

BRUCELLOSIS IN GENERAL PRACTICE

(or how well do you know your milkman?)

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HOW well do you know your milkman? Do you know where he gets his milk from? Do you know whether your milk is pasteurized, T.T., or untreated?

During a discussion on brucellosis, at a clinical meeting of the West Penwith Medical Society, Penzance, last year, Dr Barrow of the Public Health Laboratory Service, Truro, posed these three questions, the validity of which I hope to demonstrate by describing 16 cases of human brucellosis, some briefly and some in greater detail, which have occurred in this practice during the past nine to ten years.

The incidence of human brucellosis in this country is not known, mainly because it is not a notifiable disease, and also because, if the possibility of its occurrence is not borne in mind, it will not be diagnosed and this applies to patients with quite a wide variety of presenting symptoms and signs.

The acute cases present with fairly typical symptoms of fever, sweating, muscle pains and general weakness, and among the farmers in this area are often ascribed to influenza. In a country district it is perhaps easier to realize that there are diseases communicable from animal to man and since tuberculosis is, for all practical purposes, no longer a problem in this way, the one disease which is being communicated to man by the consumption of raw or T.T. milk and by contact with infected cows, is brucellosis. So, in farmers, farm workers and their families, it should be possible to diagnose acute brucellosis provided that it is included in the differential diagnosis.

Chronic brucellosis is much more difficult to recognize, since it can present with a wide variety of symptoms and signs, which may be of long duration and, unfortunately, as has been previously pointed out (Evans 1961, quoted by Bothwell 1963):

“Some patients have to live for years under the shadow of a diagnosis of

neurasthenia, which vaguely implies malingering”.

Brucellosis may not constitute so great a problem as tuberculosis but it is much commoner than is generally supposed, and it has even been suggested that with a falling tuberculin positivity rate in children and in the general population there would also be less resistance to ingested *Brucella abortus*. So, though fewer people are exposed, more will have clinical disease, even though, perhaps the dose of organisms is smaller (Bothwell 1962). This theory follows the observation by Pullinger (1936) that there was difficulty in isolating *Br. abortus* from dirty milk, due to the presence of tubercle bacilli. Simultaneous inoculation of tubercle bacilli and *Br. abortus* resulted in the latter being less able to establish infection than when injected alone; a generalized resistance to *Br. abortus* was shown to exist by injecting the organisms on opposite sides of a guinea-pig. Pullinger suggested that the mononuclear cell reaction stimulated by the tubercle bacilli destroyed the *Br. abortus*.

At the present moment, it is possible to make only an estimate of the number of cases of brucellosis per annum in this country. The Public Health Laboratory Service is notified of from 90 to 100 confirmed cases per annum from the hospital laboratories but this must represent the minimum number of actual cases, since it does not include unconfirmed and undiagnosed cases. Many authorities have collected varying numbers of cases over different periods of time—the largest series being that of Dalrymple-Champneys (1963) who reported 1,459 cases over a period of 25 years.

Brinley-Morgan (1964) stated:

In 1963, 133 cases of human brucellosis were notified to the Public Health Laboratory Service in England and Wales and it is estimated, that 500 to 1,000 cases occur annually.

Figures over the last five years show that the disease is much commoner in rural than in urban areas; one-third of the cases occurred in farmers, farm workers and veterinary surgeons. Of 68 cases in housewives, 11 were farmers' wives.

In our practice, which covers the western half of the Land's End peninsula, during the past nine to ten years there have been 16 cases, and I have no doubt that there are more yet to be proved.

Mode of transmission

Until a few years ago, when driving along the winding roads of west Cornwall, it would not have been at all unusual to have to wait behind a herd of cows wandering home to be milked and leading the herd would have been a bearded billy goat. I discovered that the goat was there because he was, in some mysterious way, instrumental in preventing the cows from ‘slipping’ their calves, i.e. aborting. I was unable to discover how this object was achieved, although some interesting theories were advanced. But the mere presence of the goat and the reason given for its presence, were sufficient indication that the cows were liable to abort.

