TABLE I.—*Main Differences between the Blood Picture of Acholuric Jaundice and that of Pernicious Anaemia*

	F. A. J.	P. A.
Colour index	High	High
Mean cell diameter	Low	High
Anisocytosis	Marked	Marked
Poikilocytosis	Absent	Marked
Anisochromia	Marked and regular	Slight
Stippling	Absent	Moderate
Diffuse basophilia	May be gross	Moderate
Reticulocytosis	Extreme	Absent
Nucleated red cells	Late type	All types
White cells	Leucocytosis	Leucopenia

It must be realized that the above remarks apply only to cases of F.A.J. and P.A. which are in an active phase of the disease. In cases of F.A.J. with but a mild degree of anaemia, or which are discovered during the routine examination of an acholuric family, the above characteristics will naturally be less well developed; but even in such cases some or all of them are generally fairly obvious.

Fragility.—So far we have refrained from any reference to fragility of the red cells because we have been concerned only with the more elementary points in the diagnosis. We maintain that the determination of the fragility of the red cells,

ated with clinically recognizable jaundice, demands painstaking clinical and laboratory work. The ultimate justification for this labour must be the availability of successful treatment. This is presented in splenectomy. In skilled hands the operation is not hazardous, for the spleen is never bound down by adhesions as in splenic anaemia. Although it is desirable by means of blood transfusion to raise the haemoglobin to a reasonable level before operation, it is sometimes impracticable to achieve this ideal owing to the rapidity of the red cell destruction going on in the body. In such cases, rather than delay too long it is better to operate at a comparatively low haemoglobin level and to give a further transfusion of blood immediately after the operation. It is remarkable how rapidly in most cases the haemoglobin rises when once the spleen is removed. In one of our cases a two-pint (1.14 l.) transfusion of fresh blood raised the haemoglobin only from 40% to 45%; splenectomy was then performed, being followed immediately by the giving of two further pints of blood, and within 24 hours the haemoglobin had risen to 70%.

Summary

The frequency with which familial acholuric jaundice is wrongly diagnosed and treated as pernicious anaemia is emphasized.

The commonest causes of this mistake have been found to be:
(1) An unfounded belief in the diagnostic value of the colour index.

TABLE II.—*Chief Clinical Features of 9 Cases of Acholuric Jaundice*

Case	Sex and Age	Anaemia (Hb)	Jaundice	Leg Ulcer	Splenomegaly	Pigment Stones	Family History	Previous Diagnosis
N. M.	F. 48	56%	—	—	Spleen not palpable, but large at operation	—	—	Nil
R. B.	F. 19	62%	Obstructive J. ++	—	Slight	+	+	Obstructive jaundice
J. B.	F. 22	30%	Slight	++	Spleen not large at operation	—	—	Obscure anaemia
M. G. B.	F. 41	74%	—	—	Slight	—	+	P.A.
E. H.	F. 63	40%	Slight	++	+	+	+	P.A.
L. D.	M. 53	56%	Slight	++	+	+	+	Nil
H. A.	M. 52	38%	+	—	Slight	—	+	Nil
W. G.	M. 73	42%	+	—	+	—	—	P.A.
E. R.	F. 68	35%	Slight	+	Slight	—	—	P.A.

unless carried out by someone who has considerable experience of the test, is often valueless and not infrequently misleading. It is not always realized that in a considerable proportion of the cases of F.A.J. the fragility of the red cells is only very slightly increased above the upper limit of normal. In one of our nine cases there was a previous report from a reputable laboratory that the fragility of the red cells was normal; while in another the departure from the normal, though recognized, was so slight that its significance was overlooked. As examples of the variability of the fragility from one case to another the following figures from two of our series are illuminating.

