

The Bacteriology of the Secondary  
Infection in Open Tuberculous  
Lesions.

Introduction to treatment by  
Bacterial Vaccines.

Thesis for M.D.

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*(M.B. Ch.B. Glasgow. 1902.)*

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The MICROSCOPE and some of the apparatus used in these investigations.

- A. Two long pipettes. (Wright)
- B. Tube for mixing vaccine.
- C. Glass beads " "
- E. Glass rod " "
- D. Mounted platinum needles.
- F. Agar culture tubes.
- G. Tubes containing vaccine  
made up in doses.

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The BACTERIOLOGY of the SECONDARY INFECTION  
in open tuberculous lesions.

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Clive Riviere, in an article contributed to Kelynack's "Tuberculosis in Infancy and Childhood" remarks:-  
"It must be borne in mind that tuberculous lesions soon become the home of other organisms".<sup>1</sup>

That this statement is true is painfully evident to anyone having even a passing acquaintance with tuberculosis. The questions of HOW SOON infection takes place, and OF WHAT NATURE the organisms, are those to which in the following pages we would endeavour to make some reply.

The first question, namely, at what time, in the course of a tuberculous lesion does secondary infection take place, has not, so far as I have been able to discover from the literature on the subject, been a matter for much comment.

As in septic infection generally, organisms may reach a particular part of the body from without (there being solution of continuity of skin or mucous membrane) or from within (by means of the blood stream). From observations we have ourselves made, details of which however are not to be recorded in this paper, and from numerous observations by others,<sup>2</sup> it is shown that in tuberculous lesions at any rate, secondary infection by means of the blood stream is unusual, in fact very exceptional.

The observations above referred to and made by ourselves consisted in the bacteriological examination of "closed" tuberculous lesions e.g.

- (1) Tuberculous joints at the time of the operation of excision.
- (2) The interior of glands on their removal by operation.
- (3) The contents of so-called "Cold Abscesses".

1. See list of references at end of Volume.



In these (to the number of 20) it was found that pyogenic infection was absent even when symptoms of inflammation were present, such as thinning and redness of the skin, pain and rise of temperature. In short it may be said that secondary infection as a rule is absent so long as the skin surface remains unbroken. Many of these cases, moreover, exhibited "open" as well as "closed" tuberculous lesions in the same individual, secondary infection being present in the former, and absent in the latter. Cases Nos 1, 37, 38, 45 and 51 in our series are examples of this condition.

When then does secondary infection occur?

In our series of open tuberculous lesions, a note was made in each case of how long the lesion had been open, and we were able to demonstrate the presence of secondary infection in 1 case within 5 days, in 1 case within a week, in 3 cases within a fortnight, and in many cases within a month of the lesion assuming the open type.

In Hospital practice, it would seem that infection takes place very soon after a lesion becomes open, whether spontaneously or deliberately (by operation). This is not surprising when we recollect that the skin itself has as a natural host, the Staphylo. Coccus Epidermis albus<sup>3</sup> (of Welch), which by inoculation into the very suitable medium of the substance of a tuberculous focus, and incubation at body temperature, soon assumes the pathogenic properties of the Staphylococcus albus.

The nature of the organisms causing the secondary infection is to form the subject for our special investigation.

During one's term of residence as Medical Officer to the Royal Sea Bathing Hospital Margate, one had a favourable opportunity for studying the subject. The observations were for the most part made upon patients of this Institution, many of whom were operated upon in the London Hospitals and sent to

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us with secondary infection already well established. To the Honorary Medical Officers of the Institution I am indebted for permission to use this material for the purpose of these investigations.

Our series is made up of 100 cases, 15 of which are cases of phthisis in an advanced stage. These latter did not belong to this Institution, but were inmates of the St Catherinés Home for Consumptives, Ramsgate, to which I had access by the kind permission of Dr. Berry the Medical Officer.

The series then represents 100 cases of open tuberculous lesions. They are arranged in no particular order, except that the phthisis cases come at the end of the series.

With regard to method, we endeavour to make our investigations as simple as possible consistent with accuracy, every care being taken to eliminate error. For this purpose, all collecting of material, inoculating of tubes, making and staining of films was done from first to last by myself.

The routine procedure was as follows:-

For 12 to 24 hours before a case was investigated, antiseptic dressings were stopped, sinuses, ulcers, &c being drenched or syringed with sterilised water and dressed with aseptic gauze.

In every case one took to the patient's bedside:-

- (1) Two dry, clean (Van Ermengem.) slides.
- (2) Two sloped agar tubes.
- (3) Two mounted platinum needles.
  - (a) with loop
  - (b) straight.

- (4) a spirit lamp.

The aseptic dressing being removed and discarded, one washed the skin surrounding the lesion with a swab wet with sterilised water. By exercising a little pressure on the side of the

lesion, one got pus fresh from its depth, and from this a loopful was taken up on the platinum needle previously sterilised in the usual way. From this loopful, one could get as a rule all the material necessary for the investigation of that particular case. The straight needle, sterilised in the same way, was first passed into the pus through the loop and withdrawn the agar tubes being inoculated with it by means of a series of strokes. Thus by using the straight needle and by exercising a little care, four successive strokes could readily be made on each tube. The loopful of pus was now divided between the two slides and spread on each by means of the platinum needle. The films thus made were dried over the flame at once, and one proceeded to the laboratory where the tubes, duly labelled, were placed in an incubator at 37° C and the slides stained, one with Methylene Blue, the other by Gram's stain, mounted in Xylol Balsam and examined under a  $\frac{1}{12}$ " oil immersion lens.

The microscope used was a Heitz<sup>†</sup>, Stand D, with eye-pieces giving with the oil immersion lens 555 and 1000 diameters respectively, the usual procedure being to search the film with the lower power using the higher only for minute examinations.

Of Methylene Blue we found a rather dilute solution the most useful, staining a fairly thin film in from 10 to 15 minutes. For Gram's differential stain we used Carbol Gentian Violet, 2 minutes; Gram's Iodine Solution  $\frac{1}{2}$  min; decolorisation being effected with absolute alcohol, and dilute methylene blue used as a counter stain. When pus was scanty for the purpose of making films, Gram's stain was given the preference, and sometimes in those cases the straight needle had to be loaded immediately from the lesions.

The cultures tubes were examined by daylight in 6,

12, 24, & 48 hours both by the eye and by means of a lens, and notes taken in the Laboratory at the time.

Sometimes subcultures had to be made in gelatine and blood-agar, but beyond these no other medium was used, except on one or two occasions when potatoes were prepared and utilised for the purpose of ~~H. coli~~<sup>5</sup> aiding in the identification of B. Coli.

Films on cover slips were made from each variety of colony and stained in the first instance with dilute Carbol-Fuchsin often also with Gram's stain, Methylene Blue, and Thionin Blue.

Hanging drop preparations were made of all bacillary forms, and occasionally special stains for capsules, spores, and flagella employed.

In the form adopted for recording the bacteriological findings in our cases, only the main features of these procedures are noted, but it is to be understood that in every case where doubt existed as to the identity of organisms of a particular colony, most and sometimes all of these processes were employed.

Again as regards the Staphylococcus aureus and citreus.

All shades of yellow were encountered, so that in our enumeration of the varieties of organisms present any staphylococcus which liquified gelatine and was not white is called "aureus".

From the 15 phthisis cases, the sputa were collected in small wide-mouthed glass bottles with rubber corks all of which were sterilised by being boiled in water. The patients were instructed to wash the mouth and throat with hot water before using the bottle, and were asked to expectorate directly into it. From the sputa, films were spread on slides and cultures made before the material had been 3 hours old. In each case two films were prepared, one was stained by the Ziehl Neelsen method for the identification of tubercle bacilli, and

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the other by Gram's method, counter staining in each case with Methylene Blue.

It should perhaps be stated that we had no special previous training in bacteriological work, <sup>and</sup> that as investigation of this kind had not been previously carried out at the Hospital, a laboratory had to be improvised and such equipment got as was necessary, with due regard to economy.

For guidance in our method and technique we are indebted to the following books:-

"Manual of Bacteriology" Miss Ritchie.

"Differential diagnosis of Bacteria" Manett.

"Clinical Methods" Ch XIV:-

Clinical Bacteriology Hutchison & Rainey.

Before detailing the records of our cases, one point perhaps required an explanation. We have assumed that our cases are all tuberculous. The proof of tuberculosis of course consists in the demonstration in the lesion of the tubercle bacillus, but in the case of lesions such as we are now considering, this is often a matter of extreme difficulty, positive results only being possible by the aid of inoculations in animals.

I may say that all our cases were clinically tuberculous, that each had been sent to us as tuberculous, and had been accepted as such by our Honorary Staff, men of vast experience in tuberculosis in all its manifestations.

Case. 1.

Patient. L. H.

Age. 15 Sex. F.

Affection Tub: disease Rt elbow. c Sinuses.

Onset. 9 mos.

Operation, if any. 6 mos. opened + scraped.

How long "open". 6 mos.

Other evidence of tuberculosis.

Tub: disease Rt sup: Maxilla.

Tub: dermatitis ht leg. Cold abscess under ht orbit.

Bacteriology.

METHOD		RESULT
<u>Pus films.</u> MB + Gram	<u>Elbow.</u>	Streptococci. by each method
	<u>leg.</u>	Staphylococci .. ..
	<u>orbit</u>	Nil.
<u>Cultures</u>	<u>Elbow</u>	Streptococci c one colony Staph: Alb.
	<u>leg.</u>	Staphyloc: albus abundant.
	<u>Orbit</u>	Sterile.
<u>Films</u> made from each variety and stained Cf. die + Gram.		Streptococci and Staphylococci confirmed. <u>Streptococcus</u> <u>Staphylococcus albus.</u>

Other notes.

This patient had been in Hospital over 10 mos. Had had treatment with sea baths + tuberculin. She formed one of our vaccine cases but was taken out by her parents before treatment was complete. She was however doing very well. Page 126.

This girl had therefore three lesions upon which bacterial investigation was made.

- ① Rt elbow with sinus discharging 6 mos gave. Streptococci + Staphylo: albus.
- ② Ulcer ht leg discharging for 2 mos gave. Staphylo. Alb: only.
- ③ Abscess under ht orbit open 10 days gave no result.



Case. 2.

Patient M.C. Age 9 Sex F.

Diagnosis. Tub: Disease spine & psoas abscess Rt.

Onset. "Since infancy"

Duration if any 6 mos. abscess opened & drained

How long "open" Since op: 6 mos.

Other evidence of tuberculosis None.

Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> Meth. Blue. Gram. Stain for capsules	Diplococci abundant. Some small chains Do. Gram +. Positive.
<u>Cultures on agar.</u>	Considerable growth on tube 1 in 24 hours, almost none on tube 2.
<u>Films.</u> Cf. dis. Gram.	The growth of one variety only, and consists of a streak composed of fairly transparent dots. There are three such streaks on tube 1. and a small streak on tube 2.
	Films from growth show a gram + diplococcus, in clumps & in chains.

Pneumococcus.

This case gave no history of pneumonia or empyema but there was little doubt as to the identity of the organism. A special feature of the case was the action of a vaccine of pneumococcus which appeared to have a very definite effect on an irritative skin eruption surrounding the abscess. See page. 129.

Upon a subsequent occasion, and after two doses of vaccine, the discharge was again examined, and the pneumococcus still found to be present. Staphylococci on this occasion however were also present and on the culture tube Staph. alb + Staph aur grew to the exclusion of any pneumococcal growth. Staphylococcus albus  
Staphylococcus aureus.

Case. 3.

Patient. A. B. Age. 13. Sex. F.

Affection Tub: disease Rt Femur & sinuses.  
Boils of both axillae.

Onset. 2 years.

Operation, if any. None.

How long "open." At least 12 mos.

Other evidence of tuberculosis Scar of  
healed sinus of Rt hip.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> from hip us: gram. <u>Culture</u> on agar.	Both show staphylococci. one variety of colony only. on tube 1, abundant & continuous " " 2, 10 colonies all became of a bright yellow colour.
<u>Films stained</u> Cf di & gram.	Confirm Staphyloc.
	<u>Staphylococcus Aureus.</u>

Other notes:-

This patient had boils in both axillae from the pus of which films were made & cultures taken. These were found to be due to Staphyloc. albus.

A stock vaccine was employed of mixed Staph: aureus, albus &.

See notes page. 116.



Case. 4

Patient. A.B. Age. 14 Sex. F.

Affection. Tub: disease Rt femur & sinuses.

Onset. 3 years.

Operation, if any. 2 years. Incision + scraping.

How long "open". 2 years.

Other evidence of tuberculosis:

Tub: disease Rt hip & shortening and fixation.

### Bacteriology.

METHOD	RESULT
<u>Pus films</u> MS + Gram.	Staphyloc. abundant both.
<u>Culture</u>	Two varieties of growth differing only in colour undoubted Staph: <u>aur:</u> + <u>alb:</u>
Films by CF disc + Gram.	Confirm.  <u>Staphylococcus aureus.</u> <u>Staphylococcus albus.</u>

### Other notes:-

Patient had been in Hospital 15 mos. Was having treatment as follows:- open air (out all day + sleeping out at night) feeding; sea water baths; aseptic dressing. Had much improved in general condition but sinuses showed little tendency to heal. With much difficulty we got permission to try vaccine treatment, a stock mixed vaccine was used. for details see page 122.

Case. 5.

Patient. J. M. Age. 5 Sex. F.

Affection Tub: disease ft. tibia & sinus.

Onset. 2 years.

Operation, if any. 6 mos. ab: opened & scraped.

How long "open". 6 mos.

Other evidence of tuberculosis none.

### Bacteriology.

METHOD	RESULT
<u>Pus films</u> Meth Blue. Gram -	Negative Streptococci.
<u>Culture.</u>	Two varieties. Growth has been rather scanty on both tubes. No. 2 shows very beautifully the large yellow colonies united by a row of tiny dots. larger colonies <u>Staph</u> smaller " <u>Strepto.</u>
Films of each. CF dia + Gram.	<u>Staphyloc: aureus.</u> <u>Streptococcus</u>

Other notes:-

The sinus in this case was very small and had on several occasions almost healed. It led to bare bone which however as time advanced became covered. Rest in this case was obtained with difficulty. The leg was afterwards put in a long plaster of paris splint with a window through which the sinus was dressed. After this it soon healed up.

Case 6

Patient H.W.O. Age 27 Sex M.

Affection Tub: disease spine c sinus back.  
pressure symptoms - paraplegia.

Onset 12 mos.

Operation, if any. Laminectomy. 1 mo.

How long "open" 5 days after op.

Other evidence of tuberculosis Nms.

### Bacteriology

METHOD	RESULT
<u>Pus films.</u> MS Gram.	Staphylococci.
<u>Culture on agar.</u>	In 24 hours several round white colonies appeared with a haze all over the face of the medium, this haze by transmitted light looked fluorescent. Later a bright green diffused thro' the whole of the medium.
<u>Films</u> Colonies CF+ from Surface CF. from	Staphylo. A short Bacillus, gram negative.
Hanging drop from latter.	Actively motile Bacilli.
<u>Other notes:-</u>	<u>Bacillus Pyocyaneus.</u> <u>Staphylococcus aureus.</u>

This case was specially interesting as it was the first time we had seen the B. Pyocyaneus. The green colour and motility were very striking. Subcultures were made but found that these soon lost their power of producing the pigment and also that they soon died. Cultures taken a week afterwards from this main case showed Staphylococcus only.

Case 7.

Patient A.O. Age 25 Sex M.

Affection Tub: sacro iliac disease & sinuses

Onset 2 years.

Operation, if any None on this part.

How long "open" 11 mos.

Other evidence of tuberculosis Tub: disease of Rt testis, removed by op: 18 mos.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> Meth Blue + Eram.	Cocci gram + small chains. Bacilli gram -.
<u>Culture</u> agar.	In 24 hours a copious growth of a slimy character invaded the whole surface of the medium. It was denser in parts but nowhere very opaque. Odour marked. No cocci were seen at all.
<u>Films</u> made from various parts of the surface Stained C.F. die + Grams method	A rather short bacillus in pure culture. gram -.
<u>Hanging drop.</u>	motile Bacilli

Other notes:-

Bacillus Coli.

Streptococcus

The streptococci which from the pus film were undoubtedly present were in this case outgrown by the B. Coli. The tubes were examined 12 hours after inoculation and by that time in each case the slimy growth had invaded the whole of the surface.

Subcultures were made and from one of these an autogenous vaccine prepared. The patient however was very ill and only had one dose after which we thought it wise to discontinue this treatment as the man was obviously going to die.

Case. 8

Patient. A. K. Age. 6. Sex. F.

Affection Tub: disease Rt. radius & sinus.

Onset. 3 years.

Operation, if any. none.

How long "open". at least 5 mos.

Other evidence of tuberculosis Tub: disease of:-  
Lt. ankle, Rt. foot, Rt. wrist & scars of  
healed sinuses.

Bacteriology.

METHOD	RESULT
<u>Pus.</u> scanty MS + Gram.	Negative.
<u>Culture</u> agar.	Several colonies of the same kind. round & smooth afterwards yellow.
<u>Films</u> G. die + Gram	Staphylo.

Staphylococcus aureus.

Other notes:-

Some doubt existed as to whether this case was purely tuberculous. Something in the patient's physiognomy induced us to put her upon treatment with Mercury & Potassium Iodide to which she responded immediately. She was dismissed very shortly afterwards with all places healed and very much improved in general condition.

Syphilis +

Case. 9.

Patient. H.B. Age. 17 Sex. M.

Affection Tub: disease spine & psoas ab: Rt. paresis of legs.

Onset. 6 years.

Operation, if any. Ab: opened & drained, 5 years.

How long "open". 5 years.

Other evidence of tuberculosis. Tub: disease of pubic bone.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> MS & Gram.	Staphylo. got by each method.
<u>Culture agar</u> Films by Cf die & gram	Staphylo: albus.  Confirm.
	<u>Staphylococcus albus.</u>

Other notes: -

Case. 10.

Patient. A.B. Age 26. Sex M.

Affection Tub: disease spine (dorsal) with psoas abscess Rt side.

Onset. 3 years.

Operation, if any. Abscess opened + drained. 3 mos.

How long "open". Since operation - 3 mos.

Other evidence of tuberculosis. Tub: disease  
Sacro-iliac joint, lumbar abscess.

### Bacteriology

METHOD	RESULTS
<u>Pus films.</u> Methyl Blue. Gram.	Isolated Cocci, only. Cocci gram positive.
<u>Culture on agar</u>	Two varieties of growth. 2 <sup>nd</sup> tube shows well the difference between the small, isolated, slow growing streptococci and the more vigorous, slimy, spreading colonies which turned out to be B. Coli. The odour on removing plug characteristic.
<u>Films.</u> Stained from each variety with CF di & gram.	Cocci in chains 3-7 long. gram +.
Hangings dup prep: made.	Bacilli rather long, gram -, & motile.
<u>Other notes</u>	<u>Streptococcus</u> <u>Bacillus Coli.</u>

This patient afterwards developed an abscess in the lumbar region in connection with disease of Sacro-iliac joint. This on being opened and explored was found to communicate directly with the bowel. For some time afterwards pus was passed per rectum. Later an abscess formed on the opposite thigh. He became toxæmic and died 6 weeks after the above observations were made.

Case. 11.

Patient. N.F. Age. Sex. M.

Affection Tub: disease spine & psoas ab: ht.

Onset. 3 Years.

Operation, if any. Ab: opened Lt. groin 2 1/2 yrs.

How long "open". Since op. 2 1/2 yrs.

Other evidence of tuberculosis.  
Ischio-Rectal abscess.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> W.B. + Gram.	Staphylococcus in abundance. No bacilli seen.
<u>Culture.</u>	In 12 hours small round colonies were seen seven in 1 <sup>st</sup> tube & one in 2 <sup>nd</sup> tube a streak appeared between the colonies first seen and this seemed to grow much more rapidly and to envelop the others.
<u>Films of each variety with W.B. C.F. die &amp; gram.</u>	Cocci gram +. Bacilli gram -. motility in bacilli.
<u>Hanging drop.</u>	

Other notes:-

Bacillus Coli.  
Staphylococcus Albus.

Cultures on potato in this case gave distinct but not very typical growth of B. Coli.



Case. 12.

Patient. E. P. Age. 16 Sex. F.

Affection Tub: disease upper end Rt. Femur  
ē Sinus.

Onset. 7 years.

Operation, if any. Abscess hip opened & drained 7 mos.

How long "open" Since op. 7 mos.

Other evidence of tuberculosis Phlyctenular  
Conjunctivitis

Bacteriology.

METHOD	RESULT
<u>Pus.</u> several Specimens Stained MB & gram.	Negative. Discharge is scanty and serous in character.
<u>Cultures</u> on four occasions made from pus from Sinus hip.	Sterile.

