

reactivation of ovarian function restores the normal hormonal balance, a continuation of which effects the regular menstrual rhythm.

Comparatively few favourable results will follow the indiscriminate use of progesterone therapy, but in cases where its employment appears to be indicated by the histological structure of the endometrium encouraging results can be obtained. Although radium therapy is successful in the treatment of metropathia haemorrhagica occurring at or near the menopause, a wider use of progesterone seems to be indicated as a more rational form of treatment.

Summary

1. Two types of irregular uterine bleeding are described.
2. The mechanism of bleeding in metropathia haemorrhagica is discussed.
3. The results of treatment with progesterone are given, and the effect of this form of therapy on the uterine endometrium is illustrated by photomicrographs.
4. The rationale of progesterone therapy in irregular uterine bleeding is discussed.

I wish to express my indebtedness and thanks to Dr. Douglas Miller for the privilege of investigating and treating cases under his care, and to Professor F. A. E. Crew for the facilities afforded me in his department.

The preparation of progesterone used in this investigation was progestin organon, and I am grateful to the manufacturers (Messrs. Organon Laboratories), who supplied it to me through the Therapeutic Trials Committee.

REFERENCES

- Corner, G. W. (1927). *J. Amer. med. Ass.*, **89**, 1838.
 Hain, A. M. (1934). *Quart. J. exp. Physiol.*, **24**, 101.
 Hartman, C. G. (1932). - Carnegie Inst. Wash. Publ. No. 433, Contr. to Embryol., No. 134.
 Markee, J. E., et al. (1936). *Anat. Rec.*, **64**, 231.
 Smith, G. van S., Smith, O. W., and Pincus, G. (1938). *Amer. J. Physiol.*, **121**, 98.

BRODIE'S ABSCESS AND ITS DIFFERENTIAL DIAGNOSIS*

BY

JAMES F. BRAILSFORD, M.D., Ph.D., M.R.C.P.

Consulting Radiologist, City of Birmingham Hospitals

(WITH SPECIAL PLATE)

In the collected works of Sir Benjamin Collins Brodie, published in 1865, will be found a paper on "Chronic Abscess of the Tibia" which was presented to the students of St. George's Hospital. In this paper he pointed out that an abscess may occur in the interior of any bone in the body, but according to his experience we meet with it more frequently in the tibia than in any other bone. He gives a brief account of eight cases. All the patients except one were males between the ages of 13 and 34 years. The abscess was in the upper third of the tibia in four and in the lower third in four. The clinical histories indicated that the lesion had existed for periods ranging from five to eighteen years. The account of his first case is as follows:

Some Early Cases

"It was as long since as the year 1824 that I was consulted by a young man, 24 years of age, under the following circumstances. There was a considerable enlargement of the lower end of the tibia, but the ankle-joint permitted of every motion and was apparently normal. The skin was thin, tense, and closely adherent to the periosteum. There

was constant pain in the part, generally of a moderate character, but every now and then it became excruciating, keeping the patient awake at night and confining him to the house for many successive days. It made his life miserable and his nervous system irritable: one effect of which was, that it spoiled his temper, and thus produced another set of symptoms in addition to those which were the direct consequence of the local malady. The disease had been going on for twelve years. He had consulted many surgeons respecting it, and had used a great variety of remedies, but had never derived benefit from anything that was done. Instead of getting better, he every year became so much worse. I tried some remedies without any advantage, and at last recommended that he should lose the limb. Mr. Travers saw the patient with me, and agreed with this opinion. Amputation was performed: and the amputated tibia is now on the table. You will see how much the lower end of it is enlarged, and that the surface of it presents marks of great vascularity. The bone in the preparation is divided longitudinally, and just above the articulating surface there is a cavity as large as a chestnut. This cavity was filled with dark-coloured pus. The inner surface of it is smooth. The bone surrounding it is harder than natural. On observing these appearances, I could not help saying that if we had known the real nature of the disease the limb might have been saved."

In another paper he tells us that the patient died a few days after the operation. The other seven patients he treated by trephining the bone at the site of the point of maximum tenderness, and the release of pus relieved the symptoms and led to rapid cure.

