orrhage one finds an ovarian hematoma or hemorrhage into a lutein cyst, which is probably the fundamental cause of the hemorrhage. I do supravaginal hysterectomy and appendectomy in these cases.

SUMMARY OF CASES STUDIED

The total number of cases studied was 227.

Sixty-nine cases of fibromyoma uteri and 2 cases of carcinoma uteri which never presented symptoms of menorrhagia or metrorrhagia.

Forty-five cases, pathologic diagnosis of endometritis. Operations performed: complete hysterectomy in 5 cases (past menopause); anterior hysterotomy and curettage in 1 case; vaginal hysterectomy in 2 cases; dilatation and curettage in 37 cases.

Twenty-one cases, pathologic diagnosis of fibromyoma with endometritis. Operations performed: supravaginal hysterectomy in 17 cases; complete hysterectomy in 3 cases; vaginal hysterectomy in 1 case.

Twenty-four cases, pathologic diagnosis of carcinoma. Operations performed: complete hysterectomy in 12 cases; supravaginal hysterectomy in 4 cases; dilatation, curettage and cauterization in 1 case; dilatation and curettage in 1 case; cauterization in 1 case; vaginal hysterectomy in 1 case; 4 cases inoperable.

Forty-four cases, pathologic diagnosis fibromyoma. Operations performed: supravaginal hysterectomy in 31 cases; complete hysterectomy in 7 cases; anterior hysterotomy in 2 cases; myomectomy in 3 cases; vaginal hysterectomy in 1 case.

Two cases, pathologic diagnosis sarcomatous degeneration of fibroid uteri, supravaginal hysterectomy being performed in both cases.

Mortality.—Four deaths, all occurring in cases of carcinoma. In one carcinoma also involved the sigmoid and the patient developed fecal fistula; one patient died of uremia and two of toxemia.

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ABSTRACT OF DISCUSSION

Dr. Lewis S. McMurtry, Louisville: A point on which I would differ from Dr. Deaver is regarding anesthesia of virgins for examination of the uterus. It is practically impossible to make a satisfactory examination without anesthetizing the patient. She is unable to control the voluntary muscles and the resistance is such that examination is impossible. I would emphasize Dr. Deaver's statement that hysterotomy should be a means for diagnosis only in the hands of experienced surgeons. In the hands of men accustomed to opening the abdomen every day it is a safe procedure, and in many cases it is justifiable. As a routine procedure it would be a very dangerous practice. All of us who have operated for fibroma have opened the uterus to find that all the hemorrhage was caused by a small polyp in the fundus and that hysterotomy would have reached it. Hysterotomy as an exploratory operation for cancer of the uterus is seldom necessary.

Dr. Deaver rendered special service in calling attention to two salient points: (1) that this symptom should be dealt with as a symptom; (2) that there should be a thorough investigation made of every woman who has a persistent uterine hemorrhage to find the pathology and deal with it in a surgical way. I would especially commend the suggestion which Dr. Deaver makes as to young women at puberty, who have persistent hemorrhage without demonstrable lesion of the uterus or its appendages. Rest and general systemic treatment should be observed rather than resort to indiscriminate dilatation and curettage and other active surgical treatment. In conclusion, it is necessary to reiterate the oft-repeated warning as to the vicious practice of resorting to the curet indiscriminately for uterine hemorrhage. Curettage is more abused to-day than any other surgical operation and does more harm.

CLINICAL NOTES ON PATIENTS FROM THE
MIDDLE NORTHWEST INFECTED WITH
ENTAMEBAS *

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In 1911, Sistrunk¹ published our earlier experience at the Mayo Clinic with regard to the finding of intestinal parasites in individuals residing in the middle Northwest. Since then the examination of the stools in certain cases has led so frequently to the identification of entamebas that we have come to consider this infection as a relatively common one. In the diagnosis of the different types of amebas present, Craig's² description of the morphologic characteristics has been followed in our laboratories by Sistrunk and Sanford. Moreover, the recent work of Darling³ and Craig⁴ on the identity of *Entamoeba tetragena* with *Entamoeba histolytica* inclines us to prefer to group cases in which a morphologic diagnosis of either one of these parasites was made as *Entamoeba histolytica*. In this review, however, the former distinctions between *tetragena* and *histolytica* are maintained because of any interest that may remain in connection with the morphologic type of those amebas found in the Northern states.