NIL.

Other notes:-

Case. 13.

Patient. E. M. Age. 34. Sex. F.

Affection Tuberculous Empyema. Rt.

Onset. 2 years.

Operation, if any. Resection rib & drainage. 10 mos

How long "open". Since Op. 10 mos.

Other evidence of tuberculosis. Tub: caries  
of upper dorsal spine, only dis-  
covered post mortem.

### Bacteriology.

METHOD	RESULT
<u>Pus films</u> ms + Gram.	Cocci, few and in clumps.
<u>Culture.</u>	Growth in both tubes. typical Staph alb.
<u>Films</u> with CF die + Gram.	Confirmatory.

Staphylococcus albus.

### Other notes:

This patient was very thin and emaciated. The empyema had been discharging many months and she had a hectic temperature. She suddenly became ill one morning with sickness and headache and had a fit in which she lost consciousness and became generally convulsed. The movements starting in the face and extending rapidly over the whole body. Spasticity of the limbs remained after the movements had ceased. The fits were repeated 6 or 7 times during the next 36 hours and she died.

Post mortem no evidence of general dissemination of tuberculosis, chiefly of lungs and Brain.

Case. 14.

Patient. B. J.      Age. 9      Sex. M.

Affection      Tub: disease Rt. humerus & sinus.

Onset.      5 mos.

Operation, if any.      3 mos. abscess opened, drained.

How long "open".      Since op. 3 mos.

Other evidence of tuberculosis

Nma.

Bacteriology

METHOD	RESULT
<u>Pus films.</u> MS + Gram. <u>Culture agar.</u> <u>Films stains</u> MS + CF. dis	Abundance of Staphylococci  Pure culture of Staphylo. aureus Even the 2 <sup>nd</sup> tube showed in all the strokes a continuous streak of yellow growth. Staphylococci & they only.
	<u>Staphylococcus aureus.</u>

Other notes:-

Case. 15.

Patient, S. R. Age. 11. Sex. M.

Affection Tuberculous disease Rt knee joint with sinuses (three).

Onset. 2 1/2 years.

Operation, if any. Joint incised + closed. 12 mos.

How long "open". 11 mos. broke down 4 wks after op.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> Meth: Blue stain Gram.	Cocci only.
<u>Culture on agar.</u>	Two varieties, and bright-green colouration throughout medium.
Films stained with Carbo. Fus. die Gram. from each variety.	Cocci, gram +, in clumps. Short bacilli, gram -.
<u>Hanging drop preparation</u>	Bacilli motile. <u>Staphylococcus aureus.</u> <u>Bac: Pycocyanus.</u>

### Other notes:-

It had been noted that from time to time the pus from this boys sinuses was of a green colour. Since the above observations were made he has had the knee joint excised. It has done well.

Case 16.

Patient B.B. Age 24 Sex F.

Affection. Tub: Disease Spine c psoas abscess Rt.  
Tub: Dermatitis both legs.

Onset. Spine 6 mos. Dermatitis 2 years.

Operation if any. Psoas ab: opened. 3 mos.

How long "open" Psoas 3 mos. Dermatitis 2 years.

Other evidence of tuberculosis none.

Bacteriology.

METHOD.	RESULT.
Pus from psoas.	only a few cocci.
Cultures.	Staphylococcus albus only.
Pus films from leg. W.B. & Gram	Staphylococci
Cultures.	Abundant growth of dense white growth, all along needle strokes.
Films.	Staphylococcus only.
CF di Gram.	
Subcultures.	Confirm Staph: albus.
Other notes:-	<u>Staphylococcus albus.</u>

In this case Staph: albus was found in two separate lesions in the same individual.

From a subculture of the organisms grown from the leg an autogenous vaccine was prepared with which the patient was treated.

She responded well, the dermatitis cleared up but the condition of the psoas abscess was unchanged.

See page 136.

Case. 17.

Patient, O.N. Age. 7. Sex. F.

Affection Tub: disease Rt hip & sinuses (two)

Onset. 12 mos.

Operation, if any. Abscess opened. 3 mos.

How long "open". 3 mos.

Other evidence of tuberculosis None.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> Meth Blue Gram.	Negative.
<u>Culture Agar</u> Films. <u>Carbo. Fusch</u> <u>Meth Blue.</u> <u>Gram.</u>	Two varieties. white and yellow. all staphylococci. Gram +.
	<u>Staphylococcus Aureus</u> <u>Staphylococcus Albus.</u>

Other notes:-

This patient was treated with a stock mixed vaccine, see Page 119

Case. 18

Patient. A. W.

Age. Sex. F.

Affection Tub: Disease Great Trochanter Rt Femur with large sinus.

Course. 8 mos.

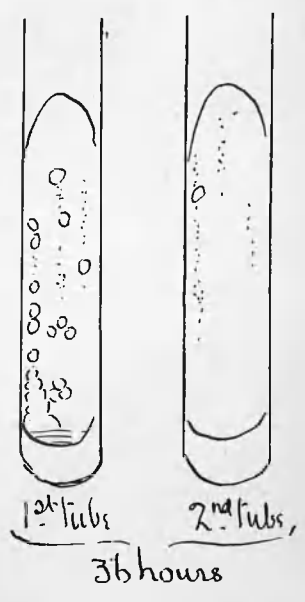
Operation, if any. 2 mos. Trochanter scraped

How long "open". a week after operation.

Other evidence of tuberculosis = None.

Bacteriology

METHOD	RESULT
<u>Pus films</u> MS + Gram.	Streptococci easily demonstrated.
<u>Cultures</u> . Agar.	In 24 hours two varieties of growth could be made out. Small & large colonies.
Films from each variety with CF disc.	2 <sup>nd</sup> tube has only one of latter variety.
<u>Other notes</u>	Staph & Strepto.
	<u>Streptococcus</u> <u>Staph: albus.</u>



About the time these observations were made this patient developed an induration round the sinus in the hip with spreading redness and high temp: She was isolated and was given several doses of Antistreptococcus Serum, each dose was 10 cc. and the variety B. W. & Co. Polyvalent. The immediate result was good, after two doses the temp: dropped from 104 to 99.2 and the local condition very materially improved. This happy condition however did not continue and in spite of several subsequent injections matters returned practically to their former condition.

Case. 19.

Patient. E.E. Age. 27. Sex. F.

Affection Tuberculous glands neck Rt. & Sinus.

Onset. 5 years.

Operation, if any. Several.

How long "open". 3 mos, this time.

Other evidence of tuberculosis. Rt. Tub: Hep & Scar healed sinus.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> - sub. material scanty.	Negative.
<u>Culture</u> on agar.	In 24 hours three colonies on 1 <sup>st</sup> tube, none on 2 <sup>nd</sup>
Films & C.F. separ.	Typical Staph. aur: Confirm.  <u>Staphylococcus aureus.</u>

Other notes: -



Case. 20.

Patient. J. P. Age. 8 Sex. M.

Affection Tuberculous Empyema Rt.

Onset. 11 mos.

Operation, if any. Resection rib. 10 mos.

How long "open". Since op 10 mos.

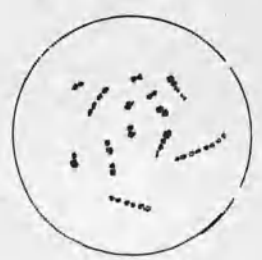
Other evidence of tuberculosis. Small cavity Rt. apex.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MB. Gram. Capsule stain.	Organisms scanty. Diplococci seen wh. are Gram +. Capsules stain moderately well.
<u>Cultures.</u>	On agar fair quantity of very delicate growth as shown.
<u>Films.</u> Cf. air. Gram.	Diplococci small, many arranged in chains. Involutum forms are present seen in 24 hours growth. These take the form of an enlargement of one of the individuals forming the diplococcus.
<u>Other notes:-</u>	Frequently also a chain shows large members at one end and diminutive at the other.



24 hours agar.



C.F. dil. Film from 24 hrs. growth.

The opening in the chest wall in this boy's case was much higher than usual and awkward for efficient drainage. On several occasions the sines assumed on the point of closing up but always broke down again. The observations were made during one of these outbursts.

Pneumococcus.

Case. 21.

Patient. R.C. Age. 13 Sex. M.

Affection Tub: Disease Lt hip. Amputation thro' hip joint, Stump c Sinuses.

Onset. 2½ years.

Operation, if any. many. Amputation. 7 mos.

How long "open". 19 mos at least.

Other evidence of tuberculosis. Lupus of Lt side of face.

### Bacteriology.

METHOD.	RESULT
<u>Pus films.</u> Meth. Blue Grams method.	Staphyloc. Gram + Short Bacillus Gram -.
<u>Cultures on agar</u> Two films made from each variety one stained C.F. die " " Gram	Two varieties (a) yellow flat colonies. (b) diffuse transparent growth. medium became tinged with green Spreading from the flat surface. Staphylococci Short Bacillus Gram negative.
Hangings dish preparation	Bacillus actively motile.
<u>Other notes:-</u>	<u>Staphylococcus aureus.</u> <u>Bacillus pyocyaneus.</u>

Case. 22.

Patient. J. Y. Age. 14 Sex. M.

Affection Tub: Disease Lt hip, Amputation.  
Stump c Sinuses.

Onset: 5 Years.

Operation, if any. Ampul: 8 mos.

How long "open". Since 2 for long time before op. - several years.

Other evidence of tuberculosis. none.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> NB 1 gram.	Streptococci abundant; and they only.
<u>Cultures agar.</u>  Films made from each +, stains CF du 1 gram.	Two varieties of growth ① Larger smooth white ② Small numerous + discrete.  The smaller colonies are streptococci. The larger a rather short bacillus. fairly thick compared with length and stains by Grams method.
<u>Hanging drop preparation</u>	Bacillus non motile.

Other notes: -

Streptococcus

Bacillus ?

Case. 23.

Patient. J. B. Age. 37 Sex. M.

Affection Tub: Disease Spine c̄ double psoas abscess.

Onset. Some years.

Operation, if any. 2 years. Ab: emptied & stitched

How long "open". One month after operation.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u>	Not taken.
<u>Culture from Rt psoas</u>	In 24 hrs showed a slimy smear all over the medium, rather transparent and blotched in places. On removing plug from tube the odour is quite characteristic.
<u>Films with C.F. disc. Gram and hanging drop preparation.</u>	Show a bacillus, motile, Gram negative with tendency to arrange themselves side by side.
	<u>Bacillus Coli.</u>

Other notes: -

In this case potatoes were prepared (Muir & Ritchie manual of Bacteriology P. 45) according to Ehrlich's method, slices being put into ordinary sterilised test tubes on to a pad of sterilised cotton wool and subcultures made.

The result was highly successful, growth of a brownish colour being evident in two days.

Subcultures were made from an agar tube and a vaccine prepared (from a 10 hours old growth) with which the patient was treated. See page 139.

Case. 24.

Patient. J. N. Age. 36. Sex. M.

Affection Tub: disease spine psoas abscess Rt.

Onset. 2 years.

Operation, if any. Ab: opened + drained 12 mos.

How long "open." Since Op: 12 mos.

Other evidence of tuberculosis: Tub: disease  
Great trochanter Rt c abscess.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS + Gram.	Cocci and bacilli seen in both films. The latter short & thick.
<u>Cultures</u> agar. <u>Films</u> of each. Cf. die + Gram	In 24 hours two varieties of growth visible, one staph and the other was thought to be Staph. albus but when films were made it was seen to be a bacillary form. A short thick gram + bacillus In growth it resembled very much the staph: albus but has perhaps less dense and

Other notes:-  
more gray than white.

Staphylococcus aureus.

Bacillus ? short, gram +

Case. 25

Patient. R. M. Age. 17 Sex. M.

Affection Tub: Elbow Rt. Excision c Sinuses.

Onset. 2 years.

Operation, if any. Excision 9 mos.

How long "open" a week after operation.

Other evidence of tuberculosis. Dactylitis of two fingers. Tub: caries Rt. tibia.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> Stained with Gram.	Abundant cocci in groups.
<u>Cultures.</u> Films with MS, CF die	Grew beautiful examples of the Staph: aureus. Confirm.
	<u>Staphylococcus aureus.</u>

Other notes:-

Case 2b.

Patient, R. S. Age, 27 Sex, M.

Affection Tub: disease Rt ankle & Sinus.

Onset, 18 mos.

Operation, if any, 12 mos. bone scraped.

How long "open", Since operation.

Other evidence of tuberculosis - Amputation of Rt foot for tub: disease ankle. lumbar abscess leading to caries spine. Tuberculous Laryngitis.

Bacteriology

METHOD	RESULTS
<u>Pus films</u> urs + Gram.	only isolated cocci. Gram +.
<u>Cultures on agar</u>	Grow fair quantity of staph: albus and aureus, the colonies being well mixed.
<u>Films in</u> CF. air.	Staph:
	<u>Staphylococcus aureus</u> <u>Staphylococcus albus.</u>

Other notes:-

Case. 27.

Patient. R.H. Age. 20. Sex. M.

Affection Tub: disease Rt femur & sinuses.

Onset. 18 mos.

Operation, if any. 8 mos. ab thigh opened.

How long "open". Since oh.

Other evidence of tuberculosis. None.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> <u>Cultures</u>  Films Stained	Show any quantity of staph: From Staphylococcus albus and aureus the colonies been about equal in number in each tube.  Staph: confirmed.  <u>Staphylococcus albus.</u> <u>Staphylococcus aureus</u>

Other notes:-



Case. 28.

Patient: J. M. Age. 20. Sex. M.

Affection Tub: disease hip ft. & sinus.

Enact. 2 years.

Operation, if any. Abscess drained. 15 mos.

How long "open". Since op: 15 mos.

Other evidence of tuberculosis Phthisis.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> wet + Gram.	Cocci gram +. Arranged many singly, but frequently in groups. no chains.
<u>Cultures</u> agar.	Growth taken place in both tubes all of same variety.
<u>Films.</u>	Fairly large rounded white colonies in 24 hours.
CF dil	Kata ran together to form continuous streak.
s. Staphyloc.	
<u>Other notes:-</u>	<u>Staphylococcus albus.</u>

Case. 29.

Patient. J. H. Age. 21. Sex. M.

Affection. Tub: Disease Hip Rt; amputation at hip joint, stump c Sinuses.

Onset. 17 years.

Operation, if any. 16 years. Amput: at hip joint

How long "open". Since op.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> Gram.	Abundant diplococci gram + outside the pus cells, and often in clumps, these cocci are small.
<u>Cultures</u> agar.	In 24 hours growth was visible and consisted apparently of one kind only.
<u>Films.</u> Ct die + Gram	Growth was of the form of a series of small round transparent dots giving a finely continuous line all over the needle stroke. Films show diplococci in chains and in masses.
<u>Other notes:-</u>	Gram +. and small.

Pneumococcus.

Case. 30.

Patient. W. H. Age. 30 Sex. M.

Affection Tub: disease spine c psoas abscess Rt.

Enact. 18 mos.

Operation, if any. Ab: opened & drained. 14 mos.

How long "open." Since op: 14 mos.

Other evidence of tuberculosis None.

### Bacteriology

METHOD	RESULT
<u>Pus films.</u>	Streptococci abundant.
<u>Culture on agar.</u>	One variety of colony only, visible in 18 hours. Small separate colonies.
<u>Films stained with Carb. f. die &amp; Gram.</u>	Streptococci in pure culture. Chains observed composed of 8 individuals, but mostly 3-6.
	<u>Streptococcus.</u>



20 hours growth.

#### Other notes:-

Cultures were taken from this patient on at least 4 occasions. Each time Streptococci were the only organisms present. At various times when we wished to demonstrate streptococci for the purpose of lectures to nurses and otherwise we were in the habit of making a culture of the pus from this man's abscess.

Case. 31.

Patient. J.G. Age. 26. Sex. M.

Affection Tub: disease spine c focal abscess Rt.

Onset. 3 years ago.

Operation, if any. 5 mos ago. Ab: opened +  
stitched up.

How long "open". 6 wks after operation.

Other evidence of tuberculosis.

### Bacteriology.

METHOD	RESULT
<u>Pus films</u>	Negative.
<u>Culture. agar.</u>	In 24 hours. 3 small colonies. widely separated. These soon became yellow and showed the usual features of Staph: aureus.
Slides. Cf. Gram.	Confirm the above.
	<u>Staphylococcus aureus.</u>

Other notes:-

Case. 32.

Patient. P. S. Age. 31 Sex. M.

Affection Tub: Disease spine. Abscess ab: Lt.

Onset. 4 years.

Operation, if any. Ab: opened + drained 12 mos.

How long "open." Since op. 12 mos.

Other evidence of tuberculosis Tub: disease Lt. Kidney. Sinuses in back from caries of Sacrum.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> MS + Gram.	Examination negative.
<u>Culture</u> agar Films Stained Exam:	only two colonies of Staph. of the yellow variety  Confirm.
	<u>Staphylococcus aureus.</u>

Other notes: -

Case. 33.

Patient. W. L.      Age. 13.      Sex. M.

Affection Tub: disease spine & psoas abscess Lt.

Onset. 2 years ago.

Operation, if any. 12 mos. ab: opened & drained

How long "open". 12 mos.

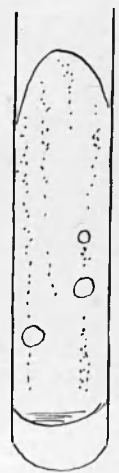
Other evidence of tuberculosis.

Tuberculous hip Lt. with sinuses.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> Meth B. Gram.	Negative. Groups of Cocci Gram +.
<u>Culture on agar.</u>  Films from each Stain & Gram.	In 24 hrs. 2 varieties of colonies. ① large white ② Small - ① Staphylococcus. ② Streptococcus.  <u>Staphylococcus albus.</u> <u>Streptococcus</u>

Other notes:-



36 hours.

Case. 34

Patient. R.P. Age. 11. Sex. M.

Affection Tub: disease Rt wrist-joint c Sinus .

Onset. many years .

Operation, if any. Scraped. 7 mos .

How long "open". 10 mos .

Other evidence of tuberculosis. Tub: disease both elbows, both knees, Rt ankle, Rt malar.

Bacteriology:

METHOD:	RESULT
<u>Pus films.</u> MS + gram.	Cocci by both methods .
<u>Cultures</u> on agar.	Two varieties of staphylococcus, albus + aureus about equal number of colonies of each in each tube .
<u>Films</u> with MS. Cf die + gram.	Staphylococci only .
	<u>Staphylococcus albus.</u>
	<u>Staphylococcus aureus.</u>

Other notes: -

Case. 35.

Patient. W. W.      Age. 13      Sex. M.

Affection Tub: disease spine c psoas abscess Rt.

Onset. 3 years.

Operation, if any. 12 mos. Abscess opened & drained.

How long "open". Since operation. 12 mos.

Other evidence of tuberculosis. None.

Bacteriology.

METHOD.	RESULT
<u>Pus films</u> Meth Blue + Gram method	Negative on three occasions.
<u>Culture</u> agar  <u>Films</u> with CF dye + Grams method	Copious growth of Staph: albus. In the case of the 1 <sup>st</sup> tube inoculated a green colouration was observed extending for a short distance into the substance of the medium. No evidence of growth other than Staph: could be seen and no other organ- ism detected by film preparations.
<u>Other notes:-</u>	<u>Staphylococcus albus.</u>



Case. 36

Patient. W.B. Age. 19 Sex. M.

Affection Tub: disease Rt-ankle & Sinus

Onset. 18 mos.

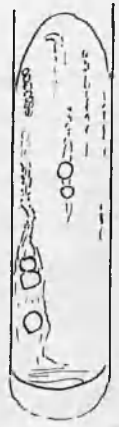
Operation, if any. none.

How long "open". 9 mos.

Other evidence of tuberculosis. Tub: Rt-Elbow.  
Amput. of ht-foot for Tub: disease.

Bacteriology.

METHOD	RESULT
<u>Pur films.</u>	Staphylococci + Bacillus gram +.
<u>Cultures</u> agar.	In 18 hours two kinds of colonies visible (1) larger + round white look like Staph. (2) smaller abundant look like Strepto.
<u>Films</u> from each variety. Stained w/ CF die + gram.	In 24 hours the smaller variety have grown beyond the size of strepto. colonies and show a tendency to run together. Later these outgrew the former and actually enveloped them.
<u>Hanging drop</u> prep.	Staphylo. gram + Bacilli. gram +. non motile
<u>Other notes:-</u>	<u>Staphylococcus aureus.</u> <u>Bacillus pseudo diphtheria.</u>



3 days growth.

When first examined (18 hours) the bacilli were uniform, rather short-rods wh stained rather deeply towards their ends, in some places giving them the appearance of diplococci. Later (24 hours) their form appeared to be less regular and many showed a beaded or septum arrangement. Later still (48 hours) large + involuted forms appeared, some very long and some clubbed, in all the septum arrangement was well marked. Also it was observed that with age the organisms stained less deeply by Grams stain.



