a minimum of fermentable material in the shape of carbohydrates. He adds a very small amount of malt sugar, but no other kind of sugar.

Stolte, in his researches,¹ comes to the same conclusion, pointing out that the thriving of an infant is correlated with increased solidity of the motions, and that the latter is due to saponification and absence of fermentation.

If, therefore, fermentation is producing fatty acids, and thus preventing saponification, the continued use of aperients and antiseptics will not cure the condition without a radical alteration of the diet; and what a saving of suffering, time, trouble, and money if we can lay our hands on the main principle of the diet required!

It must be a great saving in money to poor people who are unable to breast-feed their infants if they can rely on cow's milk, either pure or manipulated in some simple manner, instead of experimenting with this, that, or the other proprietary food, at the least excuse, and to the probable detriment of the infant.

REFERENCE.

¹ *Jahrb. f. Kinderh.*, 1911, No. 4.

BORACIC ACID POISONING.

BY

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IN THE BRITISH MEDICAL JOURNAL of March 16th, 1912, Dr. J. Herbert Sanders describes an interesting case of dysentery, in which a repeated rectal wash of boracic acid caused symptoms of poisoning. This case is all the more interesting as the symptoms only came on after the irrigation of the bowel had been continued for some three weeks.

Professor Cushny, in his *Textbook of Pharmacology*, says that symptoms of poisoning with boracic acid, when absorbed from the alimentary canal, are:

Uneasiness in the abdomen, vomiting, diarrhoea, dryness of the throat, and difficulty in swallowing; sleeplessness, great muscular weakness and depression, dimness of sight and headache were also complained of, and in some cases collapse and death followed.

I formerly used boracic acid solutions for lavage of the bowel in cases of colitis, but, after having seen symptoms arise in at least three patients, decided it might not be such a harmless method as one would be inclined to believe. Although when used as an intestinal douche I have not found it to cause any serious symptoms, it has, apparently, frequently caused marked symptoms of toxæmia. It would appear probable that this poisoning, if in reality caused by boracic acid, is due to some idiosyncrasy, as one frequently sees cases in which lavage of the bowel with boracic wash has been carried out over a considerable period without any toxæmia, and I have never come across a case like that of Dr. Sanders, when the symptoms have developed later during the treatment.

CASE I.

The first case I saw some fifteen years ago, in which a lady, with marked constipation, had colitis, passing large quantities of mucus, and sometimes membranes. The bowel was washed out with one-half saturated solution of boracic acid in the morning. A few hours later she became excitable, and complained of irritation of the skin, which in the afternoon became erythematous with some tendency to papules. The erythema was most marked over the chest and abdomen, and only slight on the limbs, but on the thighs there was some troublesome urticaria. This erythematous condition of the skin was accompanied by a considerable amount of mental irritability, the patient being fretful and seeming to exaggerate the amount of cutaneous irritation. The symptoms passed off in two days, the rectal washing having been discontinued. The symptoms, however, all recurred the following week when the boracic douche was again employed.

CASE II.

The second case was also a lady who had simple colitis. In this case the erythema was even more marked, for it appeared over the whole body, and was accompanied by most marked urticaria. The mental excitement was so great that the patient insisted on walking about the room naked, declaring that even the nightdress increased the skin irritation, and for a time she behaved like a mad person. The urticarial wheals rapidly passed off, but the erythema lasted nearly four days, and the mental excitement continued more or less during the first two or three days, and was accompanied by insomnia.

CASE III.

The third case was that of an elderly gentleman, suffering from dilated colon. The boracic acid rectal wash was here again followed in a few hours by considerable erythema, also accompanied with urticaria and mental excitement, which lasted nearly two days. This patient, some three weeks later, had copious melaena, followed by collapse. At the necropsy the hæmorrhage was found to come from a pedunculated polypus in the descending colon just above the sigmoid. There was no evidence of colitis, but an enormously dilated atonic colon.

It is of interest that in all these three cases the erythema was accompanied by urticaria and mental excitement, which rapidly passed off after the boracic lavage was stopped. The quantity of boracic acid absorbed from one or two lavages could not be very great, and consequently these patients must have had some special susceptibility, if these symptoms are to be considered due to the boracic acid poisoning.