During the last two and one-half years the stools of 1,700 patients have been examined for parasites. Entamebas have been found in 227 of these, or 13 per cent. Of this number, 148 were diagnosed as *Entamoeba coli* and 79 as *Entamoeba tetragena* or *Entamoeba histolytica*. These totals include patients from all parts of the country who have been under our observation. This consideration, however, will be confined entirely to those with residence in Minnesota, Iowa, Wisconsin, North and South Dakota, Montana and Nebraska, whose infection, as nearly as can be judged, was not obtained in the South. Most of these patients had never been in the South. A few had traveled in the South but their visit seemed to have no relation to the onset of their symptoms. The first part of this paper is concerned with a consideration of those cases in which *Entamoeba tetragena* and *Entamoeba histolytica* were present; the latter part with a consideration of the cases showing *Entamoeba coli*.

CASES IN WHICH ENTAMOEBA TETRAGENA OR ENTAMOEBA
HISTOLYTICA WAS FOUND

Of the seventy-nine patients showing *Entamoeba tetragena* and *Entamoeba histolytica*, forty-one, or a little less than one-half, evidently received their infection while residing in the before mentioned states and therefore constitute the most important group for our immediate consideration. Of this number, there were from Minnesota 14, Iowa 12, North Dakota 5, South Dakota 5, Nebraska 2, Wisconsin 2, and Montana 2.

Of the forty-one patients, thirty-six showed *Entamoeba tetragena* and only six *Entamoeba histolytica* (one of these, a patient with very severe symptoms,

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Sistrunk, W. E.: Intestinal Parasites Found in Individuals Residing in the Northwest, THE JOURNAL A. M. A., Nov. 4, 1911, pp. 1507-9.

2. Craig: The Parasitic Amebas of Man, Ed. 1, 1911, Phila.

3. Darling, S. T.: Budding and Other Changes Described by Schaudinn for *Entamoeba histolytica*, THE JOURNAL A. M. A., April 19, 1913, p. 1220.

4. Craig, Charles F.: The Identity of *Entamoeba histolytica* and *Entamoeba Tetragena*, THE JOURNAL A. M. A., May 3, 1913, pp. 1353-4.

showed both *tetragena* and *histolytica*). It is therefore a prominent fact that the parasite of predominance conforms morphologically to the description of *Entamoeba tetragena*. In those cases showing *Entamoeba histolytica* the parasites were more numerous, though it is quite certain that these patients did not receive their infection in the South.

In a consideration of the clinical symptoms of these cases the original chief complaint of the patient becomes an interesting basis for classification.

Group 1. Patients complaining chiefly of diarrhea.—Twenty-four of the forty-one patients complained chiefly of diarrhea. Thirty-five patients of the forty-one, however, gave a history of diarrhea, although in some of these it was not their chief complaint. Thirteen had had, at one time or another, severe attacks of diarrhea with more or less blood in the stools. As nearly as can be judged, however, these attacks were not so violent as those in cases reported from the South. On the other hand, most of our patients gave a history of more or less constant diarrhea of a mild type, also quite in contrast to the Southern cases. More than one-half the patients gave a history of the passage of macroscopic blood at one time or another in the course of their disease.

Group 2. Patients presenting themselves chiefly on account of abdominal pain.—A second group of cases consists of those patients who complained chiefly of abdominal pain, nine in number. It has been our custom to send patients complaining of indefinite abdominal symptoms for a stool examination and the finding of parasites in this group of cases is due to that routine. The findings, of course, may be accidental, although at least two patients of this group are well of their original complaint.

Three-fourths of the patients (thirty-two) gave abdominal pain as a minor complaint. Pain was not confined to the lower abdomen; ten of the number suffered from upper abdominal pain and six complained of pain in the right lower quadrant, suggesting the possibility of involvement of the cecum. Rectal pain was a prominent symptom in four patients.

