Phys.-in-Chief to City Hosp., Frankfort-a-Main.
Authorized American Edition
Edited by BOARDMAN REED, M.D., Philadelphia.

- I.—OBESITY: the Indications for Reduction Cures.
II.—NEPHRITIS.
III.—COLITIS: or Membranous Catarrh of the Intestines (*Colica Mucosa*).
IV.—THE ACID AUTOINTOXICATIONS.
V.—SALINE THERAPY.

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AND CO., LTD.

MEMBRANOUS CATARRH OF THE INTESTINES (COLICA MUCOSA)

BEING PART III OF SEVERAL
CLINICAL TREATISES
ON THE PATHOLOGY AND THERAPY OF
DISORDERS OF
METABOLISM AND NUTRITION

BY
PROF. DR. CARL VON NOORDEN

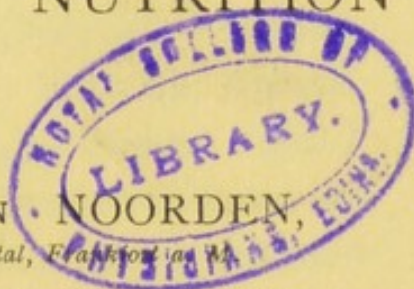
Physician in Chief to the City Hospital, Frankfurt am Main

With the collaboration of DR. CARL DAPPER.

AUTHORISED TRANSLATION UNDER THE DIRECTION OF BOARDMAN REED, M.D.,
PROFESSOR OF DISEASES OF THE GASTRO-INTESTINAL TRACT,
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HOSPITAL, PHILADELPHIA, ETC.

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PREFACE TO THE AMERICAN EDITION.

For many years I have been occupied, with my assistants and pupils, in an exhaustive study of the disorders of metabolism and nutrition. The result of this work has been a number of short essays published in various periodicals, and several longer monographs (Textbook on the Pathology of Metabolism, Berlin, 1893; Diabetes and Its Treatment, Berlin, 1st edition, 1893; 3rd edition, 1901; Chlorosis in Nothnagel's Handbook of Pathology and Therapy, Vienna, 1887; Obesity, in the same Handbook, Vienna, 1900.) The wishes of my friends and pupils have induced me to establish a medium for the publication in collected form of the results of our increasing experience in the pathology and therapy of the disorders of metabolism and nutrition. The first volume in this collection (On the Indications for Reduction Cures), and the second (On the Treatment of Acute Nephritis and Chronic Atrophic Kidney), have been already issued in German, the publisher being A. Hirschwald, Berlin. The other numbers should appear at intervals of four to six months. It has been arranged to have the collection contain not only dissertations from my pen, but also writings by my assistants and pupils,—of course under my control and responsibility. The monographs are to express, above all, the personal views and observations of the writers; or they will

contain collective presentations upon important questions. Only such subjects will be chosen as are of importance and interest to every physician.

The following themes are under consideration for the immediate future but not positively decided upon:

THE TREATMENT OF COLICA MUCOSA (Enteritis Pseudomembranacea).

THE MEDICINAL TREATMENT OF DIABETES MELLITUS.

INDICATIONS FOR AND THE METHODS OF CARRYING OUT FEEDING (mash) CURES.

THE TECHNIQUE OF REDUCTION CURES.

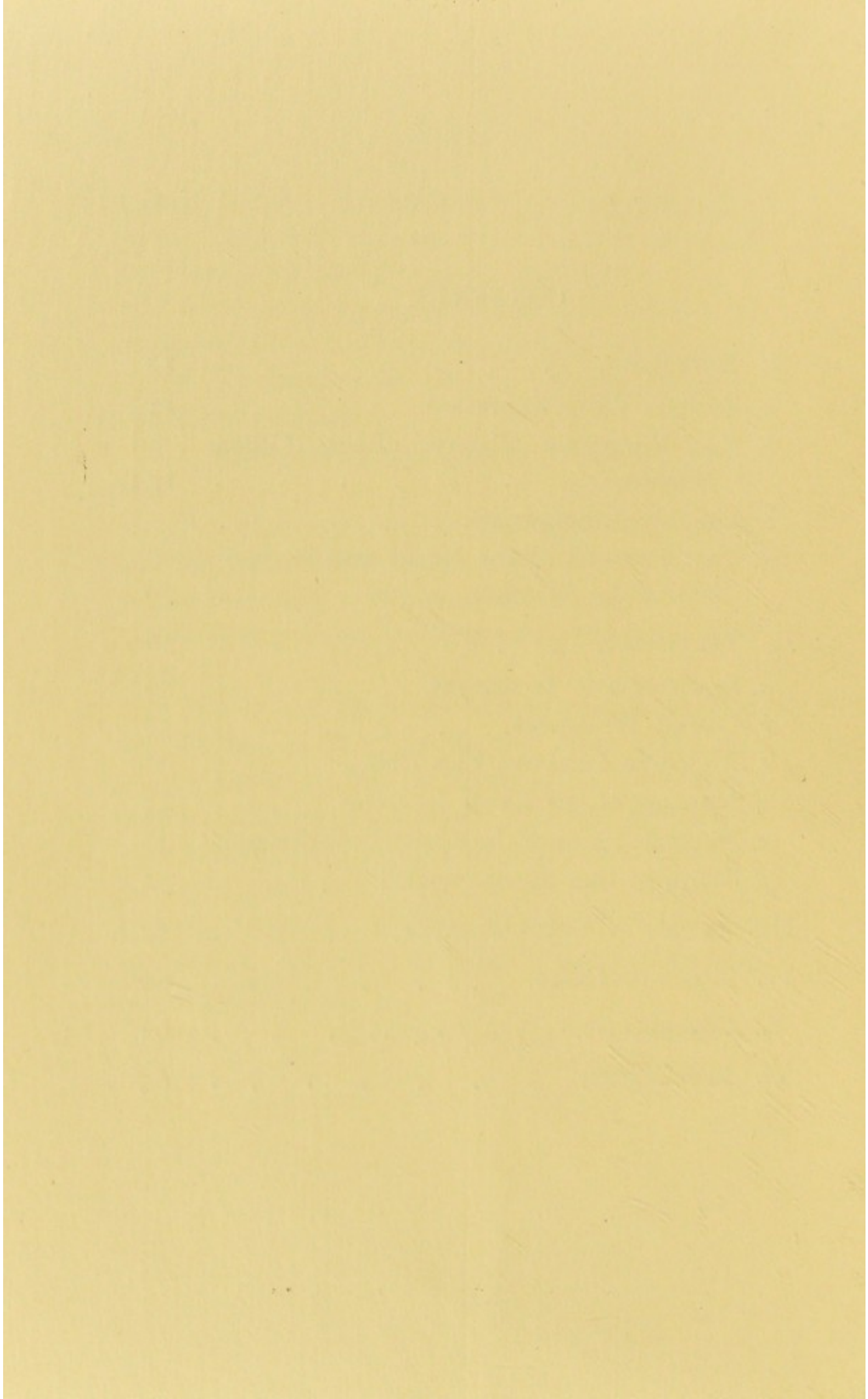
THE SIGNIFICANCE OF ACETON IN DIABETES MELLITUS.

It is a source of satisfaction to me to announce that Messrs. E. B. Treat & Co., New York, have undertaken to publish the collection of these monographs in English. Particular care will be taken to have them appear hereafter as nearly simultaneously in New York and in Berlin as possible; and I hope that this American Edition will meet with the same approbation which I am happy to say has been accorded the German.

Prof. Dr. CARL VON NOORDEN,

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NOTE BY THE AMERICAN EDITOR.

