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Staff Meeting Bulletin Hospitals of the » » » University of Minnesota

Amebiasis

Volume XVIII | Friday, November 15, 1946 | Number 7

STAFF MEETING BULLETIN
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Volume XVIII | Friday, November 15, 1946 | Number 7

INDEX

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William A. O'Brien, M.D.

I.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL
CALENDAR OF EVENTS

November 16 - November 22, 1946

No. 133

Saturday, November 16

7:45 - 8:50	Orthopedics Conference; Wallace H. Cole and Staff; Station 21, U. H.
8:30 - 11:00	Neurology Grand Rounds; A. B. Baker and Staff; Station 50, U. H.
9:00 - 9:50	Surgery-Roentgenology Conference; O. H. Wangensteen, L. G. Rigler, and Staff; Todd Amphitheater, U. H.
10:00 - 12:00	Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.
10:00 - 12:50	Obstetrics and Gynecology Grand Rounds; J. L. McKelvey and Staff; Station 44, U. H.
11:00 -	Anatomy Seminar; Postnatal Changes in the Blood and Spleen of the Mouse; C. J. Hamre; and Experimental Glomerulonephritis (Review of Literature); Jack Gordon; 226 I. A.
11:00 -	Medicine--X-ray Conference; Veterans' Hospital.
8:00 -	Clinical Research Club; Eustis Amphitheater.

Monday, November 18

9:00 - 9:50	Roentgenology-Medicine Conference; L. G. Rigler, C J. Watson and Staff; Todd Amphitheater, U. H.
9:00 - 10:50	Obstetrics and Gynecology Conference; J. L. McKelvey and Staff; Interns' Quarters, U. H.
12:15 - 1:15	Obstetrics and Gynecology Journal Club; M-435, U. H.
12:30 - 1:20	Pathology Seminar; Rheumatic Pneumonia; William Lick; 104 I. A.
12:15 - 1:30	Pediatrics Seminar; Irvine McQuarrie and Staff; 6th Floor Seminar Room, Eustis, U. H.
12:00 - 1:00	Physiology Seminar; Analysis of Muscular Contraction upon Venous Return and Cardiac Output in Exercise; Herbert S. Wells; 214 M. H.

Tuesday, November 19

8:30 -	Surgery-Pathology Conference; N. K. Lufkin, John R. Paine, and Associates; Small Conference Room, Veterans' Hospital.
9:00 - 9:50	Roentgenology-Pediatrics Conference; L. G. Rigler, I. McQuarrie and Staff; Tustis Amphitheater, U. H.

10:30 -	Surgery Reading Conference; John R. Paine; Small Conference Room; Building I; Veterans' Hospital.
12:30 - 1:20	Pathology Conference; Autopsies; Pathology Staff; 102 I. A.
2:00 - 2:50	Dermatology and Syphilology; H. E. Michelson and Staff; Veterans' Hospital, Bldg. III.
3:15 - 4:15	Gynecology Chart Conference; J. L. McKelvey and Staff; Station 54, U. H.
3:30 -	Clinical Pathological Conference; Veterans' Hospital.
3:45 - 5:00	Pediatric Staff Rounds; I. McQuarrie and Staff; W-205, U. H.
4:00 - 4:50	Surgery-Physiology Conference; Uretero-Transplantation to Intestine; C. D. Creevy and Roger Reinecke; Eustis Amphitheater.
5:00 - 5:50	Roentgenology Diagnosis Conference; Jack Friedman; M-515, U. H.

Wednesday, November 20

8:00 - 8:50	Surgery Journal Club; O. H. Wangensteen and Staff; M-515 U. H.
8:30 - 10:00	Psychiatry and Neurology Seminar; Staff; Station 60 Lounge; U. H.
11:00 - 11:50	Pathology-Medicine-Surgery Conference; Post Infectious Hepatitis Yellow Atrophy; E. T. Bell, C. J. Watson, O. H. Wangensteen, and Staff; Todd Amphitheater, U. H.
12:00 - 1:00	Physiological Chemistry Journal Club; Staff; 116 M. H.
4:00 - 6:00	Medicine and Pediatrics Infectious Disease Rounds; W-205 U. H.