In addition to the signs and symptoms recorded in the account of the first case the following are recorded in the other histories.

"The pain may be of moderate character with periodic exacerbations of excruciating almost intolerable pain and periods of perhaps several months of freedom from all symptoms. The adjacent joint may exhibit periodic effusions after exercise which are absorbed with rest. One patient had tubercles in the lungs and vomicae, dead bone in the ribs, and other complications. In one case a sinus communicated with the knee-joint. The new periosteal bone is softer than normal."

Such is the account that Brodie gave to a condition which he recognized as a distinct entity. The accuracy of his observations and the value of the method of treatment which he devised were such that though thousands of such cases have been treated by hundreds of different surgeons since his time little if any addition has been contributed to the clinical picture.

What Constitutes a Chronic Abscess?

Brodie's clinical work was unaided, or, as some would express it, unhampered, by bacteriology or radiology. It is therefore impossible to define accurately in the present terms of bacteriology or radiology the nature of the lesion which he described. Though in the light of our present knowledge most of his eight cases appear to be of a staphylococcal nature, the history of at least one of them suggests the possibility of a tuberculous infection. Consequently, though we may reasonably refer to any chronic abscess of bone as a Brodie's abscess, it would be preferable, from the point of treatment, to confine the term to abscesses that are due to the staphylococcus. These constitute all but a relatively small minority that are attributable to the tubercle bacillus, typhoid bacillus, pneumococcus, streptococcus, etc. We are also faced with the question of what constitutes a chronic abscess? Brodie stated that the duration of symptoms in his eight patients varied from five to eighteen years. To-day, with the ready accessibility of the harmless and painless radio-

* Paper read at the Annual Meeting of the British Association of Radiologists at Belfast, May 13, 1938.

graphic examination, such lesions may be detected very early in the course of the disease, and what might in Brodie's day have been allowed to progress for some years before surgical intervention was made is now capable of detection and treatment within a month or so of its onset. For the purpose of this paper I have examined the old radiographs and case histories, and made recent clinical and radiographic examination, of as many as were available of the sixty-two cases of chronic bone abscess which have been submitted to me from time to time during the past fifteen years. The results are shown in the following table:

Table summarizing the Main Features of 62 Cases of Chronic Abscess of Bone (42 males; 20 females)

Years :	Age Period at which Abscess was found						40+
	1-5	6-10	11-15	16-20	21-30	31-40	
Number of cases	6	5	19	15	10	5	2
Duration of signs and symptoms at time radiographic evidence was obtained	1 wk. to 6mths.	3mths. to 6mths.	3mths. to 5 yrs.	3 yrs. to 11 yrs.	1 yr. to 20 yrs.	1 mth. to 30 yrs.	
Site of Primary Bone Focus							
Tibia			Femur	Humerus	Ulna	Radius	Fibula
Lower end	Upper end	Mid. third					
29	9	2	8	7	4	2	1

Single focus in bone, 45 cases. Multiple bone foci, 17 cases.

Analysis of the Cases

Analysing this table, we see that the lesion occurred twice as often in the male as in the female. The majority—that is, forty-four—occurred in the age period of 11 to 30 years. The younger the patient the shorter was the duration of symptoms, though in a few isolated cases, even in adult life, a brief history only was obtainable. In those cases with a long history, starting in some instances in the early years of life, the symptoms had been intermittent; attacks of pain and swelling were followed by long periods during which there was almost complete freedom from symptoms, and it is probably due to this that the lesion was not submitted to radiographic examination. Of the six children under the age of 5 who developed signs and symptoms severe and protracted enough to cause the doctor to seek radiographic examination the lesion in five of them appeared to be due to secondary tuberculous infection.

In some cases radiographic evidence of a septic focus in bone was obtained within a month of the patient complaining of symptoms, but since we are unable to fix the date of invasion of the site by infective organisms from the patient's story we obviously cannot, in the majority of cases, say how long such a lesion has been present. The intelligence of patients, their reaction to pain and discomfort, and their resistance to infection vary considerably, and so does the virulence of the invading organisms. The physical signs also do not materially aid us in our estimation, for even in acute osteomyelitis swelling of the affected limb and redness of its skin are relatively late signs. In the case of the chronic lesion these signs appear intermittently, and though there may be long intervals during which little can be detected, these intervals tend to diminish as the signs become more prominent and intensive.