In the first two cases I did not like to lay any special stress on the condition of mental excitement, as both patients suffered from neurasthenia and exaggerated everything, so that the fact of having an erythema which they could actually see and talk about was certainly made the most of.

The third case had not nearly as marked mental excitement. Although the patient was very restless and anxious about his condition, one certainly could not call him neurasthenic, so that it was possible that this condition of mind was due to the boracic acid.

The fact that the erythema occurred with boracic wash has now to be explained, and before one can definitely accept it as a true symptom of boracic acid poisoning I think more evidence ought to be obtained. It has to be remembered that in cases of chronic constipation, when there has been retention of fæces in the colon, it is not at all uncommon to see erythema accompanied by urticaria suddenly come on when these accumulations are disturbed and, so to say, stirred up. I have seen them occur when lavage of the bowel has been given, and when no boracic acid or possible poison was contained in the solution employed as the wash water—even in a case after a simple purgative was given by the mouth, and, as it did not act, was followed by a dose of castor oil.

In a case of this kind not only did erythema occur with considerable skin irritation, although unaccompanied by urticaria, but there was considerable mental excitement. I have always considered such cases as due to toxæmia arising from a sudden absorption of the products of putrefaction from the colon contents, which had been quiescent and hence unabsorbed. The simple douche or purgative causing a loosening of the mass, together with a solution of the poisons, which were then rapidly absorbed, caused the toxic symptoms.

It still is not clear to my mind that we are justified in considering these symptoms as really due to boracic acid poisoning, and they certainly do not correspond with the symptoms described by Professor Cushny. The article published by Dr. Sanders made me think it might be advisable to record these cases which had come under my observation.

**ACUTE EPIDIDYMITIS PRODUCED BY
MUSCULAR STRAIN.**

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UNTIL quite recently I had always been strongly of the opinion that an acute inflammation of the epididymis without concomitant orchitis must in every instance emanate from disease of the posterior urethra. From an anatomical point of view it is easy to understand how, by direct continuity, inflammation of the mucosa of the prostatic urethra may travel along to the epididymis, and the pathological changes evidenced by *post-mortem* examinations and the experimental investigations by Melassez and Terrillon (quoted by Finger¹) show that the testicle proper is not involved in such cases. Consequently, one has been disposed to receive with absolute incredulity a patient's statement that the condition has been brought about by a strain. Lately, however, two

cases of acute epididymitis have come under my observation in which, the inflammation gradually developing after a violent lifting effort, no outward manifestation of urethral disease could be discovered; the urine was normal, and a most rigid urethroscopic search for inflammation in the posterior urethra proved negative. These searches were undertaken with a urethroscope of the Goldschmidt type, which, as I pointed out in a former paper,² has the great advantage of giving a highly magnified, well illuminated and beautifully clear picture of the prostatic urethra. This instrument has done much to unravel the mysteries of this deep-seated and important section of the lower urinary apparatus.

Comparatively few cases of epididymitis resulting from strain of the abdominal muscles have, as far as I can ascertain, been reported. Some apparent examples are certainly to be found in foreign literature, but it is questionable whether all possibility of latent urethral disease could be excluded until Goldschmidt and Wossidlo³ evolved their valuable urethroscopes. The following cases, however, have satisfied me that epididymitis may be excited, independently of any predisposing factor such as urethritis, by strong muscular effort, especially when such effort brings into play the muscles of the abdominal parietes.

CASE I.

A strong, muscular moulder, aged 27, seven years married and the father of four children, was on February 17th, 1911, carrying, with the help of a labourer, a large shank of molten metal, when he accidentally stepped with his left foot on to a piece of scrap-iron. This false step nearly threw him to the ground, but he made a desperate effort to regain his balance by suddenly throwing his whole weight on to his right leg. A slight pain referred to the right groin and a sensation of faintness and nausea followed. He assured me no direct blow was received on the groin or scrotum, nor were the scrotal contents nipped between the thighs or by the fork of the trousers. All his symptoms disappeared in a few minutes, and work was then resumed. About seven or eight days later, however, he noticed some swelling of the right testicle, which, increasing in size and becoming more and more painful, finally compelled him to discontinue.

