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CHRONIC MELIOIDOSIS: A CASE SHOWING BONE AND PULMONARY LESIONS.

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Whitmore and Krishnaswami (1912) described a glanders-like disease of man occurring in Rangoon. It was named Melioidosis by Stanton and Fletcher (1925), who called the causative organism B. whitmori. This organism was assigned to the Pfeifferella group of bacteria by Topley and Wilson (1941), and is now known as P. whitmori.

Melioidosis occurs in Burma, Ceylon, French Indo-China, the Dutch East Indies, Malaya and Siam. Scott (1939) recorded 100 cases, most of which were acute. He expressed the view that the disease may be commoner than is generally appreciated, quoting Krishnaswami as having observed 200 cases in Rangoon alone. Alain and Delbove (1939) reported 2 further cases in young children.

Souchard (1932) classified the disease into three clinical types from an experience of 10 cases: (a) Fulminating, with choleraic symptoms, 2 cases; (b) Acute, with symptoms stimulating enteric, 6 cases; (c) Chronic, 2 cases, which are further referred to by Souchard and Ragiot (1933). Most recorded acute cases have proved rapidly fatal and, at autopsy, areas of lung consolidation consisting of small abscesses and abscesses or caseous deposits in the spleen, liver and kidneys were the commonest findings. Cases are recorded where patients who recovered from the primary attack died later from a septicæmic condition with lung lesions resembling tuberculosis (Manson-Bahr, 1941).

We have been able to trace records of only five chronic cases, two recorded by Stanton and Fletcher (1932), two by Souchard and Ragiot (1933) and one by Grant and Barwell (1943). We are unable to obtain access to a paper by Huard and Long (1937), the title of which, "Melioidosis and Surgery in the Far East: 14 cases," suggests that the chronic condition may not be so rare. Of the five chronic cases referred to all, except one, had an acute preliminary infection. This was a child of 18 months, reported by Souchard and Ragiot (1933), who showed an osteitis of the 5th metacarpal bone with an overlying abscess and an abscess of the left parietal bone. This patient recovered after six months' illness. Apart from the other case referred to by Souchard and Ragiot (1933), in which the genito-urinary system was involved with subsequent complete recovery, bone lesions were present in all chronic cases.

One of Stanton and Fletcher's (1932) chronic cases harboured the causative organism for two and a half months in a discharging sinus over the left external malleolus. He recovered completely five months after the onset of the illness.

The other case recorded by Stanton and Fletcher (1932) was observed over a period of two years. At the end of that time the patient was in apparent good health but sinuses in his feet leading to necrosed bone were still discharging although no organisms could be isolated from the pus.
It is not possible for either the incubation period or the duration of illness of the case reported by Grant and Barwell (1943) to be estimated with any degree of accuracy in view of the presence of a concurrent gonococcal infection. It is of interest, however, that in this case definite bone lesions occurred in the bodies of the 4th and 8th dorsal vertebrae with a perispinal abscess and also in one external malleolus and the frontal bone of the skull. The infection in this case occurred in a soldier who had left Malaya before the outbreak of hostilities in 1939.

The infection about to be described was acquired by a member of His Majesty's Forces in Malaya after the outbreak of hostilities in September, 1939. It is described because of its clinical interest and because it is possible that further cases of this infection may occur amongst the armed forces engaged in the areas in which melioidosis is known to exist.

Case Report.

The patient, a Regular Army soldier, was aged 33 when his illness started. He is unmarried and there is no history of tuberculosis or other chronic illness in his family. He himself had a left-sided empyema in early childhood but does not know how this arose; it evidently healed without complications after drainage and has caused no trouble since. At 15 years of age he had acute appendicitis and appendicectomy. He joined the Army in 1930, having previously worked as a motor driver in England. He served in India from 1931 to 1937, during which period he had attacks of dysentery, malaria and tonsillitis. In October, 1938, he arrived at Singapore and remained there until invalided for the present illness. In February, 1940, he had urticaria and swelling of finger and toe joints which disappeared after two months following tonsillectomy and an autogenous vaccine. There is no history of venereal disease. So far as he knows none of his companions sustained any illness comparable with his own.