Upwards of a third of the total number of abscesses were found in the lower end of the tibia. This is in opposition to the findings recorded by other workers in

acute osteomyelitis of childhood, when the upper end of the tibia was more often involved. Except in a very few instances the primary lesion was seen to be in the metaphyseal extremity of the diaphysis, and by the aid of serial radiographs it was observed that the lesion extended from this site towards the medulla and rarely perforated the epiphyseal joint cartilage. In those instances in which the latter occurred the tubercle bacillus was found to be the infecting organism.

In the majority of cases the periosteum did not show any evidence of reaction, but when the abscess was large and involved the whole extent of the diaphyseal extremity periosteal new bone was evident. This distribution and suggestion of spread of infection is in opposition to the views put forward by Starr with regard to acute osteomyelitis. He produced evidence to show that the infection passes from the metaphysis to the periosteum, stripping the latter from the bone by the formation of a subperiosteal abscess and subsequently infecting the medulla via the Haversian canals. In these cases of chronic bone abscess I am unable to obtain any radiographic evidence of infection of the bone via this route. In nearly one-third of the cases the patients either exhibited evidence of previous septic bone foci or subsequently developed such lesions, while others gave a history of tonsillitis, pneumonia, empyema, etc. The duration of the lesion in most cases was so long that the early events in its history were not well remembered, but in no fewer than eight instances there was definite evidence of severe injury to the part preceding the development of symptoms. In some cases the symptoms and signs produced by the trauma passed imperceptibly into the symptoms and signs which have become associated with the bone abscess.

Many of the patients gave a history of having had scarlet fever, measles, and other exanthemata, and in some cases the lesion in the bone developed during or shortly after the infectious illness. In two cases a history of typhoid fever was obtained, and the organism was recovered from the abscess. As in acute osteomyelitis, the infecting organism found in the majority of the cases was the *Staphylococcus aureus*.

Physical Signs and Symptoms

The chronic abscess has an insidious onset, quite distinct from acute osteomyelitis, in which the striking clinical features are the sudden onset of severe or even excruciating pain and the development of a point of exquisite tenderness over the primary focus—which the patient guards with fear—associated with rigors, high fever, and rapid pulse, followed by the signs of a severe toxæmia, delirium, and coma. The patient may complain of recurrent attacks of pain which have gradually increased in severity. The pain is often of a boring or burning character, giving the impression of a gradual expansion of the bone from some internal compression, and at times it may be almost intolerable. Some patients complained that it was worse during the day when they were walking about, but that it became less on resting and at night. In these cases the affected limb usually became somewhat swollen, the skin reddened, and there was evidence of oedema of the soft tissues over the affected bone during the day, which subsided during the night. In others the pain appeared to be worse at night, none being experienced during the day until resting in the evening. Attacks of pain of a more severe nature lasting three or four days were followed in some instances by months of freedom. In most cases there was tenderness on pressure over the abscess. In the most acute phases the patient may show a hot, red, tense, fluctuating

swelling, with some oedema of the affected limb. The adjacent joint at such phases sometimes became swollen and showed signs of effusion into the joint. In a few cases superficial abscesses developed and discharged, and sometimes definite thickening of the affected segment of bone could be observed.

Radiographic Signs

ACUTE OSTEOMYELITIS

Radiographic evidence of acute osteomyelitis for the purpose of diagnosis does not exist. By the time the bone shows changes detectable by radiography the shaft will have been denuded of periosteum and sequestra have formed. From radiographic examination of septic fingers in which the date of onset can be more accurately fixed I have determined that changes may be found in the affected bones within ten days. The earliest sign is localized osteoporosis. When the focus is situated in the medulla absorption of the cancellous structure may be evident. In less acute lesions no apparent change may be seen for one or two months, though there may be highly suggestive clinical signs and symptoms. In a patient aged 32, who had complained of pain in his leg for one month, radiographs revealed a well-defined area of cancellous destruction in the medulla of the tibia at the junction of the middle and upper thirds, with some increased density of the surrounding cortex.