A group as stained with CF. die. 48 hours old.

Case. 37.

Patient. W. 19. Age. 17 Sex. M.

Affection Tub: Disease Rt hip & sinus.

Onset. 2 years.

Operation, if any. 12 mos. opened & scraped.

How long "open". only since Op: 12 mos.

Other evidence of tuberculosis. Tub: disease head of Rt tibia. Cold abscess Rt Knee.

### Bacteriology.

METHOD	RESULT
<p><u>Pus films</u> From sinus hip, and from abscess of Rt Knee 24 hours after it was opened. Stained MB &amp; Gram.</p>	<p>No organisms detected in 6 slides.</p>
<p><u>Cultures</u> from both sources.</p>	<p>Sterile. on two occasions.</p>

NIL.

Other notes: -

We were not surprised to find no organisms in connection with the knee lesion, which at the time of examination had only been "open" for 24 hours. In the case of the hip the absence of organisms from the pus and growth from the culture tubes did surprise us as this was a rather nasty discharging sinus.

The treatment, that of syringing the sinus with peroxide of hydrogen, may have been responsible for our failure here.

Case. 38.

Patient. F. J. S.      Age. 41.      Sex. M.

Affection Tub: disease hip Rt & sinus.

Onset. 4 years

Operation, if any. None.

How long "open". 8 mos.

Other evidence of tuberculosis None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u>	Not taken.
<u>Cultures agar.</u>	Three colonies only on 1 <sup>st</sup> tube round + even. later yellow and typically Staph. aureus.
<u>Films</u> CF di	Confirmatory.

Staphylococcus aureus.

Other notes: -

Case. 39.

Patient. A.B.      Age. 20      Sex. M.

Affection Tub: Disease spine c lumbar abscess.

Onset. 6 mos.

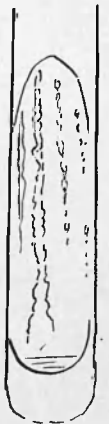
Operation, if any. Abscess opened evacuated and  
Stitched up. 4 mos.

How long "open". 14 days after op: 4 mos.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS + Gram.	only a few gram staining Bacilli
<u>Culture on agar.</u>	In 18 hours numerous small distinct colonies along the strokes in each tube. Later grew towards each other and formed lines of more or less continuous growth. Resembled growth in N° 36.
<u>Films.</u> CF. die + Gram.	Bacilli Gram +.
<u>Hanging drop.</u>	non motile. older ones involuted septate etc.
<u>Other notes: -</u>	<u>Bacillus Pseudo-diphtheria.</u>



48 hours growth.

Case. 40

Patient. A.H.      Age. 6      Sex. M.

Affection    Tub: Ulceration neck bl: in connection  
with broken down gland.

Onset.    3 mos.

Operation, if any.    none.

How long "open".    about 3 mos.

Other evidence of tuberculosis.    Tuberculous  
Keratitis Rt: Lt: c phlyctens.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> (Scanty) Stained with MS + Gram.	Negative.
<u>Cultures.</u> on agar.	Negative.

Nil.

Other notes: -

Case. 41.

Patient. R. S. Age. 30 Sex. F.

Affection Tub: disease spine C psoas abscess Rt. "open"  
C lumbar abscess Lt. "closed"

Onset. 2 years.

Operation, if any. 9 mos. ab: opened.

How long "open". Since op: 9 mos.

Other evidence of tuberculosis: None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> from psoas. MS + Gram	Some gram staining organisms present having the appearance of diplococci or short-diplobacilli.
<u>Cultures.</u> Agar. from psoas.	In 12 hours a fair quantity of small rounded transparent colonies, which later showed a tendency to run together and appeared much more vigorous than streptococci.
<u>Films.</u> CF dia + gram Hang-drop.	Short bacillus. Gram +. Non motile. older cult. involutions forms.
<u>Pus films &amp; cultures</u> from lumbar ab.	negative in each case.

Other notes: - Pseudo diphtheria Bacillus.

This patient was admitted with a discharging psoas abscess of Rt side and during her residence developed a lumbar abscess on opposite side.

Material from latter was got during the process of aspiration previous to its injection with sterilised iodoform emulsion.

It was evident that although both abscesses originated from the spine they did not communicate.

Case. 42.

Patient. E.B. Age. 23 Sex. F

Affection Tub: disease Rt Knee & Sinuses.

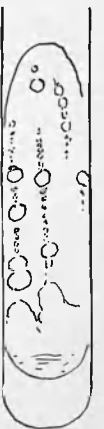
Onset: 2 years.

Operation, if any. Fw, Scrapings, last 4 weeks.

How long "open". 18 mos.

Other evidence of tuberculosis. None.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> wet gram.	Abundant cocci in groups. Gram +. also small gram staining bacilli.
<u>Cultures.</u>	In 12 hours there appeared on each tube isolated small white colonies which grew rapidly In 24 hours two kinds of growth were visible. The colonies previously mentioned wch had now grown considerably and smaller ones transparent colonies as shown.
<u>Films.</u> Cf die. wet. Gram. Thin. B. Hang. drop.	Larger - Staphylo. aur. Smaller. Bac. Non motile. Gram +. Stains irregular. Involuted.
<u>Other notes:-</u>	 <p>30 hours agar.</p>

Staphylococcus aureus.  
Bacillus pseudo-diphtheria

Case. 43.

Patient. E.E. Age. 33 Sex. F.

Affection Tub: disease Rt Knee, excision c Simmes.

Onset. 6 mos.

Operation, if any. Excision. 3 mos.

How long "open". A week after excision.

Other evidence of tuberculosis. None.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> us. Gram.	Streptococci in long chains. Do. Cocci in clumps.
<u>Cultures on agar</u>	Each tube in 24 hours showed evidence of growth. all one variety and that a series of delicate dots.
<u>Films.</u> CF di. Gram.	Streptococci Do. Chains of 15 counted.

Other notes: -

Streptococcus.



Case. 44.

Patient. F. J. Age. 17 Sex. M.

Affection Tub: disease Rt ankle & Sinus.

Onset. 2 years.

Operation, if any. 20 months, scraped.

How long "open". Since op: 20 mos.

Other evidence of tuberculosis. None.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u>	A rather short bacillus which does not stain by Gram's method.
<u>Cultures.</u>	Abundant growth of B. Coli in 24 hours over whole surface. Characteristic odour.
Films of Gram + Hanging drop preparation.	Gram - Motile.

Bacillus Coli.

Other notes:-

Why this wound should have become infected with Bacillus Coli is difficult to see. The culture was taken and pus examined the day after admission. It was a case sent to us from one of the London Hospitals. On admission the wound was very dirty and smelt badly necessitating Creolin baths. B. Coli were still present 3 weeks after admission.

Case. 45.

Patient. R.C.      Age. 14      Sex. M.

Affection      Tub: Disease Tarsal bones & Sinus.

Onset. 4 years.

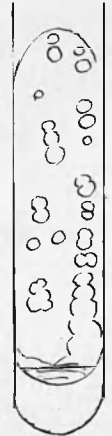
Operation, if any. Scraped 4 years.

How long "open"      4 years.

Other evidence of tuberculosis.      3rd fingers  
amputated for Tub: dactylitis.

### Bacteriology

METHOD	RESULT
<u>Pus films.</u>	} Cocci in groups abundant.
Meth: Blue. Gram ---	
<u>Culture on agar.</u>	Two varieties of colonies. Clearly visible in 24 hrs Later colonies show a tendency to run to- gether and colour be- came more established Staphyloc. in each Gram +.
Films. of each stained with Carbo F. oil Gram	<u>Staphyloc. albus.</u> <u>Staphyloc. aureus.</u>
<u>Other notes: -</u>	



Agar Culture  
4 days old.

Case. 46.

Patient. E. S.

Age. 34. Sex. F.

Affection Sub: ulceration neck from broken down glands.

Onset. 6 years.

Operation, if any. Several, scraping.

How long "open". at least 2 years.

Other evidence of tuberculosis. Scars of former ulceration neck. Sub: disease Rt femur with Scar of healed sinus.

Bacteriology.

METHOD	RESULT
<u>Pus film.</u> MS + Gram.	Negative. probably so on account of the minute quantity of pus available for examination.
<u>Cultures.</u> Films CF die.	Two colonies on 1st tube only typically staph: aureus. Confirm:
	<u>Staphylococcus aureus.</u>

Other notes: -

Case. 47

Patient. S. C. Age. 13. Sex. M.

Affection Tub: disease Rt hip & Sinus.

Onset. 10 years.

Operation, if any. 4 mos. Abscess opened & drained.

How long "open." Since op. 4 mos.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus films:</u> WBS + gram.	Staphylococci + a few strepto:
<u>Cultures.</u> agar. 3 separate occ- asions.	The culture grew only staphylo: albus. No evidence of strepto: although perfectly evident in the pus film. Even on the 2 <sup>nd</sup> tube where colonies of the staphylo: were <del>seen</del> no evidence of strepto: growth appeared. Staphylo: confirmed.
<u>Films</u> c CF + gram	<u>Staphylococcus albus.</u> <u>Streptococcus.</u>
<u>Other notes:</u> -	

Case. 48.

Patient. R.P.      Age. 15      Sex. M.

Affection Tub: disease spine (cervical) with  
Sinus from abscess neck.

Onset. 12 years.

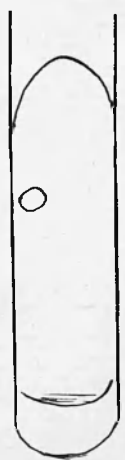
Operation, if any. 11 years. Ab: opened.

How long "open". Since op. 11 years.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u>	Staphyloc: in abundance.
<u>Culture on agar.</u>	only one colony in 36 hours. round white smooth with well defined edge.
<u>Films c CF die + gram.</u>	Confirm staphylo: Other cultures from this boy showed more growth but only one variety. viz.
<u>Other notes:-</u>	<u>Staphylococcus albus.</u>



Case. 49.

Patient. G.G. Age. 12 Sex. M.

Affection Tub: disease cervical spine & sinus of neck.

Onset. 2 years.

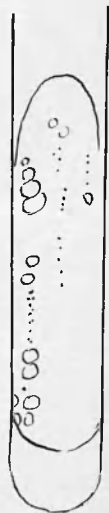
Operation, if any. 12 mos. Abscess opened.

How long "open". Since Op: 12 mos.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS: Gram.	Staphylo + some Strepto:
<u>Culture.</u> agar.	In 24 hours two varieties of growth clearly visible these were thought to correspond to the varieties as noted in the pus film but on making films at this time the smaller colonies were seen to be Bacilli. The individual colonies also grew to a greater size and had a tendency to run together.
<u>Films &amp; CF</u> + Gram	Strepto: could not be got from the tubes at all.
<u>Other notes:-</u>	



24 hours.

Staphylococcus aureus.

Pseudo-diphtheria Bacillus

Streptococcus.

Case. 50.

Patient. E. R.      Age. 24.      Sex. F.

Affection      Sub: gland neck Rt - c sinus .

Onset.      11 years .

Operation, if any.      None.

How long "open"      12 mos .

Other evidence of tuberculosis.      Tuberculous disease of Rt breast .

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS + Gram.	A few isolated gram staining bacilli.
<u>Culture on agar</u>	In 36 hours one colony on tube No. 1. round, white, even edges.
<u>Films.</u> MS. CF. die	Bacilli arranged in chains. Do. stain well ends rather rounded not square + bacilli not so large as the anthrax bacillus.
Gram.	Stain well with gram.

Other notes:-

A. Strepto-bacillus.

An attempt was made to identify this organism. Subcultures were made on agar but these did not correspond to any of the classical types. They formed a continuous streak not unlike a rather old culture of staph: albus, the edges were smooth and not wavy. No growth took place on gelatine at room temperature.

Clinically the condition did not resemble anthrax, it was chronic and there was no temperature.

The conclusion was come to that this was a Saprophytic organism implanted in a tuberculous lesion.

Case. 51

Patient F. K. Age. 36. Sex. M

Affection. Tub: dactylitis Rt. index "closed"  
Tub: disease Rt. sterno-clavicular joint  
C Sinus.

Onset. 10 weeks.

Operation if any None.

How long "open" 3 weeks.

Other evidence of tuberculosis Tub: glands of neck.  
Tub: Rt. elbow. Tub: Rt. wrist.

Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> from dactylitis JTB L. prem.	Negative.
<u>Cultures.</u> do.	Negative.
<u>Pus films</u> from Clav: joint	Numerous cocci in groups.
<u>Cultures</u> agar	Grew pure culture of staph: alb:
<u>Films</u> C. de	Confirm staphylococcus.

Other notes:-

Staphylococcus albus.

This patient is a good example as showing open and closed lesions in the same individual, the former the subject of secondary infection (in this case staph: albus) the latter being sterile. The contents of the closed lesion in this man's case were got by means of a sterilised syringe, pus films and cultures being made in the usual way.



Case. 52.

Patient. J. G. Age. 25 Sex. M.

Affection Tub: Disease Rt. femur & Sinuses.

Onset. 18 mos.

Operation, if any. 2 mos. Abscess drained.

How long "open". Since op. 2 mos.

Other evidence of tuberculosis. None.

Three members of family died of phthisis.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS & Gram.	Staphylococci abundant.
<u>Cultures.</u>  <u>Films with</u> CF die & Gram.	Beautiful example of mixed Colonies of Staph aur: & alb:  Confirm Staph: in each kind of colony.  <u>Staphylococcus aureus.</u> <u>Staphylococcus albus.</u>
<u>Other notes: -</u>	

This man, at the time these investigations were made had seven scars on Rt thigh all the result of former abscesses. These had all been opened and drained and each closed spontaneously in about four to five weeks.

Case. 53.

Patient. J. G. Age. 29. Sex. M.

Affection Tub: disease spine, psoas abscess Rt.

Onset. 5 years.

Operation, if any. Ab: opened & drained, 4 mos.

How long "open". Since op: 4 mos.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> Quantity available very small. MSB & Gram.	Negative.
<u>Cultures.</u> agar.  Films C.F. die & gram.	In 24 hours showed 4 colonies of what turned out to be Staph: aureus.  Confirm.
	<u>Staphylococcus aureus</u>

#### Other notes:-

At the time of these observations the discharge as stated was very little and the abscess within a few days completely healed. It remained dry for six weeks the temperature having been normal for over 3 mos. At that time (6 weeks after healing) his temperature went up to 102° F and he complained of pain in Rt groin the abscess reopened and has been discharging freely since. Recent examinations of the pus from this abscess show that the infection is that of Staph: aureus.

Case. 54.

Patient. W. G. Age. 15 Sex. M.

Affection Tub: disease Rt. carpus & sinus.

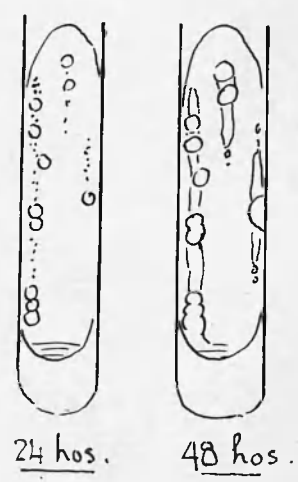
Onset. 18 mos.

Operation, if any. None to this part.

How long "open". 3 mos.

Other evidence of tuberculosis. Tub: Lt. tarsus requiring amput: of Lt. foot. Glands of neck.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> UB & gram.	Staphylo: only.
<u>Cultures.</u> agar.	In 24 hours two kinds of growth. 11 large colonies on 2 <sup>nd</sup> tube numerous smaller & more delicate variety. In 48 hours the larger variety looked yellow and the small growth had formed a more or less continuous streak.
<u>Films.</u> Cf. di. Gram	
<u>Other notes: -</u>	Films showed this latter to belong to that variety already described as <u>Pseudo-diphtheria bacillus.</u> The former variety were staphylo.

Staphylococcus aureus.  
Pseudo-diphtheria bacillus.

Case. 55.

Patient. C.A. Age. 13. Sex. M.

Affection Tub: disease spine & psoas ab: Rt.

Onset. 5 years.

Operation, if any. 2½ years. ab: opened, drained

How long "open". Since op: 2½ yrs.

Other evidence of tuberculosis. Evidence of  
General lardaceous disease. Liver  
Kidneys, spleen and  
bowel.

### Bacteriology.

METHOD	RESULT
<u>Pus film.</u> MS + Gram.	Abundant Streptococci and a good many short, stout gram staining bacilli.
<u>Cultures.</u> a-gen.	Growth on 1 <sup>st</sup> tube only. In 24 hours, small round transparent colonies slightly larger and more vigorous looking than streptococci. Further growth and films preparations show them to be bacilli. No streptococci got from culture.
<u>Films</u> with CF + Gram.	<u>Pseudo-diphtheria bacillus</u>

Other notes:-

Streptococci.

This was one of the cases which offered an opportunity for working up the characters of this particular organism.

Subcultures were made from this boy's tube and film preparations made

- (1) as soon as any growth appeared.
- (2) in 24 hours.
- (3) " 48 "
- (4) Later.

When young cultures were examined the bacilli were found to be uniform in size, rather small with rounded ends. They showed a tendency to polar staining which gave them an appearance almost of diplococci. Older cultures showed segmented, septate and involuted forms. Also the older cultures stained less deeply by Gram's method.

Case. 5b.

Patient. M.S. Age. 23. Sex. F.

Affection Tub: disease spine & lumbar abscess.

Onset. 2 years.

Operation, if any. 2 mos. opened & drained.

How long "open". Since op.

Other evidence of tuberculosis.

Psoas abscess  
Opposite side.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> M.B. Gram.	Staphylococci only.
<u>Cultures.</u>  Films from each CF in Gram.	In 24 hours two varieties of growth. One colony only of Staph. alb. also abundance of growth of the nature of the Pseudo. dip. Bac.  <u>Staphylococcus albus</u> <u>Pseudo-diphth: Bacillus</u>



24 hrs

Other notes: -

Case 57.

Patient R.M. Age 39. Sex F

Affection Tub: disease Rt. hip & Sinus.

Onset 5 years.

Operation, if any. 2 years ago.

How long "open". Since Op.

Other evidence of tuberculosis

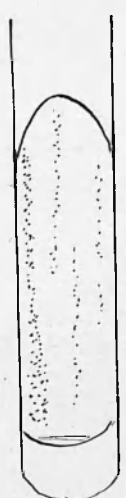
Lumbar abscess.

Bacteriology

METHOD	RESULT
<u>Pus films</u> MB + Gram. <u>Culture</u> agar. Films stained CF di + Gram.	Nothing except streptoc. Growth distinct in 24 hrs. rows of fine delicate colonies along each stroke. Strepto. Confirmed.

Other notes:-

Streptococci.



36 hours growth.

Case. 58.

Patient. M.G.      Age. 31      Sex. F

Affection Tub: Empyema with sinus Rt.

Onset. 15 mos.

Operation, if any. 12 mos.

How long "open". Since op.

Other evidence of tuberculosis.

None.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS + Gram.	Staphylo: + a few streptococci.
<u>Cultures.</u> agar.	The staphylococcus only has grown and is fairly abundant. The yellow variety.
<u>Films</u> CF + Gram Thiomis Blue	Staphylococci only.
	<u>Staphylococcus aureus.</u> <u>Streptococcus.</u>

Other notes:-

Case. 59.

Patient. J. J. Age. 16 Sex. M.

Affection Tub: disease Rt Tarsus with sinus.

Onset. 6 mos.

Operation, if any. 4 mos. Aspiration of abscess.

How long "open". Since arrival after op.

Other evidence of tuberculosis

Died of tuberculous meningitis

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> W.B. + Gram.	Positive by each method Staphylococci: in abundance.
<u>Cultures.</u>	Grew pure culture of Staph: albus. The growth in 24 hours, formed on the 1 <sup>st</sup> tube continuous streak
<u>Films.</u> Thin Blue. CF air Gram.	All confirm Staphylococci.

Staphylococcus albus.

Other notes: -



Case. 60

Patient. J.M. Age. 73. Sex. M.

Affection Tuberculous dermatitis back.

Onset. 3 years.

Operation, if any. 2 years. Scraping.

How long "open". 2 1/2 years.

Other evidence of tuberculosis.

Tub: disease  
Rt. hip joint.

Bacteriology.

METHOD.	RESULT
<p><u>Pus films.</u> UB + Gram.</p>	<p>Bacilli and cocci. groups. former gram -, latter +.</p>
<p><u>Cultures.</u></p> <p><u>Films.</u> CF. de Gram.</p> <p><u>Hang dish.</u></p>	<p>The first tube showed over its whole surface evidence a much slimy growth, in some places more opaque.</p> <p>Bacilli.</p> <p>Gram neg. motile.</p> <p>No cocci could be obtained from the tubes.</p>

Other notes: -



Bacillus coli.