The man's employers became suspicious of the nature of his complaint, and sent him to me on February 28th for examination. There was then well-marked epididymitis on the right side, but the inflammation did not involve the secretory portion of the testicle. The swollen epididymis was about three times its normal size, and painful on pressure; the spermatic cord was uniformly enlarged and sensitive. The veins showed no varicosity. No discharge could be obtained from the meatus even after repeatedly stroking the canal with the finger from the bulb forwards, and a three hours' urine passed into two test glasses showed neither cloudiness or urethral shreds in either portion. Both the vesiculæ seminales and prostate were healthy. I decided to allow some of the acuteness of the epididymal inflammation to subside before attempting any instrumental exploration of the urethra, and the employers were accordingly advised of the necessity for the delay in my report.

When the man presented himself for further examination a week later, he had retained the urine for six hours in obedience to my instructions, and an examination of it revealed no abnormality. The swelling of the epididymis had now largely subsided, and after obtaining the man's consent I proceeded to urethroscopically examine him. The anterior urethra was found after the closest investigation with a Wyndham Powell urethroscope and my telescopic attachment to be entirely free from disease, and in fact to harmonize with the man's statement that he had never suffered from any gonorrhoeal affection. The posterior urethra was then examined by Wossidlo's instrument, with negative results, the whole of the mucosa of this region, including the colliculus seminalis, the orifice of the prostatic utricle, and the mouths of the ejaculatory and prostatic ducts, being absolutely normal and presenting no appearance of having been diseased. There was no personal or family history of tuberculosis, rheumatism, or gout, and the lungs were found to be thoroughly sound. As he had resided in Manchester all his life and had never been abroad, the question of malaria, a reputed cause of primary epididymitis, was not considered. I consequently reported to the man's employers that the case was undoubtedly due to accident. Two weeks later, when I saw him again, every trace of epididymitis had disappeared, and he informed me that he had been back at work for the past three days.

CASE II.

The patient was a strongly-built gentleman, 41 years of age, who was inclined to corpulency, but had in earlier life been a well-known athlete. Although married ten years no children had resulted from the union. His previous health would have been excellent but for the fact that he had suffered for the last four or five years from piles. He had an exceptionally good family history, and he positively assured me that he had never contracted gonorrhoea.

On May 11th 1911, he was, during a "spring cleaning,"

lifting unaided one end of a heavy upright grand piano while standing on his left foot and simultaneously using his right foot to push the carpet into its place under the piano. While doing this he experienced a sensation as if—to use his own words—"something suddenly tore" on the left side of the scrotum. There was practically no real pain at the time, but he became thoroughly exhausted immediately afterwards and was compelled to lie down. About an hour later he noticed that his piles had bled rather freely.

On May 19th, eight days after the accident, his left testicle began to ache considerably, and he discovered that it was reddened and nearly as large as his fist. He visited me the following day. There was then decided enlargement and tenderness of the left epididymis, and the inflammation was sharply confined to this part of the organ. The cord for some distance upwards was sensitive, and decidedly but uniformly thickened. A distinct recent ecchymotic discoloration could be seen on the left side of the scrotum. There was a double varicocele, but the varicosity was much more pronounced on the left side. The prostate was normal, and the vesiculæ seminales could not be felt. No discharge could be expressed from the urethra, and the urine on inspection was clear and free from filaments.

On May 31st the swelling of the epididymis had entirely subsided without leaving the slightest thickening, the treatment employed being merely rest, applications of Caspar's ointment, and hot fomentations. The discoloration of the skin had also disappeared. The whole urethra was then minutely explored with the same instruments as were employed in the former case, and I was thoroughly satisfied that the urethroscopic appearances were perfectly normal, and that no sign of urethritis was present.