Thursday, November 21

8:30 -	Surgery Grand Rounds; John R. Paine and Staff; Veterans' Hospital.
9:00 - 9:50	Medicine Case Presentation; C J. Watson and Staff; Todd Amphitheater, U. H.
10:00 - 12:00	Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.
10:30 -	Roentgenology-Surgery Conference; Veterans' Hospital.
12:00 - 1:00	Histochemistry Seminar; David Glick; 129 M. H.
4:30 - 5:20	Ophthalmology Ward Rounds; Erling Hansen and Staff; E-534, U. H.
4:30 - 5:20	Bacteriology Seminar; 214 M. H.
5:00 - 5:50	Roentgenology Seminar; X-ray Examination of the Heart; Marcus Smith; M-515, U. H.

Friday, November 22

9:00 - 9:50	Medicine Grand Rounds; C. J. Watson and Staff; Todd Amphitheater U. H.
9:00 - 9:50	Pediatric Grand Rounds; I. McQuarrie and Staff; Eustis Amphitheater.
10:00 - 11:50	Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.
10:30 -	Medicine Grand Rounds; Veterans' Hospital.
10:30 - 12:20	Otolaryngology Case Studies; L. R. Boies and Staff; Out-Patient Otolaryngology Department; U. H.
11:30 - 1:00	University of Minnesota Hospitals General Staff Meeting; Streptomycin; Wendell H. Hall; New Powell Hall Amphitheater.
1:00 - 2:00	Dermatology and Syphilology; Presentation of Selected Cases of the Week; H. E Michelson and Staff; W-312, U. H.
1:00 -	Roentgenology-Neurosurgery Conference; H. O. Peterson, W. T. Peyton and Staff; Todd Amphitheater, U. H.

II. AMEBIASIS

Harold W. Brown

THERAPEUTIC CONFERENCE

The following abstract of "Some Modern Concepts of Amebiasis" by Dr. Ernest Carroll Faust, Professor of Parasitology, Department of Tropical Medicine, Tulane University of Louisiana, New Orleans was published in Science, Vol. 99, 45-51 (Jan. 21) 1944 and 69-72 (Jan. 28) 1944. Remarks were made during the delivery of the Alvarenga Prize Lecture of the College of Physicians of Philadelphia on October 13, 1943. The reader is directed to these two issues of Science for the complete article which is highly informative.

The second abstract on the pharmacological drugs used in the chemotherapy of protozoan infections is from the Minnesota Pharmacology Outline, 121-123, which was prepared by Raymond N. Bieter and Harold N. Wright in January, 1945.

Discussion today is lead by Dr. Harold W. Brown, Professor of Parasitology, DeLamar Institute of Public Health, Columbia University, New York. Dr. Brown was born in Muskegon, Michigan, 40 years ago. He received his A.B. from Kalamazoo College, 1924; M.S., Kansas State College, 1925; Doctor of Science, Johns Hopkins University, 1928; Doctor of Medicine, Vanderbilt 1931; Doctor of Public Health, Harvard, 1936. He was formerly a member of the United States Public Health Service, Professor and Dean of the School of Public Health, North Carolina University; Professor of Preventive Medicine and Public Health, Duke. Trained in general science, parasitology, pharmacology, public health and medicine, Doctor Brown brings to the field of Parasitic Disease an unusual experience. We are fortunate to have him as our special guest today, to discuss amebiasis, and the general medical man's responsibility in the field of parasitic disease.