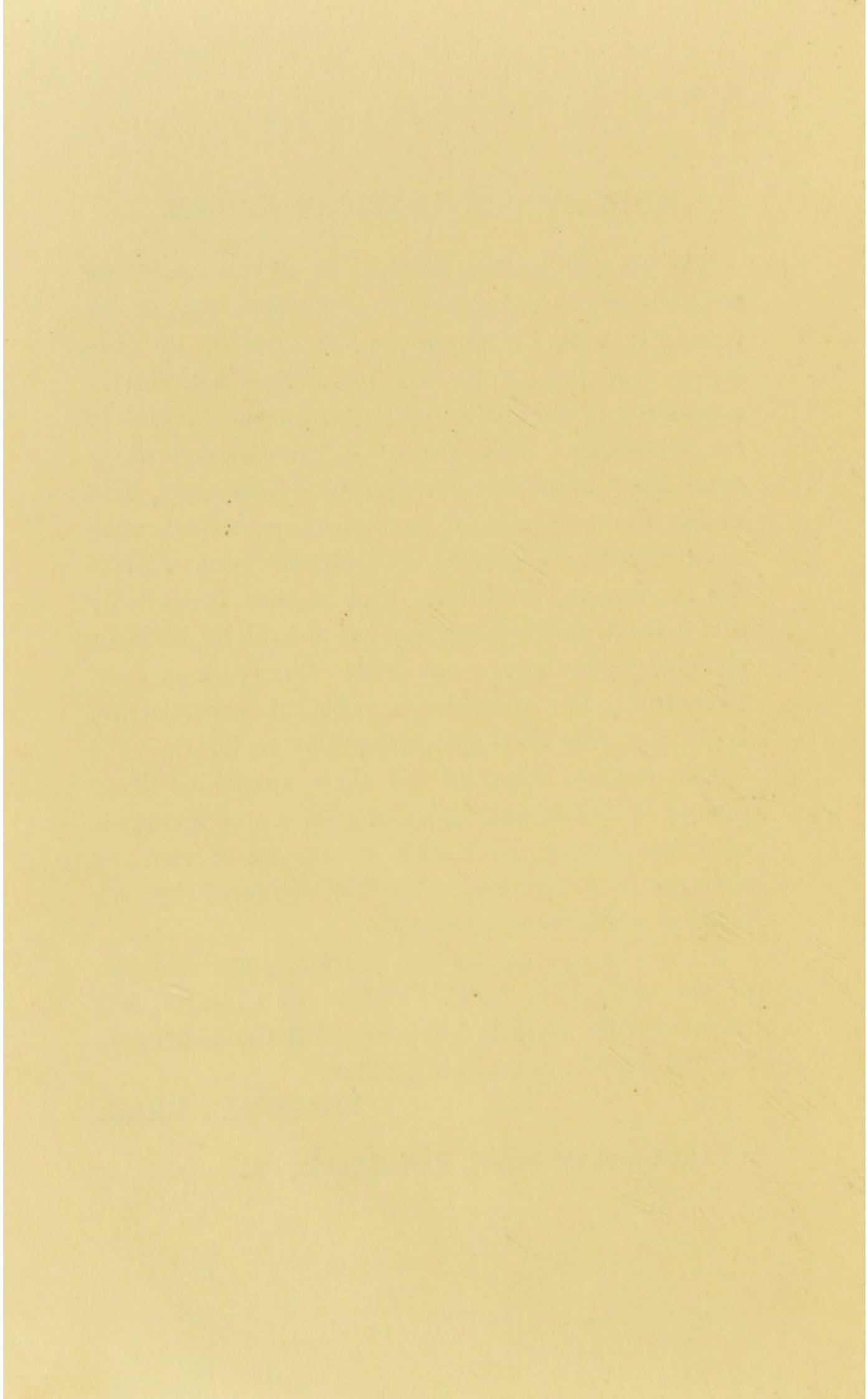
The English-reading physicians of the world are to be congratulated upon the publication here, simultaneously with its appearance in Berlin, of Professor von Noorden's and Dr. Dapper's masterly exposition of the subject of Membranous Catarrh of the Intestines. This is one of the diseases which every busy practitioner encounters frequently, and under the methods of treatment prevalent until very recently it proved difficult to cure, mainly for the reason, doubtless, that it was imperfectly understood, conflicting views being held by eminent clinicians concerning not only its etiology and pathology, but also, as a natural consequence, concerning the therapy appropriate to it.

Our author traverses all these questions in a manner which is well-nigh exhaustive and also most convincing—since he is able to report a remarkably large proportion of cures obtained by the method which he recommends.

As in the case of the two preceding monographs of the series, Dr. A. C. Croftan, of Chicago, has performed the translation and aided the Editor in supervising the American Edition.

BOARDMAN REED.

1833 Chestnut Street, Philadelphia, Pa.



MEMBRANOUS CATARRH OF THE INTESTINE (COLICA MUCOSA) AND ITS TREATMENT.

I. PATHOLOGY.

(a) *Various Views Expressed.*—Colica mucosa (syn. colitis pseudomembranacea, membranous catarrh of the intestine, myxoneurosis coli) is difficult to characterize and to classify among the chronic disorders of the intestine either from a theoretical point of view or from the standpoint of systematic nosology. Notwithstanding the fact that numerous dissertations on this subject, some of them by very competent authors, have been published within the last two decades, and in particular within the last five or six years, the disease that we call membranous catarrh of the bowel has not so far attained an established and generally recognized nosological position. After the papers by Nothnagel ⁽¹⁾ Marchand ⁽²⁾, Leube ⁽³⁾ and others appeared, there seemed to be a consensus of opinion among clinicians to the effect that the disease was a secretory and motor neurosis of the intestine. The more recent dissertations on the subject, however, by Einhorn ⁽⁴⁾, Boas ⁽⁵⁾, Epstein ⁽⁶⁾, Schutz ⁽⁸⁾ and others disagree in numerous essential points with this interpretation of the

symptom complex of colica mucosa without at the same time agreeing satisfactorily among themselves. All the more recent publications on colica mucosa have only this in common that they concede the role of inflammatory processes in the genesis of the majority, if not of all, the cases of this affection. This view differs radically from the old idea and is important both from a theoretical and a practical standpoint; for it is clear that the prognosis and the treatment of the disease must be largely determined by the interpretation of its pathogenesis, just as in corresponding affections of the stomach the existence of a catarrhal or a nervous form of dyspepsia determines the interpretation and the treatment of the disease. As long as only the two symptoms of colica mucosa that are indicated in the name of the affection, viz.: the passage of mucus and the pain, are considered, we can hardly expect to arrive at a satisfactory unification of ideas on the subject; for both these symptoms appear in a great variety of diseases of the intestine that have nothing in common with each other and that call for altogether different treatment. The excretion of mucus, and pain, are particularly common as symptoms or as consequences of affections of the bowel that are unquestionably inflammatory in character, particularly of inflammatory lesions of the lower portions of the intestinal tract. As the excretion of mucus with pain may vary in intensity and extent at different periods of these in-

flammatory affections, just as any other symptom may, we are certainly justified, from a purely symptomatic standpoint, in calling paroxysmal exacerbations "colica mucosa."

There are a number of very valuable post mortem reports on record that demonstrate positively that a disease-picture corresponding to colica mucosa (and that I will describe more fully below) may actually be observed in cases of genuine enteritis (M. Rothmann: *Zeitschrift f. Klin. Medicin*, Vol. 22, 1893, and J. C. Hemmeter, *Diseases of the Intestine*, Vol. 1, pag. 486, 1901). Other case reports by Boas ⁽⁵⁾, Einhorn ⁽⁴⁾, Schütz ⁽⁸⁾, Krysinski ⁽⁹⁾, and finally a considerable number of observations that I have made myself, all demonstrate without doubt that this is actually the case. The occurrence of the symptom complex of colica mucosa in genuine enteritis seems so unquestionable and self-evident to us that it is hardly worth while to adduce more evidence to strengthen this view.

Boas is of the opinion that these positive findings in regard to the anatomic changes in the mucous lining of the bowel are "without doubt of much greater importance than any negative findings." Personally we are inclined to maintain precisely the opposite; we consider it to be much more interesting and much more important that the typical disease-picture of colica mucosa may occasionally be observed in cases that reveal a perfectly normal condition of the intestinal mucosa on autopsy. To

this category belongs the case reported by O. Rothmann (Deutsche Med. Woch. 1887, No. 27); Hemmeter (l. c. pag. 486) reports similar instances from his experience. The latter subjected certain portions of the colon that were covered with a thick layer of mucus to careful macroscopic and microscopic examination and failed to find any histologic evidence of inflammation. He therefore agrees with Nothnagel, who says that for this reason the disease merits more the name of "colica mucosa" than "colitis mucosa." In another case that N. Jagic (Wiener Klin. Rundschau, 1901, No. 41) published and that was carefully studied by this author, small anomalies were discovered in the epithelial layer of the mucosa, but the changes differed in several respects from those found in genuine enteritis. The case occurred in my service (von Noorden). The scanty anatomic material at our disposal, therefore, teaches us, on the one hand, that colica mucosa may be one of the symptoms of genuine enteritis and, on the other hand, that this affection may also occur without any *essential* anatomic lesion of the mucous lining of the intestine or even without any anatomic lesions whatever. The latter occurrence, i. e. the appearance of the symptom complex of colica mucosa without corresponding anatomic lesions in the bowel, is decidedly the most important observation from the point of view of pathologic anatomy. The clinician will be still more inclined to attach particular importance to this

phenomenon, for clinical observation in the majority of cases and particularly in the cases that run a typical course, negatives the existence of any anatomic disease of the intestine.