The present illness started in June, 1940, with the onset of pain in the lumbosacral region radiating down both thighs, especially the right. This was insidious in onset and there was no history of trauma. He was admitted to hospital on July 28, 1940, on account of increased pain. Irregular pyrexia and heavy night-sweats were noted. No abnormal physical signs were found at that time apart from stiffness of the lumbar spine and enlarged, rubbery, inguinal glands on which biopsy revealed no abnormality. X-ray of lumbar spine and sacro-iliac joints showed no abnormality but, late in August, 1940, he developed flexor spasm of the right hip and slight wasting was noted. Blood count at this time was: R.B.C. 5,800,000, Hb. 66 per cent, W.B.C. 12,800 with 72 per cent polys., 24 per cent lymphos., 1 per cent large monos. and 3 per cent eosinos. Wassermann was negative, Widal positive only in very low titre, repeated blood cultures negative, stools negative for ova, cysts and occult blood and his urine contained occasional leucocytes only. Irregular pyrexia continued, decreased temporarily by two courses of M & B 693, and he was gradually losing weight. Blood sedimentation rate was 60 mm. in one hour in October, 1940, but fell to between 20 mm. and 30 mm. in November. He was diagnosed spondylitis ankylopoietica. In late January, 1941, he developed a lumbosacral abscess which was aspirated but the pus proved sterile. In February, 1941, he was transferred from Singapore to India by hospital ship, having remained in bed since admission to hospital.

Later in February, 1941, a right sacro-iliac abscess developed and on culture of aspirated pus V. alkaligenes is said to have been grown. Animal inoculation proved negative for tuberculosis but injected guinea-pigs died of a virulent septicæmia. Lower back pain and swinging pyrexia continued and a further course of M & B 693 had no marked effect but there was slight clinical improvement with rest and massage. In June, 1941, slight rarefaction and loss of definition in the lower part of the right sacro-iliac joint was seen on X-ray and in the chest bilateral apical pleural thickening but no other abnormality. Wassermann, Kahn and Widal reactions were again negative and the Weil-Felix reaction was positive at 1 in 25 against B. proteus OX19, OX2 and OXk.

In July, 1941, bilateral sacro-iliac abscesses developed which were aspirated and later drained. The aspirated pus proved sterile on culture, but Staph. aureus and albus were grown from specimens taken at the drainage operation and inoculated guinea-pigs died of Staph. aureus septicæmia with multiple small lung abscesses. In August, 1941, X-ray
showed gross widening with bone destruction in the lower part of the right sacro-iliac joint, affecting chiefly the alae of the sacrum and narrowing and blurring in the upper part of the joint with subarticular sclerosis here. Now diagnosed tuberculous sacro-iliac arthritis with probable secondary infection, the patient was put into a plaster double-hip spica with windows over the sacro-iliac drainage sinuses which subsequently healed. Still the irregular swinging pyrexia and gradual loss of weight continued and, in November, 1941, an abscess in the right groin ruptured under the plaster which was then removed and the patient kept flat in bed. Further destruction of the right sacro-iliac joint was visible radiologically but pus from the sinus in the groin was negative for B. tuberculosis. This sinus healed in April, 1942, and about this time destruction and sclerosis at the lumbosacral joint were seen on X-ray. A month later, X-ray of the chest showed extensive infiltration at the right base, bilateral apical pleural thickening and bilateral hilar enlargement and wedge-collapse of the 8th dorsal vertebra was also discovered, with a large paravertebral abscess and no obvious diminution of the disc spaces. Blood sedimentation rate was now 110 mm. in one hour and blood count showed R.B.C. 5,400,000, Hb. 60 per cent, W.B.C. 6,400, with 52 per cent polys., 45 per cent lymphos., 3 per cent large monos. Urine was normal and repeated sputum examinations were negative for B. tuberculosis.

In May, 1942, he was transferred to his present hospital in South Africa and, on admission, was complaining of vague backache and of pain radiating down the right leg of three weeks' duration. He was still losing weight, his general condition was poor and he was running an intermittent irregular swinging pyrexia up to 102°F which has continued at intervals ever since (June, 1943). There was an angular kyphosis at the 8th dorsal segment of the spine with slight local tenderness and right psoas spasm with a flexion-adduction deformity and painful, limited movements at the right hip-joint. Knee and ankle jerks were equal but unusually brisk and there were no other abnormal nerve signs. In the chest, poor expansion on the right side with bronchial breathing over the right lower lobe and dullness in the right mid-zone were noted.