ABSTRACT I

During the past 50 years the idea that amebiasis was strictly or primarily a tropical disease and usually manifested itself as a fulminating dysentery or a liver abscess became gradually modified. Little by little, as epidemiologic studies were carried out, the discovery was made that amebiasis is practically cosmopolitan in its distribution, although as a rule its incidence is higher and its clinical expressions are more severe in the Tropics than in cooler climates. Dysentery and liver abscess were found to be only two of its more dramatic manifestations. There might be a history of an acute or subacute appendicitis or of general colonic distress without dysentery or even without diarrhea. There might be no apparent intestinal disturbance but a mild toxic state, with moderate leukocytosis and a low-grade fever. The patient might be considered symptomless by the uncritical diagnostician and yet at necropsy extensive amebic ulceration of the colon might be demonstrated. Throughout this period both by direct and indirect methods there developed increasing evidence that Endamoeba histolytica is always actually or potentially a pathogen and that it is capable of invading and destroying the host's tissue without the aid of pathogenic bacteria.

In 1875 a Russian physician, F. Lösch, first observed and described the active stage of Endamoeba histolytica in the dysenteric stools of a patient, and at necropsy found motile amebae in material obtained from ulcers of the colon. Moreover, he succeeded in infecting 1 of 4 dogs inoculated with amebae present in the bloody-mucous exudate of the patient. Following his observations, it was demonstrated that the ameba discharged in dysenteric stools was related to amebic colitis, and if the parasite developed in a cystic stage, the pathologic lesions in man were demonstrated and the disease was experimentally produced by feeding cysts of Endomeba histolytica to volunteers, and feeding Endamoeba coli did not cause disease. A technique for in vitro cultivation of E. histolytica and a specific complement fixation test followed.

In addition to man the following hosts have been described as infected in nature or susceptible of experimental infection with Endamoeba histolytica--dogs, cats, monkeys, rats, pigs, guinea-pigs and rabbits.

Faust concludes that dogs usually obtain their infection from man but do not constitute a normal source of exposure for human beings. The lesions in the dog may be few and superficial or extensive and deep-seated. The symptoms may be acute or chronic or spontaneous recovery may result after a short period of colonization by the amebae in the bowel wall. Occasionally liver abscess may develop following invasion of the intestine.

Many workers have infected kittens with human strains of E. histolytica. Kittens develop a fulminating, frequently fatal amebic dysentery and are therefore excellent for acute experiments. There appear to be no records of their infection in nature.

Many species of Old and New World monkeys are naturally infected with strains of Endamoeba histolytica indistinguishable from those occurring in man.

On the basis of information concerning amebic infection in hosts other than man it must be concluded that man is primarily, in fact, almost exclusively responsible for his own infection.

In what way or ways do cysts of Endamoeba histolytica, discharged from the bowels of infected individuals, reach the human mouth? The most common hypotheses predicate water, food, flies and contact contamination. While each of these hypotheses fits well into the epidemiology of amebiasis, there is a paucity of direct proof for any one of them.

The direct contact hypothesis is probably applicable to a wide range of unsanitary situations in warm moist climates but in cooler climates may also apply, particularly to institutional groups, as children's asylums, mental hospitals, and prisons. Outbreaks of amebic dysentery in prisons are much more frequent than the medical literature indicates. Mental hospitals have been found to be particularly afflicted with amebiasis from Panama to Sweden and the infection has been found in children's homes from New Orleans to Saskatoon. In New Orleans several children's homes and one infant asylum have been studied by the Department of Tropical Medicine of Tulane University since 1929. In all these institutions the incidence was found to be high, beginning with children slightly over one year of age and increasing rapidly to the period of adolescence. Epidemiologic studies carried out at the infant asylum have demonstrated that identifiable cysts of Endamoeba histolytica were recoverable from the bottom of the laundry chute, from underpanties washed in tepid water, from play objects, floors and from the bottom of the children's wading pools. Although the place was apparently clean and the water supply was uncontaminated, a careful study of the habits of the children showed that direct contact contamination was prevalent. In certain mental hospitals and prisons the opportunities for gross transfer of amebic cysts from one individual to another are much greater than in the average children's home.