The incidence of bovine brucellosis in this area is difficult to

ascertain because, although a farmer will have lots of sympathy for his neighbour whose cows are always 'slipping', he will rarely admit to having any trouble himself. However, there is a relatively high incidence of bovine brucellosis in this area, and for this reason there is a correspondingly high risk of human infection and the people at the greatest risk are those who drink raw or T.T. milk, such as farmers, farm workers and their families and those who come in contact with infected animals, such as veterinary surgeons, who have to look upon the disease as a considerable occupational hazard. Another point which I think is of considerable significance is that, in this area, the population at risk is greatly increased in the summer by the influx of holidaymakers in general, and campers in particular, who may well obtain their milk straight from the farm (if not the cow) and thus there is no reason why boy scouts from Balham or Birmingham should not succumb to 'pyrexia of unknown origin' when they return to their city homes 200 miles or more from the source of the infection.

As far as the overall incidence of bovine brucellosis in this country is concerned "a national survey was made in 1960-61 by the Ministry of Agriculture in conjunction with Rothamsted Experimental Station. The survey covered dairy herds in England, Wales and Scotland and took into account differences in herd size, methods of management and vaccination histories. The results of the survey were based on the examination of milk samples and pieces of placentas for the presence of brucella and showed, that 25 per cent to 30 per cent of dairy herds contained infected animals. The majority (62 per cent) of infected herds contained only one or two infected animals per herd and 0.35 per cent contained more than 30 per cent infected animals per herd. On an overall basis 2.07 per cent of all dairy cows were shown to be infected, of which about one-half were excreting brucella in the milk and 0.5 per cent of *all* bovine pregnancies ended in abortion due to this organism. The incidence did not vary a great deal from one region of the country to another but, as expected, the incidence was highest in counties with intensive dairy farming and containing many 'flying' herds and least in self-contained and small herds" (Brinley-Morgan 1964).

It has been estimated from this, that about 36,500 cows are secreting infected milk and since it is permissible to sell raw T.T. milk in cartons from milk vending machines, this is another possible source of infection, as has been suggested by Bothwell (1963).

In another article Bothwell states:

"If everyone drank nothing but pasteurized milk, from 50 to 75 per cent of human cases of brucellosis would disappear. This is true, but the fact is that many people still drink raw milk, particularly in the country, often straight from the farm, and the freedom of cities from infection contrasts with the present problem, when the incidence is predominantly rural. However, even in large cities like Bristol, about 6 per cent of the milk supply remains unpasteurized, and about 140,000 gallons of raw milk was consumed in 1959, some from slot machine dispensers throughout the city, enough to give ample opportunity for brucellosis in a city. Clearly the distribution of non-pasteurized milk from vending machines must give quite a random possibility of infection with any brucella that might be in that milk."

W. R. Saunders, County Public Health Officer for Cornwall,

states that at the end of 1965 there were 404 producer-retailers in the county licensed by the Ministry of Agriculture, Fisheries and Food, to sell 'untreated' milk. Accurate records are not available of the gallonage of this grade of milk sold each day, but we normally consider that about 90 per cent of all the milk retailed in Cornwall is pasteurized. On this basis about 4,000 gallons of untreated milk will be sold in the county each day, although undoubtedly during the peak summer holiday season this quantity would be increased considerably.

In Cornwall efforts are made to limit the sale to the public of raw milk infected by brucellosis by taking regular samples of milk from dairy herds of producer-retailers and submitting these to the Public Health Laboratory, Truro. The routine procedure is for a sample of the bulked milk from each herd to be subjected to the milk ring screening test, and when a positive reaction is obtained then specimens of milk for direct culture examination are taken from each animal in the suspected herd. Should any of these prove positive, the milk from the animals concerned is diverted for heat treatment in a milk factory. During 1965 ten herds were found to contain a total of 48 cows who were excreting live brucella organisms into the milk.