Group 3. Those complaining of indefinite gastric symptoms.—Patients complaining of indefinite gastric symptoms have often been referred for stool examination. Three patients in the series, who consulted a physician chiefly on account of gas and sour eructations, nausea and epigastric distress, have shown pathogenic entamebas. Complaint of this character, however, is not uncommon in the other cases. Fifteen of the forty-one patients gave a history of gastric symptoms, although they complained chiefly of abdominal pain or diarrhea. Nausea seems to be quite commonly associated with the more severe attacks, eleven of the series volunteering this information.

Group 4. Patients with constipation.—It is rather not to be expected that *Entamoeba tetragena* should be found in patients complaining chiefly of constipation and without diarrhea. In two instances of this character, however, amebas were easily demonstrated. Intermittent constipation, even in connection with those cases showing severe diarrhea, is not an uncommon finding.

Group 5. Miscellaneous cases.—In the remaining three cases dyspnea and weakness were given as the chief complaints and were the result of severe anemias. Two of these anemias were definitely of the pernicious type, while one was of doubtful nature and may have been entirely secondary. The finding of entamebas in cases of pernicious anemia can only be regarded as accidental.

Only one case of abscess of the liver has been observed among patients from the middle Northwest. In this instance *Entamoebae histolyticae* were demonstrated in the stools; the abscess, which was drained, was of typically amebic character. The patient resided in Duluth, had never been in the South and gave a six weeks' history of diarrhea with bloody stools. It is not certain that this patient received his infection in Minnesota. He had emigrated from Russia six months previously but his history had been of only six weeks' duration.

The duration of the history relative to the bowel symptoms for the entire group of forty-one patients varied from six weeks to twenty years. In six of the patients it was longer than ten years, in ten over five years, while in seventeen it was less than a year; the average was four years.

The eosinophil count was low. Three of the series showed no eosinophils on differential count; the average in twenty-one counts was only 2.5 per cent. In this connection it may be of interest to note that thirteen patients have been sent to the laboratory on account of a very high percentage of eosinophilia in order that a search for parasites might be made and in all of these instances the results were negative for entamebas.

Proctoscopic and sigmoidoscopic examinations were obtained in twenty-three of the forty-one patients. In sixteen they were negative, in three a diffuse colitis was demonstrated, in two a granular colitis and in two ulceration. Those cases showing ulceration and diffuse or granular colitis were all infected with *Entamoeba tetragena*. It should be remembered that a negative proctoscopic examination may not necessarily mean a negative colon, as the disease may be localized at one of the flexures or in the cecum. It is quite likely, however, that the large number of negative examinations is at least another indication of the mild character of these cases in comparison with the infections in the South. From the patient's point of view, however, they are severe enough to be a great inconvenience and detrimental to the general health.

The parasites were usually demonstrated at the first examination. In thirty-one instances amebas were found at the first examination, in nine two examinations were necessary and in one case three examinations. It is also evident, therefore, that the search for parasites should not to be abandoned too early. In the case in which three examinations were necessary for a demonstration of the parasites the patient had complained of intermittent attacks of diarrhea with bloody stools for four years.

CASES IN WHICH ENTAMEBA COLI WAS DEMONSTRATED

As formerly stated, *Entamoeba coli* was reported in 148 patients. Of these, 106 were in patients residing in the middle Northwest. Fifty-nine, or over one-half of these patients consulted a physician chiefly because of diarrhea, while in sixty-nine or two-thirds of them diarrhea was given as one of the principal complaints. One showed granular colitis, eight diffuse colitis and four ulcerative colitis on proctoscopic examination. Of those presenting themselves chiefly on account of diarrhea, one-third gave a history of more than five years' duration, nine more than ten years and four more than twenty years. In many of them the diarrhea was severe in character. Thirty-eight or over one-third showed red blood-cells on microscopic stool examination, while sixteen gave a history of macroscopic blood. The parasites were usually found at the first examination. In only

seven of the 106 patients was a second stool examination necessary for the demonstration of the amebas.

We have no data on which to base a discussion of the possible pathogenicity of *Entamoeba coli* either positively or negatively, and present these facts only as statements of our findings.

The presence of *Entamoeba coli* in the more severe cases need indicate no etiologic relationship on the part of these organisms. And again it is quite likely that a further search for parasites would have demonstrated the presence of *histolytica* also in some instances; several of our more recent cases showed *Entamoeba coli* at the first examination and *Entamoeba histolytica*, as well as *coli*, subsequently.