An examination of the evidence concerning the methods of exposure to amebiasis leaves much to be demonstrated. Without being hypercritical, the student of scientific medicine will reserve judgment until more direct proof has been presented as to how in each situation amebiasis is actually perpetuated.

The stage of Endamoeba histolytica most likely to produce infection in man is the freshly ripened four-nucleate cyst, which is present in formed stools of infected individuals within a few hours after the stools have been passed. If these cysts gain entry to the mouth and are swallowed, they pass unmodified through the stomach into the small bowel. On arrival in a neutral or slightly alkaline medium of the latter the four-nucleate organism within the cyst wall becomes activated while the wall itself becomes weakened. This characteristically results in the ameba affecting an escape through a little rent in the wall. Thereupon a small amount of cytoplasm becomes associated with each of the four nuclei (or at times a supernumerary division of the nuclei may occur), with the result that four- or eight-minute metacystic trophozoites are formed. These trophozoites now pass down the remaining portion of the ileum, through the ileocecal valve and into the large bowel.

The exact method by which the trophozoites establish themselves in the mucosa of the large bowel has been studied experimentally in dogs, kittens, and monkeys, and is parallel in human amebiasis. By lysis a very small cavity is produced in the superficial portion of a principal or gland cell. By continued lytic action, aided at times by mechanical activity of the pseudopodia, the ameba continues its invasion into the cell, utilizing the digested cell substance as food. Following growth, it multiplies by binary fission and thus a small colony becomes established.

Once entry into the intestinal epithelium has been effected and the colony has started, the direction of tissue penetration and destruction is towards and through the muscularis mucosae.

At times in man, the monkey and the dog the lesion may be confined to the mucosa, in which case tissue destruction may be very superficial and spontaneous evacuation of the colony may occur with healing by growth of simple columnar epithelium.

Once the characteristic bottle type of amebic lesion has been developed it may by extension reach the muscular coats of the bowel and even perforate through the serosa. Amebae which have secured entry into mesenteric venules in the submucosa and muscularis may be carried to the liver, where they may set up multiple small colonies (amebic hepatitis) or one or more large cavernous abscesses. Again, extensive colonization in the submucosa may result in undermining tunnels, with the junction of adjacent colonies and complete loss of arteriolar blood supply for the overlying tissues. Amebae extruded from primary lesions in the upper levels of the large bowel may by regurgitation be carried back to the posterior segment of the ileum or become lodged on the ileo-cecal valve where secondary lesions may develop. Or, perhaps more often, the organisms will pass down the bowel, come in contact with the mucosa at lower levels and there initiate secondary colonies.

In the average host parasitized by Endamoeba histolytica the majority of primary lesions occurs in the cecal area, including the cecum, appendix, the distal segment of the ileum and the ascending colon. The other focus of high frequency is the rectal area, including the sigmoid colon and the rectum.

Although it has been demonstrated that bacteria are not necessary for successful entry of Endamoeba histolytica into the bowel wall, the older amebic ulcers are frequently complicated by bacterial invasion.

It will next be useful to inquire into the chances of infection and of tissue invasion by Endamoeba histolytica. Infection is contingent on a number of factors which vary considerably under different conditions. First of all is the question of exposure. Qualitatively there must be viable organisms which have an opportunity of gaining entrance to the mouth and of being swallowed. On reaching the small bowel cysts must be capable of excysting. If the medium is too acid or the intestinal juices are too weak or are diluted too much by food in the process of digestion it is altogether likely that excystation will not occur and thus the cysts will pass through the large bowel and be evacuated without providing an opportunity for an infection to become established. Even though excystation occurs, if the number of metacystic trophozoites is scant the chances of their coming in contact with the cuticular surface of the epithelium of the large bowel are very remote, particularly if they are in the midst of a considerable menstruum of partly digested food or feces. Moreover, hypertonicity of the bowel is likely to carry the organisms through the bowel too rapidly for them to make temporary contact with the mucosal surface. Probably human beings in mildly endemic areas are often exposed to a few viable cysts which actually excyst in the ileum but never have an opportunity to colonize in the bowel. On the other hand, in areas of hyperendemicity repeated exposure to large numbers of viable cysts provides the appropriate setting for development of heavy infections in a large group of the population.