He had no cough or sputum and twenty consecutive examinations for B. tuberculosis since admission here have proved negative. He was, however, still considered until very recently to be tuberculous and the radiological appearance of the chest was consistent with this diagnosis. A plaster jacket had been applied early in June, 1942, but this had to be removed five weeks later owing to a sacral sore. About this time a right psoas abscess re-developed which was aspirated but ruptured in the groin at the end of July and healed two or three months later. Adductor spasm of the right hip continued and knee and ankle jerks remained exaggerated without other signs of nerve involvement. Blood count now showed R.B.C. 3,400,000, Hb. 55 per cent, W.B.C. 12,200 with 87 per cent polys., 12 per cent lymphos., 1 per cent large monos. Blood sedimentation rate (Wintrobe) has varied irregularly throughout the year he has been here between 24 and 93 mm. in one hour.

In August, 1942, he had a single haemorrhage from the bowel, the origin of which was never discovered and which has not been repeated. In September, 1942, skin-traction was applied to the right thigh to overcome the flexion-adduction deformity at the hip which was tending to increase. X-ray at the beginning of October, 1942, revealed complete destruction of the head of the right femur with some destruction of the upper part of the acetabulum and dislocation of the right hip-joint. There was no obvious change in the appearance of the right sacro-iliac joint but there appeared to be active infection of the lumbosacral joint which showed considerable irregularity. In the dorsal spine, increased wedging of the 8th dorsal vertebra was noted with large bilateral paravertebral abscesses and in the chest slight opacity at both apices, increased striation at the right base less marked than previously, and slight mottling of the left lung.

The deformity at the right hip corrected very slowly under skin traction and in December, 1942, a long right plaster hip spica was applied under general anaesthesia with manipulation of the hip into slight flexion and abduction. The sacral sore had only just healed at this time and no abnormality could now be detected in the tendon jerks. His general condition started gradually to improve and all pain disappeared but, a month after application of the plaster, there were signs of a cold abscess deeply placed in the right buttock which gradually subsided without coming to the surface.

When first seen by one of us, (J. H. M.), at the end of March, his general condition was fairly good though blood sedimentation rate at that time was 61 mm. in one hour and...
intermittent bouts of pyrexia continued. Early in April a slight purulent discharge developed under the plaster on the left side which proved to be due to a superficial sore over the iliac crest. He was replastered in mid-April when an abscess was discovered pointing and almost rupturing through the skin about 4 inches below the right anterior superior iliac spine. The scars of the earlier bilateral sacro-iliac abscesses were both slightly moist but this appeared to be due simply to skin erosion as there was no discharge and no sinuses could be found. The right hip joint, which had deformed into marked internal rotation, was manipulated into slight external rotation under general anaesthesia between the plasters. X-ray at this time showed no marked changes compared with previous examinations.

Two days later the abscess in the right thigh was aspirated through an oblique puncture. The pus was unusually thin for tuberculous material and was diffusely blood-stained. A specimen was sent for laboratory examination and from this P. whitmori was isolated in pure culture. In view of this finding the following further investigations were carried out with negative results: Sputum examination for acid-fast bacilli: Complete urinalysis and culture: Culture of faeces for P. whitmori: blood culture: Wassermann, Kahn and gonococcal complement fixation tests: comprehensive tests for agglutinins against organisms of the Enteric, Brucella and Proteus groups. Agglutination at a dilution of 1 in 500 was obtained against P. whitmori.

Having accepted the diagnosis of chronic melioidosis it was decided to prepare an autogenous vaccine for treatment in view of the beneficial results reported from its use by Stanton and Fletcher (1932). Sulphadiazine, which apparently had some temporary beneficial effect in Grant and Barwell's (1943) case, was not available. Our patient has been receiving the vaccine since May 10, a primary dose of 10 million organisms being administered. By the time of writing (June, 1943) the dose has been increased to 100 million. The vaccine has produced no noticeable local reactions but the patient showed a continuous, swinging pyrexia, subnormal in the mornings and up to 100 at night, which was probably due to the refilling of the abscess in his right thigh. On May 13 the sacral sore started to discharge small quantities of pus which, when cultured, produced a mixed growth of P. whitmori and S. albus. On May 15, the thigh abscess, having refilled, was re-aspirated and again P. whitmori was grown in pure culture. A blood count on May 19 showed: R.B.C. 5,330,000, Hb. 93 per cent, W.B.C. 14,000, with polys. 55 per cent, lymphos 38-5 per cent, large monos. 3-5 per cent, eosinophils 1-5 per cent and basophils 1-5 per cent. Blood sedimentation rate on this date was 93 mm. in one hour.

