Record of some work done
during the Winter Session
1876-77

By

Wm Watson Cheyne
M.B. Edin. (1875)

Thesis in competition for the
Syme Surgical Fellowship
April 1877

~~Introduction~~

Preface

Not having thought of competing for this Prize till January of this year & being extremely busy in other ways I have been unable to work up any special subject but have thought that a record of some work done during spare moments might not be without interest. That such work is incomplete will be readily understood.

Thus as the experiments recorded in the 2nd part of the 1st Essay were not really begun till the middle of February & were not of any use for the present purpose of performing after the end of March it will be easily seen that the method of experiments followed was not such as would have been followed had I had plenty of time at my disposal. I could not delay till next year because I understood that three of the candidates this year would thus have been altogether precluded from future competition.

A few words in explanation will I trust make clear why I have made bold to hand in the present series of detached essays. (I have not even had time to rewrite the present copy).

Edinburgh Royal Infirmary
April 24th 1877

* I don't quite understand this reason. There seem to be no other Candidates this year. JS

Contents

		Page
I.	On the alleged occurrence of Bacteria Under antiseptic dressings	
	a. Introduction	1
	b. Microscopic investigation	4
	c. Experimental investigations	32
II.	On Temperature after Operations (chart)	56
	Temperature only after ligature of the Femoral duty in popliteal aneurism (with Chart	64
III.	Interesting tumours	
	(a). Adventitious thyroid gr.	66
	(b). Atheromatous cyst under the tongue	69
	(c). Chondrome of 2nd toe with Stellate branching anastomosing cells	70
	(d). Multilocular Ganglion	72
IV	Interesting case of dislocation at the Elbow joint	73

On the alleged occurrence of Bacteria (organisms) under antiseptic dressings.

A short article entitled "Die Bacterienvegetation unter dem Listerschen Verbande" published in the number of the "Centralblatt für Chirurgie" for 27th June 1874 by H. R. Rauke assistant to Prof. Volkmann of Halle is the occasion of the present investigation.

In this communication Dr Rauke gives the results of over 300 examinations of discharges from 15 antiseptic cases made during the month of May 1874.

Among the cases examined were amputations in which healing occurred without suppuration & constitutional disturbance. The examination of the discharges was made immediately after the dressing.

As results he states that with one exception he found in all cases Coccobacteria-free micrococci for the most part in pairs — more seldom small & middlesized Bacteria. Micrococci were found even 12 hours after the operation.

From these observations he concludes that "with the same certainty with which the antiseptic treatment now protects from Pyæmia &c. so the Aetiology of these diseases has not been sufficiently explained merely ~~by~~ by the growth of Coccobacteria septica."

It may be mentioned that others besides Rauke have since advanced the same statement. Thus I have heard it stated both in Vienna & Strasburg that Rauke's statement has been found to hold true in the wards there. But let us look for one moment at their "antiseptic treatment." Their operations are performed with a single hand spray. This spray is held within an inch or two of the wound or that if large the spray does not cover the whole wound. When the spray gets tired he stops to rest - the operation being still proceeded with. After stitching up the wound it is rubbed dry with a towel & a piece of dry cotton wool. Then a piece of protective is applied & then several masses of cotton wool & the antiseptic gauze dressing carefully applied outside. In all the cases there is a very fair smell of some of the aseptic course observed in Mr Lister's wards. Here observe the statement that under this dressing Bacteria do occur.

With Rauke the state of matters is quite different. Such a statement coming from one of the very few who practise the antiseptic treatment thoroughly is deserving of the most careful attention because the antiseptic treatment was based by Mr Lister on the supposition that Pyæmia &c were due to absorption of septic materials & that in a wound such septic materials were coexistent with the growth of organisms — that in fact the cause of putridity in

a wound was the development of organisms in the discharges. The treatment is therefore directed entirely against these organisms to kill them before they reach the discharges in which case the discharges ought theoretically to remain unaltered - free from the development of any organisms & the patient be secure from the risk of blood poisoning &c. If however bacteria do occur under the antiseptic dressings properly conducted this would point to one of two conclusions

1. Either the theory is entirely wrong & the putrefaction &c are not due to development of organisms at all although they are prevented by this treatment or

2. Some forms of organisms can resist the action of 1-40 Carbolic acid these forms of organisms being at the same time unable to produce irritating or injurious results.

Unfortunately Dr Ranke gives no details of the cases examined by him - not even stating their nature course &c. It would have been well had a short notice of each case been given in order to allow one to judge of the aseptic course.

We are thus led to enquire if the statement of Ranke is really correct - if organisms do occur under the antiseptic dressings properly conducted.