TREATMENT

It has been very difficult to obtain an approximately accurate idea of the results of treatment in this series of cases. It has generally been necessary for the patient to return to his home where the treatment was carried out under the care of the family physician. Ipecac alone was used in 75 per cent. of the cases in which treatment seemed advisable. Ipecac was administered in conjunction with coal-oil enemas to eight patients. This does not take into account the treatment of those patients residing elsewhere than in the middle Northwest. Enemas of kerosene (Hanes⁵) alone were used under our observation in four instances in which *Entamoeba tetragena* or *Entamoeba histolytica* was present (one of these showed ulcerative colitis), and in all of them the results were excellent. It is our impression that coal-oil enemas should be given a trial in cases of entamebic infection in order that we may learn something more definite with regard to their efficacy. The administration of emetin hydrochlorid is considered by many observers of large experience to be almost specific in its action, and is especially indicated in severe types of infection (Rogers⁶).

It may be emphasized that amebas are generally demonstrated easily at the first examination if the patient be properly prepared and the stool properly obtained. Epsom salts may be given early in the morning and an hour or two later the patient reports at the laboratory where one or more stools may be examined while they are yet warm. It is a noticeable fact that the search may be difficult either in a stool that is too well formed or in one which is too watery.

It may be well to urge a more wide-spread interest in the examination of stools for parasites in the Northern states. Undoubtedly entamebic infection is a quite generally unrecognized cause of diarrhea, and probably of certain indefinite abdominal complaints. At the same time it should be remembered that the finding of parasites can be regarded only as a part of the evidence in the diagnosis of any condition of the bowel; there may be a tendency to ascribe a patient's complaints too quickly to this finding.

ABSTRACT OF DISCUSSION

DR. VAN G. YEAGER, Hayward, Wis.: I practiced formerly in Lake Charles, La. In that particular section of the country we have a great deal of amebic dysentery. I recall one case in which the patient passed, on an average, from fifteen to twenty stools in twenty-four hours. When he came to my office his stool consisted entirely of mucus and blood, and on examination I could find from five to ten amebas in the one-sixth field. If the patient is given a good dose of magnesium

sulphate in the morning, without any breakfast, it will be possible to obtain a stool thin enough, in most instances, to demonstrate the ameba without difficulty.

In amebic infections in the early stage, there is probably always a marked eosinophilia, but when the infection has lasted sufficiently long to give marked symptoms the differential count is often of little value, for whatever the increase in eosinophils means, and it probably indicates a fight against poisons from intestinal infections with parasites, it surely approaches the normal as the system becomes accustomed to the poisons which produce it.

I have treated probably ten or fifteen severe cases of this kind. Ipecac gave satisfactory results in all. Dr. Simon in the Charity Hospital in New Orleans uses five-grain salol-coated pills, giving from 60 to 100 grains each night for a week. The salol coating is not dissolved in the stomach, but in the intestine where the effect of the ipecac is wanted, and thus the nauseating effect which would result from such enormous doses of ipecac in the stomach is avoided. To avoid the taking of much medicine some pharmaceutical houses have placed in the hands of physicians a preparation of emetin which is given hypodermically with success. Most patients will be nauseated, aside from the ipecac, just from taking a great deal of medicine. By giving paraldehyd, which is one of our safest hypnotics, immediately after the ipecac, the patient will sleep until the ipecac has had time to be effective. I recall one patient who vomited frequently during the first few hours after taking ipecac. I advised him to take paraldehyd, which he did, sleeping soundly afterward for about six hours; he vomited immediately on awakening, however. This is a common experience.

DR. CHARLES L. MINOR, Asheville, N. C.: I wish to ask if the 100 grains are given in one dose, or in a number of doses during the twenty-four hours?

DR. VAN G. YEAGER, Hayward, Wis.: The 100 grains are given in one dose at night. This treatment is carried out for a week, the patient being given from 60 to 100 grains each night and being kept on a light diet and in bed. One advantage of a light diet is that the bowel is empty, and the ipecac comes in contact with the ameba.