SUBACUTE OSTEOMYELITIS

In subacute osteomyelitis physical signs and symptoms precede the development of radiographic signs by a week or more. Thus in a girl (D. V.) aged 10 years radiographs taken one week after the onset of pronounced physical signs and symptoms showed a small ill-defined area of osteoporosis at the lower metaphyseal extremity of the tibial diaphysis, but a month later radiographs revealed irregular osteolysis of the whole of the lower third of the tibial diaphysis, including its compact cortex, and an accretion of new periosteal bone, which in places also exhibited calcium deficiency. It was impossible to define the boundaries of the infected bone. Further radiographs after another month showed that calcium had been deposited, and there was now increased definition in the affected zone, evidence of consolidation and localization of the process, and more regular ossification of the new periosteal bone. No evidence of sequestra formation could be found.

CHRONIC BONE ABSCESS

The chronic bone abscess at the diaphyseal extremity in the patient whose epiphysis has not yet fused is revealed

on the radiograph by an area of cancellous destruction extending from the epiphyseal growth cartilage towards the medulla. Its boundaries are not sharply defined, but they are perhaps rendered more apparent because the adjacent bone has an increased density. Frequently the lesion is spatulate in form, and even with five years' history may be less than a quarter of an inch in thickness but extending an inch or more from the epiphyseal line towards the medulla. The more acute the abscess the larger the cavity formed and the less defined are its boundaries and the greater the probability of new periosteal bone accretions. As the lesion increases with age its boundary wall tends to become more sharply defined and sclerosed. In one patient aged 21, who gave a history of a lesion of seventeen years' duration, the radiograph showed an abscess with a sharply defined regular wall, which was little more than a quarter of an inch in diameter, extending from the subarticular surface of the tibia for one and a half inches towards the medulla. (See Fig 3, Special Plate.) In patients above 20 years of age who give a history suggesting the beginning of an abscess about the age of 14 the radiographs may show the abscess to be about an inch above the ossified epiphyseal growth cartilage.

It is rare for the growth cartilage to be penetrated by staphylococcal infection and the epiphysis eroded; consequently, though the joint may exhibit periodic effusion, it is rare for it to be infected by extension; but after the epiphysis has fused the lesion may be extended into the epiphyseal area and even infect the joint. No evidence of accretion of new periosteal bone may be found even after the abscess has existed many years; thus, in one of seventeen years' duration no thickening was apparent, and consequently no swelling was detectable on clinical examination. However, in those cases in which the abscess has involved most of the diaphyseal extremity an accretion of new periosteal bone will be shown. No sequestrum is to be observed within the abscess cavity except in those cases that have been subjected to surgical intervention, as the abscess extends by the gradual absorption of the adjacent bone.

Much less common than the abscess in the metaphyseal region is the abscess in the middle third of the shaft of a long bone and beneath the periosteum.

MEDULLARY ABSCESSSES

An abscess in the medulla of the middle third of the shaft of a long bone is recognized from its radiographic appearances. The shaft in the area shows a spindle-shaped expansion or thickening. In the middle of the

LEGENDS FOR RADIOGRAPHS IN SPECIAL PLATE

FIG. 1.—Radiograph of G. J., a youth aged 15, showing subacute abscess in lower end of diaphysis of tibia. Duration of symptoms five months. Note ill-defined area of central cancellous destruction with increased density of the adjacent bone and accretions of new periosteal bone. A radiograph taken six years after evacuation of abscess showed linear outline of cavity in lower third of diaphysis but no evidence of reaction in the adjacent bone or periosteum. Clinically cured.

FIG. 2.—Radiograph of Mr. D. E., aged 21, showing chronic abscess in lower third of tibia three-quarters of an inch above line of epiphyseal growth cartilage. Note marked increase in density of surrounding bone. Duration of symptoms five years.

FIG. 3.—Radiograph of Mr. S. B., aged 21, showing chronic abscess in lower end of tibia which has extended to subarticular bone, the epiphyseal growth cartilage having disappeared. Duration of intermittent symptoms seventeen years. Note well-defined outline of sclerosed wall of abscess and absence of periosteal reaction.

