Sir HENRY MCCARDIE then delivered the Maudsley Lecture (*vide* p. 4).

Dr. NATHAN RAW, *C.M.G.*, in proposing a vote of thanks to the Lecturer, said that as a Past-President of the Association, it was his privilege to ask the company assembled to record their very hearty thanks to the Maudsley Lecturer. He was sure that all present had listened to a brilliant, human, witty and philosophical discourse in memory of Dr. Maudsley—a great physician and a great philanthropist. The memory of Maudsley would always be in safe keeping while the Association had a lecturer of the character of the present one. Sir Henry McCardie was a great ornament to the legal profession, and members knew that his sympathies were now and always had been with the medical profession. Sir Henry would forgive him saying he would have made an equally great physician or psychologist. To-day's lecture was based on long observation and experience in a very privileged position as a Justice, and he hoped members would have the pleasure of reading the lecture at leisure. On behalf of the Council he proposed that a very hearty vote of thanks be given to Sir Henry McCardie for having given this literary treat. (Applause.)

Sir ROBERT ARMSTRONG-JONES said he had been asked to second the vote of thanks to the learned Lecturer, the Hon. Mr. Justice McCardie, and he did so with very much pleasure. Truth had no creed, no country, no race. The seeker after truth, as the psychologist knew, was engaged in the highest human employment. The Law of Evidence, for instance, was based upon the search for truth, and the establishment of facts was a technical matter; it was an important and delicate process, and was quite properly subject to definite rules and principles. The great physician, like the great lawyer, had a passion for truth, and the Judge usually prepared the ground for his sober, considered and impartial judgment by placing his witnesses on their oath to speak the truth, the whole truth, and nothing but the truth. Sir Robert was not sure whether it was desirable or necessary that the doctor should always tell the whole truth. Was it right that, knowing, as psychiatrists did, the great influence of the mind upon the body, the doctor who diagnosed an inoperable cancer should tell his patient he had only a few more months or weeks to live? Dr. John Radcliffe bluntly told Queen Anne that her illness was nothing but "the vapours"—meaning hysteria—a piece of truthfulness that permanently consigned her care afterwards to other hands. The same physician had previously told William III that he would not exchange the King's swollen legs for his own, even if he received the Three Kingdoms in exchange; and he never was asked to visit the King again. It was the custom in those days to indulge in brutality of speech, and perhaps to confuse this with truth.

Sir Robert said he recently heard the Lecturer, in the midst of doctors, dilating learnedly upon the history of medicine, from Hippocrates and Galen to the present President of the Royal College of Physicians, and he had charmed and interested the present company again this afternoon. No one could have given an audience of psychiatrists more food for reflection than Sir Henry had done, and it would have delighted the great man who endowed this Lecture, and whom the speaker knew intimately, if he had been present. All were most grateful for the oration.

The PRESIDENT said he took it there was scarcely any need to put the vote to the meeting; he was sure it would be approved in the usual way.

The vote was carried by acclamation.

Sir HENRY MCCARDIE, in reply, said he appreciated, most heartily, the kindly and all-too-generous words which had been spoken by Dr. Nathan Raw and Sir Robert Armstrong-Jones; both were very kind-hearted men to have done this. It had been a pleasure to come that day and deliver the address; and for the courtesy, patience and goodwill of the audience he could no other answer make than thanks, and thanks again. (Applause.)

SOUTH-WESTERN DIVISION.

THE AUTUMN MEETING of the Division was held by kind invitation of the Committee of Management and of Dr. V. L. Connolly, *M.C.*, at the Hampshire County Mental Hospital, Park Prewett, near Basingstoke, on Thursday, October 30, 1930.

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The following members were present: Drs. E. Barton White, Good, Skottowe, Davies-Jones, Connolly, Benson, Nathan Raw, B. M. Mules, McGarvey, Dawson, Jackson, Major Will, Drs. Shepherd, A. S. Mules, J. J. O'Reilly, Barber, Lornie, Eager, Dudley and Martin. Mr. C. R. de la Salle, Mrs. Robert Weir, Drs. Dykes, McWilliam and McIlroy attended as visitors.