Of six human cases of brucellosis in Cornwall within the last six months, all but one could only have contracted the disease through drinking untreated milk. The odd case was a patient who lived on a farm, and although she drank raw milk could have contracted the disease directly from an infected animal.

Because brucellosis is not a statutorily notifiable disease it is only with the permission of the patient and the farmer that investigations can be instituted to trace the source of the infection. When this can be done and it is possible to trace a human case directly to the consumption of raw milk the county council or the district medical officer have legal powers to take action under section 31 of the Food and Drugs Act 1955, and under Regulation 20 of the Milk and Dairies (General) Regulations 1959.

It is an offence for any person to sell or offer or expose for sale for human consumption, or to use in the manufacture of products for sale for human consumption, the milk from any cow which he knows to be suffering from certain specified diseases likely to convey disease. Brucellosis is within this category.

Milk from these cows must be sent for pasteurization until such time as the cows are shown to be no longer infected, as certified by a veterinary surgeon. One of the difficulties in brucellosis eradication is the intermittent nature of the excretion of the organism into the milk, e.g. in one instance a cow was reacting positively to direct

cultures in November 1963, and January 1964, but did not become positive again until August 1965.

Case reports

Case 1—1957.* Mrs F. A policeman's wife aged 32. This patient presented with pyrexia of unknown origin, generalized muscle pains and sweating. She had chest pains suggestive of localized pleurisy although no pleuritic rub was ever heard. After about ten days an agglutination test proved positive for *Br. abortus* and after treatment with tetracycline 250 mg. six-hourly and streptomycin 1 G. daily for ten days, she recovered. She has had no recurrence of symptoms. The source of the infection was considered to be raw milk delivered from a farm in the village.

Unless otherwise stated, the routine of treatment with tetracycline and streptomycin was adopted in all the cases.

Case 2—1957, July.* Mr E., aged 22, an engineering student, was at first thought to have infectious mononucleosis which, until last year, appeared to be endemic in the school but this was not confirmed and because of his persistent pyrexia he was admitted to hospital. He had palpable glands in both groins and axillae and a palpable spleen. Agglutination tests were positive for *Br. abortus* 1:2,500. This patient was staying at a farm in the district and was considered to have become infected by drinking raw milk. He is now serving overseas and I have no information of his subsequent progress.

Case 3—1959, March. Mrs G.E.S., aged 42, husband a farm worker living in a cottage near the farm, was referred to hospital for investigation of pyrexia of unknown origin, with apparently spontaneous bruising on her forehead and a palpable spleen. There was a recent history of general ill health, sweating, shivering and generalized muscle pains. Initial investigations were negative but later agglutination for *Br. abortus* was positive to a titre of 1:640. She was treated with a combination of terramycin 250 mg. six-hourly and streptomycin 1 G. daily for ten days. There has been no relapse. Her infection was considered to be due to drinking raw milk.

Case 4—1960, June. Mr H.J.H., aged 41, a farmer, presented with headache, malaise, rigors, sweating, pyrexia and chest pains of acute onset. His spleen was palpable. He admitted to having trouble with 'slipped calves'. Blood count on 11 June showed Hb 83 per cent, wbc 5,100 and brucella agglutination to a titre of 1:1,250.

He was acutely ill and was admitted to hospital where he responded promptly to a course of streptomycin 1 G. and tetracycline 250 mg. six-hourly for 12 days. During his stay in hospital his pulse was frequently between 40 and 50/min, but at times reached 70–80/min. ECG showed multiple ventricular extrasystoles. He was in hospital for 12 days and was unfit for work for three months. Since that time he has been in good health although in December, 1962 he was off work for a week with general malaise, shivering and sweating and was still having an occasional 'slipped calf'. His infection was considered to be due to drinking raw milk, although he must have come into close contact with infected cows.

