

and duodenum,¹⁰ direct irrigations of the duodenum with substances toxic to these parasites, but harmless to the patient, might be of therapeutic value. Accordingly, we first tried injections of dilute methylene blue solution (1 to 3,000) into the duodenum. It was found that this treatment alone was not curative, although a marked decrease in the number of flagellates in the stools was usually noted following it. Experiments *in vitro* showed that the addition of hydrochloric acid to a mixture containing these parasites, the hydrochloric acid being used in a dilution corresponding to the acidity of the normal stomach (0.5 %), caused their very prompt destruction. Also, it was found that among other substances, the addition of quinin to the solution caused apparently a more rapid and more deleterious effect upon trichomonads. A solution for duodenal irrigations was therefore made up as follows, and has been used on numerous cases during the past year:

Methylene blue (med. pur.)	grs. 5
Quinin Sulph.	grs. 20
Hydrochloric acid (conc.)	mms. 30
Aq. Dest. qs. ad	O 1.

The above solution is injected directly into the duodenum through a duodenal tube to which a funnel is attached. About ten minutes is required for the injection. (Any form of duodenal tube may be used. We prefer those forms possessing a small tip, however, since the smaller the tip the more rapid is the entrance into the duodenum; with a small tip, only about ten minutes are required for the passage of the pylorus.) The fluid is injected warm. There is absolutely no danger to the patient from such injections. As a preliminary to the treatment, it is advisable to keep the patient upon a liquid or semi-liquid diet for two days preceding the injection and to administer a saline purgative upon the preceding night. One such injection is given daily for three mornings, the last two injections, in an adult, being double quantity. Upon the evening of each day upon which an injection has been given, an enema of 1 to 5,000 methylene blue is given high up into the colon. After three such treatments the patient is allowed to go about his business, but is instructed to return at the expiration of

one month for further examination. Upon his return a saline purge is given and the stools following this purgative are examined very carefully for the presence of parasites.

That the treatment outlined above is efficacious is evidenced from four apparently undoubted cures which we have obtained, three consisting of infection with trichomonas, and one being a patient heavily infected with lamblia intestinalis. A number of other patients treated by us in this way have been discharged apparently cured, but whether such cures were permanent could not be ascertained because of their failure to report for later examination.

Certainly it appears to us that this treatment, because of its innocuousness, its simplicity and its brevity, is worthy of further trial.

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BOTHRIOCEPHALUS LATUS INFECTION—REPORT OF A CASE

By M. D. LEVY, M.D.,
Instructor, Clinical Pathology, Medical
Department, University of Texas,
and
DICK P. WALL, M.D.,
Acting Assistant Surgeon, U.S.P.H.S.,
Galveston, Tex.

Comparatively few cases of bothriocephalus latus infection have been reported as occurring in America, although it is known that the infection is fairly common among the Finns of the Northwestern states. Singer,* in reporting a case in a Russian woman in St. Louis, was able to find records of only thirty other cases in American literature. While our case presents no unusual features, in

*Singer: J. A. M. A., 1916, Vol. LXVI., No. 21, p. 1618.

view of the fact that so few cases have appeared in the literature, we deem it worthy of report.

J. A., a seaman born in Finland, aged 32, presented himself to the United States Public Health Service complaining of a breaking out on the legs. For the past five years he has been living in this country. The history is negative except that he has been oppressed during the past year by a feeling of weakness at times, becoming tired after moderate exertion. For the past four years he has been passing segments of tape worm, at times as much as 15 feet, but as it never troubled him, he neglected taking treatment.

Physically the patient is well built, of fairly robust type, and of good color. Blood examination showed 3,240,000 red blood cells, 90% hemoglobin, color index 1.4x, differential count negative, there being only 2% eosinophiles. Stool examination revealed large numbers of bothriocephalus latus ova, as many as four ova appearing in one low power field.

Treatment was as follows: The patient was given nothing but liquids for two days, purged with Epsom salts, given no supper, and the next day was given the following mixture in one dose:

Fresh Ethereal Extract	Male Fern	drachms	ii
Calomel		grains	ii
Syrup Simplex		drachms	ii

This was to be followed in six hours by $\frac{1}{2}$ ounce sat. sol. magnesium sulphate (hot), but one hour after taking the male fern two complete adult worms (the heads of both being easily seen) of the bothriocephalus latus type were passed. Each worm measured 24 feet. Slight nausea was complained of after taking the male fern, and since passing the worms the patient states that he feels like a new man and is ready for work. Stool examinations have since been negative for ova. Of some special interest perhaps in this case is the entire lack of subjective symptoms in a person harboring two large adult worms and presenting a blood picture simulating that of pernicious anemia.

We wish to express our thanks to the Surgeon-in-Charge, Dr. L. P. H. Bahrenburg, for permission to report this case.

PELLAGRA: ITS ETIOLOGY AND TREATMENT

BY J. H. GRAVES, M.D.,
M.O.R.C., U. S. Army,
Waco, Tex.

The diet is no more important in pellagra than it is in tuberculosis, and many other wasting diseases, where nourishment is essential. Therefore, let us not be deluded into acquiescing to the dietary

theory as a *cause*, but rather let us feed to overcome it as in any wasting disease.

Pellagra presents all the earmarks of an infection, at least a severe toxemia, which is shown first on the skin, as well as being also referred to the alimentary tract. We often see cases presenting little or no nervous manifestations, but never without at some time or other showing a digestive disturbance, associated with skin manifestations, usually first seen on the backs of the hands, feet and face.

It no more devolves upon me and those who believe as we do to disprove the diet factors as regards the etiology of pellagra than upon those who advocate it to disprove its infectious or toxic nature. Microscopic workers are daily subtracting from the cryptogenic, or so-called ideopathic diseases, and adding to infectious diseases. In private homes, 7 women to 1 man have pellagra. It is a house disease. Old men over 50 and children under 10 have it most. In insane asylums incidence in male and female is the same. Why? Because some insect gets at them in poorly screened institutions and homes.

If pellagra only attacked the poor, illy nourished, poorly housed, errors in diet might appear as *the* factor in causing it. But we have found that it attacks the rich and poor alike. The rich according to their exposure and individual resistance, just as do typhoid, tuberculosis and many other infectious diseases. For the same reason, there are more cases of tuberculosis among the poor than among the rich. More cases of malaria occur in direct proportion to exposure to mosquitoes and lack of ingestion of some malaria-killing drugs.

If eating an unbalanced ration caused pellagra, as pointed out by other observers, Serbia, Montenegro, Albania, Belgium and Mexico, as well as all the big cities the world over, might easily be almost annihilated from its ravages instead of by bullets. So, too, would it have been rampant in this country during the Civil War and during droughts, where corn and syrup were consumed as the main diet.

In tetanus the organisms never reach the blood, the toxins do. So, too, in pellagra, we believe that some micro-organ-