DR. W. C. DIXON, Nashville, Tenn.: In the South we see many cases of amebic dysentery. I have used the ipecac treatment, giving large doses, but it is exceedingly unpleasant. I have not been so successful in avoiding the nausea as the doctor seems to have been in his cases. I have recently been able to secure emetin hydrochlorid and have obtained good results from its use. Previously, I used the emetin resinoid in solution. This is the most satisfactory treatment for dysentery with which I am familiar. The dosage of the hydrochlorid is one grain in twenty-four hours, given under the skin of the arm; the effect is almost magical in acute cases, or in chronic cases with much ulceration and many amebas in the stools. In the course of three or four days most of these cases clear up. It has been far more satisfactory than irrigation with quinin, coal-oil or any other agents that have been used. It is easy to give. The patients do not necessarily go to bed, although it is probably better if they are kept in bed and on a liquid diet. They are given one-fourth of a grain of the emetin one day, half a grain the next day, a grain the next day, and a grain each succeeding day. At the end of three or four days the stools are usually free from amebas and the patient makes an uninterrupted recovery.

The credit for this treatment is due to Dr. Rogers of Calcutta, India. He has had an extensive and satisfactory experience with it. He seems to have cured a number of patients with abscess of the liver by aspiration and injection of emetin into the cavity, together with the hypodermic administration of the emetin. I have had only one case of abscess of the liver in which I used emetin. The patient was in an extreme condition, the abscess was aspirated and one grain of emetin in solution was injected into the cavity. The patient showed some improvement for a few days, and then died rather suddenly. At necropsy it was found that he had two abscess cavities in the liver, the upper one having ruptured into the pleura, the lower one having been aspirated.

5. Hanes, Granville S.: Amebic Dysentery, THE JOURNAL A. M. A., June 19, 1909, pp. 1990-2.

6. Rogers: Brit. Med. Jour., June 22, 1913, pp. 1424-5; Ibid, Aug. 24, 1912, pp. 405-9.

Dr. G. D. HEAD, Minneapolis: We have a form of chronic diarrhea in the North, occurring in persons who have never been in the South. It is due to some intestinal parasites of which Dr. Giffin has spoken. There is, however, a form of diarrhea of which I have seen many cases, in which one finds in the stools the *Trichomonas intestinalis*. This form of chronic diarrhea lasts for years and simulates quite closely the diarrhea due to *Ameba coli*. Tremendous numbers of these flagellates are often found in the stools. They are recognized immediately with a one-sixth objective. If the flagellates can be gotten out of the stools, the diarrhea, as a rule, ceases. We find, however, great difficulty in killing them out. I am sure that this is a chronic form of diarrhea endemic in the North. I do not know where the flagellates come from. Even Dr. Giffin gives no explanation as to how the entamebas get into the stools in the North. When a physician meets a case of chronic diarrhea in the North, he should examine the stools as systematically and carefully as the physician in the South.

Dr. W. V. BREM, Los Angeles, Cal.: Dr. Bass has been using emetin hypodermically in the treatment of experimental amebic infections and prophylactically in quite a number of patients. He believes that of all the specifics in medicine emetin is probably the best against amebic infection.

Some time ago in reporting the result of the use of ipecac in amebic dysentery in Panama, I discussed at length the bismuth treatment as used by other men in Panama, and I expressed considerable doubt about its efficiency. I have recently examined the stools of a patient who was under treatment with ipecac according to the method that I felt to be the best. The treatment had no effect on the infection so far as eradication of the amebas was concerned. The patient was then put on the bismuth treatment, which immediately cleared up the infection. Darling, in Panama, has recently reported that he examined the stools of twenty-eight patients who had had amebic dysentery and been treated with bismuth. He found amebas in only one instance. The bismuth treatment of Deeks and Shaw may, therefore, be quite effectual in the treatment of amebic dysentery.

Dr. W. W. TOMPKINS, Charleston, W. Va.: Will Dr. Giffin give the details of the coal-oil injection? It seemed to be satisfactory in all the cases.

