

liquid intestinal contents and blood, and a coil of the ileum about 12 inches long in a gangrenous condition, black in colour, with a perforation one-half inch in diameter, presented itself. The appendix was found acutely inflamed, especially its tip, which was bright red in colour and adherent to the mesentery of the necrosed bowel. The report of the pathologist, Dr. Horst Ortel, was as follows: "The portion of the small intestines shows deep hæmorrhagic infiltration of all structures with oedematous swelling, and simple necrosis of all tissues, it evidently progressing from the deeper portions to the mucous membrane; the vessel being very much dilated and thrombosed, in one portion one-half inch in diameter. Necrosis had so far advanced as to produce rupture of the gut; immediately around the opening there was found necrotic tissue without inflammatory reaction." In discussing the case just alluded to and in referring to the character of the abdominal pain found in such cases, Dr. Alexander Lambert said that a patient of his, an intelligent physician, suffering from this condition, told him that he felt as if every little capillary throbbled with pain. It may be well to bear in mind that the patient generally rallies from the shock following perforation and if the operation is performed within 12 hours the chances of recovery are reasonably good. A hypodermic injection of ergot and strychnine with an intravenous injection of saline solution may be used to rally the patient before the operation is undertaken.

Hæmorrhoids, fissure, or anal ulcers.—Severe abdominal pain during and after defecation, followed by discharges of a small amount of blood, occurring in a woman, the pain being referred to the vagina and the uterus, is symptomatic of hæmorrhoids, fissure, or anal ulcer. The diagnosis is completed by local investigation.

Intussusception.—A violent recurring abdominal pain occurring suddenly in a healthy infant, accompanied by tenderness and passages of blood-stained mucus from the bowel and having an elongated cylindrical abdominal tumour, is indicative of intussusception.

Chronic obstruction of the colon.—Subacute intermittent symptoms of intestinal obstruction, accompanied by tenderness on pressure and the voiding of mucus tinged with blood by the bowel, are indicative of chronic obstruction of the colon.

Volvulus of the sigmoid flexure.—Subacute symptoms of obstruction occurring in a male over 40 years of age, giving a history of constipation, the prominent feature of the disease being an extreme and rapid distension of the intestines, are symptomatic of volvulus of the sigmoid flexure.

Malignant disease of the intestine.—Colicky abdominal pain occurring in a person advanced in life having a history of obstinate constipation associated with an increasing cachexia and anæmia accompanied by a hard nodular tumour which is tender on pressure, is indicative of malignant intestinal disease. The higher up in the canal the disease is located the more acute are the symptoms, while when it is located in the rectum it is indicated by more or less tenesmus brought on by, or occurring during and following, evacuations, the pain radiating down towards the loin, genitals, and upper part of the thigh, accompanied by alternating evacuations of mucus, pus, blood, and faecal matter.

Conclusion.—From what has already been said it is clear that the chief value of abdominal pain as a diagnostic symptom in abnormal intestinal conditions is not only to call attention to the fact that the patient is suffering from an intra-abdominal disorder of greater or less severity but also in the class of cases requiring surgical intervention for their relief to indicate to the surgeon the locality of the trouble; hence it becomes the duty of the physician in all cases in which severe abdominal pain is a prominent factor to make careful notes of the patient's condition and symptoms when he first sees him, to refrain from the administration of narcotic and cathartic drugs until a surgeon when practicable has seen the patient, a diagnosis made, and a definite line of treatment decided upon.

It must constantly be kept in mind that a severe, sharp, and persistent abdominal pain almost invariably means peritoneal involvement provided the chest has been carefully examined and its diseases excluded, and that sudden cessation of such a pain accompanied by a rise of pulse-rate and increased frequency of the respiration with or without a lowering of the bodily temperature, usually denotes gangrene of the gut and its perforation. Many lives will be saved and thousands of others made more comfortable when physicians generally come to recognise that in all cases of persistent abdominal pain of obscure origin exploratory operations should be performed, for it has been my experience that a

cause always does exist when such a pain is present, and that it is usually found with ease when looked for; in other words, when in doubt operate, for as Osler has wisely said, "The surgeon is often called too late, never too early." New York.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

PRELIMINARY NOTE ON THE DEVELOPMENT OF TRY-PANOSOMA IN CULTURES OF THE CUNNINGHAM-LEISHMAN-DONOVAN BODIES OF CACHEXIAL FEVER AND KALA-AZAR.