Nothnagel ⁽¹⁰⁾, recognizing the duplex character of colica mucosa, i. e. realizing that there are two forms of the disease, the one with, the other without inflammatory phenomena, strictly separates the two forms and even calls them by different names; thus he speaks of enteritis membranacea on the one hand and of colica mucosa on the other. He teaches that only the latter form is of neurotic origin. It would not be correct, of course, to consider only the production of mucus and to speak only of a secretory neurosis; the symptom complex moreover—provided we wish to adhere to the conception of a neurosis—amounts to a combined secretory, motor and sensory neurosis. This dualistic view that Nothnagel advocates dominates, as I have already said, all the literature on the subject that has appeared since his publications. Whereas, however, several authors, as v. Leube, Rosenheim ⁽¹¹⁾, Fleischer ⁽¹²⁾, Hemmeter and I myself, are inclined to see the characteristic features of Nothnagel's colica mucosa in the great majority of the cases that come under observation, other authors are inclined to consider enteritis membranacea (in the sense of Nothnagel) to be the rule and simple colica mucosa to be the exception.

We find the first attempt to depart from the dualistic view enunciated by Nothnagel in v. Leube, for the latter says: "However well established the fact may be that the formation of a membrane occurs in the course of certain varieties of enteritis, it is also true beyond cavil that this formation of membrane is dependent on some nervous affection. Almost all the sufferers from this disease that I have had occasion to observe were at the same time hysterical, and all medication directed towards improving the catarrh of the bowel, even though it was continued for months, remained without effect. I cannot help believing that the majority of these cases of intestinal disease that are accompanied by the formation of a membrane are in reality secretory neuroses of the bowel." According to this view colica mucosa may, so to say, develop as a nervous complication on the basis of enteritis. This conception overthrows the dualistic view of Nothnagel. H. Westphalen ⁽¹³⁾ emphasizes this unitarian point of view still more forcibly than v. Leube, for this writer condemns the separation of enteritis membranacea into two etiologically different groups altogether. He denies the justification of distinguishing between enteritis membranacea of inflammatory origin and colica mucosa or a neurosis of the bowel in the sense of Nothnagel. According to this author, the formation of the so-called enteritic membrane is always due to nervous hypersecretion of mucus. If we are dealing, in any

given case, with an uncomplicated secretory neurosis, then abnormally large quantities of amorphous mucus are poured out; if the case is complicated by the appearance of spastic conditions of the bowel, then the over-abundant quantity of mucus is compressed and strand-like masses are evacuated; if these masses are evacuated with violent pain then we must assume that a sensory neurosis exists at the same time. A genuine catarrh, as Westphalen correctly assumes, may be present at the same time (in this he agrees with Boas), but in such a case it is not the catarrh but the neurosis that must be made responsible for the production of excessive quantities of mucus, i. e. for the most characteristic feature of the disease. The excellent monograph of Westphalen treats of this subject in a most exhaustive manner and I recommend a perusal of his paper to every one who wishes to instruct himself in regard to the pathogenesis and the diagnosis of colica mucosa.

(b) *Von Noorden's Theory about Colica Mucosa.*—Before discussing the point of view that I occupy personally, it will be necessary to give a brief sketch of the disease-picture presented by colica mucosa, or rather it will be necessary to delineate the symptom complex that I elect to call by that name. This is especially indicated for the reason that the same thing is apparently called by different names and different things by the same name by different workers in this field.

The majority of the cases of the disease occur between the twentieth and the forty-fifth year; some cases have however also been observed in the second decade of life. After forty-five years the disease decreases in frequency. Women are much more frequently affected than men. The disease does not seem to be equally prevalent in all localities. Among my own patients a relatively large proportion were Russians.

The great majority of the cases give a history of considerable digestive disturbances for a long period of time preceding the onset of colica mucosa. In part the disturbances complained of are gastric disorders; among my patients nervous dyspepsia with superacidity seemed to be particularly common; in some of the cases a direct history of this affection could be elicited, in others the existence of this form of gastric disorder could at least be suspected. "Cramps of the stomach" that in many instances occurred a long time ago are frequently reported in the anamnesis; at the same time the information given by the patients rarely enables us to determine what was the precise nature of the trouble that produced this symptom. Frequently the patients give a history of a tendency to diarrhea persisting for years, occasionally with the characteristic and altogether bizarre peculiarities of "nervous diarrhea." In a much larger number of cases however the history reveals the existence of constipation that was treated by the greatest

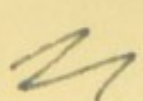
variety of chemical and physical means. During the time, in particular, that immediately preceded the development of colica mucosa we find that *almost without exception the patients suffered for some weeks or months from obstinate constipation.* Many patients report that they noticed the passage of mucus together with hard masses of feces on several previous occasions and long before the disease-picture of colica mucosa proper developed. Whereas all the disturbances that I have enumerated may be considered functional in character, we also occasionally find a history of more serious organic affections with true anatomic lesions; thus, e. g. in several cases a history of appendicitis, and on autopsy demonstrable thickening and adhesions of the tissues in the vicinity of the appendix vermiformis; in several cases, too, a history of genuine tropical dysentery. In either case we are apt to hear from the patient that they lived on a very rigid and careful diet for months or years after the acute attack and that they did this in order to prevent a relapse. Then the symptom complex of colica mucosa appears, according to their report, and the syndrome is as a rule interpreted as a recurrence of the former acute disease; the patients again adopt rigid rules of diet, or impose additional restrictions if they are already dieting, with the result that they not only witness no improvement but on the contrary an exacerbation of their symptoms; finally, the general nutrition becomes im-

paired as a result of deficient nourishment. Other diseases that may precede the onset of colica mucosa are:—Relaxation of the abdominal walls, gastrop-tosis, floating kidney, endometritis, chronic metritis, inflammation of the adnexa. All these diseases I have had occasion to hear mentioned in the history of my own cases and I find that these statements agree with the teachings of the text books on the subject. It will be noted that all the diseases enumerated may impede the movements of the bowels and I consider them important from this point of view.

All my cases have this in common that the patients for one reason or the other or on account of mild or severe digestive disturbances lived on a very simple so-called light diet for a long time; I mean a diet such as it is customary to give to patients suffering from gastric ulcer, catarrh of the stomach, catarrh of the intestine, gall-stone colic, or to patients during the stage of convalescence from appendicitis. In many of the case-histories I find a report of dietetic cures with milk and milk dishes, soups, porridges, light dishes made from flour, zwieback, toast, delicate varieties of white meat, purées of potato and vegetables. Nearly all of these patients were under-fed or did not maintain a full state of normal nutrition as a result of these strict dietetic cures. Many of them report a loss of weight of from 20 to 30 pounds. Almost without exception there was a history of nervous

symptoms of an hysteric or neurasthenic type accompanying the digestive disorders and dating back in many instances to the earliest years of childhood. I wish to call particular attention to the significance of all these points; I agree in this respect with the majority of writers on this subject, in particular v. Leube (cf. above).

Before the fully developed disease-picture appears ~~many~~ of the patients notice the passage of mucus; this they claim to have passed repeatedly together with hard masses of feces; many of them, moreover, report painful sensations in the abdomen that could be made to disappear if the evacuation of the bowel contents was promoted artificially by the administration of such remedies as castor oil, or by the use of enemata, etc.; these attacks of pain can readily be explained by assuming stasis of fecal material. Not until several of these precursory phenomena have been noticed do the patients suddenly suffer a proper attack that may appear in a variety of forms. There is either simply an evacuation of mucus without pain, the mucus passing pure and unmixed with feces, or the evacuation of the mucus is accompanied by a feeling of extreme distress in the abdomen with rolling and grumbling noises in the intestine and colicky attacks of pain. In the former instance the mucus is usually very loose and looks like frogs' eggs and is translucent; in the latter case the mucus is more solid, looks cloudy and less translucent and assumes various



shapes, as for instance of strands, bands, membranes or reticulated structures. It is a matter of subordinate importance whether or not the mucus is mixed with feces when it is deposited; the admixture of feces may be discovered at certain times, during an attack and then again not at other times so that this sign is by no means constant. Everything depends on the contents of the lower portion of the bowel; if the colon is cleaned by an enema before the attack or if the first passage of mucus clears out the bowel contents, subsequent passages of mucus will be found free from feces. In many of the cases everything is over with a single passage of mucus and the patients at once enter into a prolonged period of well being. As a rule, however, the pain and the passage of mucus continue for several hours or for several days, accompanied quite frequently by diarrhea. I have seen attacks that all in all extended over two weeks. During and after the attacks the patients as a rule feel very weak; most of them lose several pounds in weight during the short duration of the attack; this loss of flesh may not be recovered during the interval between two attacks even if several weeks or months elapse, unless the patients are instructed carefully in regard to the proper diet.

These intervals are rarely altogether free from digestive disorders. A feeling of pressure and tension in the abdomen, pinching here and there in the belly, bloating after meals, and loss of appetite are

the most common symptoms complained of. The stools are of particular importance during this period. Although sometimes a tendency to diarrhea exists during the time immediately following the attack, there develops sooner or later a tendency to constipation; before long, therefore, these patients again begin to have recourse to the use of drugs and clysters in order to regulate the action of the bowels. They do this because they know very well themselves, in fact state with great positiveness, that they are apt to suffer another attack if they allow a condition of obstinate constipation to persist.