FIGS. 4 and 5.—Antero-posterior and lateral radiographs of Miss E. M., aged 14, showing chronic abscess in lower end of tibial diaphysis. Duration of symptoms five years. Note well-defined wall of abscess.

FIG. 6.—Radiograph of Miss E. M. ten years after biopsy, which failed to reveal abscess. Compare with Figs. 4 and 5. Note drill-hole in bone (made ten years previous to this radiograph being taken) is away from site of abscess, but resolution of the infected area has largely occurred.

FIG. 7.—Radiograph of D. C., aged 3, showing abscess involving the epiphysis. Duration of symptoms one month. Tuberculous.

FIG. 8.—Radiograph of P. P., aged 6, showing tuberculous abscess which has involved the epiphysis. Duration of symptoms several months. Tuberculous.

FIG. 9.—Radiograph of Miss E. H., aged 24, showing chronic abscess in femoral shaft. Duration of symptoms fourteen months. History of typhoid fever. Typhoid bacillus removed from pus.

expanded segment a well-defined rounded or ovoid area of cancellous destruction—the abscess cavity—is seen. This area is surrounded by a thick wall of dense compact bone, which appears to obliterate the medullary cavity above and below the abscess cavity. Surrounding the thickened abscess wall, evidence of activity is indicated by the thin regular layer of new bone that is being added beneath the periosteum. Following successful surgical evacuation of the abscess cavity the bone assumes its normal compact and cancellous proportions, the reactive periosteal bone being absorbed.

PERIOSTEAL ABSCESSSES

When the lesion develops as a localized abscess there is present beneath the periosteum a localized fusiform thickening of the bone, which is due to the laying down of additional subperiosteal compact bone, in the thickest part of which a well-defined rounded abscess cavity will be seen.

Radiographic Localization of the Abscess

In these days, when lesions of bone can be accurately localized by radiography, this should be done before any surgical intervention takes place; for, as already indicated, the abscess is usually but a narrow track that may easily escape the surgeon's weapons and thus permit the recording of one more radiographic fallacy. Two radiographs (Figs. 4 and 5, Special Plate) reveal such an abscess which eluded the surgeon's search. It is interesting, for it shows that, while the abscess was not discovered by the trephine, the lesion resolved, though the scar of the trephine hole has persisted for over ten years (Fig. 6, Special Plate). Localization of the lesion, followed by the marking of the skin indicating its site, would enable the surgeon infallibly to expose the lesion in the minimum of time.

Results of Surgery on Radiographic Appearances

Serial radiographs of the bone from which an abscess has been evacuated show that the cavity may persist for many years. One, two, or three years afterwards the walls of the cavity are not sharply defined and present a radiographic picture which has been mistaken for that of an active abscess. And as it is not uncommon for a patient to have occasional bouts of pain or discomfort, with undue redness of the area over the site of the old abscess, particularly if he has an injury to the part, it is imperative that this possibility be realized, otherwise an active abscess may be diagnosed and a useless operation be performed. At this operation no abscess will be found, and histological examination of material removed will indicate the reaction of trauma. A few days' rest results in disappearance of these clinical signs, though the radiographic appearance remains. While little radiographic evidence of the abscess site may be found after two or three years, in some cases even after twenty years the walls of the cavity made by the surgeon may be observed. Such old scars in bone are clearly defined with linear contours, and present no evidence of reaction in the surrounding bone. After the effective evacuation of an abscess which was associated with definite accretions of new periosteal bone the latter is soon absorbed, and in a few months no trace of it can be found. This is an additional feature useful in the recognition of the evacuated abscess.

Differential Diagnosis

There is perhaps no lesion in which the clinical history of the patient is more helpful in diagnosis than the Brodie abscess, and in introducing the question of differential

diagnosis I cannot do better than quote Brodie's own words. He asks:

"What are the circumstances that would lead you to suspect the existence of abscess in the tibia? The answer is, When the tibia is enlarged from a deposit of bone externally: when there is excessive pain, such as may be supposed to depend on extreme tension, the pain being aggravated at intervals and these symptoms continue and become still further aggravated, not yielding to medicines or other treatment that may be had recourse to, then you may reasonably suspect the existence of abscess in the centre of the bone."