Dr. H. Z. GIFFIN, Rochester, Minn.: I shall answer only the question concerning the coal-oil treatment. Kerosene enemas have been used in the treatment of entamebic infections for four or five years. I have employed them alone in only a few cases, but with satisfactory results. After a few injections it was impossible to find the parasites. This is the reason I suggest that possibly this treatment should be given a further trial. After the large bowel is cleansed, about one quart of coal-oil is injected. The patient retains it for fifteen or twenty minutes, sometimes longer. The treatment is repeated about twice a week. There is no abdominal complaint whatever. The only irritation is possibly at the rectum, and this is easily overcome by using a small amount of petrolatum.

Dr. W. W. TOMPKINS: What is meant by coal-oil? Does it mean simply kerosene?

Dr. H. Z. GIFFIN: It means kerosene.

SARCOMA OF THE CHORIOID

A CASE WITH METASTASIS TO THE LIVER EIGHT YEARS AFTER ENUCLEATION OF THE EYE

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Sarcoma of the chorioid endangers not only the visual organ, but also life. When the eye is removed the prognosis as to life is absolutely grave. Even after the eye is removed life is still in danger, for it is impossible to foretell whether or not sarcomatous cells have been carried, prior to the enucleation, into the deeper tissues of

the body. When the sarcoma is removed late in the course of the disease there is often a recurrence of the condition in the enucleated orbit, which eventually is the cause of death. If the eye is enucleated early, however, there is usually no recurrence locally, but the patient is still not free from the danger of metastasis. The case here reported shows a metastatic growth making its appearance eight years after the eye has been enucleated.

Miss A. L., aged 18, consulted me Feb. 5, 1905, on account of failing eyesight. Her left eye had been gradually failing for about two months. She felt otherwise well. She had a good family history. Examination showed both eyes quiet and free from any inflammation; right eye, perfectly normal; left eye, cornea normal; pupil 6 mm.; no reaction to light; vision equal to light perception.

Ophthalmoscopic examination showed a dark media and no fundus reflex. With a plus 7 lens several blood-vessels were seen over a grayish retina, which was detached. The eyeball was slightly prominent as compared to the right eyeball. The diagnosis was retinal detachment with a suspicion of a choroidal tumor as the etiologic factor.

February 8: The eyeball protruded and tension was plus 2. Eye was somewhat painful on pressure and patient had headaches. I informed the patient of the gravity of the situation and advised an enucleation. Dr. Schwenk in consultation agreed with me. The patient, however, would not submit to an enucleation.

May 30: The patient returned with badly inflamed eye, severe pain and tension plus 3. The severe headache was evidently caused by the high intra-ocular pressure. Again I insisted on enucleation. She consented only after repeated warning on account of the danger to life.

June 8, 1906: The eyeball was enucleated and examined. A pigmented tumor the size of a small hazelnut was found at the posterior pole. Microscopic examination showed the tumor to be a melanotic sarcoma.

July 6: An artificial eye was inserted. No local recurrence followed and patient was well. She married in 1909 and gave birth to a healthy child.

Jan. 12, 1912: The patient consulted me on account of a conjunctivitis, which readily yielded to treatment. Otherwise the patient was in good health.

Jan. 3, 1913: The patient gave birth to another child. After delivery the family physician, Dr. Jacob, noticed an enlargement of the liver, which increased rapidly. Dr. Tyson was called in consultation and diagnosed a malignant growth of the liver. At the special request of the patient and family, and with consent of the attending physician, I saw the patient, January 10. I found her in bed, markedly emaciated and yellowish pale in color. The liver was very large, coming down below the umbilicus, filling in practically the entire abdominal cavity. The growth was lobulated. Four distinct lobules could be felt. The patient was very weak. She died May 6. No post-mortem was obtainable. The diagnosis, however, was clear.

The case is of considerable interest and shows that in sarcoma of the chorioid metastatic growths with a fatal termination may occur at any remote period after the eye has been enucleated, even though the tumor did not recur locally. It further emphasizes the absolute necessity of early diagnosis and prompt removal of the eye in order to save life.

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Necessity of Vital Statistics for Control of Contagious Diseases.—A community which has no means of knowing with what contagious diseases it is afflicted, nor how many cases there are, nor where they are, is helpless to protect itself, and unnecessary sickness and death will result.—Assistant Surgeon-General Trask.