(c) *Individual Symptoms.*—Among individual symptoms I must discuss the two cardinal signs of the disease, viz.: *evacuation of mucus* and the *attacks of pain*.

I have already mentioned that the excreted mucus may assume different types; that it may either be loose and glairy, containing much water and appearing almost deliquescent, or that it may be more solid, dryer and formed of strands that are tightly interlaced to form reticulated structures. These two types, however, represent extremes and between the two we notice many intermediary transitions; as a matter of fact we may find that in the same attack or even at the same time both types of mucus and different transition forms between the two are evacuated at once. I do not think that it is wrong to assume that the loose glairy form of mucus constitutes the fresh product of the mucous

membranes, whereas the tough and solid masses of mucus constitute older secretions that were produced some time before the evacuation occurred and that were kept for some time—no one knows how long—on the surface of the mucosa. Mucus attached in this way to the mucosa loses water by absorption (as first pronounced by Marchand) and consequently becomes tougher in consistency; at the same time the pressure exercised by the scybala that pass over this mucus through the bowel lumen molds it into bands, strands and membranes. That this actually occurs will readily be conceded by any one who has had occasion to inspect such mucus in autopsies on such cases; Rothmann and Hemmelter state that the mucus is very tightly adherent to the mucosa and I myself have in my possession a specimen (derived from the case mentioned above, reported by N. Jagic) in which the strands of mucus were attached so tightly to the intestine that they could only be removed with difficulty with a pin-cette. As in typic cases of colica mucosa no mucus whatever may be evacuated for long periods of time, and then all at once large quantities of mucus (10 to 100 grams) that is apparently old are passed at once, we may assume that these old adherent masses of mucus are freed from their attachment by the mechanical action of the bowel that is induced by the attack. The mechanics of the attack consist in the first place in violent intestinal movements with pain that apparently partake more of

the character of enterospasm than of increased peristalsis, in the second place in renewed secretion of fresh mucus that, combined with the rhythmic movements of the bowel-wall, has a tendency to loosen and free the adherent masses of old mucus. The masses of old adherent mucus apparently constitute both a mechanical and a chemical stimulus that produces the paroxysm. On the basis of this explanation we can readily understand why some of the attacks may be abortive :

For if the mucus is loose, lumpy and glairy and only slightly adherent to the mucous lining of the bowel, it may be passed without any violent spasm of the bowel wall and without pain. This abortive form is met with particularly in mild cases of the disease and, also, in the initial stages as well as in the period of recovery from this affection.

If, on the other hand, the mucus is very tightly adherent to the bowel-wall, very violent attacks of intestinal colic may appear; at the same time the object of these spasms may not be attained, i. e. : no mucus may be evacuated. If narcotics are administered, or oftentimes spontaneously, these colicky spasms cease; here similar conditions obtain as in the case of the bile ducts or the ureters in biliary or urinary calculus, for here too the spasm of the muscularis may become spontaneously relaxed. At the expiration of a certain time however, sometimes weeks or months, the storm begins again. Attacks of this character frequently lead to diagnos-

tic errors. The increased muscular effort on the part of the bowel-wall, the fact that the lowest portion of the intestine is found completely empty, the violent pain with its concomitant features, viz.: nausea, vomiting, anxious facies and the small pulse, frequently simulate the syndrome of genuine occlusion of the bowel. I saw a typical case of this kind myself when I was assistant in Gerhardt's clinic in the Charité. The patient was a girl of about 25 years who was brought to my department of the clinic in a semi-unconscious condition from pain; the attack had persisted with interruptions for 24 hours. The rectum was empty and nothing was obtained by an enema but a few crumbs of fecal matter. Gerhardt, to whom I showed the patient while he was making his rounds, agreed with my interpretation of the case, namely that the case, in all probability, was one of lead colic, as the patient had formerly been occupied in cleaning vessels in a white-lead factory. The gums, however, revealed no evidence of lead nor could any traces of the poison be discovered in the skin; besides, more than three months had elapsed between the time when she was working in the factory and the time of her admission to the ward. In view of the doubtful character of the case, Gerhardt determined to administer opium at first and to apply hot compresses; in case this treatment was unsuccessful by that evening he advised transferring her to the surgical clinic. The pain was relieved after the first

dose of opium and the patient fell into a deep and long sleep from which she awoke perfectly free from any distress. The following day a spontaneous evacuation of the bowel contents occurred without any mucus whatever in the motions. The patient was just about to be dismissed when suddenly, a week after her admission to the hospital, a new violent paroxysm of pain appeared, followed within a few hours by the evacuation of about 50 grams of tough strands of mucus and of mucous membranes; this event at once cleared the obscure diagnosis. On the following day I presented this case in Gerhardt's clinic, when I was substituting for him, and was enabled on that occasion to demonstrate the possible diagnostic errors that can be made in a case of this kind, in a very striking manner, illustrating my exposition at the same time by the presentation of this remarkable example.

In addition to the abortive forms of colica mucosa that I have mentioned there are certain other forms that are dependent on the individual irritability of different subjects. In very sensitive subjects the casting off of very recent and comparatively loose mucus may be the occasion of violent spasms and pain; cases of this character fully merit the name of "sensibility neurosis." In other cases again a variety of nervous phenomena may appear but sensitiveness to pain at the same time be very slight, so that true paroxysms of pain do not appear in these cases even though the intestine is

forced to rid itself of tough and adherent masses of mucus and finally actually does throw these masses off. In this way the different disease-pictures presented by colica mucosa may be explained. It will be seen that I, following in the steps of older writers on this subject (Da Costa ¹⁴, Nothnagel, v. Leube, Marchand, etc.), consider the production of mucus and the temporary accumulation of mucus to be the essential and the typical feature of the disease, whereas I regard the pain that, as we have seen, may vary in each case and in each attack, to be dependent on the mechanical or chemical irritation of the mucus on the one hand and the individual sensibility of the patient on the other.

If we place the increased production and the pathological accumulation of mucus in the large intestine into the foreground of our consideration we must first of all inquire whether the consistency and the constitution of this mucus may explain the occurrence of the other symptoms. Mucus is secreted in all portions of the large intestine; even in healthy subjects. The quantity of this mucus is however slight and it is so rapidly changed, presumably by the action of bacteria, that it is not discoverable macroscopically in normal feces and only occasionally with the aid of the microscope. Mucus is only evacuated with the feces and only becomes discoverable in the motions under certain particular circumstances; i. e., in the first place, naturally, in catarrhal irritation of the rectum itself (proctitis);

it is hardly possible to confound colica mucosa with this affection if a reasonable amount of care is exercised in examining the patient. Mucus is further evacuated in those forms of catarrh of the large and small intestine that are accompanied by diarrhea; in these cases the mucus is mixed with the thin, semi-solid or pultaceous motions as fine flakes that are best recognized if the feces are suspended in water in a shallow vessel. The presence of mucus in the stools must here probably, in part, be attributed to over production, and to a still greater extent to the great rapidity with which the intestinal contents are evacuated; under these circumstances it is clear that no time is given for the thorough disassimilation of the mucus. The fact is not generally known that the majority of hard scybala contain some mucus, not only on their surface but also in their interior; this mucus can be detected by macerating the hard masses with water that is acidulated with acetic acid. This mucus, too, is probably nothing more nor less than the normal intestinal mucus that may not even have been excreted in excessive quantity but that was merely protected from further bacterial decomposition by the lack of water in the feces. The question has repeatedly been investigated whether or not the mucus that is evacuated in colica mucosa is essentially different from the mucus that is found in the feces in all these different conditions. Aside however from the smaller percentage of water in the mucus of colica

mucosa and its greater consistency, no remarkable differences have been detected. The mucus in colica mucosa gives all the ordinary chemical reactions; among these reactions I mention in particular the pretty color test that A. Schmidt was the first to describe and that Pariser ⁽⁷⁾ later recommended again; this test is particularly applicable for the purposes of demonstration and is carried out as follows: a small particle of mucus about as large as a pea, is placed in a test tube; the tube is then filled with about 10 ccm. of a 5% solution of corrosive sublimate in alcohol; the tube is then vigorously shaken and the disintegration of the flake of mucus brought about in this way. After the sediment has been allowed to settle at the bottom of the tube the alcohol is poured off and replaced by 100 cm. of distilled water. Then 3 drops of a 3% solution of Biondi's staining powder (Farbstoffpulver) and a few drops of Ehrlich's triacid mixture are added; the tube is again shaken and the flake of mucus again allowed to settle at the bottom; the staining fluid is then poured off and the flake of mucus washed several times with distilled water. The mucus will show a green or a dirty greenish-violet color whereas all albuminoid bodies turn a brilliant brick-red with this reaction.