TABLE III.—*Showing Different Degrees of Fragility of Red Cells of Fully Oxygenated Heparinized Venous Blood in 2 Cases of F.A.J. compared with the Normal*

% NaCl	H. A. % Haemolysis	R. B. % Haemolysis	Normal % Haemolysis
0.30	100	100	100
0.35	100	100	100 approx.
0.40	100	100 approx.	60
0.42	100 approx.	—	15
0.44	100 approx.	50	12
0.46	80	20	10
0.48	60	3	Trace
0.50	50	Trace	Nil
0.52	30	Trace	Nil
0.55	20	? Trace	Nil
0.60	10	Nil	Nil
0.65	8	Nil	Nil
0.70	3	Nil	Nil
0.75	Trace	Nil	Nil
0.80	Nil	Nil	Nil

In a satisfactory fragility test it is necessary (1) to make up very accurate solutions of the various saline dilutions; (2) to make certain that the blood is fully oxygenated before introducing it into the saline solutions; and (3) always to carry out a quantitative estimation of the percentage of haemolysis in each saline dilution.

Treatment

From the foregoing description it will be seen that the diagnosis of familial acholuric jaundice, a disease so often unassoci-

(2) Ignorance of the fact that free acid in the gastric juice excludes pernicious anaemia. (3) Failure to appreciate the extreme importance of detailed blood examination. (4) Attribution of natural remissions to the effect of liver administration and of relapses to faulty liver preparations. (5) Failure to grasp the importance of chronic ulceration of the legs and anaemia as signs of familial acholuric jaundice.

SPLENIC CYSTS: WITH A REPORT OF A CASE

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Splenic cysts are rare. All writers on this subject begin their articles with these words and go on to quote figures given by Fowler (1940) in analysing 137 cases of non-parasitic splenic cysts.

Andral (quoted by Fowler, 1940) in 1829 described the first splenic cyst, which was found at necropsy and proved to be a dermoid. In 1880 Pean (Fowler, 1940) performed the first splenectomy for a cyst, and in 1906 the first series of 36 cases was described by Powers (Fowler, 1940). Since Fowler's review the interest of surgeons has been aroused, for cases have been recorded in fair numbers. By 1942 McClure and Altemeier had raised the total to 149, and later in that year Gallagher and Mossberger described the 155th non-parasitic cyst. Up to the end of 1944 seven further examples had been listed, and our case would appear, therefore, to be the 163rd.

That the condition is indeed uncommon can be seen by reference to the standard textbooks of surgery and pathology, which have little or nothing to say on the subject. Like most rarities it is of course probable that many cases went unrecorded until more recent years. A search through the literature reveals a willingness on the part of the authors to compose elaborate classifications of these few cases, which discourages us from attempting anything similar.

It is certainly expedient to distinguish parasitic (hydatid) from non-parasitic cysts in the first instance. The former are said to be at least twice as common as the latter. Arce (1941) of Buenos Aires found the spleen affected by hydatid cysts in 3% of his cases, and Dew (1928) that 2% of all hydatids were in the spleen. It is, we think, reasonable to regard the non-parasitic cysts as "true" or "false" according to whether there is an endothelial (or epithelial) lining or merely a connective-tissue lining. It is on the basis of this distinction that Fowler records the ratio of true to false as 1:4; or, as those who prefer percentages would say, only 20% of non-parasitic cysts are true and 80% are false. This distinction, however, may be liable to error, for in certain cases an endothelial layer may disappear as a result of pressure from, for example, haemorrhage; while in others a lining may even be acquired by metaplasia of connective-tissue elements. How often this may happen it is impossible to say, but that it does occur is suggested by the fact that some areas of certain of the cysts described show an epithelial lining and other areas only connective tissue. In this connexion Gallagher and Mossberger (1942) point out that the terminal findings may mislead as to aetiology.

Discussion

True cysts include dermoids and epidermoids and those lined by endothelium. Although it is difficult to explain the presence of ectoderm in the spleen, this is the only source of these tumours. A possible explanation is that they are derived from a primitive totipotential cell capable of producing any of the three layers, such as is postulated to explain the ovarian and testicular dermoids.