Dr. Barton White was in the chair.

The minutes of the last meeting were confirmed and signed.

Apologies for absence were received from Drs. Bedford, Ross, Gane and others.

A letter was read from Dr. W. Starkey conveying to the members his most grateful thanks for their generous gift of a Remington typewriter on his retirement, and wishing continued prosperity to the South-Western Division.

Dr. S. E. Martin was nominated as Hon. Divisional Secretary, and Drs. Barton White and J. McGarvey as Representative Members of Council, on the proposal of Dr. J. L. Jackson, seconded by Dr. B. M. Mules, and passed unanimously.

Dr. Barton White was nominated for the position of Chairman of the Division for 1931–32 on the proposal of Dr. Nathan Raw, seconded by Dr. B. M. Mules.

Drs. Connolly and Dudley and Major Will were elected members of the Committee of Management in place of Drs. T. S. Good, Nelis and S. E. Martin, on the proposition of Dr. B. M. Mules, seconded by Dr. J. McGarvey, and passed unanimously.

The following were elected as ordinary members:

MARGARET CORDELIA VIVIAN, L.M.S.S.A., "Marley," Belle Vue Road, Southbourne, Bournemouth.

Proposed by Drs. J. P. Westrup, J. R. Benson and S. E. Martin.

CHARLES GEORGE COWIE, M.A., M.D., C.M.Aberd., M.P.C., Visiting Physician, St. Ann's Convalescent Home (Holloway Sanatorium); Bonaccord, Wesminster Road, Branksome Park, Bournemouth.

Proposed by Drs. J. P. Westrup, J. R. Benson and S. E. Martin.

STANLEY MAURICE COLEMAN, M.R.C.S., L.R.C.P., D.P.M., Senior Assistant Medical Officer, Dorset Mental Hospital, Herrison, Dorchester.

Proposed by Drs. P. W. Bedford, G. W. T. H. Fleming and S. E. Martin.

The place of the Spring Meeting, 1931, was discussed, and Dr. T. S. Good kindly suggested that the meeting should be held at Littlemore on April 30, 1931. The Chairman thanked him very much, but suggested that as Dr. Good was very busy this year, if another offer was received the decision should be left in the hands of the Hon. Divisional Secretary.

Dr. GOOD brought before the meeting the question of "Voluntary Eugenic Sterilization," and suggested that all members should consider the *questionnaire* very carefully and give all their help and assistance to the R.M.P.A.

Dr. J. J. O'REILLY demonstrated a case of fracture of the left parietal bone followed by mental symptoms. A discussion ensued, in which Drs. Good, Barton White, Jackson, Eager, Nathan Raw and others took part.

PAPER.—"Undulant Fever," by J. J. O'REILLY, M.B., B.Ch., D.P.M., Assistant Medical Officer, Park Prewett Mental Hospital.

PREFACE.

Undulant fever is associated with two organisms which were at one time believed to be distinct species, the one *Brucella melitensis*, the causative organism of Malta fever, the other *Brucella abortus*, the causative organism of contagious abortion in cattle.

INTRODUCTION.

Interest was first aroused in this condition by the occurrence amongst British forces, during the Crimean War and after, of a peculiar remittent type of fever, of insidious onset, in some ways resembling typhoid fever, but characterized by the vaguer and more protean nature of its symptoms and by prolonged convalescencet

As a result of his investigations into these cases Bruce, in 1886, succeeded in isolating the causative organism, which he named, erroneously, the *Micrococcus melitensis*, the disease itself being known as Mediterranean, or Malta fever.

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In 1904 was set up the British Commission on Malta fever, which carried out an exhaustive investigation into the incidence of the disease in Malta and eventually showed that it was due to drinking the milk of infected goats. The investigation showed that the blood-serum of 40% of the goats in Malta agglutinated the *melitensis* organism and that large numbers of apparently healthy goats were passing it in their milk. The prohibition of the use of unboiled goats' milk by the garrison forces resulted in a sudden and marked reduction in the number of cases.