During the present winter as House Surgeon in Mr Lister's wards I have had an opportunity such as few have had of examining into this subject. Here I

could be certain as to the accuracy in the carrying out of the details of the treatment & could of course get the discharges for Examination whenever I chose to do so. I have therefore since the beginning of Dec.r till the middle of March almost daily Examined microscopically the discharges from patients treated here and I will now state some of the results

Before doing so let me ~~state~~ say a few words as to the method of procedure

As to the time of Examination.

In many cases dressed by myself I Examined the discharges immediately. This however found not to be necessary as I could allow a few hours even to pass without any alteration in the discharge. The Examination was however made in all cases as soon as possible after removal from the wound

The discharge was transferred to the slide either by touching it with the protective or dressing or it was taken by a flat needle from any collection of discharge observed on the dressing. In taking it with a needle care must be taken not to scrape the protective or dressing otherwise granular material may be got resembling bacteria consisting mainly of debris of the dressing This I have proved by immersing a piece of gauze protective in pure fluid for some time (hours) - then scraping the protective as if to remove discharge & got debris in some places very like bacteria - The debris when elongated having

oscillating movement. Of course care must be taken to have the needles & quite clean. Thus I have been greatly surprised at finding bacteria in a discharge where on more careful investigation I have found that I had immediately before examined a gonitid discharge with the same needle without cleaning it thoroughly & in repeated preparations made with a clean needle ~~at the start~~ I could find no organisms.

It should have been mentioned that the deep dressing when removed from the wound was taken as soon as possible out of the spray otherwise the carbolic acid would kill the bacteria & motion as one of their characteristics would be lost.

The discharge was diluted with some fluid - generally distilled water or a weak solution of Chloride of Sodium in distilled water ($\frac{1}{2}$ per cent). Due care must be taken that the liquid does not contain ~~bacteria~~ organisms & hence whenever I had the slightest suspicion I examined the fluid & used a fresh fluid. The Chloride of Sodium solution is apt to become muddy & bacteria or may be found in it.

The determination of bacteria in discharges is not so difficult as that of Micrococci. Micrococci according to Von Recklinghausen are diagnosed as follows. They are generally in clumps though they may be single &c. These clumps consist of minute granules not separated by

any intervening ~~[illegible]~~ substance recognisable by the eye (in cocci a there may be an interval between the granules apparently consisting of homogeneous material). All the granules are of the same size (distinguishable from fat & other granules which are always of different sizes). Further on adding acetic acid & glycerine the micrococci remaining, anything become more distinct. Fatty & mineral granules disappear on the addition of these reagents & other granular matter generally becomes more indistinct. This effect of acetic acid & glycerine is also true as regards bacteria. Other tests are used - thus micrococci occuring in a blood vessel (for instance in a kidney are stained violet by Hæmatoxylin in marked contrast to the surrounding tissue. I have not succeeded in getting this stain well marked when they are floating free in a fluid.

In most cases these tests were applied as well as repeated examinations of the same discharge made. In one or two cases where I was not certain & where the point was important Mr. Lister has kindly examined the discharge

I will now mention as shortly as possible some cases.

(As to the ~~[illegible]~~ microscope it was a Hartnack & the powers used ranged from 300 to 550 diameters).

was this condition not ascertained prior to amputation at shoulder?

I

Margaret Thomas. 50 servant, admitted Jan^{y} 12th 1877

On Examination there was found a very soft fluctuating swelling over the right shoulder joint. She had been aspirated twice before coming to hospital. There was also a small swelling of firm consistence in the outer part of the thigh.

On the 15th an Exploratory puncture was made antiseptically. On ascertaining that the tumour was malignant amputation at the shoulder joint was recommended but the patient would not at first consent. Being half witted she tore off the Antiseptic dressing the same night & the result was a putrid condition of the wound next day & continuing till the Arm was amputated. A fatty dressing was used as the least troublesome even though the wound was putrid. There was great constitutional disturbance high temperature averaging about 101° pulse 140 on an average. Amputation was performed on the 22^{d} & the wound remained sweet & was doing well. On the morning of the 25th however the swelling in the thigh was observed to have rapidly increased & to be fluctuating & she died next day. P. M. examination showed the whole thigh to be wounded & a mass of fluid blood & the upper part of the shaft of the femur to be eaten away by malignant growth leaving only at one part a thin piece of bone to keep up the continuity of the femur. Heart kidneys & glands infiltrated with contained portions of the malignant disease. The head of the

humerus was completely destroyed except the cartilage the head of the bone being expanded into a cast surrounded externally by a thin shell of bone. Microscopically the ~~tumour~~ tumour of the shoulder was found to be round celled sarcoma that of thigh myeloid sarcoma & nodule in the lung to consist for the most part of spindle celled sarcoma. The cast was also examined & Dr. Wyllie with a like result. I have entered thus fully into the case on account of its great pathological interest.

