difficult to make. Dr. Simon's pharmacist has, perhaps, solved that problem. Some years ago I was unable to get a pill that would not cause nausea or that would not dissolve in the intestinal tract.

DR. SIDNEY K. SIMON, New Orleans: The whole aim in the treatment of an endamebic infection lies in the removal of the cysts. The destruction of the vegetative forms alone, with the relief of clinical symptoms that follows, is in itself rarely a difficult problem. Putting the patient to bed for a period of a few days will usually suffice to relieve the immediate clinical distress even without the aid of other measures. It is only in the complete destruction of the encysted forms, however, that relapses can be prevented and a permanent cure established.

In regard to the examination of the stools, we long ago adopted the proctoscopic method in all cases of suspected protozoan infection. In this way the smears are made directly from ulcerated or denuded spots on the rectal mucosa, without the necessity of having the stools conveyed in bulk. The severe grades of anemia represent the end result of a protracted endamebic infection. With specific medication such a complication should rarely be observed. In the last few years, I have seen very few instances of severe anemia among my endameba cases.

Dr. Freund's ipecac method I intend to keep in mind. However, since the method I have described this morning has been uniformly successful as a curative measure in fully 500 cases, with very infrequent, if any, relapses, other plans do not, of course, make strong appeal. In regard to the intravenous injections of emetin hydrochlorid, mentioned by Dr. Soper, I would wish to advise caution. Such a procedure, especially in the hands of the less experienced, would be capable, I think, of much abuse.

The point Dr. Soper made concerning the availability of the salol coated ipecac pill has been a bone of contention ever since the method of treatment was inaugurated. Any competent pharmacist should be able to dispense these pills satisfactorily. However, a certain amount of technic is required which the average druggist does not seem to have acquired. The pills cannot be produced in bulk by the manufacturing pharmaceutical houses, because of the fully demonstrated lack of durability of the product. The pills must be made by the individual druggist and dispensed in quantities sufficient only for the individual case.

FOCAL INFECTIONS OF THE EYE FROM THE INTESTINAL TRACT*

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During the last few years marked attention has been paid to the consideration of infections of various parts of the body, due to a low-grade chronic infection in other parts, especially in the teeth and the tonsils. A very considerable advance has been made in the treatment of these so-called focal infections by the treatment of the original foci. The number of such cases on record is enormous and is fast increasing, and nowadays with certain infections we look for the primary cause and eradicate it if possible. Among these focal infections are some lesions of the eye that used to be grouped under a general classification, as "rheumatism," etc. We know now that there is probably no such disease as rheumatism per se, but that the symptoms classified as rheumatism are probably manifestations of some focus of infection. The work on focal infections of the eye, due to infections of the teeth and tonsils, has been reported by many observers and need not be touched on. This paper will deal with focal

infections of the eye, due in all probability to the absorption of toxins from the intestinal tract. A few suggestions will also be made as to the method of treatment now being given a trial in order to overcome these infections, since it is impossible to treat the intestine surgically in the same way teeth and tonsils are treated.

This investigation has been going on for about two years, and any statements that are made are the outcome of what we have learned in that time, and are subject to change in the future. The whole idea of presenting the paper now is to direct attention to such infections and to possible methods of treating them.

At the beginning I was confronted with the fact that no two authorities were agreed as to what the intestinal contents in general should be; that is, the reaction, the amount of chemical constituents, the food detritus and the bacteriologic content. This was and still is a great difficulty. Some may question my interpretation of what normal intestinal contents should be, but from an examination of hundreds of samples, I have come to look for certain main characteristics.

Practically all authorities agree that normal feces is faintly alkaline to litmus, but litmus is a rough and ready method of taking the titration. With phenolphthalein the reaction is slightly acid, but only with fresh feces, because the reaction changes very rapidly on standing. The question of reaction is a very important one and one not easy to decide, as the end-point of acidity of alkalinity varies with the indicator used, namely, litmus, methyl orange, phenolphthalein, etc.

Just as in diabetes and nephritis the modern schools of medicine are aiming to test the efficiency of the body to assimilate the three food elements, namely, fats, carbohydrates and proteins, so I examined the detritus, keeping these three fundamental bases in mind. My guiding principle was to cut out of the diet the types of food that were not being assimilated, in other words, food elements whose by-products are indol, skatol and phenol. These products are normally present and unless abnormal in amount can be disregarded, but as the former two are known to be absorbed into the system, appearing as indican in the urine, and as they are products of protein metabolism, I paid special attention to them, as will be noted later.