Endothelium-lined cysts are easier of explanation and can be accounted for as haemangiomas, lymphangiomas, and serous cysts arising possibly from inclusion of peritoneal cells, together with the multiple cysts associated with polycystic disease of other organs. Lubarsch (quoted by Fowler, 1940) considers that some of the serous cysts may be neoplasms arising from anlagen of lymphatic endothelium.

False cysts are usually large and single, and contain blood or blood-stained serous fluid and often cholesterol crystals. They tend to be situated at either pole of the spleen, with normal splenic tissue elsewhere, and part of the cyst wall may be formed by thinned-out spleen, though Fowler describes cartilage and smooth muscle occurring in the walls. In places the wall may be fibrous. Gallagher and Mossberger (1942) describe a pedunculated calcified cyst attached to the lower pole of the spleen surrounded by normal tissue, and McClure and Altemeier (1942) have observed the occurrence of torsion of the pedicle as a rare event. The cause of false cysts is considered to be trauma or infection, or degeneration in an infarcted area. Malaria is mentioned as a predisposing cause, and we have recently been informed by an R.A.M.C. colleague that in West African natives, in whom malaria is almost universal, splenic cysts are not infrequently found at necropsy. Syphilis and the other causes of splenomegaly may render the spleen liable to exposure to trauma, and if this is associated also with toxæmia it will make haemorrhage all the more probable. The suggestion that splenic congestion occurs during menstruation (Denneen, 1942) and that intrasplenic haemorrhage and cyst formation are therefore more likely in women during the phase of active sexual life is dismissed by Fowler, and there is nothing to support this belief in the textbooks of gynaecological physiology. Seven per cent. of cysts occur during pregnancy (Fowler), but this has probably been a coincidental finding, the presence of the cyst being observed when the uterine fundus begins to encroach upon the upper abdomen. They occur at all ages, but particularly in young adults, and women are rather more often affected than men.

Diagnosis.—When small a cyst will give rise to no symptoms, and when larger it will cause pressure symptoms and very little else; or it will be noticed by the patient or others. Milroy Paul (1943) says "the diagnosis . . . has rarely been made," and Fowler himself uses the same phrase. It is therefore encouraging to read Sweet's (1943) opinion that "large cysts, however, present a clinical picture so characteristic that the diagnosis can be readily made," and to record that in the case to be described the diagnosis was in fact made by one of us (J. A. C.), though the co-author and a considerable number of other medical men scorned his suggestion.

Dyspepsia, a dragging pain, and inability to eat a large meal owing to compression of the stomach are the chief complaints. If inflammation exists pain will be more severe. The past history may be of help in cases of malaria, syphilis, or trauma. Trauma as a cause of splenic rupture and also as a factor in the production of pseudo-pancreatic cyst is well known. But it is easy to visualize an injury which will cause intrasplenic haemorrhage only and result later in the formation of a splenic cyst. Hydatid disease should be looked for in members of stock-breeding communities and its presence confirmed by Casoni's or other specific tests.

If the cyst occupies only a part of the spleen the rest may be palpable, and this will aid in diagnosis. But if the whole organ is involved, or nearly so, it will be necessary to differentiate cysts of the pancreas, left lobe of liver, omentum, kidney, or ovary. The last should be easy, for a spleen seldom reaches the pelvis and an ovarian cyst seldom gets completely out of it, so that if the cyst originates in the spleen one should be able to "get below it." One can usually "get above" a pancreatic cyst, which should be strictly a midline structure, whereas a splenic cyst, unless pedunculated, is never completely below the costal margin and extends across the midline only if it is of considerable size. A palpable notch would be of diagnostic importance, but this has rarely been noted.

Aspiration of the cyst with the finding of cholesterol crystals is cited by Denneen (1942) as an aid to diagnosis, but the dangers inherent in this procedure should the cyst be echinococcal or an aneurysm would seem to weigh heavily against its advantages.