(d) *The Character of the Mucus and Mechanism of the Attacks.*—The only remarkable difference between the mucus of colica mucosa and other intestinal mucus is the fact that the former contains fewer

cellular elements than the mucus in catarrh of the intestine (N. Jagic, anatomic finding).

This peculiarity seems to indicate that in the case of colica mucosa we are not dealing with an inflammatory product; but otherwise no light is thrown on the mechanism of the attacks. Nevertheless it is apparent that the mucus in the disease we are discussing must possess some peculiar properties. Otherwise this mucus, being a slippery mass, should be evacuated from the intestine shortly after it is secreted with the same facility at least as scybala of fecal matter. At this juncture we are for the present forced to have recourse to hypotheses. It is possible that the secretion of mucus occurs under the stimulus of nervous irritation and that it is from the very beginning constituted differently than normal mucus—i. e., is more sticky in consistency, has a greater tendency to adhere to the portion of the mucosa in which it is produced and consequently accumulates. Analogous conditions are seen in the salivary glands, for it is well known that stimulation of the facial nerve causes the submaxillary gland to secrete an abundant quantity of very watery and barely stringy mucus, whereas stimulation of the sympathetic nerve causes the secretion of very thick, tough, gelatinous and very stringy mucus that accumulates at the orifice of the secretory duct in the form of tenacious lumps. As we have every reason to believe that certain nervous influences play a role in the pathogenesis

of colica mucosa, the hypothesis may be permitted that the chemical character of the secreted mucus, in particular its tenacity and stickiness, are changed under the influence of abnormal irritation of the intestinal mucosa. No experimental data have been furnished so far to demonstrate this hypothesis. Possibly we do not require an assumption of this character at all. I have already called attention to the fact that colica mucosa is almost without exception accompanied by a severe degree of constipation. The absorption of water from the feces that pass through the lower portions of the large intestines is consequently very considerable, and there can be no doubt that the recently secreted masses of mucus that are present in this locality are subjected to the same withdrawal of water as the feces; consequently the mucus becomes dryer and thereby loses its elasticity and motility; its plasticity and its stickiness, on the other hand, increase. As soon as these two properties of the mucus reach a certain degree the adherent masses can only be removed from the intestine by violent contractions of the bowel-wall that are usually accompanied by pain. In this way an attack may be brought about; the direct determining cause being the mass of the mucus itself and possibly, in addition, certain chemical changes in the mucus that are not understood but that lead to the generation of irritating products; a third factor that determines the onset of the attack is probably also certain ner-

vous influences. Every one must needs recognize that, in addition to the physical and chemical constitution of the mucus, nervous factors must also play a role in starting an attack of colica mucosa, for a study of the history of these cases reveals clearly that the patients are afflicted with some neurotic taint. An analogy is offered by the colicky attacks that occur in other body cavities that are inclosed by a smooth musculature.

As we understand and explain the matter the mechanism of an attack of colica mucosa is therefore quite easily interpreted. The disease, if we are right, can only appear in its typic form—i. e., in the form of periodic passages of mucus with or without pain, if there is a certain degree of sluggishness of the bowels. In this respect I agree altogether with other writers who have chronicled their clinical experience in this field, and in particular with Is. Boas (l. c. pag. 592). If Boas, however, in this portion of his work and also in several other places, declares colica mucosa to be a simple symptom of constipation and altogether dependent on the latter, I cannot agree with him in this respect. While recognizing that periodical expulsion of membranous masses may frequently occur in hysterical and neurasthenic women, Boas proceeds to say: "As we know that in subjects who are predisposed a condition of chronic and obstinate constipation may prepare the soil for the development of a great variety of nervous and hysterical disturbances, we need no

longer consider colica mucosa to be a symptom of hysteria or of neurasthenia but essentially a symptom of constipation; for colica mucosa appears as soon as obstinate constipation is once fully established and disappears as soon as the constipation is relieved." That colica mucosa may be successfully treated by removing and curing constipation one of us (Von Noorden, ¹⁶) demonstrated to be the case some time ago, and even to-day we maintain this point of view most vigorously. But we have occasion to treat some thirty or forty cases of chronic constipation with a great variety of nervous, hysterical and neurasthenic symptoms before we encounter a case of colica mucosa, even though the peculiar character of our professional work and the class of cases we are apt to encounter would naturally bring a larger number of difficult cases of colica mucosa to our attention than to the attention of the general practitioner. In contradistinction to Is. Boas, and in full agreement with Nothnagel, v. Leube and others, we arrive at the conclusion, therefore, that in addition to general hysteria or neurasthenia certain morbid changes in the secretion of mucus in the intestine play an important and determining role in the genesis of the disease. Neither constipation alone nor neurasthenia alone nor the common combination of these states can produce colica mucosa unless at the same time there is some involvement of the nervous apparatus that governs the secretion

of mucus in the large intestine. This characteristic involvement of the nervous apparatus can best, according to Nothnagel, be called a *secretory neurosis*.

We would only be justified in departing from this view if it could be shown that the constipation produces an inflammation and an inflammatory hypersecretion of mucus; if this could be shown the periodicity of the attacks might possibly be explained on the basis of certain mechanical conditions that would be thus created (rapid absorption of water, comp. above). Against this view, however, numerous arguments can be adduced. In the first place the anatomic findings (see above) in these cases; in the second place, clinical experience and observation all speak against this conception of the disease. If we assume the existence of definite anatomic changes it is hard to comprehend why the patients feel perfectly well in the intervals between the attacks and why in typical cases of colica mucosa the mucus may completely and permanently disappear from the stools within a day if the action of the bowels is regulated and the condition of constipation is temporarily relieved. If, on the other hand, we assume that the disease is due to the existence of some morbid nervous reflex-process, we can readily understand why this must occur, for as soon as the irritation of the dry hard scybala is removed there is no further occasion for morbidly increased reflex activity on the part of the intestinal mucosa.

II. TREATMENT.

When dealing with a typical case of colica mucosa, of the kind that we have delineated above, the method of treatment is self-evident. It can be subdivided into *symptomatic* treatment of the attack, and *causal* treatment of the disease.

(a) *Symptomatic Treatment*.—The object of the symptomatic treatment of the attack is to suppress the attack as soon and as completely as possible; this is necessary in order to relieve the pain and the distress of the patient and to prevent the deleterious consequences that may follow both in regard to the general nutrition of the sufferer and the whole nervous system. It is utterly useless to allow the attack to run its course unhindered.

For the purpose of quieting the spasm of the intestine *rest in bed* is indicated in the first place. When the patient is in bed *hot applications* can with facility be made to the abdomen; this old household remedy, as we know, is very grateful in all spasms of unstriated muscle fibres. It is altogether immaterial whether we use hot linseed poultices, hot water receptacles, a thermophor or electricity as a source of heat. There has been some controversy in regard to the relative merits of purgatives and narcotics in these cases and both have been recommended, but we unequivocally advise the administration of *narcotics*, and it is immaterial whether they are given in the form of an hypodermic injection of morphine, or—if there is reason to fear this

method of administration—in the form of suppositories. Four cgr. extr. opii with an equal quantity of extr. belladonna are almost always sufficient to mitigate the pain and to pave the way for other measures that are to be applied later. These other measures should all be directed towards removing the accumulation of mucus. We see no cogent reason why high *water injections*, provided too much water (at body temperature) is not used, should not be given in the beginning of the attack. If a narcotic is first administered the enema causes the evacuation of a large amount of mucus without pain. If, however, no narcotic is first given or if certain irritating substances (as salt, soap, glycerine, etc.) are added to the clyisma, then a true paroxysm of pain will be produced and the intestine, which is inclined to undergo spasmodic contractions in this disease, will respond to such treatment with so violent a spasm that the water can only penetrate to the lowest portions of the bowel and will flow from the rectum perfectly clear. Even under the most favorable circumstances (i. e., if a narcotic is first given, and if the clyisma is followed by a successful evacuation) we cannot expect to get rid of all the mucus in one treatment. I have been able to determine at autopsy that the mucus may be so tightly adherent to the bowel wall that it cannot be removed with a strong stream of water that is allowed to play directly upon it from a hydrant. It must be remembered, besides, that the first injection evacu-

ates almost nothing but mucus; further up—i. e., in those portions of the bowel that are not reached by the stream of water owing to the spasmodic contraction of the bowel-wall, hard masses of fecal matter are very apt to remain, and these must by all means be removed if further irritation of the bowel is to be prevented. For this reason a high *oil clyisma* should be administered from one to two hours after the first water injection—if necessary after a second dose of the narcotic has been administered; at least 300ccm. of oil should be injected. In this way the fecal masses that are hard and solid are softened and the mucus is loosened from the intestinal wall. Whereas the water injection need only remain in the intestine for a few minutes, the oil enema should, of course, be retained as long as possible (Kussmaul). The patients as a rule fall asleep under the influence of the narcotic. After awakening the oil, mucus and feces are passed either all together or successively and without pain, and the attack is over.