On May 21 a discharge appeared under the plaster from the right groin and, on May 24, the plaster was removed. The sacral sore appeared to be purely superficial and the old sacro-iliac scars were dry. The new sinuses in the medial part of the right groin did not communicate with the large thigh abscess but led to a track passing backwards and upwards deep to Poupart's ligament and probably to the psoas muscle down which it is suspected to have tracked from the right sacro-iliac joint. The thigh abscess was incised in three places to obtain satisfactory drainage and about 200 c.c. of blood-stained "anchovy-sauce" pus was evacuated. The abscess extended upwards to the region of the anterior superior and anterior inferior iliac spines and, though not obviously communicating with the hip-joint, it was certainly very close to the ilium just antero-lateral to the joint. The abscess cavity was thoroughly swabbed with eusol. Following the X-rays, the right hip was manipulated into neutral position and a long plaster hip spica was re-applied with windows over the infected areas. Despite the radiological appearances, suggesting bony ankylosis, the hip joint clinically was not yet stable.

X-rays of this date also revealed distinct narrowing of the intervertebral disc between the 11th and 12th dorsal vertebrae, without obvious bony changes, and there was a slight kyphosis at this level clinically. Review of previous X-rays shows that a similar change was just visible six months, but not a year, previously and this is apparently a new lesion in an early stage of development. It is of interest in that the bony lesions in all other recorded cases, and also the other lesions in our own case, have started as osteitis, whereas this appears to be rather an arthritis.

Within a week the drainage sinuses were practically dry and at the time of writing the temperature is falling and the patient's general condition continues to improve.
FIG. 1.—Right hip joint, showing dislocation and destruction of head and upper part of neck of femur.

FIG. 2A.—Dorsal spine, A-P view, showing collapsed 8th dorsal vertebra with large left and small right para-vertebral abscesses.
Fig. 2b.—Dorsal spine, lateral view, showing wedge-collapse of body of 8th dorsal vertebra with minimal disc narrowing.

Fig. 3.—Sacro-iliac joints, showing gross bone destruction in the lower part of the right sacro-iliac joint; narrowing and subarticular sclerosis of the left sacro-iliac joint; generalized decalcification.
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Bacteriology.

No organisms were observed on direct examination of a sample of pus submitted to the laboratory on April 20, 1943. A culture of the pus on blood-agar produced a fine growth, after twenty-four hours incubation, of a small Gram-negative bacillus showing polar staining. After seventy-two hours incubation, the growth on blood-agar was abundant, smooth, grey and glistening and resembled the growth of the smooth form of *P. whitmori*.

Morphology and Staining.—The organism was a small bacillus about 2μ in length by 0.5μ wide, non-sporing, actively motile and showed no evidence of capsule formation. When stained with Löeffler's methylene blue it showed the presence of an interstitial substance which formed a background to the masses of bacilli and resembled the appearance of the smooth form of *P. whitmori* described by Topley and Wilson (1941). The bacillus was readily, but rather faintly, stained by the simpler aniline dyes. It was Gram-negative and stained rather poorly with Neisser's, Albert's and Leishman's stains. Good differentiation was obtained by staining with dilute carbol-fuchsin and counter-staining with dilute methylene blue. This method showed red granules on the blue background of the bacilli. When smears were stained with carbol-fuchsin and decolorized with 10 per cent acetic acid or 2½ per cent sulphuric acid for five minutes, small acid-fast granules were observed on the body of the organisms and also lying separately. The acid-fastness of these granules was more pronounced in old cultures, especially in involution forms, and in smears from a twenty-one-day broth culture many granules were resistant to decolorization by 25 per cent acid after five minutes. They were readily decolorized by a few seconds' treatment with ethyl alcohol. The bacilli were well demonstrated in the tissues by means of carbol-thionin. They appeared longer and narrower than on culture and sometimes showed short-chain formation when observed in sections of organs of experimentally inoculated animals.

Cultural Characters.—The newly isolated organism grew on ordinary nutrient media and produced a distinct growth on agar after twenty-four hours incubation at 37° C. After forty-eight hours incubation the colonies were about 2 mm. in diameter and later showed a depressed centre surrounded by a raised ring. Three types of colony were isolated from the exudates of experimentally infected animals: One, which was perfectly smooth in texture and consistency and which grew rather slowly; a second type, identical in form with the colonies originally isolated, and a third with a wrinkled rather rugose surface. In nutrient broth the growth was uniform and a slight pellicle was usually formed after twenty-four hours. The smooth variant showed the most abundant pellicle formation. After two to three weeks growth the pellicle was thick and wrinkled and extended deep into the broth with numerous heavy wrinkled folds.