A further proof, if any were needed, of the relationship of this organism to Malta fever was provided in the case of the steamship " Joshua Nicholson," which left Malta on August 19, 1905, bound for Antwerp with a cargo of 65 goats, apparently healthy, and specially picked for ultimate consignment to the United States. During the voyage the milk of these goats was used by the majority of the officers and crew. Out of 12 officers and men, 8 fell ill at varying periods from 18–34 days from the date of sailing, and of these 5 were afterwards shown to have in their blood agglutinins for the *Micrococcus melitensis* Of the remaining four who did not develop any illness, two had taken very little of the milk, whilst the other two —German engineers—had taken boiled milk only.

The disease had been known from very early times in the area forming the Mediterranean Basin—it has been claimed by some authorities that a disease described by Hippocrates was probably Malta fever.

Contagious abortion in cattle had been described as far back as 1567, and in the *Complete Farmer* for 1807 the following paragraph occurs in relation to this disease :

> " The abortion should at once be burnt and the cow segregated from the rest of the herd, nor should she be allowed to receive the bull that goes with them."

The pioneer work on this condition was carried out by Bang, who in 1896 isolated the causative organism—the *Bacillus abortus* of Bang. Later a further strain of this organism was isolated which showed an enhanced virulence for swine.

This organism, the *Bacillus abortus*, has a predilection for embryonic tissue, and in cases of abortion can be recovered with comparative ease from the membranes, placenta and colostrum. After abortion it rapidly disappears from the genital organs, but later can be found in the tissue of the udder and the lacteal ducts, whence it finds its way into the milk.

Abortion usually occurs about the seventh month, but may occur in the first or second month and pass unnoticed, and as infection with the organism in cattle gives rise to no symptoms apart from those of abortion, the infected animal may continue to excrete the bacillus in its milk, although apparently in good health. In the great majority of animals abortion does not occur more than once, but there may be sequelæ of infection in the shape of lowered milk production, or sterility, temporary or permanent. The blood and milk of the infected animal agglutinate the bacillus.

The extent of bovine infection with this organism is not actually known, but some interesting statistics on the point have been published both in this country and in America. Wilson and Nutt examined 488 samples of cows' milk in Manchester, and found that 5·7% of single milks and 8·8% of mixed milks were infected with *Bacillus abortus*. In America in 1911 Schroeder and Cotton found the organism present in more than 10% of 77 milks examined by them. In the same year the first definite instance of human infection was reported from America following the isolation of the organism. from the tonsils of a child.

Dr. Alice Evans, of the U.S.A. Department of Agriculture, made a comparative study of the two organisms, *abortus* and *melitensis*, and demonstrated that they were indistinguishable except by agglutinin absorption tests. It had been shown earlier that the organism designated by Bruce the *Micrococcus melitensis* was in reality a bacillus showing pleomorphic variation. This fact probably accounted for the long delay in recognizing the affinity between the two organisms.

Numerous terms have been applied at different times and in different countries to designate infection of man by one or other of these organisms, but the term " undulant fever " is now used by general consent to indicate human infection by the *melitensis* organism or by the bovine or porcine varieties of the *abortus* organism. As the result of further work these organisms have now been placed in one group under the heading *Brucella*, and they are usually referred to as "*Brucella melitensis*" and "*Brucella abortus*."

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Melitensis infection tends to be more prevalent in sub-tropical climates, and as regards animals, chiefly affects the goat, where abortions are fairly frequent, but it may also affect cattle, sheep, dogs, etc. *Abortus* infection is practically world-wide and chiefly affects cattle, but tends to be less prominent where *melitensis* infection is rife. There is some evidence that *melitensis* infection protects against *abortus* infection, which may be the explanation at the back of the old custom amongst farmers of running a goat with the herd of cattle.

Characteristics of the Organisms.

The organisms are characterized by their great pleomorphism, and by the difficulty of separating human, bovine, porcine and caprine strains by ordinary laboratory methods.

The *melitensis* organism is from ·5–2μ long and ·5μ wide, non-motile, non-sporing and Gram-negative. Primary cultivation is somewhat difficult, and growth does not appear until about five days after incubation. After a few transfers on artificial media, however, it grows abundantly on all ordinary media. *B. abortus* is somewhat more difficult to cultivate, and requires an atmosphere of 10% CO_2 to ensure growth. After 10–12 transfers it can be grown at atmospheric CO_2 tension.