Case 5—1960, August. J.W., aged 16, a farmer's son, was seen when he was

*Details of the first two cases are limited by virtue of the fact that both patients have left the district and their case notes are no longer available and since my interest in brucellosis did not develop until a few years ago I did not keep any special notes.

on holiday from boarding school. History was of recurrent 'colds' with frontal headaches, sweating and sore throats during the previous six months. He had a palpable spleen and blood count on 12 August 1960 showed Hb, 107 per cent, wbc 5,200, ESR 10 mm in one hour and brucella agglutination 1:160. He was admitted to hospital and treated with streptomycin and ledermycin 300 mg. six-hourly. During the middle of the course he had a gastric upset with vomiting, anorexia and general malaise but this seemed to settle down satisfactorily, though at the time it was accompanied by a raised blood urea and an increase in haemoglobin and red cells, probably due to haemoconcentration. Blood examined on 27 August 1960 showed Hb 134 per cent, wbc 9,500, ESR 9, brucella agglutination 1:640, blood urea 82 mg./100 ml. Before discharge from hospital his blood urea, urea clearance and haemoglobin were normal. His blood was checked again on 10 October 1962 and the brucella agglutination was then 1:10 and on 25 October 1964 it was 1:80. His general health has since been satisfactory and although he sometimes tires easily, he is fit enough to play a good game of rugby every Saturday.

Case 6—1962, November. Mr R.P., aged 58, a farmer, complained of general malaise, rigors, sweating and muscle pains, an unproductive cough, and some dyspnoea. During the previous six months he had had frequent 'colds' and although his herd was a fine pedigree Guernsey herd, he had been having trouble with slipping calves.

Blood examination on 26 November 1962 showed Hb 100 per cent, wbc 3,700, ESR 20 and brucella agglutination 1:160. He was given treatment with a combined course of streptomycin and tetracycline and responded quite well, although his convalescence was somewhat prolonged and he was not fit to return to his work until January 1963. During the course of his illness it had been noticed that his pulse rate was relatively slow (52/min) and an ECG was done but this showed no abnormality. In May 1963 he had a mild pulmonary infection and a blood examination showed Hb 92 per cent, wbc 5,200, ESR 23 mm in one hour and brucella agglutination 1:80. Convalescence was again slow and he was off work for six weeks.

In January 1965 he complained of general malaise and depression and blood examination showed Hb 96 per cent, wbc 6,900, ESR 37 and brucella agglutination 1:80. During the past few months he appears to have recovered his normal health and now says that he feels better than he has done for many years. He has had no further trouble with slipped calves.

Case 7—1964, October. Mr A.T., aged 40, a farmer, complained during September 1964 of generalized aches and pains, irritating cough and thought he had 'flu'. No abnormal signs were found during this time. In the first week of October he developed regular evening pyrexia with rigors and profuse sweating and the tip of his spleen became palpable. Blood examination showed Hb 114 per cent, wbc 6,600, ESR 27 mm. in one hour and brucella agglutination 1:80. He was treated with streptomycin 1 G. daily and achromycin 250 mg. six-hourly for ten days. He complained of some paraesthesia, which appeared to be related to the streptomycin and this was satisfactorily controlled with piriton. He was off work for five weeks and has had no recurrence. He admitted to having had some trouble with slipped calves many years previously.

Case 8—1964, November. Mr M.H., aged 45, a farmer, gave a three days history of generalized aches and pains with rigors and sweating. Spleen not palpable. He admitted to having trouble with slipped calves.

Blood count 22 November 1964 showed Hb 105 per cent, wbc 6,600, ESR

6 mm. in one hour and brucella agglutination 1:320. He was treated with streptomycin 1 G. daily and tetracycline 250 mg. six-hourly for 12 days and although he became apyrexial there was no symptomatic improvement and repeat blood count on 18 January 1965 showed Hb. 106 per cent, WBC 6,500, ESR 1 and brucella agglutination 1:10,000. This patient, formerly a typical red faced Cornish farmer, has remained in a state of persistent ill health until the present time. In February 1965 a second course of streptomycin and tetracyclin was given without improvement and, in June 1965, after a further blood count had shown Hb 104 per cent, WBC 8,200, ESR 2 mm. in one hour and brucella agglutination 1:1,280, he was given a course of nalidixic acid 2×0.5 G. four times daily for 14 days—again without any apparent improvement.

