Microscopic Examination.—The thickened lower end of the common bile duct shows in transverse section (Fig. 1) the marked thickening described above. This is due to granulation tissue situated mainly inside the muscular coats, but in places passing through into the outer fibrous coat, and surrounding the mucous glands in that situation. The granulation tissue is composed of round and spindle-shaped cells; there are no giant cells and no caseation. The lumen of the duct shows a little epithelial debris.

The liver shows pericellular cirrhosis and in addition some increased fibrosis around the portal spaces, and here and there plugs of bile-stained mucus in the bile capillaries. The plugs are no doubt due to the biliary obstruction. In short, the liver shows the changes characteristic of congenital syphilis with the effects of biliary obstruction. After hardening in the usual manner sections were stained for the *Treponema pallidum*, but with a negative result.

The pancreas presents a high grade of interstitial fibrosis, the lobules of the gland being invaded and broken up and the acini destroyed or widely separated by connective tissue in various stages of development—round mononuclear cells resembling lymphocytes, plasma cells, spindle cells, and fibrous tissue. Some of the arteries show periarteritis but not endarteritis. The islands of Langerhans are well preserved and prominent, as can be seen in the photomicrograph (Fig. 2) most kindly shown by Dr. Cammidge. The ducts of the gland are not dilated. The interstitial pancreatitis is so advanced that the normal appearance of the gland is quite obscured. It is important to note that this diffuse interacinous pancreatitis is quite different from the interlobular pancreatitis described by Emanuel¹ in the usual form of congenital obliteration of

Fig. 2—Section of pancreas showing interacinous pancreatitis due to congenital syphilis. The islands of Langerhans are prominent. (Photomicrograph by Dr. P. J. Cammidge.)

the bile ducts. For, as shown by John Thomson,² congenital obliteration of the bile ducts (that is, the form presenting mixed portal and monolobular hepatic cirrhosis) is not connected with syphilis.

REMARKS.

There are two possible views as to the nature of this case, first that it is syphilitic, secondly that it is an early stage of congenital obliteration of the bile ducts. In favour of the syphilitic origin of the lesion are the following points: The definite history of syphilis and the syphilitic character of the associated morbid changes on the liver and in the pancreas. I have hesitated to publish this case because the *Treponema pallidum* was not found in the hardened sections; but this failure is probably to be attributed to the tissues having been hardened in the ordinary way. Against the view that the granulomatous change in the common bile duct is an early stage of congenital obliteration of the bile ducts is the absence of the hepatic changes (a mixed monolobular and multilobular cirrhosis) met with in that disease; further, as already pointed out, the form of pancreatitis present in this case is quite different from that figured by Emanuel in congenital obliteration of the bile ducts. I believe, therefore, that this is a case of congenital syphilitic obstructive cholangitis. This condition has been very rarely recognized. The only case like it that I know of is that reported by Beck,³ though possibly some of the reported cases of stricture of the common bile duct in early life may be a later result of this process.

This case supports the view that several different conditions may give rise to obstruction or obliteration of the larger bile ducts on the newborn. Thus, the ducts may

be narrowed as the result of peritoneal adhesions set up by fetal peritonitis; the ducts may be obstructed by syphilitic inflammation, as in this instance; or, as in the majority of cases, there may be a mixed form of hepatic cirrhosis, which is followed by a descending and obliterative cholangitis, the disease usually called congenital obliteration of the bile ducts. Further, it may be pointed out that the recognition of congenital syphilitic obstruction of the common bile duct offers an explanation of recovery under mercurial treatment of cases which appear to belong to the well-recognized group of congenital obliteration of the bile ducts. Poynton⁴ has recorded a case in point, but interpreted the obstruction as due to peculiarly tenacious bile.

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A MODIFICATION OF LEISHMAN'S METHOD OF ESTIMATING THE OPSONIC INDEX.