Radiography.—Elkeles and James (1943) state that "in the few cases in which a correct diagnosis was made prior to operation, x-ray examination was the determining factor," and certainly it has much help to offer. Where calcification has occurred it is clearly almost diagnostic, for a calcified cystic shadow in the left upper quadrant of the abdomen is likely to be either a splenic cyst or an aneurysm of the splenic artery, and the latter can be excluded reasonably easily by auscultation. This calcification often takes place in spite of the youth of a patient and a short history. Snoke (1943) quotes cases at the ages of 18, 25, 44, 52, and 60. In the absence of calcification a soft-tissue swelling which obliterates the psoas shadow, raising of the left diaphragm, and spreading of the lower ribs are seen. Sweet (1943) draws attention to the fact that the swelling, though generally rounded, often has a pointed lowest extremity where solid splenic tissue remains.

A barium meal will show the stomach to be pushed across to the right and compressed backwards, and the splenic flexure to be displaced downwards and to the right according to the size of the tumour. Intravenous and retrograde pyelograms have shown the kidney to be pushed downwards (cases quoted by Fowler, 1940; Roberson, 1940; Elkeles and James, 1943; and Sweet, 1943) or upwards (cases quoted by Shewan, 1933, and Snoke, 1943).

Treatment.—There is no doubt that splenectomy is the proper treatment unless prevented by the presence of dense adhesions. Fowler puts the mortality at 4%. Enucleation has been practised on occasion, but there is a danger of haemorrhage from this procedure. Marsupialization and incision and drainage are apt to be followed by fistula and amyloid disease, not only in hydatid cysts but in non-parasitic ones as well (Arce, 1941). There seems little doubt that emptying the cyst makes removal easier, provided infection and hydatid are excluded.

Case History

A girl aged 24, a member of the W.A.A.F., unmarried, was found at a routine medical examination to have a huge swelling in the upper abdomen. She had always been "plump," but the swelling had been present to her knowledge for only 10 years. A vague story of injury to the lower left ribs four years previously was dismissed as probably of no importance. The swelling had gradually increased in size and had given rise to dragging abdominal pain only during the last few months, in which period she had noticed that she had had to be content with small meals, as she readily became "blown out." Questioning failed to elicit any other symptoms incriminating the digestive, urinary, or genital systems. She had not noticed any shortness of breath.

Examination was equally unhelpful except for the swelling itself. This was well defined and clearly cystic, and occupied the whole of

the epigastrium. It lay slightly obliquely across the abdomen, the left side being lower than the right, but the axis was horizontal rather than vertical. Below, it reached to the level of the umbilicus, but was not palpable in the loin or left renal angle. No notch was felt. Its lower edge was well defined, and it was agreed that the cyst could be moved slightly up and down but not from side to side. It was dull to percussion, silent on auscultation, and displaced the gut downwards. The liver was not enlarged and no other abnormal physical signs were detected. A plain skiagram showed the shadow of a large soft-tissue swelling, and a barium swallow demonstrated that the stomach was pushed away to the right and also compressed backwards. Blood count and urine examinations were normal.

A diagnosis of pseudo-pancreatic cyst was made, with a minority report in favour of splenic cyst as previously mentioned. It was considered that a renal origin for this swelling could be safely excluded.

Operation (Aug. 10, 1945; Air Vice-Marshal Stanford Cade).—It was decided to explore through a left paramedian incision, cutting across the rectus muscle to gain extra space if necessary. On opening the peritoneum a shining rounded tumour of a beautiful duck-egg blue was seen, and it was thought that the first diagnosis was correct. But further exploration showed this to be a large round area of fibrous cyst wall, the remainder of the tumour being typically plum-coloured splenic tissue, thinned out over the cyst and forming a margin of grossly normal spleen to the right and below and including the notch. The latter had not been palpable clinically because it lay beneath the right costal margin, so far did the spleen extend across the midline.

An incision was made through this thin fibrous area and about $3\frac{1}{2}$ litres of fluid removed by sucker. This fluid was brownish, opalescent, and of the consistency of dish-water. The cyst collapsed and, with the division of a few adhesions and the pedicle, was easily removed through the original incision. The peritoneal cavity was mopped dry and the wound closed without drainage. Convalescence was uneventful. Six weeks later a barium meal showed a stomach of normal size, shape, and position. The patient was symptomless and had returned to duty.