This method of treating acute attacks has been found so useful in our experience that we consider it superfluous to enter into a discussion of other methods of treatment.

(b) *Causal treatment*, as all the text books teach, can be subdivided into the treatment of the intestine and the treatment of the general nervous affection. It will depend upon the individuality of the therapist whether the one or the other line

of treatment is adopted. From an historic point of view we may say that formerly more attention seems to have been given to the treatment of the nervous system. whereas, now-a-days, attention is chiefly directed towards correcting the perversion of the digestive apparatus. We believe that both methods are of equal value; if it is found impossible to treat the patient in all directions the chief attention should be given to the intestine, for regulation of the bowels invariably leads to a rapid cure of any case of colica mucosa. Even if the bowels are again normal the patient is by no means a perfectly healthy individual, for in many of the cases signs of hysteria and of neurasthenia persist. The rapid removal, however, of the most important and the most distressing symptoms of the disease often acts so favorably on the general nervous system and on the general nutrition of the patient that the digestive disorders also improve in rapid order and all the nervous symptoms ultimately disappear.

Any treatment of diseases of the digestive tract must in the first place be dietetic; all other methods of treatment are of secondary and tertiary importance. Although this is an old rule, that we have learned by experience, the dietetic treatment of colica mucosa has nevertheless been carried out along many different lines. The one extreme is to protect and spare the intestine as much as possible—i. e., to give as simple and non-irritating a diet

as possible, and a diet that leaves the smallest possible residue; here the treatment is essentially the same as in chronic enteritis or even in ulcer of the stomach. It appears to us that a remark of Fleiner's has contributed much—perhaps altogether unintentionally—toward creating new confidence in this old method of treatment and in inducing many clinicians to adopt this method in the treatment of colica mucosa. I refer to the following: Fleiner argues that the disease under discussion is apparently an affection in which the intestine is seriously involved but that it differs from simple colitis in the same way as croupous inflammation of the larynx differs from catarrh of the larynx (Berl. Klin. Wochenschr, 1893, pag. 98); this view essentially corresponds with the opinion expressed by v. Leyden. It is not quite clear from the description of the disease that Fleiner refers to, whether this author really means the form of colica mucosa that we have described. If he does mean the same disease we need hardly mention that—in common with the majority of other authors—we do not agree with him. At all events, this remark of Fleiner's has had the effect of inducing many physicians to treat colica mucosa along lines that are not rational; in addition it has unjustly conferred upon colica mucosa the reputation of a disease that is very difficult to treat and to cure; we have had occasion in numerous cases to hear patients and physicians refer to these remarks of Fleiner's. We do not deny

by any means that it is possible to attain some good results in colica mucosa with a very carefully selected bland diet, particularly if this diet is combined with a systematic oil-cure (according to Kussmaul), and if, in addition, the general state of nutrition of the patient is at the same time raised. Under this treatment the motor power of the intestine will also gradually improve, and as long as this function remains intact the patient will be protected from new attacks of colica mucosa. We believe, however, that after this treatment, relapses are not infrequent; we have seen this in patients who were treated in this way by ourselves and by others. These patients even after the oil treatment has effectually brought about a thorough cleaning out of the bowels persist in eating a non-irritating diet and a diet that leaves only a very small residue; consequently there is a great tendency to irregular bowel action with the deposit of hard and dry stools; sooner or later then another attack of colica mucosa is apt to appear.

(c) *A Coarse Laxative Diet Best.*—In place of giving sufferers from colica mucosa a diet that is bland and that leaves little residue, one of us (von Noorden, ¹⁶) some five years ago advised, on the basis of long experience in the treatment of this disease, giving these patients a diet that was very coarse and that contained a large proportion of indigestible residue. The ordinary diet that it was customary to give consisted of milk, milk dishes, gruels,

white bread, toast, zwieback, light dishes made from flour, delicate varieties of meat, purées of stewed fruit and of vegetables. When the first communications concerning the coarse diet appeared my experience extended over seven years, so that at the present time this treatment has been given and its effects studied for a period of twelve years. According to the directions given in that first communication the diet should consist of bread containing a large proportion of husks (Graham bread), in quantities of 250gr. a day and more, in addition as great a variety as possible of leguminous plants including the husks, vegetables containing much cellulose, fruit with small seeds and thick skins, like currants, gooseberries, grapes; besides, large quantities of fat, in particular of butter and bacon, were found to be useful. On a diet of this character the stools become abundant and at the same time soft, so that the motions did not irritate the bowel mucosa any more; consequently the reflex secretion of mucus also ceased very soon. As determined with the aid of one of my pupils (R. Barany,¹⁹), the permanently favorable effects of a diet of this kind are chiefly due to the amount of cellulose it contains. The cellulose of the bread, etc., undergoes bacterial decomposition in the intestine, gas is developed slowly and the decomposition proceeds so gradually that the binding together of the feces to solid hard lumps is prevented; it is clear that

the propulsion of soft and yielding masses of feces must be much easier than the evacuation of hard stools. The stools that are deposited after a diet containing much cellulose are always soft and of the consistency of pomade; this is frequently a source of great surprise to the patients, especially as they were accustomed for so long to deposit hard crumbly masses of feces (so-called sheep's dung). It is owing to this property of producing soft and massive stools that a diet rich in cellulose and in other indigestible residue in reality constitutes a much more "digestible" diet for a sufferer from colica mucosa than a diet such as we have described above containing little indigestible material and being essentially bland and non-irritating. A diet of the latter character is no doubt indicated in certain diseases of the stomach and in many other diseases of the intestine, and may in all these affections be considered easily "digestible." In spastic constipation however—and nearly all cases of colica mucosa belong to this category—a diet leaving little residue must be considered "difficult to digest;" for such a diet furnishes feces of a character that must be considered unsuitable and injurious in this disease. If such a diet is nevertheless given to cases of colica mucosa, certain medical adjuvants must be simultaneously employed to promote softening of the feces, for only in this way can the feces be rapidly removed from the intestine; such adjuvants are, for instance, internal purgatives, water

clysters or oil injections. In very favorable cases, particularly if systematic treatment with oil is continued for a long time, the general strength of the patient may gradually improve even under this treatment; at the same time the tone of the nervous system may also improve, so that finally very gratifying and permanent results are obtained in regard to the increase of the motor powers of the bowel (see above); in the method of dieting that we have adopted we have never—excepting possibly during the first days of the treatment—had to have recourse to such artificial adjuvants to the treatment. While we believed formerly that it was necessary to include irrigation of the bowels with oil or some of the other aids in the treatment, we have of late decided that the only treatment that is needed is a regulation of the diet in the sense I have outlined.

True, we must concede that there are a number of adjuvants that render it more easy to carry out our plan of dietetic treatment; some of these measures are useful particularly to counteract some of the disturbances that may arise, especially in the beginning of the treatment. In this class of measures I include *mineral waters* to be given for the first three to four weeks of the treatment. We agree with Nothnagel (Handbook, Vol. 17, pag. 147) in warning against Carlsbad water and other alkaline waters (Neuenahr, Vichy, etc.); they render the cure more difficult. Chloride of sodium waters, on

the other hand, act very favorably in the treatment we are advocating, in particular Kissingen and Homburg waters (also Racoczy resp. Elizabethquelle). One of us pointed out this fact several years ago in a paper on the scientific indications for the use of weak saline waters ⁽²⁰⁾. In that place particular attention was called to the fact that these waters greatly reduce the production of mucus in the intestine and increase the absorptive powers of the bowel for a voluminous diet containing much fat. Both these properties render waters of this kind particularly valuable in the treatment of colica mucosa.

(d) *Massage of the Large Intestine.*—Another adjuvant to the treatment is *massage of the large intestine*, particularly of the sigmoid flexure. It is well known that many physicians who have had much experience in the treatment of diseases of the intestine expressly warn against massage in spastic forms of constipation and advise massage only in cases of atonic constipation. We agree unequivocally that massage should be avoided in spastic constipation if the patients are given a diet that leaves a small residue (see Fleiner, l. c., pag. 61). As soon, however, as our method of feeding with a voluminous diet that leaves a large residue is instituted the conditions are changed at once and massage of the lower portion of the large intestine is not only well tolerated but is decidedly beneficial to patients suffering from colica mucosa. In the

first eight to ten days of the treatment massage of the bowel is well-nigh indispensable, particularly in cases in which the nervous system is greatly disturbed, as soon as the bowel becomes filled and distended; later in the treatment massage is no longer required.