This patient is an example of the great difficulty in the management of cases of brucellosis, with relation to the cause and effect of psychiatric illness. During the course of this last year he has become more and more depressed and recently it became necessary to refer him for psychiatric opinion. A blood count on 27 January 1966 showed Hb 104 per cent, WBC 6,600, ESR 2 mm. in one hour and brucella agglutination 1:160.

This suggests that the brucellosis is quiescent or is slowly burning out and the psychiatrist's opinion is that the patient now has an endogeneous depression. There is a strong family history of mental illness but I have no information as to whether other members of his family had brucellosis or not. He still gets trouble with an occasional slipped calf and this, together with what must be quite considerable veterinary bills, almost certainly contributes to his depression. Just recently his depression has considerably improved.

Case 9—1965, May. Mrs M.W., aged 46, a farmer's wife and mother of case 5, had been under treatment for reactive depression for six years and was attending the psychiatric outpatient department. In April 1963 she took an overdose of sedatives and was admitted to the mental hospital. It was not until May 1965 that a blood count was done and showed Hb 69 per cent, WBC 5,200, ESR 2 mm. in one hour and brucella agglutination 1:20. In spite of the low titre it was considered that this was a case of chronic brucellosis and a course of the usual treatment—plus iron for her anaemia, improved her general condition. Unfortunately, the reactive depression was unaltered which is probably not surprising in view of the fact that the circumstances responsible for her depression also remained unaltered.

She entered hospital as a voluntary patient for three weeks in July-August 1965 and while there was given a course of nalidixic acid, after which the brucella agglutination was 1:10. On her last visit to the psychiatrist in February 1966 he reported "she was brighter and less tense than I have known her for some time". The role of chronic brucellosis in this particular case is obviously open to discussion but the fact remains that the possibility of chronic brucellosis being associated with psychiatric or psychoneurotic illness must not be overlooked.

Cases 10, 11 and 12—1964, December. Mrs M.A.J., aged 43; E.J., aged 11 and J.J., aged 15 are a farmer's wife, son and daughter. The first case discovered in this trio was the mother. She is an energetic and hardworking farmer's wife who had during the last four to six weeks found it increasingly difficult to cope with all the household duties. She complained of general malaise, lassitude, irritability and getting worried because even small differences with her husband were being magnified out of all proportion. There had been trouble with slipped calves on the farm and the possibility of brucellosis was considered. Blood count on 8 December 1964 showed Hb 96 per cent, WBC 6,300, ESR 13 mm. in one hour and brucella agglutination 1:160. She was given a 12-day course of

streptomycin and tetracycline with marked improvement in her general condition and this improvement has been maintained.

E.J., aged 11, the son, had a history of recurrent sore throats and colds, with general malaise during the previous four months and had spent more time at home than in school. In June 1964 he was admitted to hospital for removal of an acutely inflamed appendix.

Blood count on 8 December 1964 showed Hb 92 per cent, wbc 10,100, ESR 17 mm. in one hour and brucella agglutination 1:80. He was given achromycin syrup for 14 days, with marked improvement in his general condition and he has not required any treatment since then.

J.J., aged 15, the daughter, a big, strapping girl and except for nasal catarrh appeared to be in rude health and had no symptoms. Her blood count on 15 December 1964 showed Hb 86 per cent, wbc 8,000, ESR 90 mm. in one hour and brucella agglutination 1:20. She protested that she felt in perfect health so treatment was not instituted but in view of the high ESR the blood count was repeated on 14 January 1965 and this showed Hb 82 per cent, wbc 4,400, ESR 27 mm. in one hour and brucella agglutination 1:20. She was still symptom free and was given no treatment.