Nutrient gelatine was rapidly liquefied and showed a heavy stratiform growth. Complete liquefaction was achieved in four to six days and a dense growth of the organism was observed at the foot of the culture tube. No pellicle was seen on the surface of the gelatine.

On Löeffler's serum the growth was smooth and shiny. No liquefaction was observed after fourteen days incubation. Growth in milk was rapid with clot formation after forty-eight hours incubation and commencing digestion of clot after seventy-two hours.

Growth on MacConkey's agar was slow. After forty-eight hours distinct colonies were observed. After seventy-two hours incubation most of the colonies were about 2 mm. in diameter, smooth in texture, pale brown in colour with a more deeply coloured depressed central area. A few small, pinkish, smooth colonies of uniform texture were also seen. After seven days incubation the growth assumed a marked metallic sheen. A well-defined aromatic odour was detected when the MacConkey plate was opened. This odour was not observed in cultures on other media.

Fermentation of glucose occurred after forty-eight hours incubation. No gas was formed. Lactose, dulcite, saccharose and mannite were not fermented even after incubation for twenty-one days. Andrade's indicator was completely decolorized after forty-eight hours incubation. Indol was not formed in peptone water.
No growth on ordinary media was observed under anaerobic conditions.

Animal Experiments.—0·5 c.c. of a twenty-four hour broth culture, injected intraperitoneally, killed a guinea-pig in thirty hours. At autopsy the peritoneal cavity was filled with a copious glairy exudate. The spleen was enlarged and showed numerous minute white nodules. The liver was also enlarged. The lungs appeared congested. Cultures from the peritoneal exudate and heart blood produced a copious fine growth of P. whitmori. Histological examination of the organs showed: (1) Spleen very congested and contained numerous small necrotic areas. The sinuses were filled with red cells and large round inflammatory cells. The follicles were congested and hyperplastic. Numerous areas of early necrosis with well-marked karyorrhexis were observed. The organisms were present in large numbers throughout the tissue. (2) Liver was markedly congested and entertained numerous small hemorrhagic areas. The liver cells showed well-marked vacuolation and small groups of cells showing karyorrhexis were observed. A zone of inflammatory round cells was seen around the engorged portal vessels. Numerous bacilli were seen, especially amongst the cells showing karyorrhexis. (3) Lung: The alveolar capillaries were markedly congested and many of the alveoli were filled with red cells and inflammatory cells. Numerous small abscesses were observed in the neighbourhood of intensely congested blood-vessels. The smaller bronchi were filled with inflammatory cells, chiefly large round cells. A few bacilli were observed in the alveolar walls.

Two mice were inoculated intraperitoneally, one with 0·2 c.c. of a twenty-four-hour broth culture prepared from a smooth colony, the other with 0·2 c.c. of a twenty-four-hour broth culture prepared from a rough colony. Both mice died within forty hours and showed similar post-mortem appearances to the guinea-pig described above. A similar experiment was carried out, using two male guinea-pigs, one of which was injected intraperitoneally with 0·2 c.c. of a twenty-four-hour broth culture prepared from a smooth colony and the other with 0·2 c.c. of a twenty-four hour broth culture prepared from a rough colony. The first guinea-pig died fifty-six hours after inoculation whereas the second died ninety-two hours after inoculation and showed a pronounced scrotal swelling.

A typical Straus reaction was produced by injecting a male guinea-pig intraperitoneally with 0·02 c.c. of a twenty-four-hour broth culture. The animal died seven days after inoculation. At autopsy a copious glairy peritoneal exudate was observed. The liver was enlarged and the spleen contained numerous coalescing small abscesses. The lungs were congested and adherent to the chest wall. The tunica vaginalis was filled with thick caseous material. P. whitmori was isolated from the peritoneal exudate.

Serological Reactions.—On April 27, 1943, a sample of the patient's serum was examined for the presence of agglutinins using the Dreyer technique. A twenty-four-hour broth culture containing 0·5 per cent formalin was used. Two normal sera were used as controls. Definite large-flake agglutination at a dilution of 1 : 500 was obtained with the patient's serum. No agglutination at a dilution of 1 : 25 occurred with the control sera. An attempt was made to obtain an O suspension by alcoholizing agar cultures. No trace of agglutination was observed when the alcoholized suspension was incubated with the patient's serum. Further tests carried out with the patient's serum and smooth suspension heated to 60° C. for one hour failed to elicit satisfactory agglutination when compared with the results obtained using suspensions treated with 0·5 per cent formalin. The sera from sixteen cases of proven tuberculosis were examined for the presence of agglutinins against our strain of P. whitmori. Several sera showed definite agglutination at a dilution of 1 : 50 only.