In the meantime it has become common in general practice to treat patients with colica mucosa by giving them a diet leaving a large residue. Boas, Einhorn, Hemmeter, all agree on this point; they merely state that in their opinion the suggestion made by von Noorden to immediately change from a diet containing little residual material to a diet rich in residue is not practical; Boas says that he himself has had no experience in this matter but that he prefers the gradual transition from one diet to the other on theoretical grounds. Only Westphalen agrees with von Noorden, inasmuch as he advocates the immediate change of diet, without reservation; he also agrees with von Noorden in stating that much less trouble is experienced if the bland diet is at once replaced by the coarse diet than if the old diet is only gradually replaced by the new one. We have paid particular attention to this question, especially as authoritative voices have been raised against it; after a growing experience with the matter we still maintain that it is better to change rapidly from one diet to the other than to make the change slowly. We do not wish to maintain, however, that this method of proced-

ure is necessarily a matter of principle, for good results are also obtained if the transition from one diet to the other is gradual. The external conditions existing in each individual case will have to decide which plan is to be adopted. Our own experience with rapid changes of diet was almost all gained from observation of clinical cases (sanatorium, private practice, hospital). It is clear that in this class of cases the treatment can be more brusque, and the results of such energetic treatment can be better supervised and controlled than in cases that are treated at home. We will therefore concede that those who advocate a gradual transition from a mild to a coarse diet are right as far as cases are concerned that are not under clinical observation; in other words we agree that this treatment would better be reserved for the latter class of cases. Where external circumstances do not forbid the adoption of our plan it is clear that it is by far the best method of procedure. For in the beginning of the treatment a great variety of disturbances almost invariably appear, as for instance, nausea, a feeling of tension and fulness in the abdomen, rolling noises in the bowels, and occasionally even pain—whether we proceed rapidly or slowly. If the change in the diet is rapid, these disturbances rarely persist for more than two to four days, and after this period the patients feel perfectly well. If the change in diet is made slowly these disturbances and symptoms of distress in the abdomen

persist for a much longer time, so that the patients, who are nervous and irritable and as a rule very anxious, easily become discouraged.

We usually allow the patients to remain on a coarse diet that leaves a large residue for from three to five weeks; we particularly encourage the use of much Graham bread; in order to aid the action of the bowels sugar of milk, honey, fruit juices, marmalade, dried prunes, leguminous plants, and boiled or baked potatoes are given. We never give purgatives. We do not consider a glass of Homburg or Kissingen water, that is frequently although not always given in the morning on an empty stomach, to be a laxative, for the reason that these waters when taken in the doses that we recommend (about 250cc. a day) do not possess any laxative virtues whatever; their only effect is stomachic. As soon as the action of the bowels has become uniform and regular on a diet of this character, we *very gradually* return to the ordinary mode of life. It is very important to determine whether the patient has not acquired certain bad habits prior to the beginning of the cure. Such bad dietary habits must of course be corrected, whether they consist of extreme dietetic restrictions or excesses. Unless this is done relapses are unavoidable.

(e) *Normal Action of the Bowels Indispensable.*—One goal above all must be attained—i. e., the action of the bowels must be rendered normal not only

for the time of the "cure" but *for all time*. By "normal" bowel action we understand regulation of the bowels as in a normal subject by the ingesta alone. If laxatives of any kind, massage or clysters, etc., are necessary to promote the evacuation of the bowel contents, the action of the bowels is not "normal"—even if the color, the consistency, the form and the chemical composition of the feces do not differ in any way from normal dejecta in healthy subjects. As soon as the sluggishness of the bowels is removed, and as soon as the action of the bowels is "normal" in the sense that we have outlined, *the disease, colica mucosa, may also be considered cured and it will never return.*

While we agree with Boas, Westphalen and others, that the chief indication for treatment lies in the removal of the constipation, we nevertheless recognize that there are as large a number of good and successful methods of treatment of colica mucosa as there are methods of treating spastic constipation in general. Without wishing to deny, therefore, that other methods of treatment are valuable and important, we nevertheless feel justified in stating that our particular method of procedure in the particular conditions that we are dealing with in this disease—i. e., in the combination of spastic constipation with colica mucosa—is not surpassed in regard to safety, rapidity and permanency of results by any other method.

The dietetic regulations are rarely exhausted with the arrangement of a dietary suited to remove the condition of chronic constipation and the accumulation of mucus. As a rule the patients are generally reduced and under-nourished or they are subjects who have never reached what is for them the height of nutrition. Directly or indirectly dependent on this poor state of nutrition is the impairment of the nervous powers; and the patients belong to that group of hysteric and neurasthenic subjects in whom a successful rest cure with overfeeding may be the starting point for renewed physical and mental vigor. In all such cases of colica mucosa I consider the *improvement of the general nutrition* to be the fundamental preliminary condition that must be fulfilled if we wish to attain a permanent cure; we agree in this respect with the majority of writers on this subject. The choice of foods and the amount of food allowed must be selected and regulated to fit this purpose, and we have invariably found that patients who were treated on this plan gained considerably in weight. The average duration of a systematic cure was four weeks; the minimum three weeks, the maximum six weeks. The gain in weight amounted to 6 kilo as a minimum, 16 kilo as a maximum, 10 kilo on an average, during the period of time that we have mentioned. This good result was chiefly attained by enormously increasing the fats. If we add all the fat that these patients received in the form of milk, cream, butter,

bacon, we find that an average of from 200 to 250 grams of pure fat was given a day. The fact that we were able to administer such large quantities of food, and in particular such large quantities of fat without producing any appreciable disturbance,—a few cases excepted—demonstrates better than any theoretical arguments that colica mucosa has nothing whatever to do with a truly anatomic, inflammatory disease of the intestine.

It has become a literary habit for an author who prescribes a certain dietary not only to lay down the general rules and principles that should govern the therapist in the selection of the diet but also to append to his work specialized bills of fare. We do not like to follow this custom, and only do so unwillingly, for we have learned from experience that success can only be expected if we individualize carefully; we have learned to appreciate that any form of dietetic therapy is apt to be abortive and unsuccessful if we adhere too closely to any one scheme. We give a dietary that has been found serviceable in many cases.

(f) *Form of Diet Recommended.*—In the morning in bed, at seven o'clock.—Three-tenths of a liter of milk and cream (two parts of milk and one part of thick sweet cream, ordinarily O. Rademann's sterilized Holstein cream); then, usually, a rub with moderately cold water.

—At eight o'clock.—One-quarter of a liter of Kissingen, Racoczy or Homburg Elisabeth water.

At nine o'clock.—Three-tenths of a liter of the milk-cream mixture or of thin tea or coffee with much cream; sometimes, too, cocoa prepared with cream or butter and sweetened with sugar of milk. In addition 50 to 70 gr. of coarse bread containing much cellulose, and 30 to 50 gr. of butter.

At ten-thirty.—If necessary a massage of the intestine or hydrotherapeutic treatments of different kinds, sometimes electrification of the colon.

At eleven o'clock.—Soup made from leguminous plants boiled with bacon or Westphalia sausage; in addition Graham bread with plenty of butter. Also a glass of breakfast wine or a small glass of brandy.

At one o'clock.—Some meat dish, as much as wanted. In addition vegetables of different kinds, boiled or baked potato with butter. Fruit with coarse skins and large seeds, as currants, gooseberries, cranberries, boiled, or a pound of grapes. One-half a bottle of light young Mosel wine. After eating rest in bed for an hour and a half with hot applications to the abdomen.

At four o'clock.—A light lunch similar to the breakfast at nine o'clock. Then a walk of one and one-half to two hours.

At seven o'clock.—Supper like the dinner; sometimes, too, junket or fruit-soup. In addition 50 to 70 gr. of Graham bread with plenty of butter.

At nine o'clock.—Three-tenths of a liter of the milk-cream mixture as in the morning.

On the first and the third day of the treatment an oil clyster is usually given in the evening in order to prevent all disturbances that might possibly arise. It is rarely necessary to repeat this, later on.

The average quantity of cream consumed amounted in our cases to one-half a liter a day; this amount contained 150gr. of pure butter-fat (the manufacturers of the sterilized cream, mentioned above, guarantee a percentage of 30% of butter-fat). The daily average of butter equalled 230gr. Of this quantity about two-thirds were eaten as pure butter with bread and potato or with vegetables and fish. The rest was taken cooked with the food.

The average quantity of Graham bread was 200 to 250 gr. We usually give the bread sold by O. Rademann (Frankfurt-am-Main) under the trademark "D-K."