As regards the causation of this "strain-epididymitis" the majority of writers on the subject ascribe the condition purely to the sudden contraction of the cremasteric muscle, which, they say, violently drags up the testicle and bangs it against the pillars of the external abdominal ring. To this action the French have given the name *coup de fouet*. Judging from the histories of my two cases I think it is very questionable whether this whip-snap action plays the real part in the causation of strain-epididymitis. The strength of this muscle is comparatively feeble. The few strands of muscular fibres which compose it could not have the power by themselves to inflict such damage on a healthy organ, and again most of the force of the contraction of these muscular strands would have expended itself before the testicle had reached the outer inguinal ring. I think Case II helps to explain the etiology more rationally, for it will be noted that the patient was subject to haemorrhoids, which bled profusely shortly after the accident. Again, in this case an ecchymosis of the skin in the neighbourhood of the inflamed epididymis appeared a few days after the abdominal strain; and lastly, the patient suffered from a varicocele which was especially marked on the left side. Clearly some branches of both the spermatic and haemorrhoidal plexuses must have been ruptured by the muscular effort. That they should give way under such pressure is not to be wondered at when one considers that they are surrounded by loose tissue, which gives them little support, and are lacking in the aid afforded to other veins, as in the limbs, by muscular movements. Again, their valves are few and imperfect, the main veins are of considerable length, and are tortuous and form many anastomoses. The spermatic veins would, during an exceptionally violent contraction of the rectus abdominis muscle, very probably also be pinched by those fibres of the rectus which pass to the inner lip of the iliac crest. The arteries having more rigid walls would not be affected, and the result would be an engorgement of the veins, with their liability to give way at the weakest parts. Assuming, then, that a man is subjected to sudden and very severe muscular exertion, requiring him at the same time to make use of a violent expiratory effort, it is easily to be understood that a rupture of several small venules into the substance of the epididymis or cord may result under such tension and compression even though the vessels themselves are quite healthy. No other explanation but this haemorrhagic theory would satisfactorily account for the gradual development of the inflammatory exudate and afford the reason why the pain of strain-epididymitis should be slight at first, and slowly and gradually increase. If the "whip-snap action" were the correct explanation, one would expect, assuming for the moment that a banging of the testicle against the external abdominal ring by the cremaster muscle could be sufficiently powerful to set up an inflammation, that this would, just like an ordinary direct blow on the organ, give rise to immediate excruciating pain.

In the actual appearance and palpation of the testicle there is nothing to distinguish strain-epididymitis from gonorrhoeal epididymitis. Judging from my two cases the inflammation in the former disease is much slower in its development, recovers quicker, and appears to be less prone to leave behind the inflammatory deposit at the head or tail of the epididymis which is so common a sequel of the gonorrhoeal variety. To those unaccustomed to urethroscopic work an examination of the urine alone will nearly always suffice to settle the diagnosis between traumatic and gonorrhoeal epididymitis, for in the former the urine is always absolutely normal, whereas in whatever stage a gonorrhoea may be in the urine will afford the clue by showing the presence of cloudiness or clap-threads. Microscopy of these threads will usually reveal the presence of gonococci, excepting when the disease is of great chronicity, and in such cases an epididymitis is very unlikely to arise. When there is a history of injury there may be considerable difficulty in distinguishing during the first week or two an acute tuberculous epididymitis from a strain-epididymitis. Here again an examination of the urine usually aids us, for in most of these tuberculous cases there is some primary urethritis which renders the urine turbid, and this turbidity, when centrifugalized, may be found to contain tubercle bacilli. Further, in cases of acute tuberculous epididymitis the corresponding vesicula seminalis is early involved. Later on the formation in the epididymis of nodules which may break down into abscesses and the irregular thickening of the cord are characteristic of the tuberculous affection. Malaria, gout, and rheumatism are said also to be capable of producing a primary or idiopathic epididymitis. I have no experience of the first named, and I am very sceptical of the ability of the two latter to cause an epididymitis unaccompanied by orchitis when there is no posterior urethritis. However, as other rheumatic or gouty manifestations would be present, no difficulty could arise in distinguishing epididymitis so produced from strain-epididymitis.

Case 1 is of marked forensic interest in view of claims under the Workmen's Compensation Act. In a case of epididymitis referred to me three years ago the inflammation was said by the workman to have been produced by his slipping over a greasy iron plate. There were no witnesses of the alleged accident, and the claim was thought to be fraudulent. As frequently happens when the swelling is at its height no distinct discharge could be expressed from the urethra, but the urine passed into two test glasses was markedly purulent and loaded with urethral threads in both portions, pointing to the probable involvement of the posterior urethra. When these shreds were submitted to Gram's method and microscopied, numerous gonococci were to be seen. I accordingly reported that I was satisfied that the condition was one of disease and not the result of accident. On the strength of this opinion the case was put up for trial before Judge Parry at the Manchester County Court, and resulted in judgement for the employer.

REFERENCES.