Staphylococcus.



Film showing the arrangement of these Bacilli.

Case. 61.

Patient. W. M. Age. 9. Sex. M.

Affection Tub: disease ht: humerus & sinus.

Onset. 12 mos.

Operation, if any. Opened, scraped & drained. 9 mos.

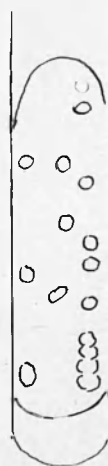
How long "open". 9 mos.

Other evidence of tuberculosis. None.

### Bacteriology.

METHOD	RESULT
<u>Pus Films.</u> material very scanty	Negative.
<u>Culture</u> in agar.	On 1 <sup>st</sup> tube in 24 hours 15 colonies of typical Staph: aureus.
<u>Films</u> from culture Stained Cf. die + gram.	Staphylococci Confirmed.
	<u>Staphylococcus aureus.</u>

Other notes: -



36 hours  
growth.

Case. 62.

Patient. W. H.      Age. 24      Sex. M.

Affection. Tub: Disease Rt hip & sinus.

Onset. 8 years.

Operation if any. Abscess opened, 8 mos.

How long "open" Since operation. 8 mos.

Other evidence of tuberculosis None.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> Meth B, Gram	Abundance of staphylococci by each method. Some strepto:
<u>Cultures</u> on agar, and gelatine at room temp: <u>Films.</u> C.F. air. M.B. Gram.	Tubes in 24 hours had two varieties of colonies. Abundant Staph: albus. and some colonies of Strepto: Staph: + Strepto. Confirmed by stained films.
<u>Other notes:</u> -	<u>Staphylococcus albus.</u> <u>Streptococcus.</u>

This was a very chronic case. The sinus on the hip had been open and discharging for years but had at last healed. It broke down again however 3 mos before the investigations of the bacterial contents of the pus were made. He was said to have had Coxavara on that side which was successfully operated upon and that tuberculous disease had set in in this region 3 years after the operation.

Case. 63.

Patient H. J. Age. 4 Sex. M.

Affection. Tub: Disease spine c sinus in dorsal region.

Onset. 12 mos.

Operation if any. Removal of sequestrum of spine, 6 mos.

How long "open" Since 14 days after operation.

Other evidence of tuberculosis. None.

Bacteriology.

METHOD.	RESULT.
<u>Pus film.</u> W.S. Gram.	A few Staphylococci Abundance of Streptococci in Chains of as many as 10-12.
<u>Cultures on agar</u>	In this case Staphylococci grow almost to the exclusion of the Streptococci of wh there were only a few colonies in 2 <sup>nd</sup> tube.
<u>Films.</u> CF die Gram.	Staphylococci & Streptococci.
<u>Other notes:-</u>	<u>Staphylococcus aureus.</u> <u>Streptococcus</u>

Case. 64

Patient N.D. Age. 10 Sex. M.

Affection. Tub: Disease Rt. hip & sinus.

Onset. 5 years.

Operation if any. Scraping done some years ago.

How long "open" Since operation.

Other evidence of tuberculosis. None.

Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u>	Staphylococci only.
<u>Cultures</u> agar.	Staphylococcus aureus in pure culture.
<u>Films</u>	Confirm.
<u>Other notes:-</u>	<u>Staphylococcus aureus.</u>

Case. 65

Patient J. S. Age. 13 Sex. M.

Affection. Tub: Disease Rt. hip @ Smies.

Onset. 3 years.

Operation if any. Aspiration + injection of Iodoform emulsion 12 mos.

How long "open" Since 7 days after operation.

Other evidence of tuberculosis Scars of Tub: glands in axillae.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films</u> MS + Gram.	A few streptococci seen only in the slide stained by Gram method
<u>Culture</u> agar	Did not grow at all.

Streptococcus.

Other notes:-

Recently a surgeon belonging to one of the London Hospitals reported a series of 100 cases of cold abscess successfully treated by incision, evacuation, injection of iodoform emulsion, and stitching up. It would seem that in this case secondary infection must have been introduced at the time of aspiration. The fact that the abscess after being aspirated broke down in a week would certainly suggest that.

Case. bb.

Patient. P. F.

Age. 24

Sex. M.

Affection Tub: disease axillary glands Rt.  
C Sinus.

Onset. 3 years.

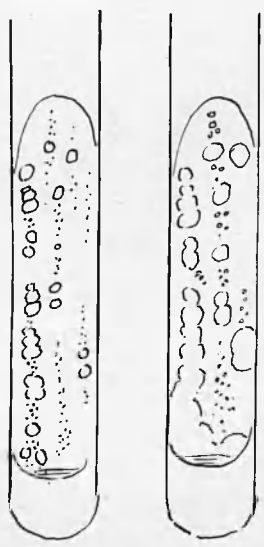
Operation, if any. None.

How long "open". 2 mos.

Other evidence of tuberculosis. Tuberculous glands scars both sides of neck.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS + Gram.	Cocci in clumps and a few in chains. A short thick Gram + bacillus.
<u>Cultures.</u> on agar	Growth visible in 12 hours In 24 hours two distinct varieties. Large and small colonies.
<u>Films with</u> MS. CF die ' Gram.	In 48 hours growth more abundant + colour marked. Large colonies are Staph: Aur: + alb: Smaller colonies tho' they look big are nothing but Streptococcus.



Other notes: -

The bacillus seen in pus films did not grow or was outgrown by the others.  
Observations were only made on one occasion as this patient left the hospital just at this time.

Staphylococcus aureus

Staphylococcus Alb. us.

Streptococcus

A Bacillus not identified.

Case 67.

Patient R. N. Age 26 Sex F

Affection Tub: disease spine & sinus in lumbar region.


Onset 2 1/2 years.

Operation, if any 2 years. Abscess opened.

How long "open" 2 years. Since op.

Other evidence of tuberculosis. Psoas abscess Rt side

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MB & Gram.	Lots of gram staining <u>Cocci</u> , in clumps and in chains (short) a suspicion existed as to their being diplococci. Along thin gram + bacillus. was also observed.
<u>Cultures</u> agar  <u>Films</u> of each MB. C.F. dil + Gram.	Growth appeared only on tube 1. Apparent in 24 hours, and as shown in 48 hours.  The larger colonies are diplococci which stain with MB. C.F. dil + are gram +.
<u>Other notes:-</u>	The smaller colonies marked X are long narrow bacilli or filaments at places showing a tendency to splitting. These are gram +.

Pneumococcus..  
Bacillus long and irregular.



A group as stained with C.F. dil.



Case. 68.

Patient. W. J.      Age. 31      Sex. M.

Affection Tub: Dermatitis arm Rt.

Onset. 5 mos.

Operation, if any. Incised, 4 mos.

How long "open". Since op. 4 mos.

Other evidence of tuberculosis. Tub:  
Disease Lt. testis removed  
by operation.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> MS & gram.	Show both staphylococci and streptococci
<u>Cultures on agar</u>	Did not grow at all.

Other notes: -

Staphylococcus.

Streptococcus.

Case. 69.

Patient. E. W. Age. 30. Sex. F.

Affection Tub: gland Rt elbow c sinus.

Onset. 3 mos.

Operation, if any. none.

How long "open". 2 mos.

Other evidence of tuberculosis. Lupus of  
Rt side of face.

### Bacteriology.

METHOD	RESULT
<u>Pus films.</u> MS + Gram.	Staphylococci only.
<u>Cultures</u> agar	Ten colonies of 1 <sup>st</sup> and three on 2 <sup>nd</sup> tube of typical Staph: albus.
<u>Films.</u> CF di	Confirm.
	<u>Staphylococcus albus.</u>

Other notes: -

Case. 70.

Patient. E. B. Age. 34 Sex. F.

Affection Tub: glands neck Rt C sinuses.

Onset. 12 mos.

Operation, if any. none.

How long "open". 9 mos

Other evidence of tuberculosis. none.

Bacteriology.

METHOD	RESULT
<u>Pus films.</u> rather scanty. wet gram.	Staphylococci seen only on the gram stained film.
<u>Cultures</u> agar.	Trro colonies only. They have the appearance of Staph: alb.
Films Cf. air	Confirm.
<u>Other notes:-</u>	<u>Staphylococcus albus.</u>

Case. 71.

Patient B.C. Age 13. Sex F.

Affection. Sub: pleurisy. Empyema Rt.

Onset. 2 years.

Operation if any 9 mos. resection rib + drainage.

How long "open" 9 mos.

Other evidence of tuberculosis none.

Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> US + Gram.	Abundant - cocci, some in clumps and many in short chains. Gram +.
<u>Cultures</u> agar <u>Films</u> from each CF. dil	Growth in each tube in 12 hours. Larger and smaller colonies seen in 24 hours. The yellow and white staphyloc and the streptococci.
<u>Other notes:</u> -	<u>Staphylococcus aureus.</u> <u>Staphylococcus albus.</u> <u>Streptococcus.</u>

Case. 72.

Patient H.C. Age 10 Sex M.

Affection. Tub: Disease hip Rt c sinus.

Onset. 12 mos.

Operation if any 5 mos. abscess opened.

How long "open" Since op. 5 mos.

Other evidence of tuberculosis None.

Bacteriology.

METHOD.	RESULT.
<u>Pus films</u> MB + Gram.	Streptococci only seen and these in long chains of 12-15 individuals.
<u>Cultures on agar</u> <u>Films</u> from Cult. Cf. die + Gram	Staphyloc. + Streptococci have both grown. The latter abundant + vigorous. Films confirm.
<u>Other notes:-</u>	<u>Staphylococcus albus.</u> <u>Streptococcus.</u>

Case 73.

Patient W. K. Age 9. Sex M.

Affection. Tub: Empyema Lt.

Onset. 3 years.

Operation if any Resection rib, about 3 years.

How long "open" Since operation but healing at intervals.

Other evidence of tuberculosis Consolidation of lung Rt-apex.

Bacteriology.

METHOD	RESULT
<u>Pus films</u> MS gram.	Negative.
<u>Cultures</u> Films CF cu	One colony only of Staph: alb: Confirm.

Other notes:-

Staphylococcus albus.

Case. 74.

Patient R. W. Age. 10 Sex. M.

Affection. Tub: disease hip Lt & Smus.

Onset. 3½ yrs.

Operation if any 6 mos. Scraping.

How long "open" Since op. 6 mos.

Other evidence of tuberculosis None.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films</u> Gram.	Abundant Cocci in groups and also singly. Also a gram staining diplo- Coccus.
<u>Cultures</u> agar	abundant growth of Staphylo: aureus and nothing else.
<u>Films</u> of air &c.	Confirm Staphylococcus.
<u>Other notes:</u> -	<u>Staphylococcus aureus.</u> <u>Pneumococcus ?</u>

Case. 75.

Patient J. N. Age 9. Sex M.

Affection. Tub: disease spine & Sinus in dorsal region.

Onset. 3 years.

Operation if any none.

How long "open" 12 mos.

Other evidence of tuberculosis. none.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films</u> MS + Gram	Cocci in groups by each method. Gram +.
<u>Cultures agar</u>	A beautiful mixed growth of Staphylo: albus + aureus. Colonies about equally divided and fairly abundant.
<u>Films from</u> Each Cf die Gram.	Staphylococci in all cases.
<u>Other notes:-</u>	<u>Staphylococcus albus.</u> <u>Staphylococcus aureus.</u>



Case. 7b.

Patient R. H.      Age. 14      Sex. M.

Affection. Tub: glands Rt groin & Sinuses.

Onset. 12 mos.

Operation if any none.

How long "open" 2 mos.

Other evidence of tuberculosis Tub: disease  
Rt tarsus, closed.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> MS + Gram.	Staphylococci only.
<u>Cultures.</u>	Staphylococcus albus and Aureus.
Films. MS, CF die	Confirm.
<u>Other notes:-</u>	<u>Staphylococcus albus.</u> <u>Staphylococcus aureus.</u>

Case. 77.

Patient R. E. Age. 9. Sex. M.

Affection. Tub: glands neck Rt. C sinus.

Onset. 6 years.

Operation if any Scrapings. 5 years + 4 years.

How long "open" 12 mos.

Other evidence of tuberculosis none.

### Bacteriology.

METHOD.	RESULT
<u>Pus films</u> MS. Gram.	Pus was scanty and result in each case negative.
<u>Cultures</u> Agar.	No growth in any of four tubes on two occasions.
	<u>NIL.</u>

Other notes: -

Pus in this case tho' scanty was of sufficient quantity to make fair films and more than that present in many of the cases in which organisms were demonstrated.

Soon after these observations were made the sinus in the neck became quite dry & healed.

Case. 78.

Patient E. B. Age 30 Sex F.

Affection. Tub: glands neck Rt. & sinus.

Onset. 12 mos.

Operation if any none.

How long "open" 9 mos.

Other evidence of tuberculosis none.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> M.B. Gram.	Cocci very abundant. Cocci in groups, and also in chains
<u>Cultures.</u> agar	Growth in both tubes. Large white regular colonies. Small separate delicate "
<u>Films</u> from Each CF die	Former Staphylococci. Latter Streptococci. in very long fine chains.
<u>Other notes:</u>	

Staphylococcus albus.  
Streptococcus.

This patient was a married woman, swelling of the cervical glands after the birth of one of her children 12 mos ago. She was advised to stop nursing the child which she did.

The glands however became larger, became soft and broke down about 3 mos after they were first observed. Clinically they were certainly tuberculous.

Case 79.

Patient N.G. age 9 sex F

Affection. Glandular abscess neck Rt.

Onset. 2 mos.

Operation if any none.

How long "open" 7 days.

Other evidence of tuberculosis. Enlarged tuberculous glands Rt side neck "closed".

Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> MS + Gram.	Cocci in both films. no chains observed.
<u>Cultures</u>  Films of the Gram.	Grew abundantly the two varieties of Staphylococcus. The Staph. alb was the more abundant.  Films confirm staph. in each variety of colony.

Films and cultures in this case were taken at the time of admission

Staphylococcus albus.  
Staphylococcus aureus.

The abscess in neck having broken a week before. The dressing of the neck up to the time of admission was done by her mother at home and was performed by the application of "pieces of clean rag". The patient generally was in a dirty condition and of feeble constitution.

Case. 80

Patient Q.Q. Age 10 Sex F.

Affection. Tub: glands neck Rt. C Sinus.

Onset. 18 mos.

Operation if any none.

How long "open" 7 days.

Other evidence of tuberculosis Enlarged tuberculous glands Rt-axilla.

Bacteriology.

METHOD.	RESULT.
<u>Pus films</u> - Gram.	Cocci fairly abundant singly but for the most part in groups.
<u>Cultures</u> on Agar + Gelatine.	Pure culture of <i>Staphyloc. albus</i> . growing well on agar, but slowly on gelatine with slow liquifaction.
Films from each CF die.	<i>Staphyloc.</i> demonstrated in each.
<u>Other notes:</u> -	

Staphylococcus albus.

The cultures from this case gave me the impression of its being a not very virulent *Staphylococcus*. The pus from the lesion was thin, and contained little masses of disintegrated gland substance. We were strongly of the opinion that infection was from the skin, the lesion having become "open" under our own care and during treatment by aseptic dressings.

Case. 81.

Patient E.P. Age 16. Sex F

Affection. Tub: Disease Rt hip & sinus.

Onset. 7 years.

Operation if any 10 mos. abscess opened.

How long "open" on this occasion 14 days.

Other evidence of tuberculosis Phlyctenular  
Conjunctivitis  
both.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> <u>MB.</u> <u>Gram</u>	Cocci abundant. Film not very satisfactory. Cocci Some in groups but mostly in pairs all gram positive.
<u>Cultures.</u> <u>Films.</u> Cf. die <u>Gram.</u>	In 24 hours two distinct varieties of growth easily differentiated in tube 2. Larger staphylococci and small abundant pneumococci.
<u>Other notes:-</u>	Films confirm the above.

This was an old case of Staphylococcus aureus:  
hip joint disease. An Pneumococcus.  
abscess had formed  
in connection with Rt  
hip and had been opened & drained 10 mos before.  
After discharging for 7 mos it eventually healed  
patient being up & about without crutches or appliance  
for nearly 3 mos but under treatment meantime for  
her eye condition.

The scar had broken down and was discharging  
for a fortnight before the bacteriological examination  
was made.

Case 82.

Patient W. B. Age 42. Sex M.

Affection. Tub: disease spine & lumbar abscess.

Onset. 2 years.

Operation if any. Abscess opened & drained 10 mos.

How long "open" Since op. 10 mos.

Other evidence of tuberculosis

None.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films</u> .	
<u>Wrt Blue</u> .	Cocci abundant singly & in groups.
<u>Gram</u> .	Staphylococci only.
<u>Cultures</u> . agar.	In 12 hours, growth was evident, the colonies being round white and in tube & tending to run together.
<u>Films</u> .	Later they were typically staphylococci of white and yellow varieties.
<u>Cf. dit.</u>	Confirmed by films.
<u>Gram</u> .	

#### Other notes:-

The type of staphylococci in this patient's case seemed somewhat larger than usual & had the appearance of extreme vigour, subcultures made upon gelatine grew rapidly and caused early liquifaction of the medium.

Staphylococcus albus.

Staphylococcus aureus.

Case. 83.

Patient W. R.      Age 6      Sex F

Collection. Sub: glands neck Rt c Smuses .

Onset. 2 years.

Operation if any none.

How long open 6 mos.

Other evidence of tuberculosis Glands "closed" Rt Side neck.

### Bacteriology.

METHOD.	RESULT.
<u>Pres films.</u> Material scanty Gram.	A few isolated cocci, gram +.
<u>Cultures.</u> agar.	A fair amount of growth of Staph albus and of Streptococcus
<u>Films.</u> CF die Gram	Confirm the above. The staphylococcus was a rather large variety. Subcultures were made of gelatine which was dissolved very slowly. The streptococci were found in chains of as many as 15.
<u>Other notes:-</u>	<u>Staphylococcus albus.</u> <u>Streptococcus.</u>

This girl's neck healed up shortly after this, the glands of Rt side were removed by operation, the wound healing by first intention.

The "cure" of Rt side was spontaneous there had never been an operation on that side.



Case. 84.

Patient W. A. Age. 10 Sex. F

Affection. Tub. disease Rt. Knee joint & Sinuses.

Onset. 18 mos.

Operation if any Abscess in connection with knee opened 4 mos ago.

How long "open" Since op. 4 mos.

Other evidence of tuberculosis None.

### Bacteriology.

METHOD.	RESULT.
<u>Pus films.</u> Gram.	Cocci and short bacilli both of which stain by gram.
<u>Cultures.</u> <u>Films.</u> CF die + Gram	In 12 hours growth was visible in the form of isolated round colonies later (18 hours) these, which had grown, still retaining the round form, seemed connected by bands of a finer growth. Later this band was seen to be composed of small colonies of rather fine transparent growth which

Other notes:  
grew together to form a more or less continuous streak. The streak grew rapidly became more densely white and outgrew the other growth.

Films made from the two varieties from time to time showed the former to be Staphylococcus albus. The latter were rather long and stout gram + bacilli. The individuals of a 24 hours growth stained unevenly and involutions forms were the rule.

Case. 85.

Patient J.D. Age. 15 Sex. M.

Affection. Tub: Disease Rt Elbow joint & Sinuses

Onset. 4 years.

Operation if any Several, Scrapings.

How long "open" At least 2 years.

Other evidence of tuberculosis Healed Sinuses of Rt wrist.

Bacteriology.

METHOD.	RESULT.
<u>Pus films:</u> MS Gram	Cocci mostly in chains and very numerous.
<u>Cultures</u> agar	In 24 hours beautiful growth in the form of almost continuous streaks of streptococcus, the streak being made up of a double series of very fine colonies.
Films of dis.	No other growth of any kind.
<u>Other notes:-</u>	Films from various parts of growth all show streptococcus.

Streptococcus

We usually, I think, associate streptococcus with acute spreading inflammations. This was a very chronic case, the lad had little temperature and was able to be up and about.

Streptococci were got from this and nothing but streptococci on two separate occasions.

Case. 86.

Patient A.C. Age 32 Sex M.

Condition. Phthisis. Stage 2.

Onset. 12 mos.

Location. Lobes involved 2.

How long "open" ?

Other evidence of tuberculosis Tuberculous disease of bladder & Rt testis.

### Bacteriology.

METHOD.	RESULT.
<u>Sputum films.</u> Stain. Ziehl-Neelsen Gram.	T.B. abundant. Cocci large, singly, in groups and in short chains.
<u>Cultures agar</u>  <u>Films of each</u> <u>Thin Blue.</u> <u>CF die.</u>	In 24 hours two varieties of growth mostly large white colonies but on tube 2 a fair quantity of finer growth later these latter showed no tendency to run together and were typically Streptococcus.
<u>Other notes:</u>	Films confirm staph & streptoc.