According to our experience mild disturbances occur under this regime (see above). It is well to prepare the patients for this in advance. In order to counteract these disturbances it is a good plan to keep the patients in bed for the first few days; in addition hot compresses or possibly suppositories of three-fifths cgr. of extr. belladonna and the oil clysters mentioned above may be given (this on the first and third days of the treatment). After the first two to four days the stools that are evacuated assume a normal consistency and a normal appearance. As soon as this occurs all the dis-

turbances usually disappear, in particular all painful sensations. Mucus, however, is passed for some time longer. This mucus, to judge from its appearance (see above) is freshly secreted. This demonstrates that the hyperirritability of the mucus-secreting apparatus is not allayed at once. At the same time the mucus no longer accumulates and the quantities passed are very insignificant. If the cure takes a normal course the secretion of mucus does not continue for longer than a week. In at least one-half of the cases the secretion of mucus ceases at once, as soon as soft motions are evacuated, and never returns thereafter.

After the first difficulties were overcome the subsequent treatment caused no further trouble; as soon as the character of the stools improved and the general nutrition became better, the general well being of the patients was also improved from day to day; we noticed particularly that the patients themselves gained more and more confidence in the ultimate outcome of the treatment, and this is a factor that cannot be underestimated in the treatment of neurasthenic subjects. The further treatment of these cases, as we have already said, consists in accustoming the patients to a different diet than they were in the habit of taking, and this must be done gradually and without injuring the functional powers of the bowel; the diet should be adapted as nearly as possible to the diet that is customary in the particular locality where the

patients live and should be suited to their circumstances. It is impossible to say how long this "gradual" process of education will last. Sometimes the intestine began to react normally to the normal average diet within four to six weeks, in other cases several months elapsed before this goal was reached. We wish to particularly emphasize that in all the cases that suffered relapses this was due to a too early departure or a too sudden departure from the dietary regulations that were prescribed. It became too tedious a matter for these patients to carry out the dietary regulations for a long time, and it became too inconvenient to refrain from eating the ordinary diet that they craved; or, again, intercurrent diseases appeared that necessitated an interruption of the system of dieting that was ordered (in two cases, for instance, an attack of febrile angina, and in another case pregnancy and hyperemesis).

It will be seen from the above example of a special dietary that we, like all the other writers on this subject, advise combining certain general measures with the dietetic treatment that are intended to *strengthen the nervous resisting powers* of the patients. Very much is gained in this direction merely by causing improvement of the bowel function and the general nutrition. How much of hydrotherapeutic treatment, electric therapy, etc., should be employed in different cases will largely depend on individual factors, and also on the characters of the

adjuvants to the treatment that are at our disposal in each case. Generally speaking, we are inclined to advise against treatment at home, at least during the first three to five weeks of the course; we say this because it is notoriously difficult to carry out dietetic regulations at home, and because the effect on the general nervous system is also more difficult to attain in home surroundings. Of the twelve cases of "incomplete success" reported in the small statistics that are given below no less than six were treated at home. There can be no doubt in regard to the great advantages accruing to these patients from treatment in closed institution or in watering places, for the treatment can be carried out with much greater facility under such conditions; this is chiefly due to the fact that the patients are completely free from all other obligations and can devote themselves exclusively to the cure of their disease. The question is often asked where to send these patients as soon as the actual systematic course of treatment is over, the latter occupying, as we have said, some three to five weeks. According to our experience we must expressly warn against two extremes—viz., too great altitude and the sea shore. It remains undetermined why these two locations are not beneficial; the fact remains that the greater number of patients who are suffering from digestive disorders, including sufferers from nervous dyspepsia, do not thrive well in high altitudes nor at the sea shore, and show a greater

tendency to relapses if they seek such localities. Life at a moderate altitude, in a wooded country, and in a place where they can enjoy walks of moderate length that do not overtax their strength, are the most suitable locations for these subjects.

III. REVIEW OF THE CASES TREATED.

One of us in 1893 reported twenty-three cases of colica mucosa (von Noorden sixteen) that were treated according to the method that we have just described in detail. To this number must be added, if we include our joint experience since that time, fifty-three cases more; there are therefore all in all seventy-six cases. Among these, four were children (two boys of four and six, and two girls of seven and nine). Among the adults there were forty-eight women and twenty-four men. We mention expressly that only typical cases of colica mucosa are included in this tabulation, all of them cases that corresponded in all their features to the disease-picture given above. In twenty of the patients the motor and secretory functions of the stomach were also tested; four of them suffered from achylia gastrica; in the others there was comparatively frequently a condition of hyperacidity; sometimes, too, of subacidity of the gastric juice. Seventy-one of the patients suffered from chronic constipation; in five of the patients the constipation occasionally alternated with diarrhea.

The following is a summary of the results of our treatment :

In four cases complete failure. It became necessary to stop the treatment after a few days, in part because the secretion of mucus and the attacks of enteralgia did not stop, in part because the patients did not possess enough energy to carry out the treatment. The former happened in the case of two women, the latter in the case of two men who were highly neurasthenic.

In twelve cases there was only an incomplete result; so much was attained that the attacks became less frequent and that the pain grew less severe. In a part of these cases the treatment could only be carried out with unwelcome interruptions. Six of the twelve cases, remarkable to say (see above), underwent the treatment at home, partly because they did not have time or means to take the treatment in an institution or at a watering place.

In the remaining sixty cases the treatment was completely successful; in other words, as long as the course of treatment was continued, the evacuation of mucus, the constipation and the pain disappeared completely; the general nutrition of the patients improved, in some of the cases to a remarkable degree (see above), and the nervous symptoms also became ameliorated. In twelve of the cases no further record was obtainable in regard to the subsequent course of the disease, so that

we can only report in this direction on forty-eight of the sixty cases.

In ten of these cases the first results were excellent and the good effects persisted for from three to six months after the course of treatment. At the expiration of this time, but not before, constipation returned and, later, attacks of colica mucosa. In ten of these cases we know, further, that they began too soon to neglect the dietary regulations that had been given and that they did this because they felt in such excellent health; the result was that the bowels again became constipated; then they further neglected the regulations even after this occurred or had recourse to unsuitable measures in order to relieve the condition (powerful laxatives and clysters). Under these circumstances relapses are of course unavoidable. Four of the patients repeated the treatment after one or two years and since that time they may be considered cured. (Duration of the cure to-day from three to four years.)

Thirty-eight of the patients (four children and thirty-four adults) remained perfectly well for at least a year after the first treatment—i. e., no symptoms whatever pointing to a derangement of the bowel function appeared within this time. In the majority of the patients the cure has remained permanent for many years, in some of the cases for ten years and longer.

IV. TABLE OF CASES.

Complete success of the treatment in 79% of the cases.

Incomplete success in 15.8%.

Permanent success in 50%.

Relapses in 13.1%.

Unknown in 15.8%.

Failure in 5.2%.

We may add to these small statistics that most of the unsatisfactory results were obtained long ago, that is, at a time when we ourselves were not very thoroughly experienced in this method of treatment. The same applies here as in other fields of dietetic treatment—viz., the general principles and the theory of the treatment may be ever so well understood, but a certain amount of practice and experience is needed in addition if the result of the treatment is to be positive and favorable in all cases. We request all of our colleagues who intend to employ the method of treatment that we have described and that we consider without doubt to be good and promising, to remember this self-evident truth, for we believe it to be quite possible that they may encounter many practical difficulties in their first attempts to follow our plan.

V. CONCLUSIONS.

(1) Typical colica mucosa occurs almost exclusively in subjects who have been suffering for a long time from constipation (usually so-called ob-

stipatio spastica) or in subjects who still suffer from this affection.

(2) Chronic constipation alone, however, never produces colica mucosa. There must be in addition excessive irritability and over-activity of the glands of the large intestine that produce mucus. This over-activity of the glands is not due to anatomic changes in the mucosa (inflammation), but is due to certain nervous influences. It occurs almost exclusively in persons who have a neurasthenic or an hysteric predisposition.

(3) In addition to the typical symptom-complex of colica mucosa there are certain abortive forms that have been described and explained in the text.

(4) The cure of colica mucosa presupposes a cure of the constipation. Any method of treatment that causes a complete and permanent disappearance of constipation will also cause disappearance of colica mucosa. The method that we have proposed is the best one for the treatment of the combination of colica mucosa and constipation that exists. We call it a dietetic exercise-treatment of the intestine in contradistinction to the protective treatment that is usually employed.

(5) The general nervous state of the patients calls for particular attention if for no other reason than that a continuance of the nervous disturbances exercises a deleterious effect on the functions of the bowels, and derangement of the bowel-action can precipitate a new attack of colica mucosa. Ap-

propriate treatment of the nervous system should be combined with the dietetic treatment or should follow it—it should not precede it. This is the correct plan, for frequently a cure of the digestive disturbances (constipation, the passage of mucus, pain) and an improvement of the general nutrition lead to an amelioration or a complete cure of the nervous system without any other treatment.

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Further literature will be found referred to in the text.

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