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LEISHMAN'S original method of estimating the opsonic index is so much simpler and more rapid than Wright's that it seemed desirable to experiment with it in the direction of greater accuracy. Several estimations were made from blood mixed direct with a citrated emulsion of tubercle bacilli, and the results showed marked discrepancies with estimations made by Wright's method, a normal index working out, for instance, to 2.0 or to 0.5, and seldom exactly to 1.0. After trials in various directions it appeared that the inconstant factor vitiating results was the differing number of leucocytes in the respective bloods. Counts of the leucocytes, estimations of the index by Wright's and by Leishman's method modified were then made, and it was found that the figures, expressing the index by Leishman's method and the number of leucocytes, varied inversely, the emulsion being constant.

By a simple formula, based on the above proposition, several apparent indices were corrected, and were then found to agree closely with those estimated by Wright's method; but still discrepancies occurred, and for the following reason. It is usually convenient to obtain blood by the pressure of an elastic or other band; if the same drop of blood thus obtained is used both for the index and leucocyte count, good results are produced. But this needs agility, and in practice would require an assistant. If different drops of blood are used, the haemocytometer and incubation pipettes may contain differing numbers of leucocytes; it is inconvenient to get blood without pressure as a deep puncture has then to be made, possibly daily. Finally, a simple plan was hit upon; after mixing blood direct from the finger—under any pressure, with the bacillary emulsion, the number of leucocytes in the mixture itself was counted, either before or after incubation, each batch being done in the same way. For this the red blood corpuscle pipette serves, and the process is more rapid if there is one for each blood; but any pipette and any dilution desired may be used by drawing up successive volumes of the mixture and diluent as recommended by Wright.¹

After using a drop or two to make a film the mixture is kept in its capillary tube till required for the leucocyte count. The total number of leucocytes need not be estimated, the figure expressing the average for the fields sufficing. A fallacy exists that the phagocytes are not in constant proportion to the total number of leucocytes.

The actual modification of Leishman's method is very simple. The capillary pipette is that in ordinary use; it is convenient to make a bend in it 2 or 3 in. from its distal end. A rubber tube, as in the haemocytometer pipette, is easier to manage than a rubber teat, or a Wright's throttled pipette may be used. A mark is made above the bend, giving a long column of blood and emulsion, making for greater accuracy of dilution and providing enough of the mixture for its two purposes—namely, for making a film and for leucocyte count.

The emulsion consists of (tubercle) bacilli suspended in citrated normal saline—say, 0.75 per cent. each of

sodium citrate and sodium chloride. This emulsion is sucked up to the mark above the bend; it will be found that it is difficult or impossible to do this with a rubber teat owing to fluidity of the emulsion (unless a throttled pipette be used). The pipette may now be laid down, and the column of emulsion will be found to stay steady while a puncture is made in the finger. A short column of air having been taken up, a column of perfectly fresh uncoagulated blood is aspirated to the mark, and the whole rapidly blown out on to a glass slide, so that the citrate may at once act on the blood and so prevent coagulation; this is not so efficiently done if blood is taken up first.

The two fluids are then mixed, aspirated, sealed, and incubated, unless a portion be reserved for the leucocyte count. The films are made in the usual way, by blowing out and mixing before spreading; this remixing is important if the estimation of the leucocytes is made after incubation. The film need not be fixed before staining with carbol fuchsin; the index is calculated in the usual way. To correct the apparent index, multiply the control index by its corresponding number of leucocytes and divide the result into the other index multiplied by its corresponding number of leucocytes, as shown in the following examples:

T. B. per Cent.	Index (Leishman).	Index (Wright).	Leucocytes.
A. 190	1.0	1.0	11,000
B. 115	0.6	0.9	16,000

The corrected index, 0.87, corresponds closely to 0.9 as got by Wright's method:

T. B. per Cent.	Index (Leishman).	Index (Wright).	Leucocytes (Average per Field).
A. 114	1.0	1.0	18
B. 84	0.73	1.01	25

In another case, where a hundred leucocytes were found in one field, they were found to contain about 100 per cent. bacilli; whereas in the control only twelve leucocytes were found, and those on the film were so full of bacilli that no count could be made, though they illustrated the proposition of inverse proportion.