BACTERIOLOGY

Here I was confronted with the biggest problem of all, as the intestine normally contains many and various forms of bacteria. I made no endeavor to identify the various forms of bacteria present, as that would have been impossible; but bearing in mind the work of various investigators, especially Metchnikoff, I paid special attention to the presence or absence of the colon bacillus. Now, the colon bacillus appears in the intestine a few days after birth, and is usually found there throughout life. Again, the colon bacillus is gram negative, that is, it stains a different color from that of the other bacteria usually found, the latter being gram positive with very few exceptions. Hence we have a ready means of comparison. The ptomain producers are usually gram-positive large bacilli, producing either acid or alkali, according to the group. Many of them are of the anaerobic varieties, such as the *Bacillus aerogenes-capsulatus*.

Keeping these facts in mind and trying to narrow the whole affair down to a practical working basis, I carried out the following routine: The intestinal contents were examined as to their reaction, their content

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of indol and skatol, the food residue and the bacteria. Besides these cardinal principles, other side factors were noted. If the contents were found to be practically normal, these were noted as controls. In most of the patients examined, the contents could be classified under two headings, as to whether they were highly acid or alkaline. In both classes, the colon bacilli were either entirely absent or present only in very small numbers, the other bacteria being practically gram positive. This was true whether the reaction was to either extreme, since the colon bacillus cannot live in a highly acid medium, although it is an acid producer, and of course it is killed off in alkaline mediums. It was always found that in both highly acid and highly alkaline specimens the indol and skatol content was high, and there was always a high percentage of indican in the urine.

The following methods of treatment were then adopted. In the highly acid specimens, an endeavor was made to alkalize the contents by the use of irrigations of a 1 per cent. sodium carbonate solution and then to practice colon transplantation in order to approach the normal. At the same time the patients were put on rather free diet, cutting out those foods that were not completely assimilated, such as meat. In other words, the tolerance for the three fundamental foods was established as far as possible. In the highly alkaline specimens, irrigations with lactose were given and then the colon bacillus was transplanted. At the same time the Bulgarian bacilli were given by mouth, the whole idea being to approach the average normal. Lactose was also administered by mouth in such cases to provide a suitable pabulum for the colon bacilli. At stated intervals, examinations were made and the treatment was repeated until I got a good growth of colon bacilli.

The types of cases I have chosen to be reported are those that would not respond to any other form of treatment—cases in which the patients were thought to be focally infected, although treatment of the teeth and tonsils proved unavailing. They are all cases that had lasted for weeks, the patients being better one day and worse another, showing no real improvement.

REPORT OF CASES

CASE 1.—Charles B. had lost the sight of the right eye on account of a low grade ulcerative keratitis that had lasted six months and left the eye in a badly damaged condition, with the pupillary area of the cornea covered with a macular scar. He had been treated for this eye by some of the best ophthalmologists in the city and had been an in-patient at one of our hospitals for weeks. When I saw him, he had been in our wards for some weeks with the same condition in the other eye, the history of this lesion dating back two months. Every test had been negative and he was put on antispasmodic treatment, as it seemed the most promising remedy. On taking his history, I elicited the fact that he had had intestinal poisoning for years and could not get any relief. He volunteered the information that the other eye had become quiet as soon as he had gone to a stomach specialist. At first examination, the condition of the eye revealed a diffuse low grade keratitis, with a low grade iridocyclitis. In spite of all measures, the pupil could not be kept dilated but would dilate under the atropin and then contract again. One noticeable point was that the man's face was covered with acne rosacea. Immediate examination of the intestinal contents revealed a reaction highly alkaline, indol and skatol +++++, and bacterial smears totally gram positive. The treatment outlined in the foregoing was carried out, and within two days, the condition of the eye was much better, the pupil remaining dilated under cycloplegia. Within a week he went home with a perfectly quiet eye. The acne

cleared up and when he last reported, after six months, he was in excellent condition, with a perfectly serviceable eye.

CASE 2.—J. Mc., a man, had suffered nine months from a plastic iritis of low grade in both eyes, which kept him from business and made a semi-invalid of him. He had been under the care of competent ophthalmologists in the city, had had his teeth roentgenographed and the diseased teeth removed, and had had his tonsils out, yet the condition persisted. The same condition was found here. Within eight days the eyes had quieted down and, according to the last report I had, some months after the lesion, he was in excellent condition.

CASE 3.—Mr. S., Orange, N. J., consulted me about his eye. He was suffering from an intense plastic iritis that had lasted two months, and he had had all the accepted methods of treatment. His condition cleared up rapidly with the treatment outlined for highly acid stools.