The virulence of the particular strain

of ameba also undoubtedly has considerable influence on initial colonization and continued tissue invasion.

The factors thus far considered concerning opportunities for infection have been extrinsic in character and have not dealt with host susceptibility. Certain animals are undoubtedly completely resistant to infection with Endamoeba histolytica. In others, as the rat, there is suggestive evidence that colonization may possibly take place without the necessity of tissue invasion. On the other hand, in man, the monkey, and the dog and cat the evidence preponderates in favor of the view that infection can not be maintained for any length of time without tissue invasion.

Probably the most important single intrinsic factor which determines whether amebiasis in the susceptible animal is acute, chronic or relatively asymptomatic is the degree of host resistance based on the nutritional level. In general, carbohydrates provide an opportunity for Endamoeba histolytica to multiply, and animal proteins reduce this capacity, but the problem is not so easily solved.

Vitamins conceivably have a very important role in the control of amebiasis, but in so far as the writer knows this problem has not been subjected to critical experimental or clinical study.

There is no clear evidence indicating that race or sex is in itself important, but there are good epidemiologic data indicating that long exposure of a particular population group to strains of Endamoeba histolytica tends to establish a host-parasite equilibrium for the homologous strains of the parasite. In such groups of human beings, even with constant exposure due to primitive sanitary conditions and a correspondingly high rate of infection with a heavy "load" of parasites, clinical manifestations are uncommon. Nevertheless, individuals from outside the hyperendemic areas who are exposed to the same strains of Endamoeba histolytica not uncommonly develop a fulminating amebic colitis.

A clear picture of the levels at which the amebic lesions occur, their numbers AND the depths of penetration of the amebae constitutes the essential fundamental background for a clinical appreciation of the disease. Thus, a mucous diarrhea, with amebic trophozoites in the stool, but without macroscopic blood suggests early, rather extensive superficial invasion of the bowel wall or a mild relapse, while a fulminating dysentery indicates deep invasion in at least one focus, usual in the rectal area.

Perhaps the most commonly overlooked syndrome which should suggest the possibility of amebiasis, especially in tropical countries, is that of appendicitis. Amebic lesions in the cecum, appendix or adjacent levels of the ileum or ascending colon may give rise to dull throbbing or intense knife-like pain in the lower right quadrant of the abdomen or by reference the pain may suggest gall bladder disease or peptic ulcer. Patients having infection at this focus may consistently pass stools which are formed or constipation may alternate with diarrhea. In New Orleans 10 per cent of appendicitis cases in the surgical service of Dr. Alton Ochsner in Charity Hospital were found to have amebic involvement. In the Santo Tomas Hospital in Panama the frequency of amebiasis of the cecal area usually allows management of the case by the internist and prevents unnecessary surgical intervention, since anti-amebic therapy in these cases will probably eventually be required.

Asyndromic amebiasis may cause general colonic disturbance, nervous symptoms or fatigue. In such patients one or more well-established amebic ulcers have usually developed, most commonly in the cecal area.

Amebic invasion of the liver is probably much more common than the records of acute hepatic amebiasis indicate. Amebae which enter the mesenteric venules in the submucous coat of the large bowel are swiftly carried to the liver, to be filtered out in the portal capillaries. In the great majority of cases the amebae do not colonize in the liver parenchyma but soon die. The cause of this amebostatic action is unknown, but it is plausible that the same unknown substance in liver extract which has been found experimentally to control the infection in the bowel operates even to a greater degree in the liver itself.