The father, a very hardworking farmer, with a history of many years duration suggestive of duodenal ulcer (he could never spare the time to have this confirmed by x-ray) had a blood count on 15 December 1964 and this showed Hb 106 per cent, wbc 9,200, ESR 6 mm. in one hour and the serum failed to agglutinate the antigen for *Br. abortus*.

The cows were not tested for evidence of bovine brucellosis and whereas there used to be 10 or 11 slipped calves every year, they only had one last year!

Cases 13, 14 and 15. J.T.B.H., aged 20, farmer's son. Mr W.H., aged 56, farmer, and M.H., aged 26, farmer's son.

The first patient, J.T.B.H., (27 May 1965) gave a history of four to five days of general malaise, some backache and shivering, and sweating at night. Temperature 98.6°F, pulse 68. The spleen was palpable and tender and there were palpable glands in the groins. The possibility of brucellosis was considered although the farmer was reluctant to admit to having any trouble with his cows and this patient's main job on the farm was looking after the pigs. A blood count showed Hb 95 per cent, wbc 6,100, ESR 10 mm. in one hour and brucella agglutination 1:80. He was treated symptomatically and on 1 June 1965 the titre for agglutination to *Br. abortus* had increased to 1:640. He was treated with streptomycin and achromycin for 12 days and has required no treatment since then.

W.H., aged 56, the father of J.T.B.H., had no symptoms but had been seen on several previous occasions because of backache, sacroiliac pain and large joint pains. His blood count on 14 May 1965 showed Hb 102 per cent, wbc 8,200, ESR 1 mm. in one hour and brucella agglutination 1:80. Neither he nor his son, M.H. whose blood count on 14 June 1965 showed Hb 102 per cent, wbc 8,300, ESR 18 mm. in one hour and brucella agglutination 1:20 were given any treatment—mainly because of their freedom from symptoms and because they did not think that any treatment was necessary. To complete the family picture a blood count was done on the mother and this was normal with a negative agglutination for *Br. abortus*.

Case 16—1965, September. A.K.G., aged 49, a farmer, gave a history of five days generalized aches and pains, stiff neck, frontal headache and marked lassitude. He admitted to having trouble with slipped calves. Blood count on 9 September 1965 showed Hb 106 per cent, wbc 10,500, ESR 2 mm. in one hour

and brucella agglutination 1:160. He was given a course of streptomycin and achromycin and blood count was repeated on 29 September 1965 showing Hb 102 per cent, WBC 7,300, ESR 1 mm. in one hour and brucella agglutination 1:80. He was off work for one month and since then has been fit and well. A check blood count was done on his wife and this was normal with negative agglutination for *Br. abortus*. The milk on the farm was not checked for bovine brucellosis.

Summary

The 16 cases described involved 11 farms in this area and I think it would be more than optimistic to suppose that these are the only farms which are potential sources of brucella infection.

This must mean that quite a large proportion of the farming community in this area is exposed to the possibility of brucellosis.

Even more important, as has been suggested already, is the fact that the population at risk is greatly increased during the summer months by the influx of holidaymakers—especially campers. A further possible danger is that church fetes and sunday school treats are often supplied with free milk from the farms.

The problem of the control and eradication of brucellosis has previously been adequately discussed and constructive suggestions made by Bothwell, *et al.* (1963) and by Brinley-Morgan (1964). Without going into greater detail, these amount to the fact that human brucellosis cannot be controlled nor eradicated without first eradicating the disease in cattle.

It will be appreciated that this process will involve considerable trouble and financial loss to the farmers and this problem is fully discussed in the articles already mentioned—but it has also been pointed out, that as far as animal disease is concerned, “abortion, infertility, reduced milk yield and reduced capital value of stock has been estimated to cost £16 million per annum” (McDiarmid 1960).