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THE Cunningham-Leishman-Donovan bodies found in the spleens and other organs in cases of cachexial fever (previously known as malarial cachexia) present evident characteristics of protozoal parasites, although the exact class to which they belong is still disputed. Recent successful cultivation of another protozoal parasite—namely, the trypanosoma—led me to try to get the former organism to live and to multiply outside the body in order to allow of its life-history being more closely studied. For this purpose I placed infected blood obtained from the spleen during life in small tubes with a little citrate of soda solution to prevent the blood clotting and kept it under varying conditions. First, they were incubated at 37° C. but it was found that even when numerous in the original blood they had nearly completely disappeared within 24 hours, only a few lightly staining evidently degenerate forms remaining. It, however, occurred to me that in the case of the trypanosoma the organism had been found to live longer outside the body when kept at a lower temperature than it did at blood heat, so I placed some similar culture tubes in an incubator at a temperature of 27° C. I then found that the organisms retained their natural characteristics for several days and in blood films made from the tubes they stained quite as well as in the blood freshly taken from the spleen during life, while not only were they in undiminished numbers but they were actually more numerous than before. At first I thought this might only be an apparent increase as the number of parasites found in two slides made at the same time from fresh blood may vary considerably, but by repeating the observation a number of times I have been able to get conclusive evidence that an increase in the number of the organisms had actually taken place in the culture tubes.

This evidence is of two kinds. First, films were made each day from the fluid blood medium and the number of organisms found in many fields in various parts of the specimen was noted, and it was found that even when they were scantily present in the freshly taken blood they could be found in much larger numbers after from one to three days' incubation at from 22° to 27° C., while in some instances in which they had been numerous in the fresh blood, two or three being found in a single field, after one or two days they had become so numerous that from 50 to 100 have been counted in a single field of an oil immersion lens. Secondly, and of still greater value, is the fact that in the films made after incubation forms showing various stages of subdivision were relatively very numerous, while in those specimens which originally showed a large number of the organisms enormous numbers of the smallest forms were found, many of them in clumps of from 10 to 20 or more, several of which were often seen within a single field of an immersion lens. Around these very numerous forms of varying sizes were scattered so thickly as to look as if they had been sprinkled from a pepper-pot, as was remarked by one medical man on seeing them. Now, it is a very marked feature of films made from freshly drawn spleen blood that the proportion of forms undergoing subdivision is extremely small, so that a good deal of search through specimens showing numerous parasites is necessary in order to make out different stages of the subdivision, such as I have already described in a former communication, and Lieutenant

R. S. Christophers, I.M.S., also remarks on the rarity of these forms in ordinary spleen puncture films. Yet in my specimens from the culture tubes it is quite common to see a number of dividing forms in varying stages in a single field of the microscope and I have met with fields showing nearly complete series of these forms. In such specimens it is easy to make out two methods of multiplication of the parasites. In one form the typical oval organism with a large and a small nucleus enlarges to beyond the usual size, then each nucleus divides once, so that two large and two small nuclei are present in a single cell, after which the cell itself divides into two, the point of division being at one end so that just before the final separation the other ends alone remain united. A second mode of division, which evidently accounts for the very numerous new small forms of the organisms which are very rarely seen in fresh films, commences very much as I described in my former paper by the nuclei undergoing multiple division until a number of them are seen in a single cell. Next, in the culture a kind of slimy zooglea mass is formed, the outline of the original parasite having disappeared, and the minute multiple nuclei appear to sort themselves out in pairs of a large and a small nucleus which gradually increase in size but have as yet no capsule. When they reach a certain dimension, which is smaller than the usual form found in spleen puncture blood, a capsule appears around each, forming a characteristic group of complete young parasites such as occurs in fresh spleen blood. It is worthy of note that in these specimens the blood corpuscles have nearly or entirely been dissolved and have therefore disappeared, so it is quite certain that the forms of subdivision just briefly described take place outside the red corpuscles and in no stages have they been observed within them. It is clear, then, that the parasites are not *piroplasma*.

As I found the organisms died out within a few days at 27°C. I next tried a temperature of 22°C. and soon found that it was more suitable for their growth, as even when very few in the freshly drawn blood they were found in much larger numbers within a day or two. Further, a number of larger forms than I had seen in the fresh blood appeared in the citrated blood at this temperature, which led me to look out carefully for flagellated bodies, as the two nuclei of different sizes suggested to me a resemblance to trypanosomes, just as it did to Leishman before. This search was soon rewarded by my finding fully developed trypanosoma in two cases in the cultures. They were best developed in a spleen blood after one day's incubation, although only the usual oval forms were found in the freshly drawn blood and showed many forms undergoing longitudinal splitting, with double flagellæ, macro- and micro-nucleus complete, together with pear-shaped flagellated forms exactly similar to those described by Plimmer in trypanosoma of tsetse-fly disease. The other case, fortunately, was one of kala-azar from Assam, for the spleen blood of which taken by puncture I am indebted to my assistant, Assistant-Surgeon G. C. Chatterjee. In cultures of this many intermediate forms and a few complete trypanosoma were found. Thus this new human trypanosoma has been obtained by culture of the bodies found in the spleen by Leishman, so that the latter must be one stage in the life-history of the organism and not degenerated forms as he at first thought them to be. Further, they have already been obtained from both the endemic form of cachexial fever seen in Lower Bengal and also in the Assam epidemic form known as kala-azar. It is worthy of note that Assistant-Surgeon Chatterjee found a living trypanosome in an anopheles mosquito some time ago, while I am also indebted to him for help in the microscopical examination of my cultures. I hope to be able to publish illustrations of the different stages of the development of the trypanosome at an early date.