Mallein Test.—The patient and nine controls were each inoculated subcutaneously with 0·2 c.c. of a 1 : 10 dilution of Mallein prepared at the S.A. Government Veterinary Laboratories, Onderstepoort. Apart from a red local swelling developing about four hours after the inoculation and lasting for about thirty-six hours, the patient showed no reaction to the Mallein. Similar reactions were observed in a number of the controls and it was clear that our case did not react specifically to the Mallein used in the test.
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DISCUSSION.

The case described is remarkable for its insidious onset, its great chronicity, its remarkable resemblance to pulmonary and articular tuberculosis and the multiplicity of lesions. Originally diagnosed as spondylitis ankylopoietica and later as pulmonary and articular tuberculosis, it was not until two and three-quarter years after the onset of the illness that the organism was isolated which could be considered the specific aetiological factor.

This organism was found to resemble \textit{P. whitmori} in almost every respect. It was observed, however, that whereas all descriptions of \textit{P. whitmori} available to us state that it possesses no acid-fast properties, the organism isolated from our case shows beads or granules which are resistant to decolorization by 2.5 per cent sulphuric acid or 10 per cent acetic acid acting for five minutes. Despite this characteristic, and although it has not been possible for us to compare the organism isolated from our case with recognized strains of \textit{P. whitmori}, the descriptions available—Stanton and Fletcher (1932), Topley and Wilson (1941)—would indicate that the general characters of our strain entitle it to be classified as \textit{P. whitmori}.

It is of interest to speculate on the possible relationship of the acid-fast properties of our strain to the chronicity of the lesions produced in our patient and their marked clinical resemblance to tuberculous lesions. It should be pointed out, however, that our strain produces the acute granulomatous lesions in rodents which have been described as characteristic for \textit{P. whitmori}.

Melioidosis is recognized as a disease of rodents and men and it is generally assumed that infection of men is acquired through infected rodents, possibly by infestation of food and water supplies. In our case there is no record of any such infestation although it is possible that the water supply of the Battery to which the patient was attached may have been infected. Another possibility is that our patient may have been infected by a tattoo artist in Singapore by whom he was liberally tattooed before the development of his first symptoms.

Apart from Grant and Barwell's case (1943), we have been unable to find a record of any case of chronic melioidosis in which the onset was as insidious as that recorded above. These authors suggest that the first clinical signs in their case might have been arthritis of one hip and one ankle-joint. Here the issue was muddled by concurrent gonococcal infection whereas, in the case just described, arthritis was undoubtedly the first clinical manifestation and in this respect the case differs from any other previously described.

The early low backache with sciatic radiation did not incapacitate our patient during the first month of his illness and although, when admitted to hospital, he was suspected to have a low-grade septicaemia, no specific aetiology was identified. In the absence of radiological abnormalities, the diagnosis of spondylitis ankylopoietica was made as the only likely cause of his symptoms: later this was amended, on account of the development of abscesses and radiological changes, to tuberculous arthritis and not until two and three-quarter years after the onset of symptoms was the true cause discovered.

In reconsidering the case in retrospect, several minor features which might have aroused doubts as to the diagnosis of tuberculosis can be detected, such as the long-continued pyrexia despite adequate rest before the development of radiological lesions and, later, the wedge-collapse of the 8th dorsal vertebra with minimal disc-narrowing and no affection of adjacent segments and the failure to obtain \textit{B. tuberculosis} from two dozen or more sputum examinations despite the radiological evidence suggesting widespread active pulmonary infection.

The majority of cases of this disease previously recorded have occurred in natives. Of the chronic cases recorded, Grant and Barwell's, (1943), is the only previous one reported in a European and, like our case, has pursued an unusually chronic course. It is possible that Europeans possess greater resistance than Asians to infection with \textit{P. whitmori} and that in them the condition may resemble the chronic granulomata. Should this be so, it is not impossible that cases of chronic melioidosis may occur in European troops campaigning...
in the areas in which the disease is endemic and may be mistaken for pulmonary or articular tuberculosis. The development of chronic granulomatous lesions in persons who have lived in the Far East should invite the possibility that the infection may be chronic, melioidosis and all possible steps should be taken to exclude this diagnosis before a definite and final diagnosis of tubercular infection is made.

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BIBLIOGRAPHY.