COMMENT

By far the largest number of cases of choroiditis, retinitis, iridocyclitis, glaucoma and the like I have diagnosed as to the condition present, but I cannot go any further in the etiology or in the treatment. The cases run their course in spite of the treatment adopted. It would be the ideal condition if we could take such cases and study them extensively so as to arrive at the cause. The reference of eye infections to the intestinal tract is not new, as evidenced by the article of such writers as Herter and Smith, published in 1894, describing their cases of ophthalmoplegia, low grade conjunctivitis, etc., which were cured by treatment of the intestinal tract. My attention was called to this article by Dr. Coffin, who was incidentally the means of directing my attention to the intestinal tract.

I do not claim that my work is new. It is simply an experiment. But the results in the series of sixty-seven cases I have treated were in the main very striking, and it seemed well worth while to work along these lines.

ABSTRACT OF DISCUSSION

DR. EDGAR S. THOMSON, New York: Focal infection of the eye attracts attention most frequently in connection with uveal disease. Its intractability and tendency to relapse are well known. Cases of iritis and cyclitis relapse in spite of the greatest care and the most careful control. The baneful influence of the digestive tract, especially the intestinal tract, has long been recognized, and treatment has often been productive of good results, but the question has not been placed on an exact basis. The exact method mentioned by the essayist has not been employed. Intestinal vaccines have been used, and cultures of acid-producing bacilli have been given, chiefly by mouth, but with no very exact checking up of results, at least in ophthalmic work. Judging by clinical experience, the most important single factor in the examination of the feces is the determination of the reaction. A low acid reaction is the most desirable balance for reducing putrefaction and for establishing the cultures of colon bacilli, and, given these two factors, the fermentative processes remain more stable and the local condition in the eye does not recur. In our cases the local symptoms in the eye apparently have kept pace with the intestinal condition. Manifestly toxic conditions—iritis, cyclitis and choroiditis—have improved rapidly, and in the majority of cases have not relapsed in the time during which we used the method. The course of the disease has in general been much shortened and local absorption of precipitates and exudates has gone on in a way that was suggestive of a "cut-off" in the toxin supply. A few cases of optic neuritis and episcleritis have been affected very favorably. Certain forms of keratitis, associated with slow tissue repair, and low hemoglobin percentage, have done remarkably well. A few cases of intractable ciliary cramp have been affected very favorably.

DR. HIRAM WOODS, Baltimore:: There is no doubt that there is a sufficiently intimate association between gastro-intestinal disorders and these intractable cases of uveitis and recurrent ciliary cramp to justify the suspicion of cause and effect. Those of us who have had clinical experience in studying these cases can appreciate the value of Dr. Dwyer's paper, provided the claim is confirmed. He brings us down to two very definite things, which we ought to get clearly in our minds, the hyperacidity on the one hand, and the hyperalkalinity on the other hand, plus the absence of the colon bacillus. If these are definite diagnostic points, we have something far more reliable to go on than we have ever had before.

MAJOR HARRY S. GRADLE, Chicago: I believe that absorption from the intestinal tract, as Dr. Dwyer said, plays a far greater rôle in the etiology of various ocular diseases than we have been willing to acknowledge for some time. We are dealing with an absorption of toxins from the intestinal tract, which affects an organ unable to withstand the influence of these toxins. Toxins in the intestines normally result from the breaking down of the various protein constituents of the food. There are few types of absorption, the abnormal absorption of normal toxins, and the absorption of abnormal toxins. By that I mean, in the first case, the excessive production and absorption of toxins from the intestinal tract, more than it is accustomed to (usually the result of a more or less chronic constipation); and, second, disturbances in metabolism, resulting in the production of abnormal toxins, that the human system is not at all accustomed to, and has no power of protecting itself against. The cases require radically different treatment. We must establish a normal passage through the intestines and eliminate the hyperproduction of the so-called normal toxins, and we must correct the disturbance of metabolism that results in the production of the abnormal toxins.

DR. CLARK W. HAWLEY, Chicago: The analysis of feces is important. I have been advocating the study of the relation of uveal tract disease and the toxins from the lower bowel for a number of years. My first discovery of a relation between uveal tract disease and toxins from the lower bowel was in my own case. I was suffering from a slowly increasing chronic cyclitis of both eyes and supposed I was getting blind, or nearly so. I was treating an autointoxication following a very severe case of facial erysipelas and soon discovered that my eyes were improving. This led me to believe that there might be a relationship between the two. Since then many cases have been treated along the same lines with as good results. I have been surprised at the number of cases of inflammatory glaucoma which were due to these toxins. Six patients treated remain cured.