This was the only one of our phthisis cases which did not have the pneumococcus. No diplococci were seen in any of three films made, but large round cocci were abundant in each. The tubercle bacilli also stained well in one of these films. they were very abundant.

Staphylococcus albus.  
Streptococcus.

Case 87.

Patient C.N. Age 29. Sex M.

Condition. Phthisis. Stage 2.

Onset. 5 mos.

~~Respiratory~~ Lobes involved 1.

How long "open" ? expectoration purulent 3 mos.

Other evidence of tuberculosis None.

Family history very bad.

### Bacteriology.

METHOD.	RESULT.
<u>Sputum.</u>	
<u>Ziehl-Neelsen.</u>	T.B. fairly abundant.
<u>Gram.</u>	Diplococci very abundant with Some short-chained streptococci.
<u>Welch.</u>	diplococci have capsules.
<u>Cultures agar.</u>	In 24 hours there was evidence of copious growth which was thought to be pure culture of streptococcus.
<u>Films.</u>	Films made from the growth how- ever revealed diplococci as well
CF die	
Thin Blue	
Gram.	Small and gram staining.
<u>Other notes:-</u>	

This patient was a hospital porter and an army pensioner. He left the army and passed a medical examination, before entering the Reserve Force, 6 mos before these observations were made. There was therefore in all probability no evidence of active tuberculosis 6 mos ago, so that infection with T.B. as well as secondary infection must have taken place during that time.

Streptococcus  
Pneumococcus.

Case 88.

Patient E. B. age 34. sex F.

Diagnosis. Phthisis. Stage 2.

Onset. 5 mos ?

~~Duration~~ Lobes involved 1.

How long "open" ? purulent expectoration 3 mos.

Other evidence of Tuberculosis Tuberculous glands of neck "open" Case 78.

Bacteriology.

METHOD.	RESULT.
Sputum films. <u>Ziehl Neelsen</u> . <u>Gram</u> .	T.B. present; but scanty. Great abundance of organisms Cocci in chains + masses. diplococci singly, in chains and in masses.
Cultures. Films... Cf. air. Gram etc.	Staphylococcus of both albus and aureus variety. Streptococci and pneumococci intimately mixed in culture.

Other notes? In film preparations staphylococci.  
 Could easily be got alone but streptococci and pneumococci appeared always in the same film made from the culture tube. The former were easily recognised by their larger size, rounded shape and more persistent chain formation. The latter appeared also in chains as well as singly the chains in many cases showed in 36 hours marked involution forms.

- Staphylococcus albus.
- Staphylococcus aureus.
- Streptococcus
- Pneumococcus.

Case 89.

Patient N. B. Age 28. Sex F.

Condition. Phthisis. Stage 3.

Onset. 6 mos.

~~Number of~~ Lobes involved. 3.

How long "open" ?

Other evidence of tuberculosis None.

Bacteriology.

METHOD.	RESULT.
<u>Spitium.</u> <u>Ziehl-Neelsen</u> <u>Gram.</u>	Positive. abundant. Cocci abundant in groups. Diplococci singly, grouped and in chains often lying parallel. Latter capsulated.
<u>Welch.</u> <u>Cultures.</u> Films. Cf. de Gram.	on tube 1 almost continuous growth of staph. albus. on tube 2. 9 colonies of staph alb and fair quantity of pneumococcal growth.
<u>Other notes:-</u>	Film preparations confirm staphylococci and diplococci.

Staphylococcus albus.

Pneumococcus.

Case. 90.

Patient M. N. Age. 31. Sex. F.

Affection. Phthisis. Stage 3.

Onset. 8 years.

~~Respiration~~ lobes involved H.

How long "open" ?

Other evidence of tuberculosis None.

Bacteriology.

METHOD.	RESULT.
<u>Sputum</u> . <u>Ziehl Nielsen</u> . <u>Gram.</u>	TB very abundant. Cocci in groups and in chains. Diplococci singly + in chains also in large masses.
<u>Cultures</u>  <u>Films.</u> CF die + Gram.	Some small colonies but - mostly large colonies of <u>Staphyloc. albus</u> and <u>aureus</u> . <u>Staphylococci</u> . <u>Streptococci</u> . chains of 10. + less. <u>Pneumococci</u> .
<u>Other notes:-</u>	

Staphylococcus albus.

Staphylococcus aureus.

Streptococcus.

Pneumococcus.

Case. 91

Patient E. J. Age 26. Sex F.

Affection. Phthisis. Stage 3.

Onset. 2 years.

Location of any lobes involved 4.

How long "open" ?

Other evidence of tuberculosis Tuberculous  
laryngitis.

### Bacteriology.

METHOD.	RESULT.
<u>Sputum</u> Ziehl Neelsen. Gram.	Positive, abundant. Staphylococci. Diploe: abundant and a gram negative bacillus of which a fair number were seen. These were short, staining faintly but uniformly with the counter stain.
<u>Welch.</u>	Diplocoeci capsulated but bacilli mentioned had no capsule.
<u>Cultures</u>	Staphyloc. albus and pneumoc.
<u>Other notes:-</u>	Confirmed by films in each case.

A fresh set of cultures being made from this sputum with a view to obtaining the bacillus by this method, no growth whatever appeared (the sputum being by this time 36 hours old).

Staphylococcus albus.

Pneumococcus.

? Bacillus



Case. 92.

Patient H.H. Age 36. Sex F.

Affection. Phthisis. Stage 2.

Onset. 6 years.

~~Number of~~ lobes involved, at least 2.

How long "open" ?

Other evidence of tuberculosis None.

Bacteriology.

METHOD.	RESULT.
<u>Sputum films.</u>	T.B. present tho; not abundant. Cocci in groups. Diplococci in chains as well as singly. Diplococci have capsules.
<u>Ziehl Neelsen Gram.</u>	
<u>Neleh.</u>	
<u>Cultures</u>	Show least amount of growth of all the sputa examined. The larger colonies consist of a very large staphylococci: The smaller of pneumococcus entirely.
<u>Films.</u>	
<u>CF die. Gram.</u>	
<u>Other notes:-</u>	



24 hours. Agar.

Staphylococcus albus.  
Pneumococcus.

Case 93.

Patient A. H. Age 16. Sex F.

Affection. Phthisis. Stage 2.

Onset. 3 years.

Number of lobes involved. 2.

How long "open" ?

Other evidence of tuberculosis nil.

Bacteriology.

METHOD.	RESULT.
<u>Films of Sputum.</u> <u>Ziehl Neelsen</u> <u>Gram.</u>	T.B. abundant. Streptococci in very long chains and diplococci also in chains and very abundant. Not a single field could be brought under the objective which did not contain these latter in ocres.
<u>Cultures</u> <u>Films.</u> <u>CF Gram</u>	Abundant growth in 24 hours all of the finer variety.
<u>Other notes:-</u>	Films made from three portions of the growth contained both streptococci and diplococci, the latter having all the morphological characters of Fraenkel's pneumococcus.

Staphylococci in this case were neither seen in the sputum films nor in cultures. The sputum did not differ in appearance nor in consistency from the others in which staphylococci were present.

Pneumococcus.

Streptococcus.

Case. 94.

Patient M.A. Age 33 Sex F.

Affection. Phthisis. Stage 2.

Onset. 6 mos.

~~Operation~~ lobes involved 2.

How long "open" ?

Other evidence of tuberculosis none.

Bacteriology.

METHOD.	RESULT.
Sputum films - Ziehl Neelsen. Gram.	T.B. very abundant. Staphyloc: Pneumococcus? Streptococcus. Pneumobacillus?
Cultures. agar. Films. CF die. Gram. Thion Blue. Hanging drop.	In 24 hours abundant growth of three distinct varieties. Two colonies on Staph: albus on tube 1. one on tube 2. Pneumococcus + Streptococcus on both and on tube one two colonies of round white growth with surface dome shaped & well raised above the level of the medium. These latter were specially investigated and found to be diplobacilli of very
Other notes: - variable size, some rather long forms, Gram negative, and when grown on gelatine gave a distinct though not quite typical "nail like" growth, liquefaction almost nil. Films from the other varieties of growth were quite typical of each - The streptococci were in very short chains 3-5.	

- Staphylococcus albus.
- Streptococcus.
- Pneumococcus. (Frankel)
- Pneumo. bacillus (Frislander)

Case. 95.

Patient E.R. Age. 35. Sex. M.

Affection. Phthisis. Stage 3.

Onset. ?

Opportunistic lobes involved 3.

How long "open"? Purulent sputum 2 years.

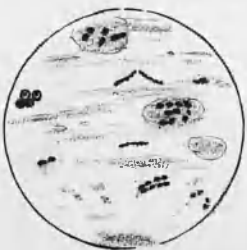
Other evidence of tuberculosis Nil.

### Bacteriology.

METHOD.	RESULT.
<u>Sputum films.</u> Gram. Nech.	T.B. abundant: Cocci singly and in groups. Diplococci with distinct capsules.
<u>Cultures agar</u>  Films. Cf. die.	Staphylococcus albus on 1 <sup>st</sup> tube only. Pneumococci and Strepto: on both tubes.  Confirm. Staph: Streptococcus + Pneumococcus.

### Other notes:-

This sputum was in the first instance stained by Gram's method and by accident was much overstained. Decolorization was performed with alcohol aided by gentle heat. The result was that tubercle bacilli were beautifully stained showing very well the irregular staining sometimes observed.



Pus film (sputum)  
Gram stained showing  
Staphyloc: Pneumococci  
and Tubercle Bacilli.

Staphylococcus albus.  
Streptococcus.  
Pneumococcus.

Case. 96.

Patient S. H. Age 18 Sex M.

Affection. Phthisis. Stage 3.

Onset. ? Cough for 4 years.

~~Number of lobes~~ lobes involved. 2.

How long "open" ?

Other evidence of tuberculosis. Enlarged.

Cervical glands both sides.

### Bacteriology.

METHOD.	RESULT.
<p><u>Sputum films.</u>  <u>Ziehl Neelsen.</u>  <u>Gram.</u>  <u>Nielsen capsules.</u></p>	<p>Positive. T.B. very abundant.            Staph: Streptoc: Diploc: + filaments.            Capsules of diplococci stain            filaments also show a capsule.</p>
<p><u>Cultures.</u>  <u>Films.</u>  <u>CF die</u>  <u>Gram.</u></p>	<p>Staphyloc: aure has almost-out-grown everything else. Between the colonies however at places a finer variety of growth is seen. Streptococci + diplococci in long chains are got in films made from the finer growth.</p>
<p><u>Other notes:-</u></p>	<p>No evidence of filamentous growth.</p>

Gelatin tubes incubated at room temperature grew nothing but Staphyloc: This liquified the medium rather slowly.

The filaments in sputum films were rather stout and showed a tendency to branching. They were gram +, had a capsule much stained, the filaments themselves stained regularly.

Staphylococcus aureus.

Streptococcus.

Pneumococcus.

Leptothrix

Case 97.

Patient J.M. Age 21 Sex M -

Affection. Phthisis. Stage 3.

Onset. ?

~~Opportunely~~ Lobes involved 1.

How long "open" ?

Other evidence of tuberculosis Nil.

### Bacteriology.

METHOD.	RESULT.
Pus films (Sputum) <u>Ziehl Nielsen.</u> <u>Gram.</u>	T. B. Very abundant. Staphyloc. Diplococcus (Frankel) Streptococcus. + Filamentous forms.
Cultures agar <u>Films.</u> CF. die. Gram. Thun B.	The staphyloc. was of the white variety and only 3 colonies between the two tubes. In the smaller colonies present of which there was quite a good supply Streptoc: + diplococ were got respectively. No evidence of growth due to a filamentous form could be got.
<u>Other notes:-</u>	

The sputum in this case was very purulent as if it had remained for a long time in a cavity. This it probably had done as the man had a large cavity involving the greater part of the upper lobe of Rt lung.

The filaments mentioned as seen in sputum films were long and narrow, stained regularly, and were not decolorised by Gram.

Staphylococcus albus.

Streptococcus.

Pneumococcus.

Filamentous Forms.

Case. 98.

Patient J.S. Age 18. Sex M.

Affection. Phthisis. Stage?

Onset. 3 years.

~~Operation~~ Lobes involved. 4.

How long "open" ?

Other evidence of tuberculosis None.

### Bacteriology.

METHOD.	RESULT.
Sputum films. <u>Ziehl-Neelsen.</u> Gram. <u>Nech.</u> for capsules.	TB abundant. Staphyloc. Pneumococcus. Diplo-bacillus. Positive for latter two.
Cultures. <u>Films.</u> Cf. dil. Gram. Thin. Blue.	In 24 hours abundant growth of at least two distinct varieties. The most abundant was that identified as staphyloc. but pneumococcus was fairly copious especially in tube 2. The latter showed irregularities of a denser and more opaque nature.
Staining dish preparation <u>Other notes:</u>	From these places films showed a long diplo-bacillus gram negative and non motile.

In the Sputum film in this case there appeared a diplo-coccus or diplobacillus which did not stain by Grams but was stained by the Counter stain (M.B.) in using that method. It looked much bigger than the pneumococcus (Frankel) present in the same film. Each however showed a capsule.

Staphylococcus aureus.  
Pneumococcus (Frankel)  
Pneumobacillus (Friedländer)

Case. 99.

Patient J.G. Age 39. Sex. M.

Affection. Phthisis. 3rd Stage.

Onset. 2 years.

~~Observation~~ Lobes of lungs involved. 4.

How long "open" ?

Other evidence of tuberculosis None.

### Bacteriology.

METHOD.	RESULT.
Sputum films. Zeihl-Nielsen Gram. Melch.	The sputum was haemorrhagic. T.B. abundant. <u>Staphylococci</u> , <u>Streptococci</u> . <u>Pneumococci</u> , <u>Micrococcus tetragenus</u> . and a <u>Leptothrix</u> .
Cultures on agar. Films of each Stained Cf. die Thin. Blue. Gram.	Abundant growth in both tubes. Colonies are of at least four varieties. Staphylococci: albus. ten colonies in all. Pneumococcus + Streptococcus equal. Tetragenus - 3 white tenaceous colonies. The morphological character of each Colony was confirmed by staining films.
Other notes:-	

This was the first and only occasion upon which we had the opportunity of seeing Micrococcus tetragenus. Subcultures were made from these and the organism got in pure culture. We were able to verify the appearances described in the books and were struck by the tenaceous, gummy, consistency of the growth.

The leptothrix mentioned above consisted of very long filaments, these were very abundant, stained by the gram stain and about three times as thick as a tubercle bacillus.

- Staphylococcus albus.
- Streptococcus.
- Pneumococcus.
- Micrococcus tetragenus
- Leptothrix



Case. 100.

Patient J.G. Age 36 Sex M.

Affection. Phthisis. 3rd Stage.

Onset. 2 years.

~~Operation if any~~ Lobes involved: - 2.

How long "open" ?

Other evidence of tuberculosis None.

### Bacteriology.

METHOD.	RESULT.
<u>Films Sputum</u> Stained <u>Ziehl-Neelsen</u> " <u>Gram</u> .	T.B. very abundant. Staphyloc. a few. Pneumococcus - abundant. Streptococcus. some, short-chains. Short-gram + bacillus.
<u>Cultures on agar.</u>  <u>Films from each</u> <u>Variety of colony</u> <u>C.F. die. Gram.</u>	<u>Staphylococcus albus</u> . 3 colonies. <u>Pneumococcus</u> - fairly copious. <u>Streptococcus</u> - a few colonies. Confirm the morphological characters of those mentioned above.
<u>Other notes:-</u>	There was no evidence of growth from bacillus mentioned. It was however quite apparent and fairly numerous in the sputum film. It was short, fairly stout with rounded ends. Stained deeply by gram stain, sometimes occurring singly and sometimes in groups, the individuals having a tendency to lie side by side rather than in chains.
	<u>Staphylococcus albus</u> <u>Pneumococcus</u> . <u>Streptococcus</u> <u>A short-gram staining Bacillus</u> .

S U M M A R Y

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In 100 cases examined.

No organisms of secondary infection detected - - - 4

Organisms present:-

One variety only	37.	
Two varieties	45.	
More than two varieties	14. - - - - -	96.

N.B. For the purpose of this classification Staphylococcus Albus and Aureus are considered as separate varieties.

With regard to the 4 cases in which no organisms were found.

Two were cases of tuberculous cervical glands in which pus was very scanty. 40 & 77.

One was a case of tuberculous disease of the femur with slight discharge . 12.

One was that of tuberculous disease of hip with a long sinus which at the time of investigation was being syringed with Solution of peroxide of hydrogen 37.

In the 96 cases in which organisms were present we encountered Staphylococcus Albus 49 times.

" Aureus )	43	"
" Citreus )		
Streptococcus - - - - -	35	"
Pneumococcus - - - - -	20	"
(14 of which were phthisis cases)		
Pseudo diphtheria Bacillus	9	"
Bacillus Coli - - - - -	6	"
Bacillus pyocyaneus - -	3	"
Pneumobacillus (Friedländer)	2	"
(both phthisis case)		
Micrococcus tetragenus -	1	"
other organisms. - - -	9	"

If we classify these results for the purpose of comparison with the figures of Petroff, as quoted from his paper "L'infection mixte dans la tuberculose chirurgicale" we find as follows:-

Number examined	<u>Petroff's cases</u> <sup>2</sup> <u>44</u>	<u>Our cases</u> <u>100</u>
Sterile	3 or 6.8 p.c.	4 p.c.
Organisms found	<u>41</u> or <u>93.2</u> p.c.	96 p.c.
Staphylococcus Albus	16 or 36.3 p.c.	49 p.c.
" Aureus )	7 or 17 p.c.	43 p.c.
" Citreus)		
Streptococcus - - -	18 or 41 p.c.	35 p.c.
Pseudo Diphtheria Bacillus	8 or 18 p.c.	9 p.c.
Bac: Pyocyaneus	4 or 9 p.c.	3 p.c.
Micrococcus tetragenus	2 or 4.5 p.c.	1 p.c.
Bacillus Coli	1 or 2.5 p.c.	6 p.c.

It will be seen that the only marked difference in these tables is with regard to the frequency of Staphylococcus, especially the aureus and citreus varieties.

Petroff finds staph: of some kind in 53 p.c. of his cases

We find " " " " " 75 p.c. " our "

Our figures correspond more nearly with those of Jakowski<sup>4</sup>, who in the examination of 827 cases of acute suppuration (not necessarily tuberculous) finds staph: of some kind in 73 p.c. of his cases.

We found that the character of the discharge in any particular case was as a rule no guide to the identity of the organisms in that case, and that except in the case of B. Pyocyaneus, (when the discharge stained the dressing a bright green), and B. Coli (where the characteristic odour existed), no reliable information could be got from the appearance or consistency of the pus.

An interesting point is the relative value of information got from the examination of pus films compared with that obtained by the making of cultures. In the following table we have endeavoured to show the finding by each method in respect of the various organisms. It is of course frequently impossible to make a diagnosis from pus films alone; on the other hand, this method often gives information obtainable in no other way.

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	<u>Detected by pus films alone</u>	<u>Detected by cultures alone</u>	<u>Detected by a combination of both methods</u>
Straph: Albus ))	60	74	75
" aureus )			
Streptococcus	28	31	35
Pneumococcus	20	19	20
Bacillus Coli	3	6	6
Bac: Pseudo Diphtheria	5	9	9
Bac: Pyocyaneus	2 1	2 3	2 3
Pneumobacillus	2	2	2
Micrococ tetragenus	1	1	1
other organisms	8	4	9

With regard to the occurrence of the various organisms in the more common lesions we find:-

	<u>Psoas abscess</u> 1 <u>14 cases</u>	<u>Tub: hip</u> <u>16 cases</u>	<u>Tub: glands</u> <u>12 cases</u>	<u>Phthisis</u> <u>15 cases</u>
Straphyloc: albus	6	6	6	10
" aureus )	3	5	4	5
" citreus )				
Streptococcus	3	6	2	10
Pneumococcus	1	3	-	14
Bac: pseudo diphtheria	2	-	-	--
Bac: coli	2	-	-	--
Pneumobacillus	-	-	-	-- 2
Micrococ tetragenus	-	-	-	1
other organisms	1	1	1	5

It will be seen that out of 15 cases of phthisis we were able to demonstrate the presence of pneumococcus 14 times. The presence of this organism in all these cases could hardly have been accidental,

for as before stated, the patients were instructed to rinse the mouth and throat with warm water before using the expectoration bottle. We did not see this actually carried out however, and contamination from the throat in at least some of the cases is what might be expected. Since these observations were made, we have discovered that it is the custom of some bacteriologists to wash the sputum with several changes of saline solution before submitting it to examination.<sup>7</sup>

As the result of these investigations, we would formulate conclusions and suggestions as follows:-

- (1) That "closed" tuberculous lesions do not as a rule contain pyogenic organisms.
- (2) That when such a lesion become "open", secondary infection by these organisms occurs almost immediately.
- (3) That the organisms usually responsible for the infection in order of frequency are:- Staphylococcus, Streptococcus; Pneumococcus and a pseudo-diphtheria bacillus.
- (4) That staphylococcus is by far the commonest, frequently the first, and often the only organism of this infection.
- (5) That treatment of a "closed" lesion by "opening" and draining is always followed by secondary infection.
- (6) That surgical treatment ought therefore to be delayed, and, when resorted to, should have for its object the evacuation of the focus under aseptic precautions followed by closure in all cases.
- (7) That because such a lesion has become secondarily infected it should not receive less rigid aseptic attention, for the reason that a mixed infection is always more chronic and troublesome than that due to a single form of organism.