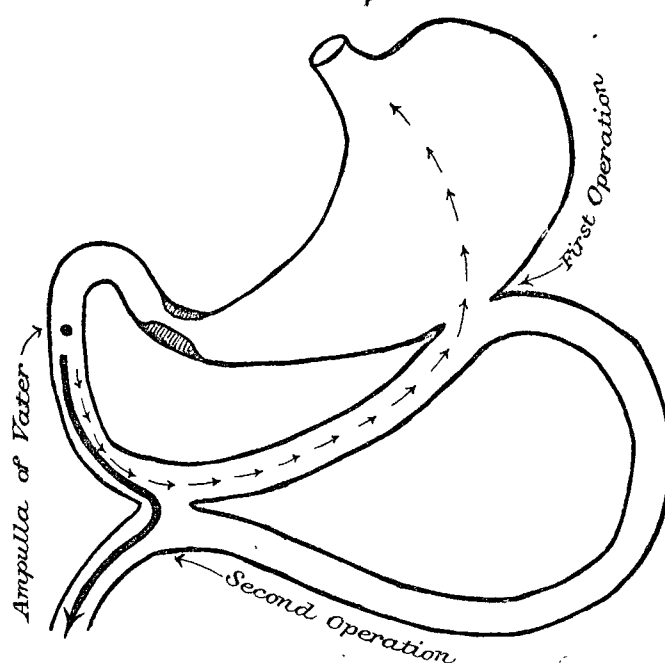
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ON OPERATION FOR THE RELIEF OF BILIOUS VOMITING FOLLOWING GASTRO-ENTEROSTOMY.

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THE patient was a woman, aged 36 years, who had undergone a gastro-enterostomy for pyloric stenosis due to old ulcer four months prior to the onset of bilious vomiting. In other

respects the operation had been satisfactory. She had gained weight, had no pain, and enjoyed her food, but each morning she vomited about 12 ounces of green bile. This over, she went through the day in comfort and took ordinary food. Her condition was very distressing and after trying lavage and various medicines I reopened the abdomen and performed the operation in the manner indicated in the diagram. (The sketch shows the stomach, anatomical, not pathological.) The result has been good, the vomiting has ceased, and she is quite well.



The dotted line shows the bile tract before, and the thick line after, the second operation of entero-enterostomy.

Regurgitant bilious vomiting has only occurred twice after gastro-enterostomy in my experience of the operation during the last 11 years—namely, the case just mentioned and one other that is waiting for similar treatment. I do not suggest that this procedure is original; probably the same idea has occurred to others who are dealing with the problem of intestinal anastomosis, but I have not seen any case recorded in any English journal.

Leeds.

A CASE OF RUPTURE OF THE BOWEL CAUSED BY COMPRESSED AIR.

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By permission of Mr. T. P. Greenwood, senior surgeon to the Stamford and Rutland Infirmary, I send an account of the following case which is of interest if only on account of its rarity.

A youth, aged 17 years, was admitted into the infirmary on April 22nd, 1904, at 1.45 P.M., with the following history. One and a half hours previously he had "got blown up with an air force-pump" per rectum. He had been driven about eight miles to the hospital. On admission he was in a state of collapse, the pulse was imperceptible, the face was slightly cyanosed, his breathing was short and difficult, and he spoke with great difficulty, but he was suffering more from discomfort than actual pain and complained chiefly of great thirst.

On examination the abdomen was tightly distended with gas; liver dulness was absent. The anus was dilated to about one and a half inches and the lower part of the rectum was prolapsed into it. The finger passed three inches into the rectum and the gut was felt bulging down like a presenting intussusception. An œsophageal tube was passed four inches and was then obstructed, no gas being expelled. A stomach-tube was obstructed at the lower end of the œsophagus. The abdomen was then punctured in the right iliac fossa with an aspirator trocar and cannula and a quantity of gas was expelled with intestinal odour. The abdomen went down to its natural size and the patient was relieved for half an hour, his pulse and general condition improving. He then complained of pain in the lower abdomen which rapidly spread and he died three hours