Some interesting experiments with the writer's own blood were made, and may be recommended as a method of practice; a drop of blood was obtained from the finger, mixed and incubated as usual; then a second drop of blood from the same finger, and only three minutes later, was similarly treated, except that the pressure used in obtaining it was not necessarily the same as that used for the first drop. The leucocytes and indices were estimated in the two specimens, calculating the first as 1.0, and very good illustrative results were seen; thus, on one occasion, each specimen contained the same number of leucocytes per haemocytometer field (13), and the bacilli ingested were respectively 200 and 205 per cent.; on another occasion approximately twice the number of leucocytes and half the number of ingested bacilli were found in one specimen as compared with the other; several similar results were seen, and as the same blood was used on all occasions for each comparison there could be no doubt as to the actual index.

A tube was mixed and kept for half an hour at room temperature, and showed no phagocytosis at the end of that time, but showed good results after incubation. The mixing may therefore be done at the bedside, and the mixture carried some distance to the laboratory. Dr. Campbell² suggests that the emulsion be made up of previously stained and washed bacilli. This would further simplify the procedure. One might almost be able to count these already stained and ingested bacilli, and the leucocytes in the haemocytometer chamber at the same time.

The method as a whole is simple, requires little apparatus, and is quite within the powers and opportunities of the general practitioner after a little practice. It seems to be more especially applicable when it is only desired to estimate two or three indices occasionally, as

in diagnostic work, as with T. R.,³ or as suggested by the writer with T. O.⁴

The proposition of the inverse proportion between ingested bacilli and leucocytes suggests several interesting speculations. Should it be proved universally true, the number of leucocytes per c.mm.—at any rate, within wide limits—seems unimportant as far as the opsonic action is concerned. Yeast, cinnamic acid, and other drugs have been used in the hope that the leucocytosis caused by them would combat disease. But Huggard and Morland⁵ showed that yeast altered the tuberculo-opsonic index as well as the number of leucocytes, and so it may possibly be shown of the other drugs. May we regard leucocytosis as superfluous as far as opsonic effect is concerned? The leucocytes might be compared to the fielders in a cricket match. If the fielders are as good at their work as the leucocytes are, of a hundred balls delivered ten fielders could theoretically stop as many of them as a hundred fielders could. But the limits must not be too wide; one man could not stop them all, and one leucocyte cannot do the work of a hundred. Another consideration is that experimental phagocytosis lasts only (say) fifteen minutes, whereas in the body phagocytosis has all day to go on, when a larger number of leucocytes may be more useful if only in bringing up reinforcements.

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MALIGNANT DISEASE OF THE INTESTINE RENDERING AN INGUINAL HERNIA IRREDUCIBLE.

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THE rareness of this condition warrants, I think, the account of a case occurring in my practice.

R. T., a man, aged 57, apparently otherwise healthy, came to me in July, 1906, with an irreducible left inguinal hernia of long standing, which was causing him pain. He also had a complete inguinal hernia on the right side, but this was reducible.

He was kept in bed for a week or so on a careful diet, but as the hernia remained irreducible and painful, he was advised to submit himself to operative treatment, to which he consented.

Operation.

On July 18th, 1906, the sac was opened and was found to contain a loop of large intestine markedly adherent to the sac. On freeing the gut a hard mass of malignant disease was found in the concavity of the loop, and in the centre of this mass a small abscess cavity containing 2 or 3 drachms of foul, appendix-abscess-like pus; this was evacuated, and the loop of intestine was excised, together with about 2½ in. of healthy gut on each side of the growth. The cut ends of the intestine were fixed in the original incision in the inguinal canal, an end-to-end anastomosis not being considered advisable, owing to the presence of the pus. The patient made an uneventful recovery.

After-History.

The colotomy opening so formed was only meant as a temporary measure, but the patient having been fitted with a double inguinal truss, the pad on the left side being replaced by a cup-shaped receiver for the faeces, found that he could get about his work all day without any inconvenience and has hitherto refused to have an end-to-end anastomosis done.

I saw him twelve months after the operation; he had gained weight, the colotomy wound looked healthy, and there was no evidence of any secondary deposits in the liver.

Description of Specimen.

It consists of 12 in. of large intestine having a growth involving the central 6 in. which at one point has protruded into the lumen of the intestine. In the centre of the growth is a necrotic area. Microscopic examination showed a columnar carcinoma.