The organism may be recovered from the blood during the early stages of the disease, and indeed isolation of the organism has been reported in cases lasting 6–8 months. The chances of obtaining the organism appear to be most favourable if the blood is withdrawn when the temperature is at its highest point. The organism has also been recovered from the urine.

Probably the most certain way of isolating these organisms is to inoculate a guinea-pig with the suspected blood. It is of interest to note that the *post-mortem* appearances of infected guinea-pigs strongly resembles those of tuberculosis, and it has been suggested that in some cases where guinea-pigs have been killed and examined following an inoculation with milk suspected of containing T.B., and in which *post-mortem* conditions resembling T.B., but without the presence of an acid-fast bacillus, have been found, the condition may have been due to infection with one or other of these organisms.

Undulant Fever in Man.

Undulant fever is a disease of adults, occurring usually between the ages of 20 and 45. No case has been reported under the age of 5. It is interesting to note in this connection that young calves are said to be immune to the disease. It is said to be more prevalent amongst males, but the validity of this contention is doubtful.

There is no essential difference between the disease caused by the *melitensis* and that caused by the *abortus* except that the latter is much more rare. The disease is characterized by an insidious onset, with a feeling of general malaise, headache, bone-ache, pains in the joints of fleeting nature, and sometimes associated with transient swellings, the sacro-iliac joints being particularly liable to be affected. The temperature is remittent in type; it begins to rise between 10–11 a.m., reaches its maximum between 2 and 3 p.m., and then falls again to normal or subnormal between 10 and 11 p.m. The fall is associated with profuse sweating, so much so that it may be necessary to change the clothing once or twice during the night. The sweat has a peculiar and characteristic tang easily recognized when once experienced. There is often cardiac discomfort, palpitation and tachycardia on slight exertion, and præcordial pain. There may be harsh, troublesome cough, congestion of the lungs has been reported, but this is said to be rare. The liver and spleen are nearly always enlarged and palpable, and there may be swelling of the lymphatic glands in various regions.

Mastitis, oöphoritis and orchitis have all been reported; one of these symptoms, oöphoritis, occurred in one of our cases and caused considerable confusion in diagnosis. Mental symptoms also occur—irritability, depression, loss of memory, inability to concentrate. These were so prominent in one of our cases as to render the victim unfit for continued duty. The striking feature of the disease is the prominence of the symptoms in contrast to the lack of objective signs and the comparatively healthy appearance of the patient. Severe constipation is an invariable accompaniment of the disease.

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The incubation period is unknown, but is estimated by various observers to be between 10–15 days. The duration of the disease varies; as a rule it consists of a series of febrile attacks each lasting one or more weeks, and followed by a variable period of absolute or relative freedom from pyrexia. Cases have, however, been reported lasting 6–8 months or even as long as two years. Although the mortality is low, the seriousness of the disease will be appreciated when it is stated that at the present time there is no known cure; the infection seems to burn itself out.

The blood changes are usually confined to a relative lymphocytosis, with or without an absolute leucocytosis; there may be a secondary anæmia. This relative lymphocytosis is regarded by some authorities as characteristic of the disease. Cantaloupe states that the combination of sweating, aches, constipation, asthenia, undulant temperature and relapses is found more often in this than any other disease, and is sufficient to justify a diagnosis of undulant fever. At the same time, however, these symptoms are so inconstant that no one of them can be said to be typical of the disease, and it is practically impossible to make a differential diagnosis without the aid of bacteriological and serological investigation.

Differential Diagnosis.

The following are some of the diseases from which undulant fever has to be differentiated: typhoid fever, malaria, tuberculosis, influenza, tularæmia, malignant endocarditis and focal sepsis.

Laboratory Diagnosis.

The three chief methods here are hæmoculture, animal inoculation and agglutination reaction. The latter is somewhat variable in this disease, and is probably not so reliable as in the enteric group. Unfortunately many of the published results of investigations of the agglutination reaction in this disease have been obtained by different methods, and it is extremely difficult to compare the figures of one worker with those of another. All the results given in this paper have been obtained with Oxford standard sera, using Dreyer's technique.