While an internist who has had years of experience in the study of dysenteries can frequently make an accurate diagnosis of fulminating amebic or bacillary dysentery on the macroscopic appearance of the freshly passed stool, this method does not provide a safe basis for diagnosing amebiasis in its broader aspects. In practice it is necessary to recover Endamoeba histolytica itself either in its trophozonite or cystic stage, and to differentiate it from other protozoa of the digestive tract as well as from macrophages and Blastocystis.

First of all, microscopic films of the freshly passed stool are prepared. These consist of (1) a direct film, one side unstained, one side stained with D'Antoni's iodine; (2) a supplementary hematoxylin-stained direct film; (3) a film resulting from concentration of cysts by the zinc sulfate centrifugal flotation technique. Three stools, passed on alternate days or preferably every third day, are examined in this way. Both by practical tests and by calculation it has been found that 85 to 90 per cent of positive cases are diagnosed by these combined techniques on the three stool samples, whereas a single direct fecal film accounts for only 20 to 25 per cent of E. histolytica positives. In individual cases with a history of chronic colitis proctoscopic examination, purgation with Glauber salts or phospho-soda, or high physiologic salt enemas are carried out.

In the United States very high incidence occurs in certain population groups, as in rural areas of the Southern Appalachians and in children's asylums in New Orleans. In other areas, particularly in the north, the incidence may be as low as 1 per cent, although in most regions it varies between 5 and 10 per cent.

An analysis of the present status of chemotherapy in amebiasis indicates that marked progress has been made in the past quarter of a century in the development of a few relatively specific drugs which are rather well tolerated by the patient. Yet in amebic colitis no one of these drugs and occasionally no combination of them provides a guaranteed cure. There is abundant need and opportunity to explore other preparations, including refined products of crude drugs utilized by Oriental and Amerind peoples, as well as new synthetics.

Finally, a suggestion may appropriately be made concerning the nutritional state of the patient in amebiasis. Experimental evidence suggests that during the period of treatment the carbohydrate intake should be reduced and that nutritious, readily digestible animal proteins should be increased. The possible role of vitamins in raising the threshold of resistance to the pathogen has never been given experimental or clinical trial, either in preventing infection or in controlling tissue invasion. This suggests the need for serious intensive study.

In an infection like amebiasis it is easier to dodge the issue than to meet it squarely and to provide machinery for practical control. While the epidemiologic evidence is not conclusive, it is apparent that the safeguarding of food and drink from contamination should do much to protect the population. The public must be made aqare that dirty food handlers should not be tolerated. By sanitary regulations these individuals should be examined for amebic infection and, if found positive, should be treated until they are negative. Filth flies should not be allowed to breed; they are not only a menace in this infection but in practically all other diseases primarily involving the gastro-intestinal tract. Thorough sanitary campaigns should be carried out in eleemosynary institutions to clean out these hotbeds of infection. An awakening of the public consciousness regarding the potential dangers of amebiasis constitutes an additional essential part of the control program. Meanwhile the practicing physician, by his respectful attitude towards amebiasis in his own patients, whether they manifest symptoms or are apparently symptomless, can do much to further this end.

ABSTRACT II

Drugs Used in the Chemotherapy of Protozoan infections

A. Amebiasis

Emetine

Is a protoplasmic poison. A concentration of 1:1000,000 kills motile forms but is less active on cysts. Is also an irritant. Maximum dose per day 1 mg./Kg; per course 10 mg./Kg.
Toxic and fatal dose; animals and man, 10-25 mg./Kg. (cumulative).
Symptoms readily relieved; cures about 10-15%; about 50% of patients become carriers. Is only effective drug for treatment of liver abscesses.
Nausea, vomiting, depression, pain, bloody diarrhea.
Heart muscle: cloudy swelling, shrinking and atrophy of fibers, arrhythmias, myocarditis, edema, sudden cardiac failure.
Degenerative lesions in muscles, liver, kidneys.
Peripheral neuritis - wrist and foot drop (possibly muscle injury).
Symptoms appear to occur with cumulative effect of drug.
Treatment: Stop drug and treat symptomatic.