AN INTRODUCTION to treatment of these affections  
by BACTERIAL VACCINES.

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Although the Vaccine treatment of disease due to Bacterial invasion is now no new thing,<sup>7</sup> one gets from the literature on the subject very conflicting opinions as to its practical utility. There are those who, from extensive experience and a large number of cases, tell us that results from this mode of treatment have been uniformly good, whilst others whose experience is no less extensive and whose conclusions are based upon much material, assure us that results have in their hands been extremely disappointing. For example we read:-

"Vaccine treatment is of great service in most staphylococcal infections. Staphylococcal skin lesions, however chronic, are curable by its means".<sup>8</sup>

And

"The Vaccine treatment of septic infections has been extremely disappointing. There is no appreciable difference in the time spent in Hospital by those who had vaccines and those who had not."<sup>9</sup>

A point of great practical importance is the question of whether successful treatment by means of vaccines must necessarily be controlled by the determination of the opsonic index in every case and from time to time in each case.

The accurate estimation of the opsonic index requires much experience in the observer, and long training in, and acquaintance with, its particular technique, so that if vaccines were only to be used in conjunction with accurate determination of opsonic indices their use as a form of treatment must needs be very limited.



The exact rôle of opsonics in the production of immunity, and the value of the "opsonic index" as a guide to the diagnosis and treatment of disease, have yet to be decided.

But granting that the opsonic index can be accurately determined, and that by the use of vaccines we can bring the index to normal, or above normal, have we by so doing cured our patient?

The answer unfortunately is, no. It appears that the formation of opsonics is but an incident in the elaborate process of the production of immunity, and that other substances are necessary,<sup>10</sup> (antitoxins agglutinins, lysins) of whose presence the opsonic index in all probability takes no account, and of whose quantity<sup>ti</sup> and quality it is no measure.

With regard to treatment by vaccines it is now generally admitted that in many cases, especially when the condition is localised and accessible, the clinical signs and symptoms offer a sufficient guide to the size and timing of the dose.<sup>11</sup>

It struck me very forcibly upon coming to an Institution which had for its object the treatment of the various forms of tuberculous disease, that the great majority of the patients were not suffering from tuberculosis in the strict sense of the term, but from secondary infection. One also noted that, although tuberculin had been used at the hospital for several years, results from its use as a form of treatment were by no means gratifying, least benefit being derived by those patients in whom secondary infection formed a prominent feature of the case. It was decided, therefore, to introduce treatment by bacterial vaccines for the secondary infection, combining this if necessary with the former treatment by tuberculins.

For this purpose, of course an accurate bacteriological Analysis of each case had to be undertaken, and we became so engrossed in these investigations that we fear our original intention



regarding vaccine treatment was to a great extent lost sight of. We are able to record details of treatment by vaccines in 7 cases, 5 of which were treated with stock vaccines, and 2 by autogenous vaccines prepared by ourselves from the patients' own organisms.

One had not much choice in the selection of cases for vaccine treatment because the treatment being new its object had to be explained and permission got for its employment in each case, and we discovered that however enthusiastic we may have been about it, the treatment did not seem to commend itself particularly to the patients, in the case of adults, or to the parents particularly to the patients, in the case of children.

Finding the commonest form of secondary infection to be of a mixed staphylococcic variety we procured a stock mixed staphylococcic vaccine. Three of our cases were treated with this vaccine. One case of streptococcal infection was treated with a stock vaccine, and another due to Frankel's diplococcus, by a stock pneumococcal vaccine. All these vaccines were those prepared by the Lister Institute of Preventive Medicine.

The remaining two cases were treated with autogenous vaccine, notes (in) the preparation of which will be found with the record of the cases..

An attempt was made to estimate the opsonic index in the first two cases before treatment was begun. This involved much time and labour, and results were so inconsistent even with specimens of the same serum examined on the same day, that it was decided that the time necessary to acquire any confidence in the procedure could be spent to better advantage in another direction. The treatment was controlled therefore entirely by clinical observation. At the commencement of treatment the patient was put to bed, his temperature, pulse, and respirations recorded every 4 hours, and his dressing performed daily by myself and notes taken at the time regarding -

## (1) Any constitutional change.

Headache Rigor.

Malaise Rash.

Sickness.

Loss of appetite etc.

## (2) Any local change.

In the lesion itself.

Redness.

Pain.

Amount of discharge etc.

At the seat of infection

Pain.

Redness.

~~Swelling~~ de. Swelling.

The injections in all cases were made into the flank.

In the event of no disturbance, general or local, a slightly increased dose was given as a rule in from 7 to 10 days.

When a re-action occurred, the same dose was repeated in due course.

A G N E S B U L L E N. Age 13.

Affection Tuberculous disease of Lt femur with sinuses  
Lt thigh.

Boils of both axillae.

History. Trouble commenced in Lt thigh 2 years ago.  
She had had a somewhat similar condition on Rt. thigh which discharged for a time and healed up.

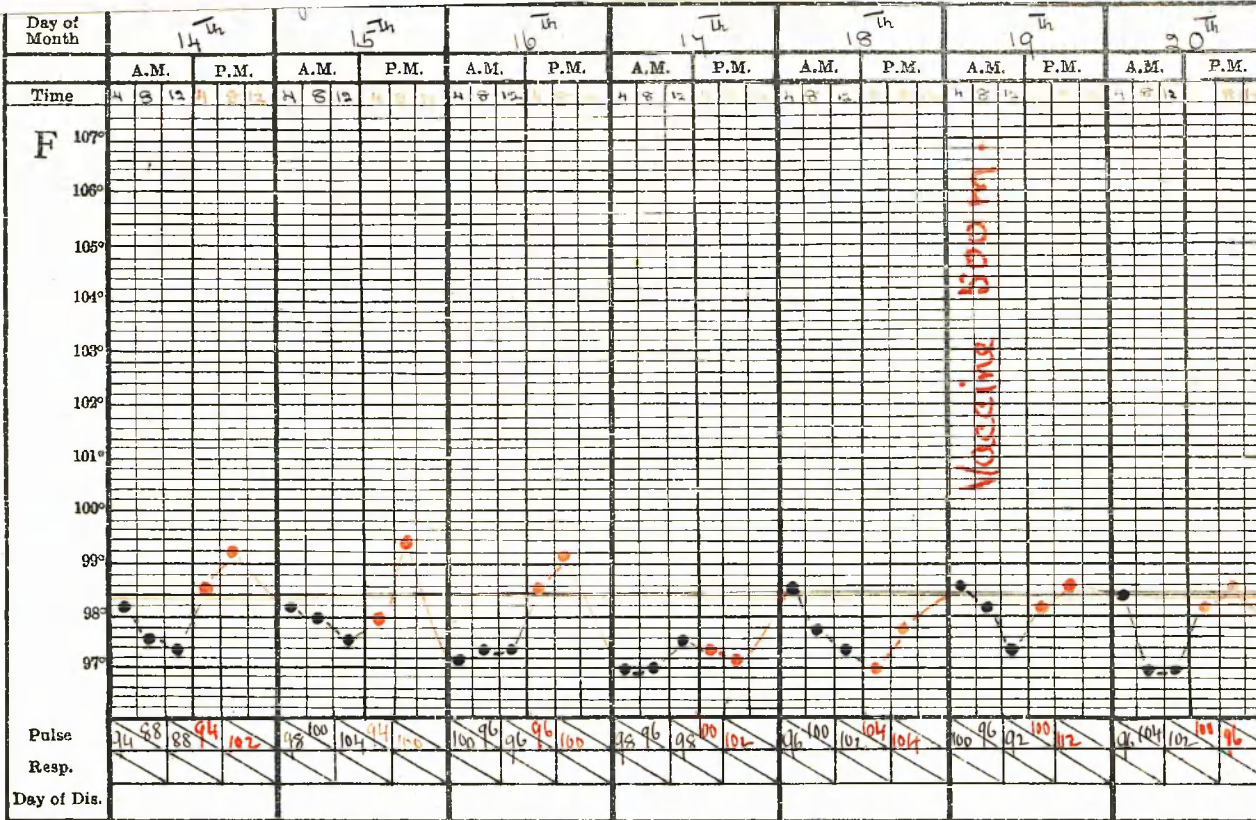
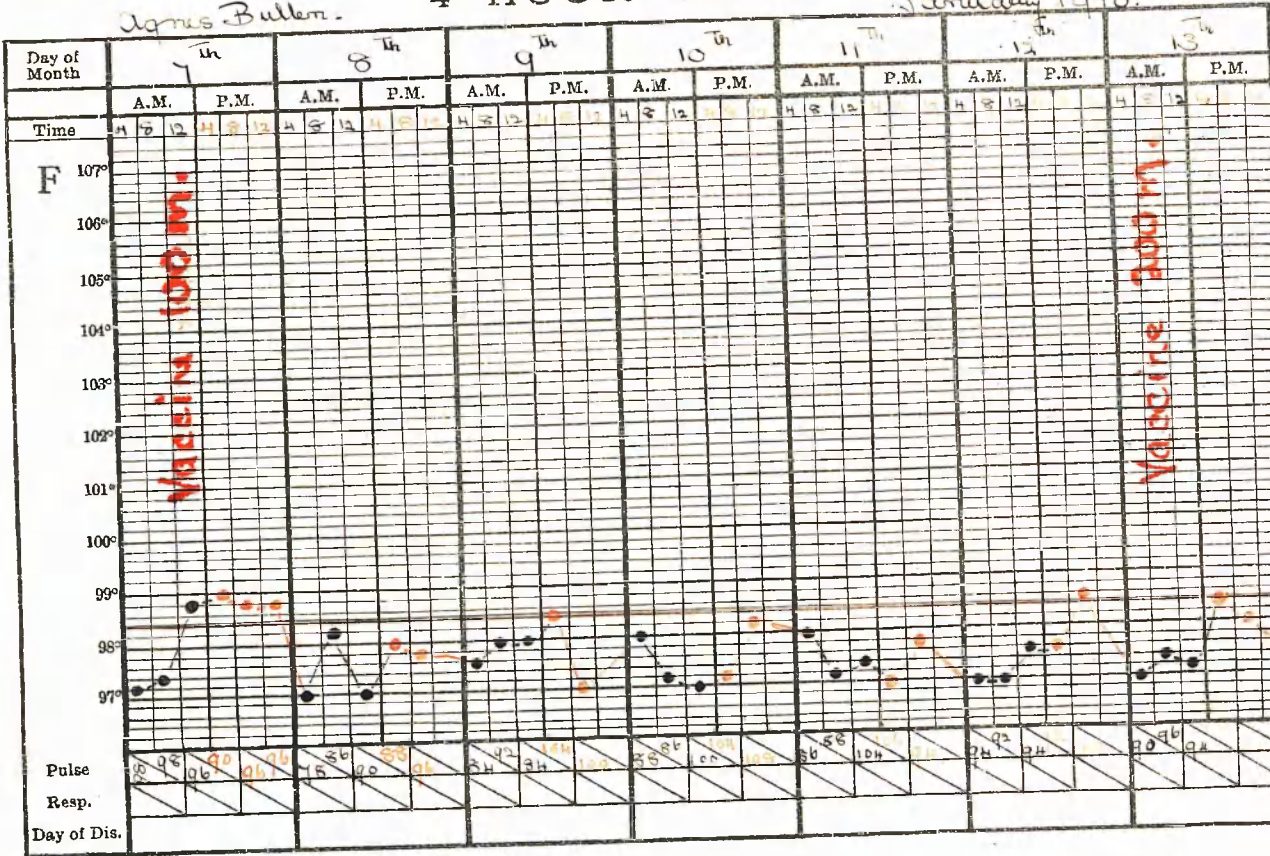
She had no operation and Lt thigh has now been discharging for at least 12 months.

She had boils in various situations for the last 6 months.

Agnes Bullen.

# 4 HOUR CHART.

January 1910.





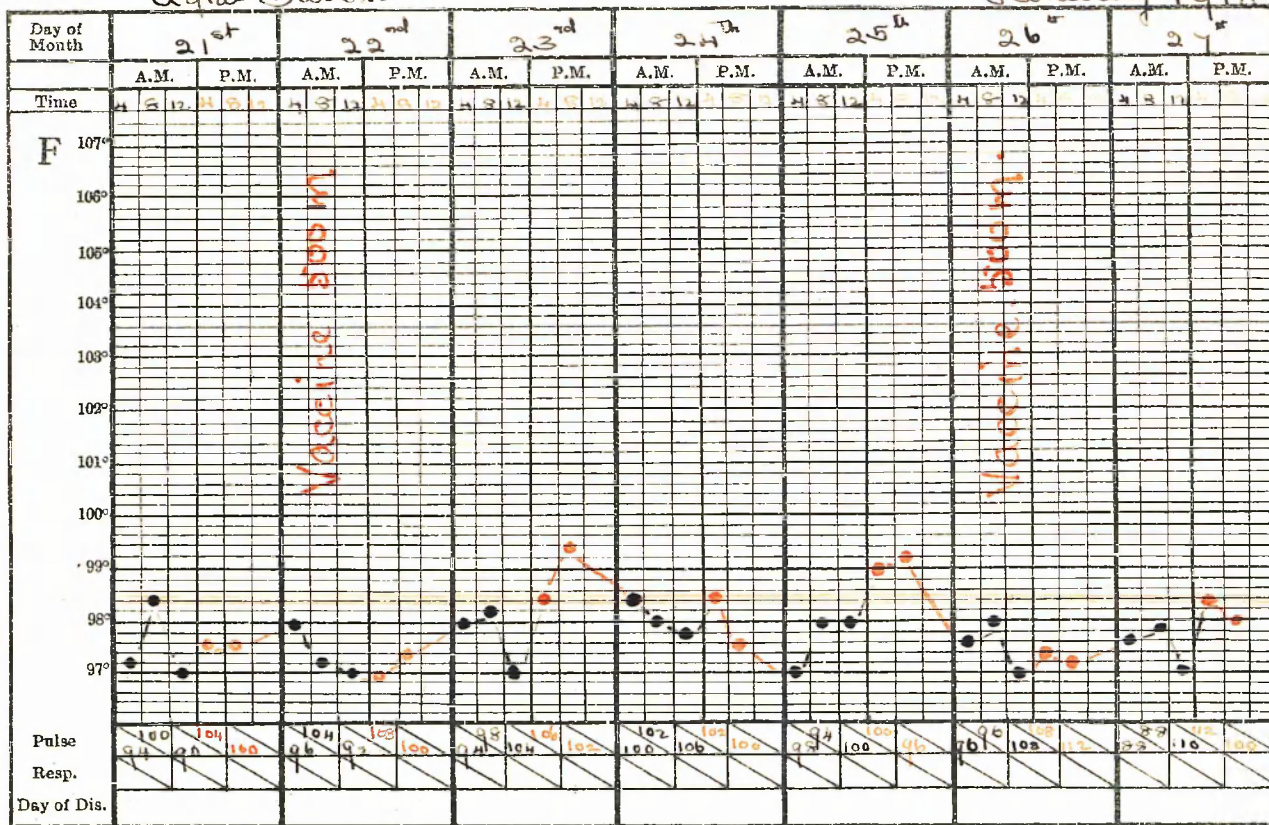
On admission            General condition not good. Two sinuses of outer side Lt thigh open and discharging freely. A probe runs upwards a distance of 3" towards great trochanter and there encounters bare bone. Scar of former sinus in corresponding position Rt side.

Date	T R E A T M E N T			R E S U L T.
	GENERAL	<u>SPECIAL</u>	<u>SPECIAL</u>	GENERAL
2.9.09 to 6.1.10.	Open air, Feeding Sea baths, Rest in bed, Antis <sup>er</sup> ptic dressings.			Much as on admission. General condition has improved somewhat. Temp: always normal or sub normal. Discharge from sinuses moderate. Has boils of both axillae.
6.1.10.	Bacteriological examination of pus from sinus thigh shews staphylococcus aureus, that from one of the boils staph: albus. Case 3. Mixed stock staphylococcic Vaccine.			
7.1.10.		Stock mixed Staph: vaccine <u>100 m</u>	No special reaction of any kind.	The condition of the sinuses and the amount and quantity of discharge was absolutely unaffected
13.1.10.		Vaccine <u>200 m.</u>		
19.1.10.		Vaccine <u>500 m.</u>	No rise of T. No headache,	
22.1.10		Do.	No malaise. No local reaction.	The boils began to get better after the 2nd dose of

Agnes Bullen.

### 4 HOUR CHART.

January 1910



Agnes Bullen (continued)

Date	T R E A T M E N T		R E S U L T	
	GENERAL	<u>SPECIAL</u>	<u>SPECIAL</u>	GENERAL.
26.1.10.		Do.	No local reaction.	vaccine. and by 30. 1.10. has com- pletely dis- appeared. General con- dition good.

This patient had vaccine treatment for a month only, during that time she had 5 doses.

CONCLUSIONS. Patient's general condition improved markedly during the time treatment was in progress. The boils during this time completely disappeared whether due to the vaccine one is not prepared to say, as boils usually heal without special treatment.

The condition of the sinuses and hip generally was absolutely unaffected.



Olive Wood

Aged 7.

Affection

Tuberculous disease Lt hip joint with two discharging sinuses in outer side hip.

History

Affection started 12 mos before admission.

3 mos ago an abscess was opened and drained by means of two tubes.

On admission

1.2.10. General condition fairly good. Two small sinuses in outer side of Lt hip. Joint very fixed and much swelling round head of bone and great trochanter. Muscles of thigh and leg much atrophied.

Has been having treatment at home for last 3 mos. Rest in bed, splint extension with daily dressing.

Date T R E A T M E N T R E S U L T.

Date	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
1.2.10. to	Rest in bed Open air feeding.			As on admission. temp: 98 to 99 <sup>o</sup> 2 weight 6 st.
13.2.10.	Sea baths Dressings			
3.2.10.	Bacteriological examination of pus from sinus demonstrated the presence of staphy: aureus and albus. Case 17.	Mixed Stock	Staphylococcal Vaccine.	
5.2.10.	Do.	Vaccine <u>100 m.</u>		
7.2.10.			No special reaction temp: 98 to 100.2.	Sinuses as before.





## Olive Wood (Continued)

Date	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
24.2.10.		Vaccine <u>200 m</u>		
26.2.10.			Slight headache and feeling of sickness. T.yes- terday 101.2	Discharge a little more profuse. Some redness round the sinuses.
10.3.10.			Temp: much as	Sinuses as
13.4.10.		Vaccine <u>500 m</u>	before.treatment commenced.	before.
14.4.10.		Vaccine <u>200 m.</u>		
16.4.10.			Temp: yesterday 100.4 No other reaction.	No change.
23.3.10.	As before.			Condition of hip as before commencement of treatment.
29.3.10.		Vaccine <u>400 m</u>		
31.3.10.			No reaction to last dose	I.S.A.
8.4.10.			Temp: as before treatment.	Discharge free & as copious as before. Feels well Eats & sleeps well.

Olive Wood (Continued)

<u>Date</u>	T R E A T M E N T		R E S U L T	
	GENERAL	SPECIAL	SPECIAL	GENERAL
20.4.10.			No reaction	General condition good. No change in sinuses now in amount of discharge.
30.4.10.				(As before. Weight 6 st.4 lbs.

The patient had vaccine treatment for 9 weeks and had during that time 5 doses.

CONCLUSIONS Response to Vaccine was very slight.

General condition which was good remained so and patient put on 4 lbs in weight.

The total result of the treatment on the hip conditions was so far as we could see Nil.

This patient is having the treatment continued as the time since commencement is rather short.

Alice Bolton

Aged 14 years.

Affection

Tuberculous disease of Lt femur with two sinuses on outer side of thigh.

Ankylosis of Rt hip from old tuberculous disease

Scars of former sinuses on Rt hip, Rt leg and Lt wrist.

History

Trouble is of 3 years duration. Has had treatment in Hospital more or less since onset.