Normally the agglutination reaction appears during the second week of the disease, but cases have occurred, as in one of our own, where it has failed to appear for some time, or it has been absent throughout even though the organism has been isolated from the blood. Instances have been reported where the serum failed to agglutinate the strain isolated from the patient's blood.

There is some diversity of opinion as to the significance to be attached to a positive agglutination reaction, and as to the titre of agglutination which should be regarded as indicating active infection. Some authors have put forward the theory that the occurrence of positive reactions of low titre in apparently healthy persons is the result of absorption of agglutinins present in the cow's milk. There does not appear to be much support for this theory. It appears probable that individuals may suffer from mild infections which pass unnoticed at the time.

Wilson, in a recent paper, put forward the following suggestions:

In the absence of clinical symptoms a titre of 1–80 or less probably indicates past infection with a *Brucella* organism, which infection may not have been attended by definite disease. A titre of 1–100 or more in the absence of clinical symptoms probably indicates a latent infection or repeated past infection.

In the presence of pyrexia or other symptoms of the disease a titre of 1–100 or less may be taken as diagnostic of *Brucella* infection. A titre of 1–20 to 1–100 in the presence of clinically undulant fever may likewise be regarded as practically diagnostic of *Brucella* infection. Finally it must be emphasized that the disease may be present with complete absence of agglutinins in the blood, though this is uncommon, at any rate in *abortus* infection.

Another method of diagnosis is the intradermal reaction of Burnet, which consists in the intradermal inoculation of ·05–·1 c.c. of filtered 20-days' old broth culture of the organism. A positive reaction is indicated by the appearance within six hours of a small, slightly raised œdematous plaque, of a redder tinge than the surrounding skin. Its clinical value is not yet firmly established.

In the use of the agglutination reaction there are two sources of error. The causal organism is liable to agglutination by non-specific sera. This source of error may be avoided by heating the blood to 56° C. for half an hour prior to the

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test. The other source of error is the occurrence of paradoxical reactions, when agglutination disappears or is absent in low dilutions but reappears in higher dilutions; it is important therefore to employ a long range of dilutions in the test. There appears also to be the possibility of agglutination of the organism by the sera of apparently healthy persons. This is a point which requires further investigation; it may be that these reactions are the result of a mild infection, past or present. In our series of routine agglutination tests, several patients gave reactions varying from 1–10 to 1–50 without other evidence of having suffered from the disease.

Cases Occurring in this Institution.

Three cases were met with showing pyrexia, malaise, sweating and constipation, and a lymphocytosis, and giving a positive reaction with the agglutination test, varying from 1–250 to 1–1,350. They were regarded as clinically active cases of undulant fever, but in none of them was it possible to isolate the causative organism.

Case No. 1: Member of Female Staff, æt. 42.

In November, 1929, she began to complain of loss of appetite, a general feeling of tiredness after her day's work, and tired pains in her back and legs. She felt depressed, had a sinking feeling in her epigastrium, and was somewhat drowsy. She always felt tired when she awakened in the morning and disinclined to get up.

She used to sweat excessively at night, and in the morning would wake up "in a bath of perspiration." Sometimes she used to get a sharp stabbing pain in the right gluteal region resembling a neuralgic affection of the sciatic nerve. On January 25, 1930, she reported sick and retired to bed. During the previous week she had complained of dull pain in the lower part of the abdomen, varying from the right side to the left, and of pain on passing urine.

Physical examination failed to reveal any objective signs of disease.

During the whole of her illness she exhibited a pyrexia with a daily variation between normal and 101°, occasionally rising to 102°, the lower limit occurring about 6 a.m. and the maximum between 6 and 10 p.m., more usually at 6 p.m. Pulse-rate averaged 86, respirations 20.