¹Finger, Die Hoden und Nebenhoden. *Klinisches Handbuch der Harn- und Sexualorgane*, vol. iii, 1894. ²Edwards, Chronic Disease of the Colliculus seminalis, *BRITISH MEDICAL JOURNAL*, December 11th, 1909. ³Wossido, Ein neues Instrumente für die Urethroscopie posterior, *Deut. med. Woch.*, No. 7, 1910.

FROM the fifth annual report of the British Guiana Society for the prevention and treatment of tuberculosis, we learn that full advantage has been taken of the public dispensary opened in 1908. The society undertakes the gratuitous examination and treatment of all persons, irrespective of race, colour, or financial status. The total number of persons who attended at the dispensary for examination and treatment during 1911 was 760. The total number of attendances made was 2,112. During the year under review a lady visitor was appointed whose duty consists in visiting the patients in their homes, helping them to carry out simple measures for general hygiene, and in particular preventing the spread of consumption. A great improvement has taken place in many homes. One of the difficulties met with is the fact that patients, thinking, possibly, that notification means persecution, give an incorrect address, and cannot be found. The report mentions some startling facts in connexion with the occupation of those suffering from tuberculosis—namely, that twenty consumptives followed the occupation of cook in various parts of Georgetown, fifteen were school teachers, twelve were bakers, seven were nurses.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

REMOVAL OF THE EYEBALL: A QUICK AND EASY METHOD.

IN the *BRITISH MEDICAL JOURNAL* of November 11th, 1911, is a short article by Dr. W. Robinson of Sunderland on "Removal of the Eyeball: a Quick and Easy Method." Permit me to say that the method described by Dr. Robinson was constantly employed over twenty years ago by one of my colleagues in the Victorian Eye and Ear Hospital, the late Dr. Aubrey Bowen, and is still followed by me in many cases of enucleation of the globe.

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ADDISON'S DISEASE TREATED WITH TUBERCULIN.

THE article by Dr. J. H. Munro in the *JOURNAL* of March 23rd, page 665, was of great interest to me, because when in practice in Tasmania I had the care of a similar case which I treated in a similar manner. Unfortunately the disease was too far advanced when the patient came under my care to allow of any very progressive result from the treatment; but although the fatal end could not be avoided still the circumstances of the patient were made easier, and each inoculation of tuberculin materially lessened the pain. Futile as they were, the immediate results of the tuberculin inoculation in this case of Addison's disease strengthened my opinion that if such a case came early under treatment, inoculation of tuberculin would effect a cure. I am glad to learn that this form of treatment has proved so successful at the hands of Dr. Munro.

London, E.C.

THEO. M. KENDALL.

THE EFFECT OF SWALLOWING A LARGE DOSE OF BORIC ACID.

IN the *BRITISH MEDICAL JOURNAL* of March 16th, 1912, page 605, Dr. J. Herbert Sanders gives detailed notes of a case of severe poisoning, the result of absorption of boric acid solution by the rectal mucous membrane. A boric acid rectal wash had been used twice a day for a month, each wash containing about three drachms of boric acid. He also refers briefly to four other cases of poisoning by boric acid. All these cases were due to the repeated absorption of small amounts of the substance.

Possibly the following very brief notes of a case in which a single large dose of boric acid was taken may be of some interest. In such cases symptoms of gastric and intestinal irritation are usually prominent; but in this case the toxic effect predominated.

A married woman aged 33, somewhat addicted to alcohol, had in her house an unopened packet, containing one ounce of boric acid crystals, which had been obtained from a chemist for use as a lotion. The patient's husband mixed the contents of this packet with half a tumbler of cold water, and it was drunk by the patient as a draught, only a few crystals being left adhering to the tumbler. I was sent for two hours later. The patient was lying down in a collapsed condition; the extremities and face were cold, and the cheeks and nose cyanotic. The pupils were widely dilated and equal; the conjunctiva of both eyes was markedly injected, the bright red vessels being very plainly seen. A diffused erythematous rash was present on the skin of the trunk and limbs; it disappeared completely on pressure, was not elevated above the skin, and was not itchy. The pulse was 150, small, of very low tension, and regular. The respirations were proportionately increased in frequency. The patient complained of great weakness and of abdominal discomfort. She had no marked nausea, and had not vomited.

An emetic of mustard was given at once with large quantities of warm water, and the stomach was emptied several times. Three doses of magnesium sulphate were then given at intervals of two hours till active catharsis occurred.

All the symptoms gradually subsided after this, and next