Has had 5 operations, that on Lt thigh 2 years ago

On admission

9.7.09. General condition good.

Two discharging sinuses on Lt side over great trochanter of femur., leading to caries bone.

Lt hip joint free. Evidence of former tuberculous mischief R.hip and femur.

DATE

T R E A T M E N T

R E S U L T

	GENERAL	SPECIAL	SPECIAL	GENERAL.
9.7.09.	Open air.			General condition better
	Feeding			
to	Rest			Locally there is very little change
	Sea baths			
6.1.10.	Antisept.dressg.			sinuses still require daily dressing.
3.1.10.	Bacteriological examination of discharge shows	Staphylococcus Alb	and aureus.	
5.1.10.				Patient has been in bed since New Years Day T & P. taken systematically. <u>Temp</u> slightly over normal <u>Pulse</u> 78 to 100.





Alice Bolton (Continued)

DATE	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
6.1.10.	Do.	Stock Vaccine Mixed Staphylo: <u>250 m</u> in flank.		
10.1.10.			No special reactn. <u>Temp this ev:</u> 99.6. P. 90.	J.S.Q.
13.1.10.	Vaccine	Vaccine <u>250 m.</u>	No temp:	Discharge
15.1.10.			No headache.	slightly more.
19.1.10.	Same as before.		Temp: been sub normal & pulse quiet.	Feels very well. Gets up 2 days after the injec- tions.
20.1.10.	Patient is al- lowed up with crutches	Vaccine <u>500 m</u>	Had T. 99.6 on 21st subnormal ever since. No discomfort.	Sinuses look a little bet- ter. Certainly less dis- charge.
26.1.10.				
29.1.10.	Do.	Vaccine <u>500 m</u>		
1.2.10			No effect from last dose	J.S.Q.
5.2.10.		Vaccine <u>500 m</u>		
8.2.10.			Slight head-	





Alice Bolton (Continued)

DATE	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
11.2.10.	Do.		ache day after inject: No rise of T.	More discharge from sinuses and they look red and irritable. Appetite not so good.
15.2.10.	Do.	Vaccine <u>1000 m</u>	Small sequestrum discharged itself from upper sinus today.	still a good deal more than formerly.
17.2.10.			Had headache yesterday but otherwise feel well. T. 100.4.	Discharge still considerable.
24.2.10. 26.2.10.	Do.	Vaccine <u>1,000 m</u>	Has small hard nodules at seat of 2 former injections, Not red but painful on pinching.	Feels very fit Eats & sleeps well. Sinuses look much healthier & have less discharge.
4.3.10.	Do.	Vaccine <u>1,500 m</u>	) No reaction whatever.	Sinuses much better.
14.3.10.		Vaccine <u>2,000 m</u>		



## Alice Bolton (Continued)

<u>DATE</u>	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
21.3.10.		Vaccine <u>2,000 m</u> )		Sinuses much better hardly any dis- charge from the upper one.
28.3.10.				Patient is so well that parents are taking her home. The upper of the 2 sinuses has healed General conditions excellent. Wt. not taken.

The patient was treated for about 3 mos during which time she had 10 doses of vaccine.

We were able to use doses here which we feel sure would have caused serious reaction in others of our cases.

CONCLUSIONS

Response to vaccine was not marked.

General condition during treatment had certainly improved.

The local conditions at the time of her discharge was almost well. Whether we can attribute this to the vaccine is doubtful, because during the vaccine treatment a sequestrum discharged itself and this alone might have brought about the favourable result.

Lydia Holloway.

Aged 15.

AFFECTION

Tuberculous disease Rt elbow joint with two sinuses one on outer and one on inner side of joint. Former tuberculous disease Rt malar now healed but leaving much pitted scar. Cold abscess over Lt orbit.

HISTORY

Rt elbow started 2 years ago - was opened and scraped 18 months ago and has been discharging since. Disease of malar bone Rt started 12 months ago broke down of itself, discharged for 2 months and then healed up. Abscess over orbit developed since admission.

On ADMISSION

30.3.09. General condition is fairly good.

Much swelling, redness and tenderness of Rt elbow joint. Two granulating discharging sinuses in connection with elbow.

DATE

T R E A T M E N T

R E S U L T.

	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
20.3.09.	Open air.	Tuberculin.	No special	General cond-
to	Feeding.	$\frac{1}{100,000}$ mgm.	reaction to	tions fairly
	Sea baths	every 10	tuberculin.	good. elbow
4. 10.	Antiseptic dressing.	to 14 days	local condi-	not at all
	Scraping of -eration	for 3 mos.	tions if any	improved since
4. 10.	Bacteriological examination of pus from sinus elbow results in the detection of Streptococcus only.		thing worse	admission.
5.1.10.	Decided on treatment with a stock vaccine of polyvalent Streptococcus.			
	Open air.			





## Lydia Holloway (Continued)

DATE	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
6.1.10.	Feeding Antiseptic dressings. kept in bed	Stock Streptoc vaccine <u>3 m</u> in Rt flank.	temp seldom over 99.4. Pulse 92. Temp.100 Pulse 100.	Discharge free and very ir- ritating from sinuses elbow Rt. Weight 7 st: 12 lbs.
9.1.10.	Do.			
10.1.10.	Do.	Vaccine <u>5 m</u>		Complains slightly of headache.
12.1.10.			Gets slight	
14.1.10.			temp.each evening. Temp yesterday ev: was 101.2.	Discharge slightly more and pain more Elbow quiet again.
15.1.10.	Same as before.	Vaccine <u>10 m</u>		Elbow much quieter discharge slightly less and less irri- tating.
17.1.10.			Temp: not above 99.8. More pain in elbow.	Headache slight & tendency to sickness. Slept badly last night.
19.1.10.			Temp: normal since 18th	Quite well again.
25.1.10.	Same but is allowed up, elbow in a sling.		Temp: quite normal.	Has heard that parents wish to have her home Elbow much better. Discharge from the outer sinus almost nil. Swelling less tender- ness much less

## Lydia Holloway (Continued)

<u>Date</u>	GENERAL	SPECIAL	SPECIAL	GENERAL.
28.1.10.	To go home today.		Temp: 98. Pulse 80.	Can move elbow without pain. Outer sinus dry and inner as if it might heal. Wt. 8 st; 0 lb.

This patient had vaccine treatment for a fortnight only. She had 3 doses.

CONCLUSIONS

The vaccine treatment seemed to improve the general condition. Patient in a fortnight gained 2 lbs in weight. This may in part be due to the fact that she was kept in bed.

We got a very definite response to the vaccine.

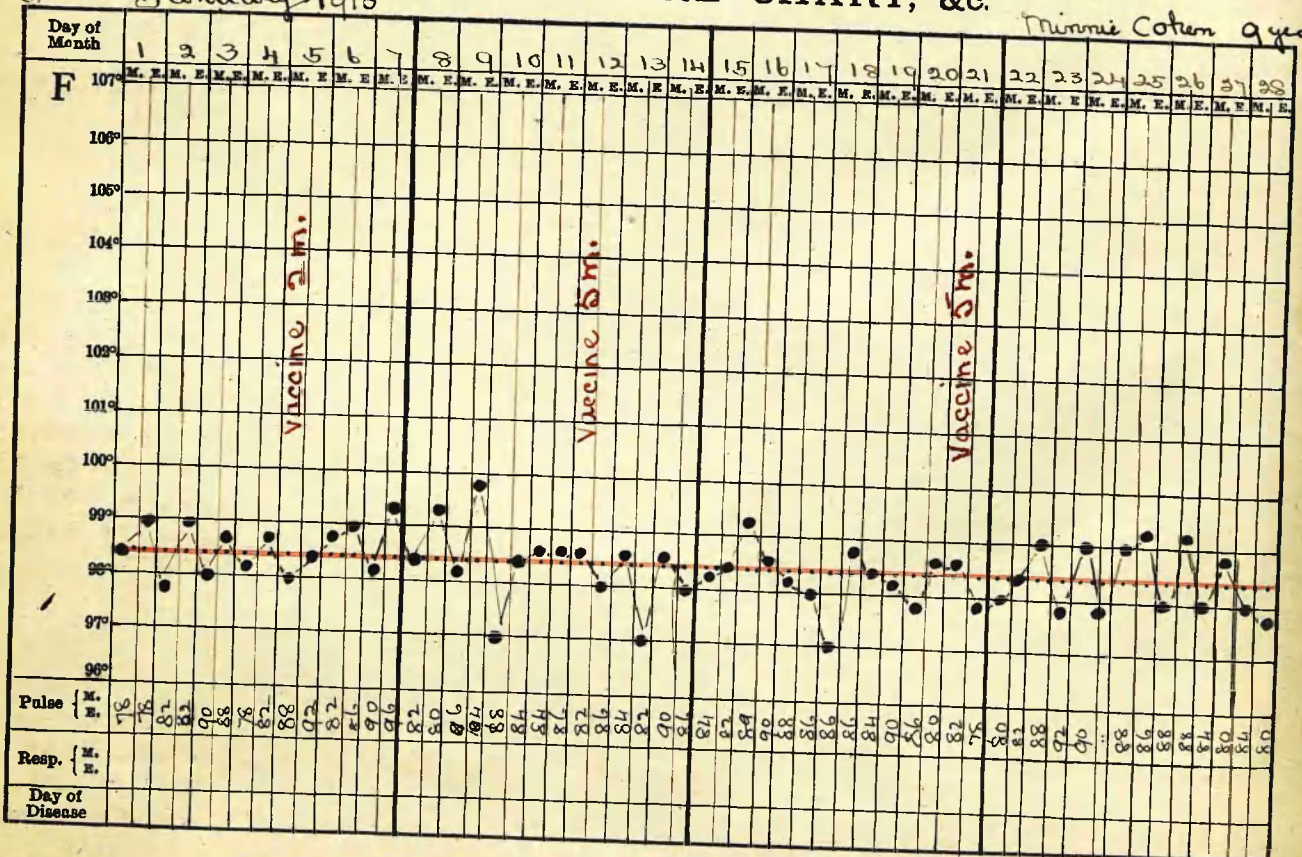
The elbow at the time of her leaving the Hospital (23 days after the commencement of treatment) was very much improved and better than it had been for 6 months..



# TEMPERATURE CHART, &c.

January 1910

Minnie Cotter 9 years



Minnie Cohen.

Aged 9 years.

AFFECTION Tuberculous disease of spine in mid dorsal region with severe posterior deformity involving three vertebrae, with psoas abscess of Lt side, sinus being in Lt groin above Poupart's ligament,

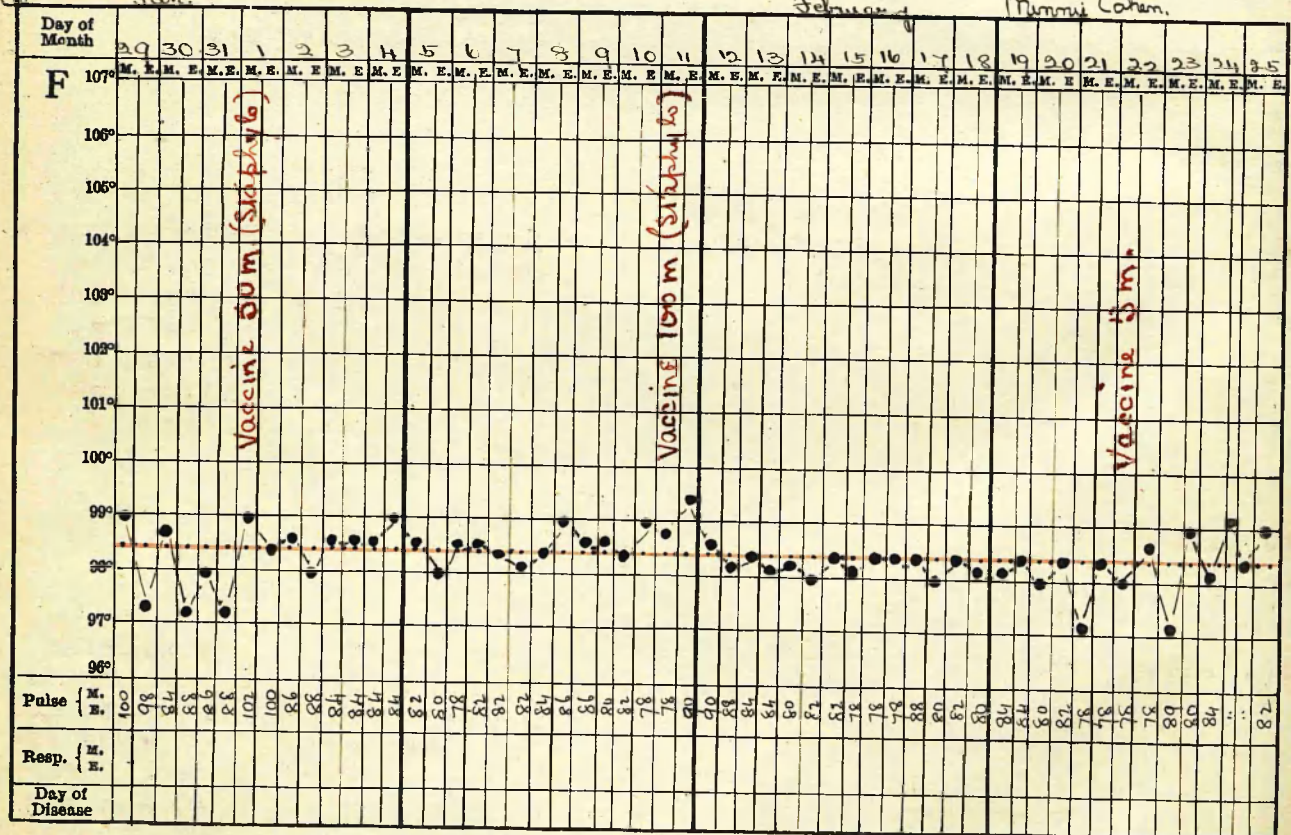
HISTORY Had had deformity of spine since infancy, attended a childrens' Hospital in London for years.

On ADMISSION 12.9.09. General condition poor. Severe deformity of spine. Disease active.  
Discharging psoas abscess Lt side.

<u>DATE</u>	<u>T R E A T M E N T</u>		<u>R E S U L T.</u>	
	<u>GENERAL</u>	<u>SPECIAL</u>	<u>SPECIAL</u>	<u>GENERAL.</u>
12.9.09.	Open air feeding.			Much improved
5.1.10.	Absolute rest on back. Antiseptic dressings.			in general condition. Has put on 7 lbs in weight Abscess still discharges.
3.1.10.	Bacteriological examination of pus by films and cultures demonstrates the presence of  Pneumococcus.			
4.1.10.	Do.			Sinus discharging freely a very red and irritable skin condition surrounds the sinus for 2 inches all round.
5.1.10.	Do.	Pneumococcal Stock Vaccine. <u>2 millions</u> injected into Rt flank.		
10.1.10.	"		No special effect locally.	feels & looks well. discharge and redness same.
12.1.10	"	Do. <u>5 m</u> Rt flank.		
14.1.10.	"		has been sick twice today.	Discharge same



## TEMPERATURE CHART, &c.





Minnie Cohen (Continued)

T R E A T M E N T

R E S U L T.

<u>Date</u>	GENERAL	SPECIAL	SPECIAL	GENERAL.
18.1.10.	Same as before		T. not up complains of head-ache.	Redness a good deal more marked.
18.1.10.	Same as before		No rise of T.	Discharge much the same
			No further sickness.	in character & amount.
			No reaction at seat of injection.	Redness round sinus is distinctly better
21.1.10.	Do.	Pneumococcal vaccine <u>5 m.</u>		
28.1.10.	"	Rt. flank.	No special reaction after last dose.	General condition good. discharge less Redness quite disappeared.
30.1.10.	Bacteriological examination of pus now demonstrated the presence of Staph. albus and aureus as well as the Pneumococcus. It was decided to give a few doses of Staphylococcic Mixed vaccine.			
1.2.10.	Do.	Mixed Staph: vaccine <u>50 m</u> Lt. flank.		
7.2.10.	"		No special reaction. No rise of Temp.	Redness quite gone. discharge much as before. General condition improved.
10.2.10.	"	Staphylococ: vaccine <u>100 m</u> RT. flank.		
15.2.10.	"		Complained of sickness day after injection no other effect.	Discharge unchanged. Redness has to some extent returned and sinus looks sore.
20.2.10.	"		No special symptoms	Redness round abscess as bad as ever. very irritable.



## Minnie Cohen (Continued)

T R E A T M E N T			R E S U L T	
DATE	GENERAL	SPECIAL	SPECIAL	GENERAL.
22.2.10.	Do.	pneumococcal vaccine <u>5 m</u> Rt flank.		
25.2.10.			headache nausea and loss of appe- tite. T.some- what irregular.	Sinus very red and pain- ful.Dis- charge not altered.Con- dition not so good.
28.2.10.		Pneumococcal vaccine <u>10 m</u> Rt flank.		
3.3.10.			Return of headache, Sick on two occa- sions. temp: highest 100.4.	Redness ra- ther less Discharge I.S.Q.
7.3.10.	As before			General con- dition good. Appetite res- tored. Sinus almost free from redness & irritation
9.3.10.	Do.	Pneumococcal vaccine <u>10 m</u> in Rt flank.		
14.3.10.	"		No reaction local or gen- eral after the last dose	Discharge perhaps a little less Redness quite gone. Skin healthy up to margin of sinus.
17.3.10.	Do.	Do. <u>10 m</u>		
20.3.10.	"		Temp: rose to 100 after last dose, no constitution- al reaction	Much as be- fore.
24.3.10.	"	Do. <u>10 m</u>		
27.3.10.			Practically no effect from last dose	Improved generally appetite good has gained 4 lb since be- ginning of the vaccine treatment. Amount of dis- charge the same.

## Minnie Cohen (Continued)

## T R E A T M E N T

## R E S U L T.

<u>Date</u>	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL
7.4.10.		do. <u>10 m</u> )	No special response to any of these doses. temp: never over 99,4,	Sinus still discharging freely. Generally very much improved.
14.4.10.		Do. <u>10.m</u> )		
22.4.10.		" <u>15 m</u> )		
30.4.10.		" <u>15 m</u> )		
The patient was treated for <u>3 mos.</u>				

During this time she had 14 doses of Vaccine.

CONCLUSIONS

The Vaccine treatment certainly did no harm.

The general condition of the patient improved under the treatment, she gained 5 lb during these 3 mos.

The eczematous and irritable condition of the skin was probably due to pneumococcus and was markedly affected by the Vaccine,

The psoas abscess was not affected in any way. The discharge did not lessen materially as a result of the treatment nor did the sinus shew any attempt at closing up.



Beatrice Bayliss

Age 23.

AFFECTION Tuberculous disease of spine with psoas abscess  
Lt side

Tuberculous dermatitis of skin of both legs.

HISTORY The condition in the legs had been of two years standing. The spinal trouble started 6 mos ago. 3 mos ago an abscess pointed in Lt inguinal region and was opened.

On admission General condition very good. Patient is plump and well nourished. Discharging psoas abscess Lt side and superficial dermatitis of both legs and ankles with tendency to the formation of boils in these situations.

This case is No 16 in our list of open tuberculous lesions and as recorded there the staphylococcus albus was demonstrated both in the psoas abscess and on the ulcerated surfaces on the legs. From a subculture of organisms grown from the latter situation a vaccine was prepared and standardised.

The process,<sup>12</sup> which applies equally to the case immediately following, will be recorded here.

The following apparatus<sup>†</sup> was got ready and sterilised by being boiled in water.

(1) Two graduated glass tubes with rubber corks.

(the conical urine tubes of a centrifuge were used)

(2) A glass rod.

(3) Two long glass pipettes with rubber teats (Wright)

(4) Two small glass beads.

To prepare the vaccine a subculture was used of 10 hours growth

(a) 7 c.c. Sterile saline solution .1 p.c. were pipetted into one of the conical tubes.

(b) With the platinum loop some of the young culture was removed from the surface of the medium and transferred to the

† See photograph. Frontispiece.

saline solution in (a) about 2 to 3 loopsful were found to be sufficient, and care was taken not to touch the surface of the medium itself, particles of which we found seriously interfered with subsequent counting)

- (c) By means of the glass rod, which just comfortably fitted the inside of the conical tube the mass of growth thus transferred was thoroughly broken up and emulsified.  
(15 to 20 minutes were usually necessary for this process)
- (d) Having withdrawn the glass rod and introduced the beads into the conical tube the cork of the latter was pressed in tightly the whole enveloped in a clean towel and thoroughly shaken for half an hour.
- (e) The tube was then allowed to stand for an hour for the purpose of letting clumps of bacteria settle to the bottom after which 5 c.c. of the emulsion from the upper part were pipetted carefully into bottom of the second conical tube.
- (f) The second tube was now placed in a hot water bath at a temp: of  $60^{\circ}\text{C}$ . for half an hour.  
It was then removed from the bath, the mouth plugged lightly with sterilised cotton wool, and allowed to cool.
- (g) When cool loopsful were sewn on agar tubes and incubated at  $37^{\circ}\text{C}$ . to test its sterility.
- (h) The emulsion was then standardised.  
This was done by drawing into the long pipette, which contained a small quantity of solution of sodium citrate, equal parts of blood, and the emulsion.  
(the blood being got from one's own finger.)  
These were thoroughly mixed by expressing several times the contents of the pipette on to a clean slide. Films were now made from the mixture and stained by Jenner's stain.