The condition was at first thought to be cystitis, but her urine proved completely negative. Toward the end of February she was seen by one of the consultant surgeons to the hospital, who made a provisional diagnosis of appendicitis, or ovarian trouble, and suggested her removal to a general hospital for more detailed examination. This was done, but no physical abnormality was detected. Culture of the blood proved negative, as did also the agglutination reaction for typhoid and paratyphoid. It was then suggested that the condition might be due to infection with *Brucella abortus*. The patient had then been ill ten weeks. Her blood was examined for agglutinins to *Brucella abortus* and *melitensis*, but proved negative on two separate occasions. On the third occasion the blood agglutinated both organisms to a titre of 1 in 1,250, and absorptions tests showed the causative organism to be *Brucella abortus*.

Her red cell-count was 3,800,000 per c.mm.; her white cell-count was 8,347 per c.mm. Differential count showed polymorphonuclears 35·5%, lymphocytes 63·5%, transitionals 1%.

The patient stated that since she joined the staff of this hospital three and a half years ago, she had been accustomed to drink 1½ pints of raw milk daily.

Treatment consisted of rest in bed and general antipyretic methods; she gradually lost her feeling of tiredness, sweating was less marked, and by the end of March, 1930, her temperature had returned to normal.

Examination of her blood on May 26, 1930, showed an agglutination reaction to *Brucella abortus* in a titre of 1–150. Differential count showed polymorphs 39·5%, lymphocytes 52%.

On October 14 the agglutination titre had fallen to 1–335; she is now apparently in good health.

It is interesting to note in this case that the diagnosis was obscured by localization of symptoms to the genito-urinary system, presumably due to a condition of oöphoritis, and that the agglutination reaction was absent until the tenth week of the disease. Attempts to recover the *Brucella abortus* from the blood were unsuccessful.

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Case No. 2: Member of Male Nursing Staff, æt. 33.

Joined the army in 1917, and entered the service of this hospital on his discharge in February, 1924. He served in France and India, and whilst in the latter country he was bitten by a mosquito and was given quinine treatment. He does not know whether he was regarded as suffering from malaria, but at intervals of perhaps six months he had to spend a few days in hospital with general malaise, feverishness, and muscular aching, his temperature rising to 102°. His condition, however, had entirely cleared up by 1924, and when he joined the staff here he felt quite fit.

In February, 1930, he began to complain of headache, tiredness, pains in his legs, and constipation. These attacks came in bouts lasting for two or three days, but he did not report sick, and his temperature was not taken. At the time he was in the habit of taking one pint of raw milk two or three times weekly. Examination of his blood in April, 1930, showed: Total red cell-count, 5,483,000 per c.mm.; total white cell-count, 6,660 per c.mm. Differential count: polymorphonuclears, 42%; lymphocytes, 56%. Agglutination reaction positive at 1–80 to *abortus* and *melitensis*.

One month later his blood showed a positive agglutination for *abortus* 1–50, *melitensis* 1–125, and agglutination absorption tests showed the causative organism to be *Brucella melitensis*. A differential count taken at the same time showed: Polymorphonuclears, 70%; lymphocytes, 22·5%; monocytes, 6·5%.

On October 14 his blood was again examined, and agglutinated *B. abortus* and *melitensis* to a titre of 1–175. He still complains of obstinate constipation, but is otherwise free from symptoms.

It is of interest to note in connection with this case a remark by Muir and Ritchie that *melitensis* organisms may remain alive in the body of a mosquito for four to five days, and that possibly these insects may occasionally be the means of carrying the disease; they add, however, that there is no evidence that this takes place to any extent.

Case No. 3: Member of Female Staff, æt. 20.

In January she began to complain of feeling tired and unfit for work. Prior to this she had been a willing worker and a good nurse, and had shown considerable ability at the lectures and examinations. As a matter of fact she sat for and obtained the R.M.P.A. Certificate during her illness. This condition of general malaise gradually became more marked; she sweated on slight exertion and at night. Her appetite became poor and she complained of obstinate constipation. This condition continued until May, 1930, when she came under medical observation, having fainted whilst taking a bath.

She gave a history of having taken ½ pint of milk (unboiled) daily with her meals. Physical examination showed nothing abnormal except tachycardia. She stated she had occasional attacks of palpitation since her illness first started. She showed a slight daily rise of temperature to 99·8°.

Her total red cell-count was 2,977,000; white cell-count 8,750. Differential count showed polymorphs 54·5%, lymphocytes 43·5%, and eosinophiles 2·0%.