The clinical history will indicate the age of the lesion and the existence of any previous septic focus or infection likely to be associated with bone abscess. Such information is invaluable in view of the fact that lesions of a widely different significance produce radiographic appearances which are rather alike. Such lesions are tuberculous abscess, gumma, simple bone cyst, sarcoma, and endothelioma.

TUBERCULOUS ABSCESS

In this series of cases five of the six children under the age of 5 years who presented a lesion of the bone so intractable that radiographic investigation was sought had a tuberculous abscess which was associated with some typical lesion in another part of the body. The tuberculous abscess does present certain features which assist in identification. Mention has been made of the fact that the tuberculous process does not appear to be checked by the growth cartilage at the metaphysis and prevented from invading the epiphysis, as is the usual feature of the staphylococcal abscess (Plate, Figs. 7 and 8). The early tuberculous bone abscess is a regular rounded excavation with clearly defined walls, for the effect of the organism is the solution of the bone against which it comes into contact without any apparent reaction, such as osteoporosis or osteosclerosis in the adjacent healthy bony wall. After an interval of some months general decalcification of the involved bone occurs, and then an ill-defined sequestrum of somewhat greater density than the neighbouring bone may be recognized.

GUMMA

Gumma of the bone is usually identified by the massive reaction it produces in the adjacent bone. This finding should indicate the need for obtaining the Wassermann reaction. Evidence of other syphilitic lesions may be forthcoming.

SIMPLE BONE CYSTS

The commonest sites for such lesions are in the neighbourhood of the great trochanter of the femur and the middle third of the shaft of the humerus and the lower third of the radial diaphysis. In these sites the bone is expanded. The expanded area is ovoid, cyst-like, and devoid of cancellous trabeculae. Its boundary is but a thin wall of bone, which appears to be yielding to the pressure of its contents. There is usually no evidence of new periosteal bone; in fact, the thin bony wall may even appear to have been completely absorbed in one area. Spontaneous fracture through such a cyst is often the event which leads to radiography and to the discovery of the lesion.

OSTEOCLASTOMA

In the early stages of its development this tumour may present a radiographic appearance which rather resembles the chronic abscess. The discovery of such a tumour at this stage would be accidental, for the signs and symptoms are negligible, radiography of a bone following trauma being the usual means of recognition. The clinical history will therefore be a most essential factor in identification.

SARCOMA

There is a type of sarcoma which starts in the medulla by destroying adjacent bone and producing an abscess-like cavity that may or may not have reactive changes in the adjacent bony wall. Its boundaries are not clearly defined as in the case of the simple bone cyst. It may lead to spontaneous fracture, and subsequent radiographic appearances may give the suspicion of a sequestrum within the abscess-like cavity. The short history and the paucity of clinical signs and symptoms associated with the radiographic features should arouse suspicions of the gravity of the lesion: further radiographs after a week or so may reveal conclusive evidence of its nature. Often the bone in the region of the fracture will now show periosteal spicular formation.

ENDOTHELIAL MYELOMA

Endothelial myeloma of the bone occurs at about the same age periods as we find with chronic bone abscess. Like bone abscess it may be associated with lesions in other parts of the skeleton. It often shows intermittency of symptoms. The clinical features, however, do not reveal the chronicity of the bone abscess; the progress of the lesion is more rapid. The radiographic features, which bear some resemblance to those of chronic bone sepsis, I have dealt with elsewhere. Often a marked response to x-radiation therapy is seen in endothelioma, and this is of diagnostic significance. Serial radiographic study of the lesion will usually suffice for identification.

BIBLIOGRAPHY

- Brailsford, James F. (1935). *The Radiology of Bones and Joints*, 2nd ed., J. and A. Churchill, London.
- (1937). *Brit. J. Radiol.*, N.S., **10**, 171.
- (1937). *Proc. roy. Soc. Med.*, **30**, 781.

PARASITIC FOETUS SUCCESSFULLY REMOVED BY OPERATION *

BY

MAX GREENBERG, F.R.C.S.Ed.