A thin part of the film being chosen the numbers of red corpuscles and organisms were counted in 20 successive fields, by means of the oil immersion lens and movable stage. It was found convenient to plan out a little diagram consisting of 20 squares each of which was divided by a diagonal one half of the square representing the corpuscles the other half the organisms in one field. In this patient's case the film though a good one, was fairly thick the figures being.

Corpuscles  
Organisms

115 22	108 18	105 16	105 18	88 10
91 12	82 11	88 12	74 9	86 14
77 9	110 14	89 11	86 12	99 12
75 10	69 10	82 6	78 9	78 14
Total				1783 249

From this the number of organisms in each c.c. of the emulsion was obtained by a simple sum in proportion.

$$\begin{aligned}
 \text{organism per c.c. emulsion:} & \quad \text{Corps per c.c. blood} :: 249 : 1783. \\
 & \quad \quad \quad \quad \quad \quad \quad \quad : 5,000 \text{ millions} \quad \quad \quad :: 249 : 1783. \\
 & \quad \quad \quad \quad \quad \quad \quad \quad = \underline{5,000 \text{ m} \times 249} \\
 & \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 1783. \\
 & \quad \quad \quad \quad \quad \quad \quad \quad = 700 \text{ m.}
 \end{aligned}$$

A small quantity of 5 p.c. carbolic was added to the emulsion as a preservative, and dilutions were made with sterile saline solution, and the vaccine stored in small sterile glass tubes containing 1 c.c. each and arranged so that practically any dose from 35 m to 700 m could be obtained.

Beatrice Bayliss.

DATE	T R E A T M E N T		R E S U L T.	
	GENERAL.	SPECIAL	SPECIAL.	GENERAL.
28.11.09.	Open air.	Mist Potass.	No improvement	General con-
	Rest in bed.	Iodide.	under iodide	dition good
to	Feeding.		treatment.	spinal de-
	Antiseptic		Temp very much	formity
5.2.10.	dressings.		up and down	slight. Psoas
			98 to 101.	ab: dis-
				charging Lt
				groin.
				Many scars
				of old ul-
				ceration
				both legs &
				both hips.
				Large ulcera-
				ted area on
				Lt leg near
				ankle.
				Rt leg near
				knee.
5.2.10.	Do.	Staphylococcic Autogenous Vaccine. <u>35 m</u> in Rt flank.		
7.2.10.			Temp 99.6	Does not
			Pulse 100.	feel so well
			slight tender-	Nausea,
			ness at seat of	headache.
			injection.	Loss of ap-
			Ulceration of	petite.
			legs more pain-	These symp-
			ful.	toms lasted
				for 4 days
				after the in-
				jection. By
				13th feels
				quite as
				before.
13.2.10.	Do.			
14.2.10.		Vaccine <u>35 m</u>		
17.2.10.			Very little re-	Headache
			action after	slight and
			last dose.	lasted only
			Legs look deci-	2 days.
			dedly better,	
			granulations	Feels well
20.2.10.			more healthy.	again.





Beatrice Bayliss (Continued)

DATE	T R E A T M E N T		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL.	GENERAL.
22.2.10. 26.2.10.		Vaccine <u>35 m</u>	Almost no re- action.Temp: more even. see chart.	Not disturbed by last dose.
1.3.10.		Vaccine <u>70 m</u>		
3.3.10.			Temp: 100.4 Legs painful but looking better. Psoas abscess is unchanged.	Return of headache and nausea. Took little food for 48 hours. Symptoms passed off in 3 days.
10.3.10.			Temp:normal Ulcers look very much better.No ten- derness at seat of injection	Seems much better generally. Psoas abscess discharges as before.
12.3.10.		Vaccine <u>70 m</u>		
14.3.10.			No reaction Temp: normal.	Feels very well. Legs healing nicely.
22.3.10.	Same as before.	Vaccine <u>100 m</u>		Psoas abscess I.S.Q
24.3.10.			Temp: not over 99. Pulse 90.	Headache for a few hours yesterday. Slept badly on ac- count of pain in legs.
29.3.10.		Vaccine <u>135 m</u>		
2.4.10.			Temp: has been 100. Pulse 112. Seat of last injection pain- ful and small hard swelling.	Headache and sick- ness for 24 to 48 hours after in- jection. Legs feel sore.
4.4.10.				Ulceration on Rt leg has healed. Lt leg granulating A boil has appear- ed on Rt thigh
5.4.10.		Vaccine <u>135 m</u>	Very little reaction, No notable rise of Temp.	Lt leg almost healed & quite free from pain. General condition very good. Psoas abscess still dis- charges v.freely.
14.4.10.		Vaccine <u>200 m</u>		
23.4.10.		Vaccine <u>200 m</u>		
30.4.10.		Vaccine <u>300 m</u>	No reaction.	Legs both quite healed with firm scars.The boil no- tices on Rt thigh

## Beatrice Bayliss (Continued)

				GENERAL.
				on 4.4.10. aborted and disappeared without breaking the skin. A somewhat similar condition was present in connection with one of the injections viz that of 2.4.10. This also disappeared without bursting.

Patient was treated for 3 mos.

and had 11 doses of vaccine.

CONCLUSIONS.

Patient responded to almost every dose of vaccine.

The skin <sup>condition.</sup> was I believe cured by the vaccine treatment.

The psoas abscess was absolutely unaffected.

The patient's general condition, good to start with, had improved considerably under the treatment.

James Bass.

Aged 37.

AFFECTION

Tuberculous disease of spine lower dorsal with double psoas abscess.

HISTORY

of injury about 3 years ago followed by pain and weakness in the back.

A swelling appeared in Lt inguinal region about 2 years ago; this was opened and drained. 3 mos. later a similar swelling appeared on Rt side and was treated in a similar way.

Since then he has had several scraping operations, and 3 mos before admission he had the sinuses injected with Bismuth Carbonate.

ON ADMISSION.

Moderate degree of deformity in lower dorsal region of spine. Double psoas abscess, discharge profuse and offensive. General condition fair.

DATE

T R E A T M E N T .

R E S U L T .

	T R E A T M E N T .		R E S U L T .	
	GENERAL.	SPECIAL	SPECIAL	GENERAL.
Nov. 1909. to	Open air. Feeding. Rest in bed on back.			Has improved somewhat in general condition. Discharge very profuse. Bismuth discharges itself for the sinuses from time to time. The Solution syringes through from side to side. Temp: Hectic 98 to 101. Drainage tubes in each side.
Jan. 1910.	Antiseptic dressing including syringing with solution of peroxide of Hydrogen.			
Jan 4.	Bacteriological examination of discharge shows the presence of Bacillus Coli.  No other organisms were detected in pus films or in cultures.  Subcultures made from the latter and a vaccine prepared from a growth of 10 hours old.			





## James Bass (Continued)

The vaccine was prepared by the method described in the previous case. The emulsification of the culture here was a much simpler matter than in the previous case, probably on account of the mobility of the organisms, which seemed to show less tendency to clumping.

In the standardisation the figures were:-

122 22	130 26	141 34	137 26	140 35
152 25	102 27	144 37	122 32	132 31
79 15	89 15	87 13	77 13	82 15
82 17	75 20	62 9	71 12	73 10

TOTAL 

2159 436
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∴ 1 c c of emulsion = 1010 m organisms.

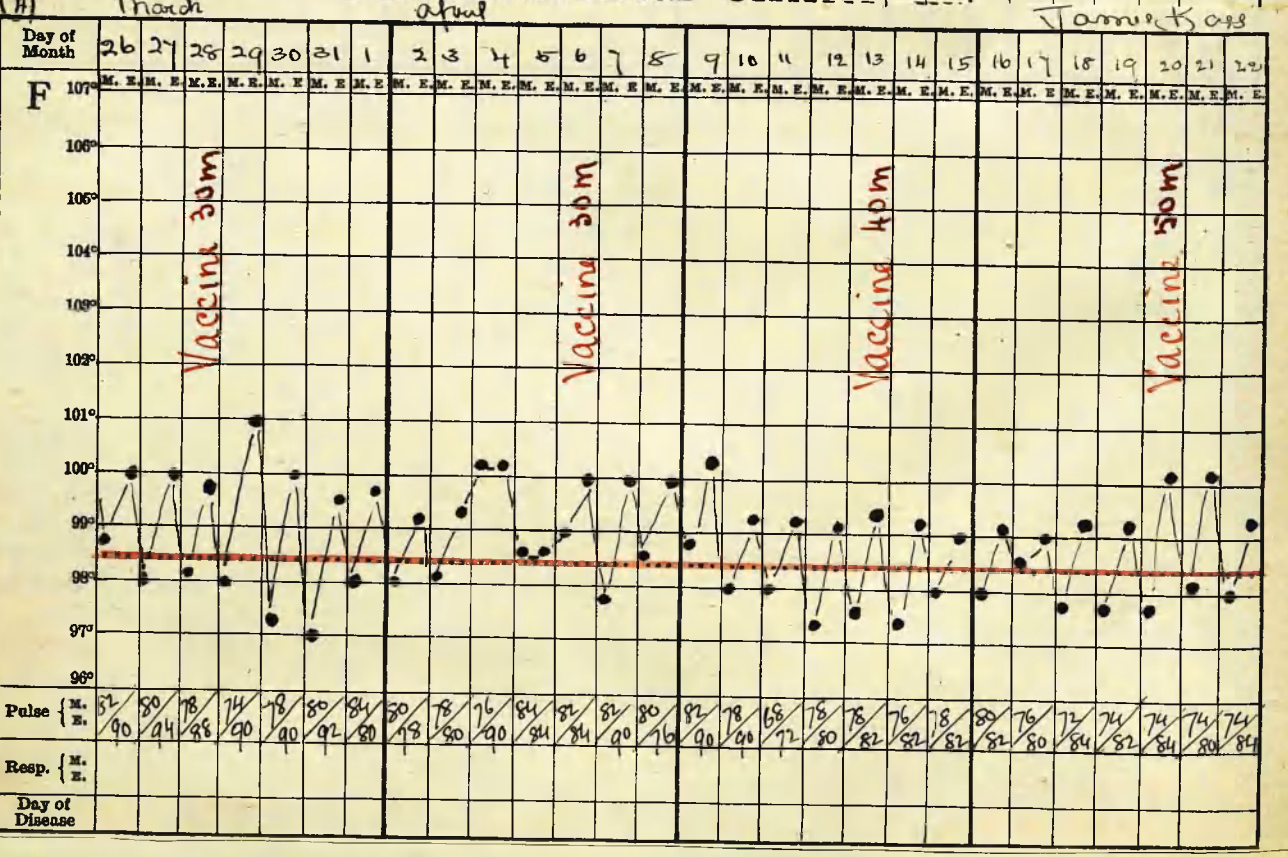
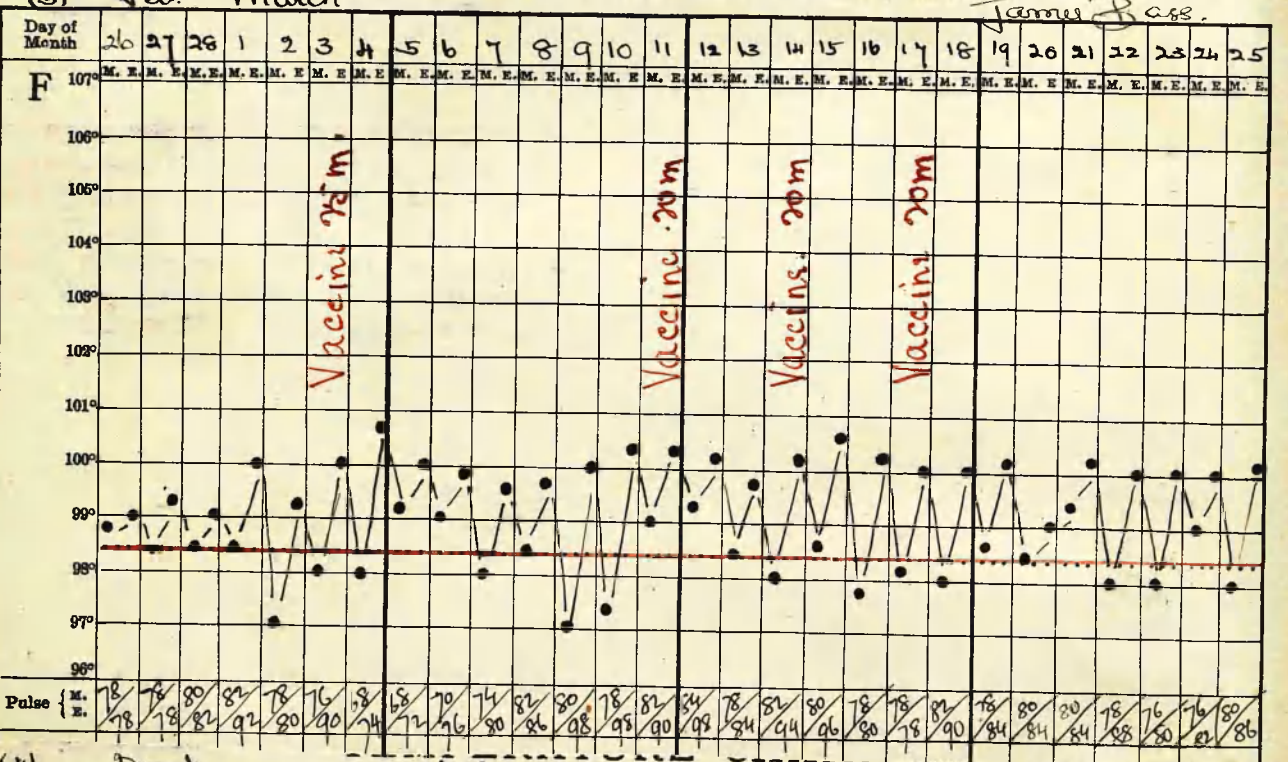
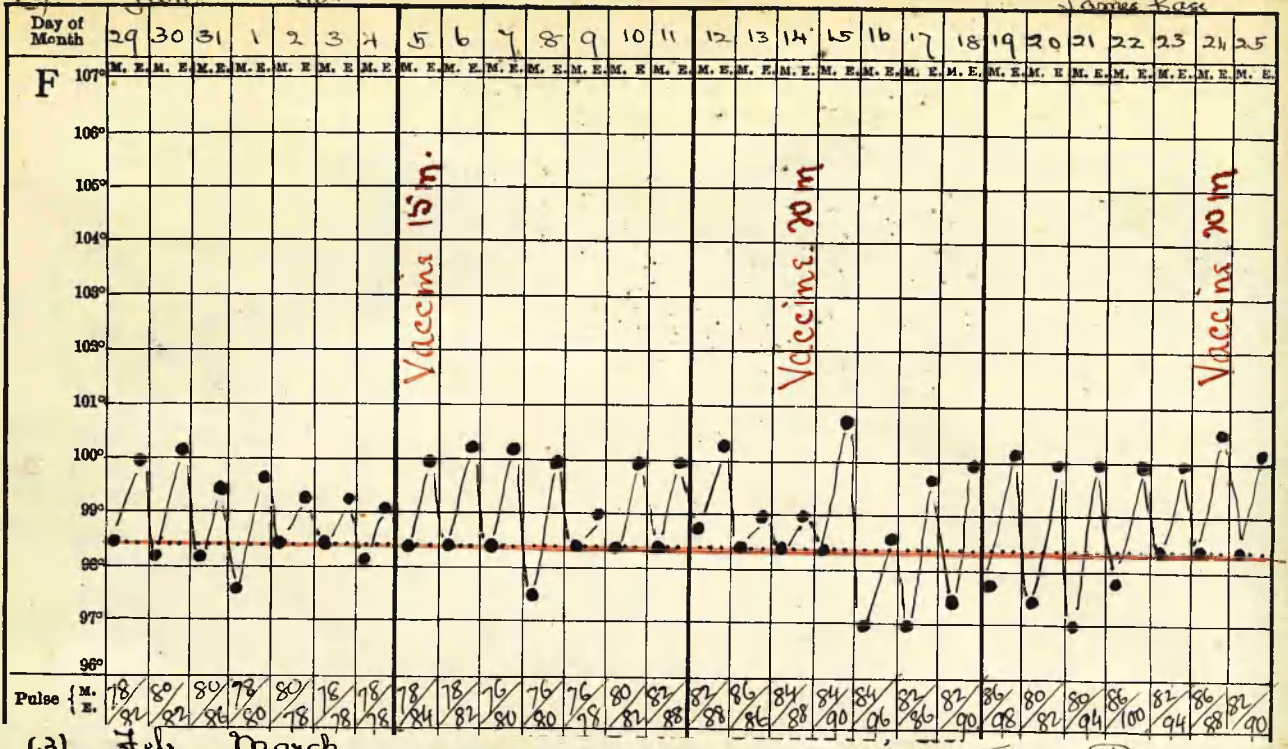
Dilutions were made in the usual way.

Now this was a case in which judging from the ex-

perience of others we hoped to get a good result.<sup>13.</sup>

DATE	T R E A T M E N T.		R E S U L T.	
	GENERAL	SPECIAL	SPECIAL	GENERAL.
7.1.10.	As before.	Autogenous vaccine 5 m (in Rt flank.)	No reaction local or general.	
10.1.10.				
13.1.10.				Excursions of Temp: less. Feels well.
17.1.10.		Vaccine 10 m		
21.1.10.			No reaction from vaccine	Local condition I.S.Q.
24.1.10.		Vaccine 10 m.	Temp: last evening rose to 101.2	
25.1.10.			Pulse 110 Complains of slight headache & loss of appetite.	







James Bass (Continued)

DATE	T R E A T M E N T		R E S U L T.	
	GENERAL.	SPECIAL	SPECIAL	GENERAL.
4.2.10.	As before.		Temp: has been rather better	General condition remains the same. Discharge still profuse and offensive.
5.2.10.	Do.	Vaccine <u>15 m</u>		
8.2.10.			No definite reaction. No headache,	I.S.Q.
14.2.10,	Do.	Vaccine <u>20 m</u>		
16.2.10.			Complained of feeling cold yesterday but no definite rigor. Slight headache but requires aperient.	Discharge as before. Requires dressing twice daily. Some Bismuth came away yesterday from sinus of Lt side.
24.2.10.	Do.	Vaccine <u>20 m</u>		
27.2.10.			No reaction Temp: not above 99.4 yesterday.	
3.3.10.		Vaccine <u>25 m</u>		
7.3.10.			No definite reaction.	Feels very well Local condition as before.
11.3.10.		Vaccine <u>20 m</u>		
14.3.10.		Vaccine <u>20 m</u>		
17.3.10.		Vaccine <u>20 m</u>		
19.3.10.			No effect from first two doses of last series. Today was sick on two occasions & complains of pain in Rt side.	Discharge more profuse if anything. Dressed twice daily.
28.3.10.		Vaccine <u>30 m</u>	No very definite reaction but usually was not so well the day following the injection & for 24 hrs.	General condition much as before treatment, perhaps a little stouter. Locally quite unchanged
6.4.10.		Vaccine <u>30 m</u>		
13.4.10.		Vaccine <u>40 m</u>		
20.4.10.		Vaccine <u>50 m</u>		
27.4.10.		Vaccine <u>50 m</u>		

He had vaccine treatment for 4 mos.  
 Had in all 15 doses.  
 He was in our opinion unaffected by the treatment.

GENERAL CONCLUSIONS regarding V A C C I N E  
TREATMENT in these CASES.  
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- (1) We have seen no bad effect from the administration of Vaccine; on the contrary, all the patients are at the time of writing better than they were before the commencement of this treatment.
- (2) We are inclined to think that, as pointed out by Bruce,<sup>10</sup> Vaccine treatment has a distinctly beneficial effect upon the patients' nutrition.
- (3) That in all our cases the major lesion was little if at all affected by the Vaccine; any improvement observed might have been attributed to concomitant treatment.
- (4) There was no marked difference in the results from Stock as compared with Autogenous vaccine.  
(A case of B.Coli infection treated with an Autogenous Vaccine was a distinct failure.)
- (5) Three of our cases had bacterial skin affections which were present before treatment was begun, and which during treatment entirely disappeared.
- (6) That for the secondary infection of open tuberculous lesions, vaccine treatment, as we have used it, is not superior to the usual surgical methods.

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