Jan. 15th Material evacuated from shoulder consists of round cells in section showing sarcomatous nature. No bacteria or organisms.

" 17th Old formed cells some white cells granular matter & some oscillating rods resisting reagents - very disagreeable fetid smell general muddiness of discharge.

" 18th Some white cells & masses of granular matter No micrococci. Numerous unmistakeable bacteria of all sizes & in active motion resisting reagents.

" 19th very foul smelling. Numerous bacteria no appearance of the ordinary granular matter observed after operations nor any collections of granules in rod like forms

" 20. very bad smell; full of bacteria large & small some in chains & active movement & thus resistant also numerous fat granules. With acetic acid & glycerine the bacteria remain & also much granular matter

" 23d (after amputation) granular matter assuming

no like management just as in other wounds
some shreds of tissue.
24 Great quantity of granular matter no
bacteria altered white cells.

II.

Finlay MacDonald ætat. 29. Linen
admitted Jan.y 12th 1877
Deformed tibia.

As a result of a fall on the inner side of the
upper part of the leg some months prev he had fractured his
tibia immediately below the tuberosity
& the bone had united at an angle the lower
part of the leg being directed more inwards than
natural. As he was not able to walk
properly he wished that something should
be done.
Jan.y 16th Mr Lister cut down on the fibula & cut it
across Then exposing the tibia at the seat of
fracture he cut out a wedge shaped piece
with a chisel the base of the wedge being outwards
& large enough to bring the leg straight. He
then removed what of the necessary
amount from the fibula to admit of
accurate coaptation. The bones were then
drilled & tied together with silver wire. No
stitches inserted the wound being left
quite open & drainage tubes used.
As the result of the operation there was
not the slightest bad symptom. No con-
-stitutional disturbance whatever. The
blood clot lay Exposed in the wound till
it became organised. After the first evening
no pain whatever On the 1st of March
both wounds were quite Exposed after a week's
union

By white cells I mean all cells of the same appearance as white blood corpuscles — pus &c. These terms are used indiscriminately.

interval & found to be quite healed. On the 10th of March the leg was examined & the bone found to be firm.

Temperature chart will be found under the org "temperature."

Jan 17th Great amount of discharge. altered red & white cells much debris assuming all forms pus cells small granules the granular matter sometimes of a rod like form these rods being very irregular in outline & having here & a vibrating motion & no forward motion. Also some long rods disappearing on addition of glycerine (hence probably fat crystals) no smell. no blackening of the protective

the deep dressing was not touched again till the 23d so that the discharge was left from the first

" 18th no white cells much granular matter assuming much the same forms as yesterday. On addition of acetic acid & glycerine no appearance of whatever of bacteria or micrococci. No smell

" 19th no white cells. some debris consisting for the most part of large granular masses & a few of the smaller forms mentioned before disappearing on addition of reagents.

" 20th Granular matter no white cells no bacteria or micrococci to be seen.

" 22nd A few white cells. a little granular matter containing a few of these rod like arrangements of granules

" 25th Mr Lister examined the discharge today & said that these rod like arrangements of granules were not bacteria.

" 26th No bacteria, some granular bodies

no well formed leucocytes.
" 27th no leucocytes, no organisms some granular debris
" 30th nowhite cells no organisms a considerable quantity of granular matter.
Feb 3d a very few white cells a considerable quantity of granular debris. Nothing at all suspicious.
" 14th Dressing changed now every 3 or 4 days blood clots now completely vascularized & on a level with the skin as ones. On the tibial side at one little spot some granulations are seen. The greater part of both wounds completely cicatrized. Epithelial cells, pus cells, no bacteria.
" 18th well formed pus cells, very little granular matter. No bacteria.

III

James Leeds ct. 53 Seaman
admitted Jan 22 1877
Ununited fracture of the Radius

The patients radius had been broken by direct violence about its middle 22 weeks before admission. Forearm & hand quite useless.
Jan 26th
Mr Lister divided the ulna & removed a portion so as to allow the ends of the radius to be brought into close apposition after removing the rounded ends. The forearm was put quite straight & the ends of the bones drilled & tied together [illegible] silver wire. Two wounds were made one on

the ulnar & the other on the radial side of the forearm. No stitches

The operation was followed by no constitutional disturbance whatever. No pain - no rise of temperature. The temperature the night of the operation was 99° & Pulse 80 the temperature afterwards rained within the normal limits. The wound was dressed on the 27- 28- 30- 3 (Feb.) 7- 12 & 21. The wounds were quite healed in between 5 & 6 weeks. The blood clot lay flush with the surface becoming more & more vascular On the ulnar wound a piece of tendon lay exposed uncovered by blood clot at first white but gradually becoming more & more vascularised from the circumference to the centre finally becoming covered with epidermis though without granulation.

