Only two patients reported a second operation, but it seems possible that some of those who did not reply to the questionnaire would fall into the category of "subsequent operations." One patient had a cholecystectomy performed after a previous cholecystostomy had failed to relieve her symptoms, while the other had a second operation for adhesions.

Operative Mortality.—Of the 153 operations performed there were nine deaths, giving an operative mortality of 5.8 per cent. for all cases. This figure may appear somewhat high when compared with that quoted by Davis, 3.75 per cent., and 4.73 per cent. in a series of 4,032 cases by various American surgeons quoted by Sanders, but it must be remembered that the present series includes the most serious cases, and that in the United States patients suffering from cholecystitis come for treatment at a much earlier stage than they do in this country. This latter fact is emphasized by Rendle Short in the *Index to Prognosis*, and appears to be confirmed by Sanders's statement that only 40 per cent. of his 500 cases had stones, whereas 87 per cent. of the present series had the combined pathology of inflammation and stones.

Further, a series of fifty-three consecutive operations performed more recently showed an operative mortality of less than 2 per cent., which compares favourably with the best American figures.

The causes of death were as follows: paralytic ileus, 1 case; suppurative cholangitis, 2 cases; associated with acute pancreatitis, 1 case; pneumonia, 1 case; "choleæmia," 1 case; and post-operative collapse and cardiac failure, 3 cases. From a perusal of similar series, these causes appear to be the ones usually found. Cholecystectomy was performed in 117 cases, cholecystostomy in thirty-six, while in two cases removal of the mucosa only, by cautery, could be effected.

These figures reflect the modern tendency to remove the gall-bladder whenever possible. I have avoided comparison of the relative mortality of these two operations, as that of cholecystostomy, performed as it is in the more serious cases, must inevitably be the higher.

CONCLUSIONS

1. Complete cure may be expected in 82.4 per cent. Of the rest 10.5 per cent. are relieved, while 7.01 per cent. remain *in statu quo*.
2. The symptoms of flatulent dyspepsia, including qualitative anorexia, completely disappear in over 80 per cent. of cases.
3. It would appear that the absence of stones renders the prospect of cure perceptibly less. However, in cases of acute cholecystitis the absence of stones has no effect whatever on the prospect of cure.
4. The operative mortality varies between 2 and 6 per cent., depending to a large extent on the type of case dealt with. In the present series, dealing with every type of case, the mortality was 5.8 per cent.
5. The average period of convalescence before resuming full work is thirteen weeks. I have not been able to find any reference to this feature in the literature for purposes of comparison.

I wish to acknowledge my indebtedness to the surgeons and assistant surgeons of the Liverpool Royal Infirmary for permission to use their cases in this investigation, and for their help.

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A CASE OF ABORTUS FEVER IN YORKSHIRE

BY

ALEXANDER FORBES, M.B., C.M.

LATE PHYSICIAN TO OUT-PATIENTS, SHEFFIELD ROYAL INFIRMARY

If, as the Americans tell us, this fever—*B. abortus* Bang—is to be "the fever of the future," it is important that cases should be recorded and the attention of practitioners called to this subject. It is unlikely that, while thousands of cases should have occurred in America during the past few years, we in this country should have been exempt, since contagious abortion in cows has been known to be of common occurrence for many years, and particularly since B. Bang in 1897 described the organism which caused the disease, and which has since borne his name. At a recent meeting of the Health Section of the League of Nations undulant fever was stated to be the most important problem facing public health workers at the present time.

The following case, which occurred in my practice last February, is interesting owing to the fact of having had this disease connected up with the source, which has not been possible, so far as I am aware, in the few previous cases recorded in England.

CASE REPORT

A master upholsterer, aged 32, living in a small Yorkshire town in the West Riding, gave the following history:

He was taken ill on January 24th, 1932, with what was diagnosed as influenza, which was prevalent in the district at that time. He complained of severe headache of a boring character, which lasted for ten days, and his temperature was 103°. At the end of the first week a blood test was made—presumably for the typhoid group—but this was negative. At the end of a fortnight the temperature was normal and remained so for a week, at the end of which time he motored, accompanied by his wife, to a seaside resort about ninety miles distant, for a week's convalescence. On arrival there, having in the meantime provided himself with a clinical thermometer, he found that his evening temperature was 102.6°, and each evening during his stay of eight days was between 102° and 103°, while the morning temperature was normal.

On his way home he visited some relatives in Sheffield, and I was called in the following morning. This was at the beginning of the fifth week of the disease (February 23rd). His temperature was normal, heart and lungs negative, liver freely palpable and somewhat tender, especially over the left lobe, spleen doubtful, some flatulent distension with discomfort over abdomen, and bowels stated to have been somewhat constipated. The tongue was clean at tip and edges, but posterior two-thirds was covered by a thick yellowish fur.

From the history I suspected having to deal with one of the typhoid group, and at once had a specimen of blood conveyed to the pathological department of Sheffield University, where it was found to be negative for *B. typhosus* and *B. paratyphosus* A, B, and C.

Two days later, on the advice of Dr. A. E. Barnes, who saw him in consultation, further samples of blood were taken. A complete set of agglutination tests was done, all of which were negative except the one against *B. abortus* Bang, which caused definite agglutination in a dilution of 1 in 25 to 1 in 250. Three days later another specimen of blood showed a positive reaction in a dilution of 1 in 25 to 1 in 500 (full titre) and a negative reaction for the typhoid group. At this stage an attempt was made to isolate the organism, but after cultivation at 37°C. this was not successful, and there was a similar result with a specimen of urine. A week later a positive reaction was found in a dilution of 1 in 25 to 1 in 1,000, while six weeks later—a month after the patient had returned to work—the blood serum agglutinated *B. abortus* Bang in a dilution of 1 in 25 to 1 in 250, the Widal reactions remaining negative.