Her blood agglutinated *B. abortus* to a titre of 1–250. With the exception of ten days in bed after first reporting sick the patient remained on duty during the illness, but other members of the staff began to remark that she was getting rather peculiar. She became depressed, moody and irritable, would not associate with others, and resented being spoken to by her superiors. On one occasion, for no apparent reason, she struck another nurse on the head with a bag of laundry and then ran off. She finally resigned, and left because she felt she was not being given her proper place in the wards, and I have been unable to obtain any details as to the subsequent course of her illness.

In addition to the foregoing, investigations have been carried out on the blood of 26 females—13 patients and 13 staff, and 65 males—57 patients and 8 staff.

Of the females one patient gave a positive agglutination reaction in a titre of 1–10; she showed a differential count of polymorphs 63%, lymphocytes 36%, but had no symptoms or history of suggestive *Brucella* infection.

Amongst the males 3 patients gave positive agglutination reactions. One, C.V. A—,

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in a titre of 1–40, differential count polymorphs 49%, lymphocytes 48%. Examination of this patient showed no physical symptoms of any description. In 1918 he had " 'flu," and in 1923 and 1924 had malaria whilst abroad; this latter diagnosis, however, was his own; he had not been medically examined, nor was his blood examined for parasites. The question of a *Brucella* infection remains undecided; it may have been what he called malaria.

Another, R. A. S. D—. showed an agglutination reaction in a titre of 1–50. Differential count showed polymorphs 72·0%, lymphocytes 18·0%, eosinophiles 2·5%, and mast-cells ·5%. This patient gives no history suggestive of *Brucella* infection. Another, L. P—, reacted up to 1–20, with a differential count of polymorphs 53%, lymphocytes 43%. No history of any illness. There is, of course, the possibility that these cases had a mild infection which passed unnoticed.

Further investigation remains to be carried out before the source of infection of these cases can be traced. Up to the present we have not been able to examine the institution herd, but we hope to do so shortly. The question becomes complicated by the fact that from time to time it is necessary to supplement our own supply with milk from an outside source.

Prevention.

Fortunately the prevention of infection even with a contaminated herd is a comparatively easy one. Pasteurization of the milk renders it perfectly safe so far as infection with *Brucella* organisms is concerned.

Apart from this country, undulant fever has been becoming increasingly prevalent during these last twenty years, and the following forecast regarding it by Nicolle is interesting. He says, " Malta fever is in the course of evolution, and is tending to become chronic. It is a malady which on account of its manifestations and its chronicity will become one of the commonest and most stubborn of diseases. It is a disease of the future." So far the prophecy has not been fulfilled as far as this country is concerned. Up to the end of 1929, 14 cases had been reported in which the infection was supposed to have been contracted in this country. Since then, however, some 20 further cases have been reported, and it is probable that there are other cases not reported.

Whether these cases represent a real increase of the disease in this country, or are due to recognition resulting from increased knowledge, is a point which remains to be elucidated, and is dependent on a more complete knowledge of the extent to which *Brucella* infection is prevalent amongst cattle in this country; but it is interesting to note that of 928 routine agglutination tests on cows and heifers at the Royal Veterinary College during 1927–1928, 31·8% were positive, whilst of 13 sera from breeding bulls tested in the same period 46·1 were positive.

The Ministry of Agriculture of Northern Ireland carried out tests on the bloods of 158 cattle during 1927, found a positive reaction in 24·9%, and formed the opinion that contagious abortion is probably the most important disease of cattle in Northern Ireland.

Four theories have been put forward to account for the apparent immunity of this country from undulant fever:

1. That the particular strain of *abortus* causing abortion in this country has a negligible pathogenicity for man.
2. That a passive immunity has been acquired by the ingestion of protective antibodies in the cows' milk.
3. That cases may have been mistaken for other diseases owing to the unfamiliarity of practitioners with this condition.
4. That a very mild type of the disease due to low virulence of the organism or a high natural resistance in the individual may be prevalent.

This latter is the explanation favoured by most of the workers in this field.

Summary.