The Specimen.—The cyst, together with the fluid removed, weighed approximately 13 lb. (5.85 kg.). The wall was leathery, and it was easily distended again for the purpose of fixation, though not to its original size. The photograph indicates the present size, the cir-

cumference being 24 in. (60 cm.) in its long and $21\frac{1}{2}$ in. (54 cm.) in its shorter axis. The fluid contained red blood cells and polymorphs, some degenerate but mostly recognizable. Numerous cholesterol crystals were seen and culture was sterile. In places the wall was purely fibrous and translucent: in others a layer of spleen about 1 cm. thick was stretched over it. The interior of this single cavity showed massive trabeculation and a considerable quantity of necrotic fibrous tissue adherent to the walls.

On section the "sandwich" effect of a layer of spleen enclosed between a thick fibrous capsule on the outer side and a less thick fibrous lining on the inner side was well seen. The latter was not limited by any specialized epithelial or endothelial cells. A section through "normal" splenic tissue taken from the anterior margin of the cyst showed increased fibrosis but no other abnormal change.

Summary

A case of false splenic cyst of considerable size in a young woman is described.

The size of the cyst was out of all proportion to the symptoms.

A pre-operative diagnosis was made and the condition was successfully treated by splenectomy.

Skiagrams taken before operation showed compression and displacement of the stomach, which state of affairs had righted itself six weeks later.

The literature is reviewed and differential diagnosis considered.

The specimen has been accepted by the Royal College of Surgeons.

[NOTE.—Since going to press further sections have been cut and show that in places the cyst was lined by flattened endothelium. Patchy calcification was seen here and there. It is considered that these appearances are not inconsistent with the description of the cyst as "false."]

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SIGNIFICANCE OF THE PREMENSTRUAL FEVER IN PULMONARY TUBERCULOSIS

BY

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In recent years pulmonary tuberculosis has been diagnosed by radiography, to a greater extent than ever before, at a stage when no abnormal physical signs are present. Once the diagnosis is made, the next step is to determine whether the disease is active or not. In many cases admitted to sanatoria investigation shows only healed scars. Serial skiagrams, however, reveal definitely whether the lesion is active or not, but these changes take some time to declare themselves. In 1921 Sir James Kingston Fowler wrote that "the temperature is the guide to the activity of the disease." But many cases which on admission to sanatoria appear to be afebrile, in that their temperature never rises above 98.4° F., prove later to have a natural maximum temperature of only 98° F. or even 97.8° F., so that the early readings really represent a mild degree of pyrexia.

The Present Investigation

In this connexion there arises a question of great importance—namely, the significance of the premenstrual temperature in women. If the temperature increases, does the increase indicate tuberculous activity, or can it be disregarded in considering increases in patients' exercise? In an attempt to elucidate this problem 15 normal healthy young women were persuaded to take their temperature as controls, both morning and evening, for ten minutes in the mouth, as is done in recording the patients' temperatures in this sanatorium. This was done for at least one whole menstrual cycle. Van de Velde (1904, 1929) first showed that in the normal woman the body temperature is relatively low during the first and relatively high during the second half of the menstrual cycle. Barton and Wiesner (1945) have confirmed, by taking the waking temperature, that a relatively high temperature is characteristic of the premenstrual phase, and that it persists after conception. Such a diphasic change was found in 13 of the 15 normal women studied, and the temperature reached a steady maximum beginning a few days before menstruation was due. The reactions were of three types. First, a rise in both the morning and the evening temperatures; secondly, a diminution in the daily variation, usually caused by a rise in the morning temperature; and, thirdly, a combination of these two changes—i.e., a rise in temperature as well as a diminution in the daily variation. The changes fell with almost equal incidence into these three groups. The average duration of this premenstrual change in the temperature was 5 days. The highest temperature reached was in no case above 99° F., and this occurred in only one instance. In 75% of cases the premenstrual temperature showed no readings above 98.4° F.