Jan. 27th Altered blood corpuscles - a considerable quantity of granular debris having all sorts of arrangements. No organisms.

" 28th Less debris than yesterday nothing at all like bacteria or micrococci. No white cells.

" 30th Red & white blood cells. The white being generally altered in shape & more granular than usual. Much granular matter assuming in some places the form of irregular rods with merely oscillatory motion - no onward motion.

Feb. 7th Less granular matter. No white cells No bacteria (& organisms)

" 21st Granular matter the granules of small size. A very few white cells. No bacteria

Temperature by Chart 100° on 2nd. 101 on evenings of 3d 24th days

No notice of state of pulse or any premonitory symptoms of hemorrhage occurring subsequent a date after operation! JJ

II

James Low ætat. 12 Millwright, Dundee
admitted Dec^r 7^th 1876
Dislocation of Elbow

The dislocation was of 6 weeks standing & had been treated as a fracture.
On the 9^th of Dec^r Mr Lister made a long longitudinal incision posteriorly & reduced the dislocation after considerable difficulty. The skin was sutured with difficulty brought together. The wound was stitched up after insertion of two drainage tubes.

His temperature chart will be found among the temperatures.
X All went as usual for 6 days but on the evening of the 6^th day, the joint having been for the first time moved that day, hemorrhage occured from the wound which stopped however on removing the dressing. The hemorrhage continued into the substance of the limb & there was great tension and constitutional disturbance. Mr Lister made an incision into the extravasated blood & soon the temperature subsided & patient felt well. During this continuance the limb was not moved so easily as yesterday yet however passive motion can be performed almost completely & there is increasing voluntary motion.
Dec^r 10^th Altered red & white cells - the red being altered in form corrugated & aggregated in clumps much granular matter & even assuming worm like forms irregular in outline & oscillating. No well [illegible] or like appearance

Query bacteria - See p. 6 -

It may be said that the word "bacteria" has been used inadvertently here & elsewhere as including micrococci & where a definite statement "no bacteria" occurs it means that microscopically no organisms can be seen & it implies also that reagents have been used.

Dec. 11th Examined by Mr Lister. No bacteria Much granular matter. Inodorous.
" 13th A few red & white cells some granular matter. No organisms.
" 15th (after Hemorrhage) Blood cells - red & white some granular matter - some rod like bodies disappearing on the addition of reagents & having no forward motion.
" 16th Much granular debris & some granular rod like bodies disappearing on the addition of reagents. A few white cells.
" 17th On cover made. Altered red blood corpuscles a few white cells Much granular matter. No organisms
" 18th Blood sprayed out contained some specks (white) of suppurating blood. Much granular matter. No bacteria.
" 31st Some white cells a considerable amount of granular matter. Some small clumps of granules. No bacteria
Jan. 7th Numerous white cells - Some throughout granular matter - Some small epithelial cells. No organisms.
(The pus cells seen here were from the ~~superficial~~ margin of the small one which was granulating not from the deeper parts.

Feb. 15th Dismissed & treated as an out patient

V

James Mc Phillips ætat. 27. Quarryman admitted Dec. 31st 1867
This patient was admitted with gangrene of the forearm after severe compound fracture into the wrist joint (an apparatus having been applied)

* Had the septic conditions present produced no symptoms constitutionally — or if so why not recorded.? JT

The limb was distended with putrid gases
as far up as the middle of the upper arm.
The gangrene had existed for 24 hours
On the same day Amputation of the
arm was performed immediately above
the elbow through parts which were
distended with foul smelling gases.
Things followed the usual aseptic
course except that the drainage tube
having been removed too early tension
& suppuration occurred in the stump.
Feb. 2nd No smell no blackening of the protective
a few blood cells, some granular
matter, no bacteria
" 3d Small imperfect formed pus cells
some granular matter. Nothing
suspicious.
" 4th Pus cells some well & some imperfect
formed. Much granular matter.
indefinite as to bacteria. No smell.
" 5th Pus cells less granular matter
some rods looking like bacteria but
disappearing on addition of reagents.
& having no forward motion.
Sep. 6
" 7th Pus cells, granular matter decreasing
No organisms.
" 8th Pus cells. a little granular matter
in some places somewhat suspicious
however no motion & the suspicious
bodies disappearing on addition of reagents.
" 10th Numerous pus cells. Much less
granular matter - the granules being
very small. No appearance of bacteria.