The diagnosis was now definitely established—a case of so-called undulant fever. Reference to the accompanying chart will show that the temperature was not of the typical undulating form. The rise in temperature from March 2nd to 5th was due, I think, to active congestion of liver, particularly the left lobe, or possibly to a masked splenitis, the pain from which gave the patient two bad nights, and was completely relieved by a hypodermic injection of scopolamine-morphine, and did not recur. There had been no treatment

beyond rest in bed, nourishing light diet, and for the first few days salol for the bowel condition.

As there is no known treatment I decided to try intramuscular injections of S.U.P. 36. This was done on March 5th, 8th, and 12th—that is, at the end of the sixth week of the disease, and the second week after I first saw him. A glance at the chart will show a quite dramatic change, considering that the average duration of this disease is fifteen and a half weeks. Beyond that was the fact that the following morning, for the first time since the beginning of his illness, the patient enjoyed his food—he had previously had some anorexia—and enjoyed a cigarette. His tongue, which had remained thickly coated, was cleaning, and within forty-eight hours was quite clean, and from that time his temperature remained at or about normal.

He returned home on March 16th, three weeks after I had first seen him. Six weeks later he telephoned to say he had been working full time for a month, and except for slight anaemia, he was quite well. The sequel to the use of S.U.P. 36 was possibly a coincidence, but I should certainly try it again, as I have found it very useful and even striking in somewhat analogous conditions, and in any case it is harmless. It is not suggested that this chemotherapeutic agent strikes at any particular micro-organism, but that it has a great influence on pyrexia and creates a general feeling of well-being in the patient is certain.

Through the activity of Dr. J. Rennie, medical officer of health, and the courtesy of the veterinary department of the West Riding, vaginal swabs, milk, and blood were obtained from the herd of nine cows owned by the farmer by whom the suspected milk was supplied.

All the swabs and milk were negative, but in the case of two cows, which were kept in different sheds, the blood agglutination test was positive—in one in titre 1 in 1,000, and in the other 1 in 500.

COMMENTS

The name abortus fever seems to me preferable to undulant fever, as, although there is a certain amount of undulancy, it is nothing approaching that of a typical case of Mediterranean fever, but bears a close resemblance to that found in tuberculosis, with the regular evening rise and morning fall.

The surprising thing is that the incidence of abortus fever is so low. It may be that the bovine strain is of relatively low pathogenicity for human beings, or that there are other factors of immunity responsible for the low incidence. It is also difficult to understand why children under 5 years of age appear to be almost immune. Is it possible that unrecognized cases in infancy account for the relatively high immunity in adults?

My thanks are due to Dr. A. E. Barnes for suggesting further blood tests, to Professor Edington and staff for their very great help and interest, and to Dr. Rennie for his help in linking up the disease with the source.

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A CASE OF UNDULANT FEVER IN DERBYSHIRE

BY

P. H. J. TURTON, M.D.ED., D.P.H.MANCH,
 PHYSICIAN, HEANOR MEMORIAL HOSPITAL

AND

C. F. PECKHAM

ASSISTANT BACTERIOLOGIST, DERBY COUNTY HOSPITAL

As undulant fever has not hitherto been reported as occurring in Derbyshire in any person indigenous to the county, the following case of this disease is perhaps worthy of record.

CLINICAL HISTORY

A farmer, aged 44, was first seen by one of us on November 20th, 1931. He complained that for a period of three or four weeks previously he had felt very unwell and run down, and had not looked well from the end of September. On October 27th he had a very bad headache when helping a friend to make some doors, and had to go home. The sensation of unwellness continued with bad headaches and tiredness. His appetite was poor, and he slept badly. The headaches were over the vertex and frontal regions. During this time he had no sweats.

He has been a dairy farmer for many years, and owns a herd of twenty cows. He does not live on the farm, which he rents; the occupants of the house at the farm, a maiden lady and her maid, have not, to our knowledge, been ill. He lives at a considerable distance from the farm, and the occupants of this house—his wife, two children, and his father—have all been well. His last illness was seven years ago. He does not visit neighbouring farms, and occasionally attends market at Derby. He works very little on the farm himself, as the milking is done by a man. In late September, 1931, a cow, which he has had two years, had difficulty in calving. He assisted the "vet.," but states that his only contact was to pull on the rope; the calf survived only a short time after delivery, as the mother was "short of room." Contagious or epidemic abortion among cattle is a very common disease in this county. Round Heanor there is scarcely a farm which has not been affected during the past five years. The patient states that his cow was healthy. In the spring of 1931 he had two cows which cast at seven months while running on grass, but he has had no other cases. The patient never drinks raw milk or cream, and only occasionally in summer-time eats home-made butter. No goats are kept on the farm.

On examination the patient had a temperature of 102° F. There was nothing in the chest, abdomen, or urine to note, and the heart sounds were normal. He complained of severe headache and malaise. On the previous evening he had had a rigor, followed by profuse sweating. This was repeated on the three following evenings. He had severe pains in the legs, thighs, and back. Later on he had tenderness and some enlargement of the spleen. The liver did not enlarge, and he did not develop orchitis or synovitis of any joints. During the time fever was marked, sweating at night was profuse and troublesome. On one afternoon during the second week following examination a dusky red, mottled rash was noted on the back and abdomen, and at this stage it was thought that the case was possibly one of paratyphoid. Since he was a farmer, and the symptoms were atypical, the blood serum taken at this stage was tested against a standard culture of *Br. abortus*, and it was found to be the only organism which