Contraindication - heart and kidney disease.
Administration.
Ipecac and Emetine Bismuth iodide orally.
Tincture of Opium may reduce nausea and vomiting.
Emetine HCL hypodermic.
Emetinae Hydrochloridum, U.S.P. daily dose 60 mg., 1 grain.
Injection Emetinae Hydrochloridi, U.S.P. 20 mg/cc. to 60 mg/cc.

Chiniofon, Iodohydroxyquinoline sulfonate 27% I

Vioform, Iodochloroxyquinoline 40% I
Quinoline --- toxic and antiseptic.

Produces retinitis in rabbits
Oxyquinoline sulfate.

Bacteriostatic and relatively non toxic.
Rapidly absorbed from Gastro-intestinal tract and rapidly excreted by kidneys in conjugated form.

Both drugs have a direct amebicidal action due chiefly to the I.
In vitro not as highly active in motile forms as emetine.
Act on both motile forms and cysts.
Chinofon one of least toxic and most efficient of amebacides.

Symptoms of toxicity.
Diarrhea for a few days, in up to 50% of patients.
Occasional gastric distress (Vioform).
Iodisin (Vioform).
Danger of liver injury with high doses.
Contraindications - liver and thyroid disease.
Administration:
In courses of 7 to 12 days, then rest periods.
Chiniofonum, U.S.P. 1 Gm., 15 grains.
Tabellae Chiniofoni, U.S.P. 1 Gm.

Vioform, N.N.R. 0.75 - 1. Gm. daily for 10 days.
In capsules each containing 0.25 Gm.

Diodoquin

A hydroxyquinolin compound containing 64% I
In doses of 1.5 to 2. Gm/1day in man no toxic symptoms observed.
Therapeutic results very good. Symptoms and pathological lesions relieved in 7-14 days.

May become one of most valuable drugs in amebiasis.
Prophylactic use: 2. Gm. per day p.c. for 20 days.

Acetarsone 27.3% As

Carbarsone 28.5% As

Pentavalent arsenicals, therefore possibility of As poisoning.
Acetarsone most dangerous from this standpoint, toxic effects seen in 15% of patients.
Carbarsone one of most efficient amebacides. Produces satisfactory results in 90% of patients, both acute

and chronic forms (both motile forms
and cysts.

Symptoms of toxicity.
- Cutaneous eruptions (probably As) most with acetarsone.
- Diarrhea, fever.
- Lethargy, weight loss.
- Sluggish reflexes, peripheral neuritis, visual disturbances.
- Liver and kidney injury.

Contraindications.
- Liver and kidney disease.
- Hepatitis and amebic abscesses.

Administration.
- Oral in courses for 10 days to 2 weeks.
- Carbarsone also in retention enema; 2 Gm. in 200 cc. of 2% Na bicarbonate soln. on alternate nights; 5 doses.

Carbarsonum, U.S.P. 0.2 Gm. 3 grains.

Acetarsone, N.N.R.
Tablets Acetarsone, N.N.R., in 0.05 Gm., 0.1 Gm. and o.25 Gm. sizes.

Summary:

Drug	Amebacidal concentration in vitro in 24 hours.
Emetine	1:300,000 to 1:1,000,000
Vioform	1:10,000
Carbarsone	1:4,000
Na Acetarsone	1:600
Chiniofon	1:500

Best Therapeutic results: Use 2 or more drugs alternately. Can reduce failures to below 5%.

Reed prefers 1) Carbarsone
2) Vioform

Craig prefers 1) Chiniofon
2) Carbarsone.