1. It will be seen that undulant fever is not so rare in this country as was formerly supposed, and that increasing numbers of cases are being reported.

2. There is some evidence that infection of cattle with this organism is fairly frequent in this country, and milk consumed by the public has been found to contain the organism—in one particular instance in 5·7% of the samples.

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3. Pasteurization of the milk destroys the organisms, although this is not a method which can be satisfactorily applied outside institutions and large urban areas. In doubtful cases it would be safer to use boiled milk only for drinking purposes.

4. The disease is liable to be overlooked or an erroneous diagnosis made unless the aid of laboratory methods is invoked. Therefore in all cases of obscure illness with pyrexia, continued or remittent, the possibility of *Brucella* infection should be borne in mind.

5. Herds in which there is an unduly high proportion of abortions or missed pregnancies should be submitted to the agglutination test of the blood or milk for evidence of infection with this organism.

In conclusion I have to thank Dr. Connolly, the Medical Superintendent, for permission to utilize the clinical material embodied in this paper, and my laboratory assistant, Mr. Gates, for his painstaking work in connection with the routine tests.

References.—(1) Report No. 56, Ministry of Health.—(2) Hull, *Diseases Transmitted from Animals to Man.*—(3) *Brit. Med. Journ.*, October 25, 1930.

Drs. LORNIE, EAGER, JACKSON, GOOD, NATHAN RAW and others took part in the subsequent discussion.

A hearty vote of thanks was proposed to Dr. J. J. O'Reilly for the interesting case he demonstrated and also for his paper on "Undulant Fever."

Owing to shortage of time it was resolved to postpone Dr. J. S. I. Skottowe's paper on "The Utility of the Psychiatric Out-Patient Clinic," with his consent, until the Spring Meeting.

Previous to the general meeting the members were most hospitably entertained to lunch by the Committee of Management of the Hospital, Mr. C. R. de la Salle, being in the Chair. The Chairman and Committee of Management were heartily thanked by Dr. Barton White for their kind hospitality.

During the morning members had the opportunity of inspecting the modern and well-equipped institution, including the Pathological Laboratory, Nurses' Home, Rooksdown House, Admission Hospital, Convalescent and other Villas, X-Ray Department, Hair-teasing Room, Steam Meter Flow, etc.

A hearty vote of thanks to Dr. Connolly terminated a most successful meeting.

NORTHERN AND MIDLAND DIVISION.

THE AUTUMN MEETING of the Northern and Midland Division was held by the courtesy of Dr. C. W. Ewing at Storthes Hall Mental Hospital, Kirkburton, on Thursday, October 30, 1930.

Present: 18 members—Prof. J. S. Bolton, Drs. Barkas, Baugh, Bruce, Dove Cormac, Chevens, Ewing, Fraser, Gemmell, Horton, McGrath, Mackenzie, Mathieson, Parkin, Russell, Tattersall, Vincent, Wilson; and 6 visitors—County Aldermen Booth and Sykes, Drs. Ewing, Harkness, Miller, Montgomery.

Members were conducted round the Hospital and were afterwards entertained to luncheon.

Prof. Bolton proposed a vote of thanks to Dr. Ewing and his Visiting Committee for their hospitality, Mr. Alderman Booth and Dr. Ewing responded.

It was proposed by Prof. BOLTON, seconded by Dr. DOVE CORMAC, that in the absence of the Divisional Chairman Dr. Ewing be asked to preside. This was carried unanimously.

The minutes of the previous meeting were read, approved, and signed.

Apologies for absence from 62 members were communicated.

The following was elected by ballot an ordinary member of the Association:

JOHN JOSEPH O'RIORDAN, M.B., Ch.B., D.P.M., Assistant Medical Officer, North Riding Mental Hospital, York.

Proposed by Drs. J. Ivison Russell, William Fraser and Henry Wilson.

The following were elected to serve on the Divisional Committee of Management: Dr. Archdale, Dr. Barkas and Dr. Dove Cormac.

Invitations to hold meetings in 1931 at Wadsley Mental Hospital and at Bryn-y-neuadd Hall, Llanfairfechan, were accepted with pleasure, and the Secretary

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