As far as the mode of infection is concerned, in the 16 cases described, it would appear that seven of them became infected as a result of drinking raw milk and nine by a combination of contact with infected cows and drinking raw milk. Unfortunately, this statement is not capable of absolute proof and is an assumption based upon the opportunity of contact with infected cows. Human brucellosis is not statutorially notifiable, and only in those cases where the farmer and the patient give their permission can possible sources of infection in the milk be investigated and proved. Some farmers have their cows and the milk tested by arrangement with their veterinary surgeons and I believe that the great majority of farmers in this area take advantage of the free vaccination scheme with S.19. However, in those cases where a farmer who is attempting to maintain a brucella-free herd finds that any of his cows have

become infected, there is nothing to prevent him selling such cows in the open market and this, of course, is liable to introduce the disease elsewhere.

Of six farms in this series whose milk was investigated, four produced positive results for brucella infection and two were apparently negative. I have been unable to obtain detailed results of these tests, except for one case in which 39 bovine milk samples were tested; nine of which were positive to the milk ring test and one of these was positive for brucella organisms on culture.

POSTSCRIPT

Since writing this article, seven more patients have been investigated as possible cases of brucellosis—two were suffering from osteoarthritis possibly related to chronic brucellosis. Four of them produced positive agglutination reactions and three negative.

1. M.K., aged 62. A farmer, with severe degree of osteoarthritis of his hip. Result:—negative.

2. J.R., aged 56. A farmer, with osteoarthritis of lumbar spine and hips. Result:—Agglutination for *Br. abortus* positive to titre of 1:40.

3. P.R., aged 30. (J.R.'s daughter.) History of recurrent sore throats and laryngitis. Result:—negative.

4. W.J.E., aged 37. Former farm worker. Ten days history of general malaise, with backache and evening rigors. Blood count:—Agglutination for *Br. abortus* positive to a titre of 1:20. Treatment is symptomatic and blood count will be repeated to see if there is a rising titre.

5. J.K.R., aged 41. Farm worker on the farm where three cases were discovered in 1965. Cases 10, 11, and 12. Asymptomatic. Result:—negative.

6. Mrs I.E.R., aged 39. J.K.R.'s wife. History of general malaise, lassitude and frequent 'colds'. Had previously drunk raw milk. Blood count:—Agglutination for *Br. abortus* positive to a titre of 1:80.

7. K.J.R., aged 5½. J.K.R.'s son. Frequent colds with chronic hypertrophy of tonsils. Had previously drunk raw milk. Blood count:—Agglutination to *Br. abortus* positive to a titre of 1:40.

It may be not without some significance to note that in May 1959, Mrs I.E.R. had a three months' miscarriage, although whether this patient had brucellosis at the time, or even if she did, whether it would have contributed to the miscarriage, is a matter for speculation. However, it is well worth while noting that according to Topley and Wilson: "Infection during pregnancy is sometimes, but not often, followed by abortion. The organism may be isolated from the placenta and uterus of the mother and from the stomach contents of the foetus".

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UNMARRIED MOTHERS—THE NEED FOR SPECIAL CARE

Speaking at the annual general meeting of the National Council for Unmarried Mothers the Minister of Health, Mr Kenneth Robinson said:

“What would perhaps be of most value to the unmarried mother and illegitimate child is a more enlightened climate of opinion. Despite the vastly freer discussion of sexual matters in the more liberal atmosphere of today the young unmarried mother cannot yet feel assured that she will always meet with compassion and understanding.”

Stating that many young mothers were not prepared to go into a mother and baby home for a fixed period of time, Mr Robinson said this implied that a greater variety of provision was required and a more flexible length of stay. He went on: “There have been encouraging experiments in finding foster homes, especially for younger girls, or lodgings with a family prepared to take a real interest in a young mother and to build up a supporting and continuing relationship. I hope we shall see more of this kind of individual care developing alongside traditional methods, not least because it helps to keep the mother in the community at a time when she may feel particularly cut off from everyday life.”

“I do not wish to use this occasion to pronounce on the merits or otherwise of providing family planning facilities for the unmarried. There may be differences of view. But we are surely all agreed that there is a pressing need to educate our young people to approach the problems of sexual relationship with a sense of personal and social responsibility.”