Senior Surgeon, Johannesburg Hospital

(WITH SPECIAL PLATE)

A male child born on April 6, 1937, was admitted to the Transvaal Memorial Hospital for Children under my care on April 26. He was born normally in a right occipito-anterior position, there being no difficulty with the labour in spite of the child being the mother's first. The period of gestation was normal.

On examination an incompletely symmetrical conjoined twin was found attached to the epigastric area of the host by a fleshy pedicle, and consisted of a right arm, an abdomen, lower limbs, penis, and scrotum. The lower limbs were kept in a frog position astride the abdomen of the host, the penis and scrotum being opposite the host's umbilicus (Figs. A and B). On palpation a bony pelvis and sacrum could be made out, but no vertebral column or ribs. A rounded firm mass could be felt in the abdomen of the parasite, and there was an imperforate anal dimple; a heart-beat could not be felt or heard, and no movements were observed, the parasite appearing devoid of sensation. Both the host and the parasite passed urine at different times. The host, except for the attachment of the parasite, was normal.

Barium was given to the child by mouth, and was observed under an x-ray screen. It was found to pass through the stomach and small and large bowels of the

* Shown at the March meeting of the Southern Transvaal Branch of the Medical Association of South Africa (B.M.A.).

host, but not in the parasite, suggesting that even if there were bowel in the parasite there was no communication between the two.

Four cubic centimetres of uroselectaff B were later injected into a vein and radiographs were taken at frequent intervals for an hour. The dye was easily visible in the parasite, revealing a normally functioning kidney, but it



FIG. A



FIG. B

Illustrations showing the relative positions of host and parasite. (Redrawn, from photographs, by Audrey J. Arnott.)

was poorly shown in the host, owing to there being a large quantity of intestinal gas; but the secretory systems were present and the dye collected in the bladders of host and parasite.

The host during the following two months was growing normally, while the parasite remained stationary, the ratio of host to parasite having risen from approximately 2½ to 1 at birth to 4 to 1 on June 15. The child continued making this progress till August 23, when surgical removal of the parasite was decided upon.

The Operation

Under general anaesthesia an incision was made round the parasite through skin and subcutaneous tissue, and it was then noticed that the peritoneal cavities of the host and parasite were continuous. A loop of blind-ending bowel from the parasite lay free in the host's part of the peritoneal cavity, and a fibrous cord, apparently a urachus, joined both bladders. The host's abdominal cavity contained its normal viscera, but in the parasite's peritoneal cavity there was only a horse-shoe kidney with two ureters entering a bladder.

The peritoneum was cut close to the parasite, leaving enough for the host's abdominal cavity, the blind loop of bowel was returned to the parasite, and the fibrous cord joining the two bladders was ligatured and cut near to the host's bladder. The host's abdomen was then closed in layers. The wound healed by first intention, and the child was discharged from hospital on October 2, 1937. The parasite is shown in Fig. 1 of the Plate.

On February 2, 1938, the child was again seen, being then in perfect health. He had put on weight, and there was no sign of ventral hernia having developed at the site of operation (Plate, Fig. 2).

JAMES F. BRAILSFORD: BRODIE'S ABSCESS AND ITS DIFFERENTIAL DIAGNOSIS
(For legends, see Text)