MAJOR WALTER B. LANCASTER, Boston: I was surprised that the writer in enumerating the foci of infection outside the intestines limited himself to the teeth and tonsils. There are many other foci of infection which affect the eye secondarily. I have been very slow to accept the theory that these ocular inflammations arise from the intestines. I have inclined toward the theory that the ocular condition is of bacterial origin, the micro-organisms gaining access through the blood stream. This was well illustrated in one case in which the seminal vesicles acted as an infection focus.

DR. WILL WALTER, Chicago: There is no authority for the thought that the colon bacillus is infecting the intestinal tract in these cases, and it must not be forgotten that the liver intervenes between the absorbed intestinal contents and the general circulation. A focal infection means a tissue infection the chemic or bacteriologic elements of which are carried by the blood stream to areas more or less remote, where they set up inflammatory changes. Patients suffering from intestinal toxemia often show little indican or none. Whether there is present in these cases another toxin than that included in the indoxyl sulphates, and hence not shown by the tests for indican; or where there are elements which alter the tests in these cases; or whether, as I think most probable, the hepatic functions are neutralizing or altering these toxins, is not clear.

DR. JAMES G. DWYER, New York: The term "infection" does not mean the presence of bacteria in the blood. Bacteria

produce protein toxins, and we have the phenomenon of anaphylaxis. We can produce the anaphylactic phenomenon in the body by simple extraction from bacteria, whether they are pathogenic or not. With regard to the liver: Work has been done showing that the extracts of spleen, of heart, of lung, etc., are nontoxic, but there is a toxic quality in the liver, because it takes up these toxins. It does not matter whether the toxin comes from putrefactive organisms. We are not dealing with infections from the colon bacillus. That is exactly the opposite of what I am trying to bring out. The three common foci are usually the teeth, the tonsils and the intestinal tract. I do not know that we are far enough advanced to identify what are normal protein products and what are abnormal. The point I wish to bring out is this, that the reason the joints and the eyes are affected is in all probability because we have a very sudden change from blood supply to lymph supply. In the uveal tract we have an ideal condition of lymphatic supply.

EARLY DIAGNOSIS OF CEREBROSPINAL MENINGITIS BY THE EXAMINATION OF STAINED BLOOD FILMS

REPORT OF A CASE *

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Surgeon, U. S. Public Health Service

SAN JUAN, P. R.

According to the clinical notes furnished me by Dr. N. Doval of San Juan, Porto Rico, the attending physician, A. B., a mulatto girl, aged 4½ years, native and resident of San Juan, who had never had any serious illness, and whose family history was unimportant, after a slight rhinitis lasting several days, without fever or any particular discomfort, complained of headache and severe pain in the right shoulder. This was about 6 p. m. Later she was noticed to have high fever. When first seen by Dr. Doval, at 8 o'clock, the temperature was 39.8 C. (103.6 F.); pulse, 130, and respiration, 28. She had vomited several times. About midnight, convulsions began and continued several hours; there were clonic spasms of short duration. The temperature was 40.2 C. (104.4 F.), the pulse weak and uncountable. The patient vomited a dark colored fluid.

I first saw the patient at 8 a. m. She was then in coma; the extremities were cold; there was no pulse. On the cheeks, arms and body were several irregular and indefinite areas slightly darker than the normally dark skin. Supposing this to be a beginning hemorrhagic eruption (later confirmed), I made a tentative diagnosis of cerebrospinal meningitis. Two small drops of blood were squeezed from a puncture in the lobe of the ear, but the peripheral circulation had so nearly stopped that no more could be obtained. These were used for making two smears on slides. A syringe for making lumbar puncture was not at hand, and the patient died before the laboratory assistant sent to do the lumbar puncture arrived at the house.

Death occurred at 9 a. m., about fifteen hours after onset.

At the laboratory, a slide was immediately stained with Leishman's stain. The enormous number of leukocytes attracted attention at once, and then it was seen that some of the polymorphonuclear neutrophils contained a diplococcus resembling the meningococcus. The second slide was stained by the Gram method controlled by the simultaneous staining of a known gram-positive coccus, and the diplococci were seen to be gram-negative. On these points, the diagnosis of cerebrospinal meningitis was regarded as confirmed.

Necropsy was refused, but permission was finally given to make punctures to obtain blood, and to make a small opening into the spinal canal. This was done five hours after death, and 15 or 20 c.c. of blood were secured from the right heart, basilar meninges and dorsal region of the spinal canal, all

* From the laboratory of the Institute of Tropical Medicine and Hygiene of Porto Rico.