Emetine best to control acute symptoms, and for hepatitis and abscesses. For other stages, 2 or more of the following given alternately:
Carbarsone, Chinofon, Vioform.

- - -

III. GOSSIP

Former Minnesotans, Drs. E. G. Holmstrom and Charles E McLennan, who are directing Obstetrics and Gynecology at the University of Utah Medical School, were awarded a prize by the Central Association of Gynecologists for their essay on "Menorrhagia Associated with Irregular Shedding of the Endometrium" which they had studied in 22 women. They discovered as a result of their experiments on 4 normal women that the characteristic microscope picture of the disease can be reproduced in the endometrium of the normal female by injection of progesterone during the bleeding phase of the cycle. The other prize winner was Dr. Willis E. Brown of Iowa. Dr. J. L. McKelvey can point with pride to his academic offspring who are compiling such an excellent record in Morman Land....Borghild Hanson, new director of the Course in Occupational Therapy is a sister of Chemist Betty Hanson of the Minneapolis General Hospital. Miss Hanson came to us from the National Tuberculosis Association where she was consultant in occupational therapy, and prior to that time had extensive experience as an occupational therapist in several hospitals. The group in occupational therapy is an outstanding crowd of young women which should do much to bring added fame to Minnesota's reputation...Dr. Henry Pinkerton, Professor of Pathology, St. Louis University School of Medicine, was a stimulating guest this week at the Center. The rickettsial infections, histoplasmosis and toxoplasmosis were his contributions to our program. He was here about 2 years ago for a meeting of the Minnesota Pathological Society, at which time he stimulated our interest in toxoplasmosis and on this trip he must have been pleased to have learned of our extensive experience. As far as I know, no one has yet made a diagnosis of "Q" Fever, but it shouldn't be long now. Dr. Pinkerton has had to answer the question many times and even though he is quite a detective in his own rights, he is not related to the gentleman who founded the detective agency....Sir Lionel E. H. Whitby, Regius Professor of Medicine, Cambridge University, who will be our visitor next week, is interested in diseases of the blood. The fifth edition of his book, Disorders of the Blood, which he wrote with C. J. C. Briton, has just been announced by the Blakiston Company. Like his distinguished predecessor, he also has been interested in the art and science of medicine and has written in this field. His medical school lecture will be given Friday, November 22 at 4 p.m., Room 15, Medical Sciences. The subject is "Haemotological Effects of Radiation."...Last Sunday I attended the organization meeting of the South Dakota Division of the American Cancer Society. There are 360 physicians in South Dakota and it is the hope of Dr. O. S. Randall, Chairman of the Division, that he can get everyone interested in better cancer diagnosis and treatment. Doctor Randall is a former Minnesotan who had an extensive experience on the cancer service while he was a surgical fellow at this hospital. He wished to be remembered to his friends here and apparently he has been most successful in his surgical practice in Watertown. South Dakota is still infested with more hunters than game, although the ducks were flying the morning I was there and there was plenty of open water. Tall tales of Eastern hunters who shoot all sorts of animals at sight brought up an incident in which one of them brought in a young pig and asked what kind of an animal it was. Local hunters who have a chance to go "often" report they have been able to get their limit of pheasants, although the number of birds is much smaller than usual...November 11 passed with a small snow by comparison with the blizzard of 1940 when so many hunters lost their lives...The children at University Village are said to have become well adjusted to life in cramped quarters. The 280 adult parents have nearly 300 children in this restricted area. Life in the village is neighborly, but most of them will be glad when regular houses are available...Mrs. Lotus D. Coffman, wife of the former University President, was the honored guest at the Continuation Center birthday party. This unit was one of her husband's pet projects and since his death, she has taken an active interest in it. Mr. Coffman will long be remembered for his constructive administration of the University...Dr. Lester Evans of the Commonwealth Fund was a University visitor this week...Tomorrow is Dad's Day and for those of us who have children at the University, it is quite an event....