FIG. 1

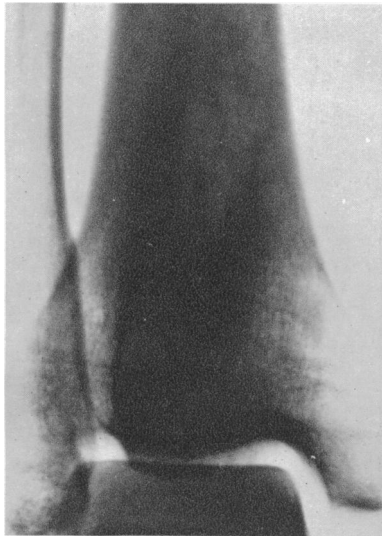


FIG. 2

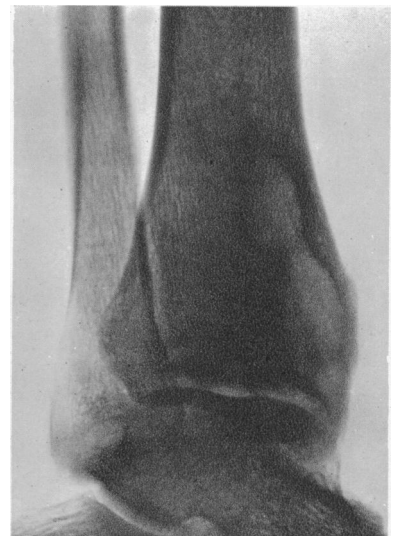


FIG. 3

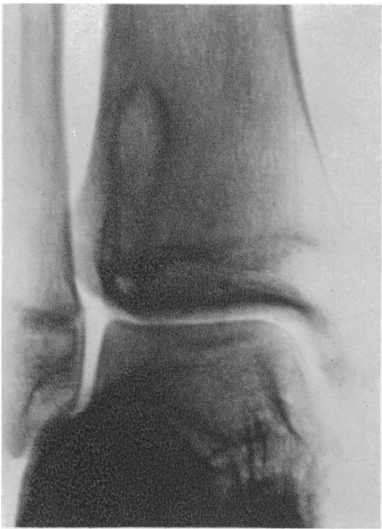


FIG. 4

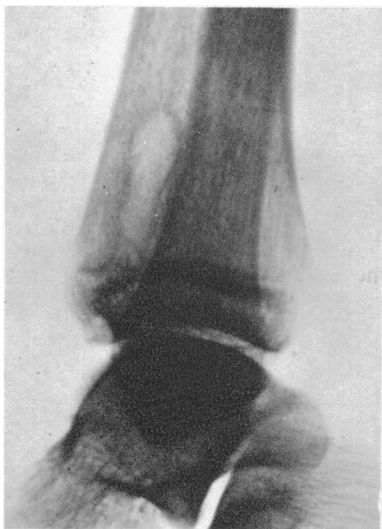


FIG. 5



FIG. 6

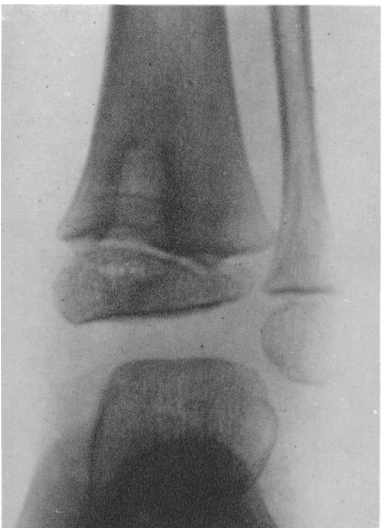


FIG. 7

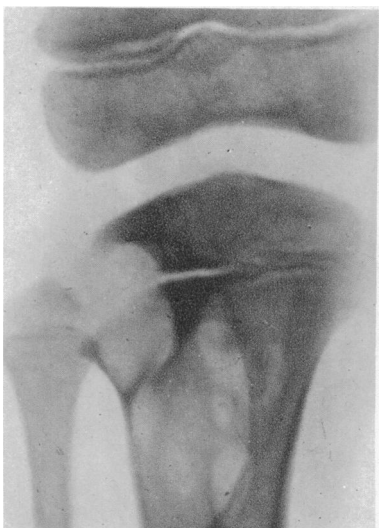


FIG. 8

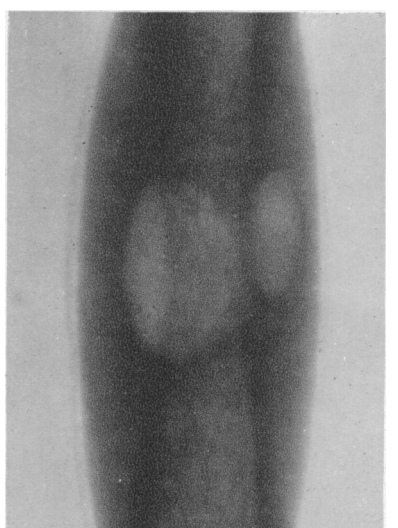


FIG. 9