VI

Charles Beecham ætat 29 miner, Campsie
admitted Feb^y 19^th 1877.

Sciatica

Patient has suffered from severe sciatica almost for a year & has had ~~every~~ imaginable remedy tried in vain. He is unable to walk or turn in bed & has constant severe pain in hip leg & thigh.

Feb^y 19^th Mr Listen performed the operation of nerve stretching. The lower border of the gluteus maximus being exposed by a longitudinal incision it was drawn upwards & the finger passed in & the nerve hooked out. There was very little cutting or tearing. Wound stitched & drainage tube inserted.

Wound healed by 1st intention except where the drainage tube was & when dressed on the 10th March after several days interval there was only a small superficial sore.

The pain did not suddenly disappear but gradually though rapidly diminished till before leaving hospital at the beginning of April he could walk & turn in bed without any pain - in fact was perfectly cured.

As the result of the operation there was no constitutional disturbance the patient being only relieved from his old pain & no new pain being superadded.

Feb^y 20^th Some granular debris & masses of granular matter rolling about in the fluid not nearly so much granular matter as usual. Smell. Nothing suspicious

Feb. 21st Granular matter some white cells
No bacteria.
" 22nd No white cells No bacteria A few
~~many~~ granular masses
" 23rd Some regular white cells. a little
granular matter No bacteria.
" 24th A few granular masses No distinct
white cells. No bacteria
" 28th Some of these granular protoplasmic
masses. No pus cells, a little granular
matter Nothing suspicious

The same observation as to small amount of granular matter, compared with the amount usually present after operations was made in another case I have stated done during the winter & it is to be particularly observed that in this operation there was little more than a mere linear incision & no dissection of the parts.

VII

Lewis Eastman ætat. 40 Mason
admitted Dec. 26th 1877

Emphysema

After suffering for some time from cough, pain in the side & difficulty of breathing a swelling suddenly appeared on the upper part of the right chest anterior 2 weeks before admission & 3 days afterwards another swelling appeared lower down. These rapidly increased till admission. On admission 2 large abscesses were found on the right side of the chest anteriorly & examination by a physician revealed the existence

Dec 1867 Jan Empyema

28th Mr Chiene opened the lower collection today & evacuated the upper collection through the lower thus having been a small point of communication between the two. A communication could be seen between the upper cavity & the chest (the air drawing in the skin in a valvular manner. Mr Chiene did not think it advisable to complete the opening into the thorax for some days.

Large sloughs of tissue came away & a coarse & the wound was dressed daily till the 3rd of Jan when Mr Lister syringed & enlarged an opening which had been already found from the lower cavity into the thorax inserted a drainage tube into the thorax evacuating at the same time a large quantity of pus

After this all went well - the man who was in an extremely low state rapidly regaining strength the discharge rapidly diminishing in amount and becoming serous in character.

On the 6th of Jan the drainage tube was found not to have acted & some pus was evacuated on getting the tube fairly into the thorax. On the 10th the same thing took place & thin serous looking fluid was evacuated. (60z)

On the 17th Ditto & 30z of clear serum was evacuated.

On the 23rd Mr Lister removed the drainage tube & in a few days the wound had completely healed

Dismissed Feb 9th Cured.

From the beginning to end of the case the temperature varied steadily from 99° to 99.4°.

Dec. 31st Large lumps of fibrous ~~tissue and~~ tissue (Fresh) much granular matter. Some pus cells which are very granular & irregular in shape. No bacteria. No smell

Jan. 4th Much granular matter a few ill formed pus cells No organisms.

" 6th Some granular matter pretty well formed pus cells No bacteria (from fluid evacuated)

" 7th Much granular matter. No bacteria. A few irregular granular pus cells.

" 10th (From fluid evacuated) A considerable number of pus cells not very well formed a moderate quantity of granular matter. No organisms

" 12th Much granular matter. No white cells Small & large ~~protoplasmic~~ clumps granular matter lying about under the coverglass A few red like this very irregular in outline & disappearing on the addition of reagents.

" 17th Fluid evacuated - Clear - Some granular matter - a few white & red cells not granular After 12 hours the fluid had for the most part coagulated, the coagulation beginning around the small groups of red corpuscles No bacteria

VIII

Walter Gray ætat 22 Clerk admitted Dec. 6th 1877

Abscess in the Buttock

When admitted was found to have a large fluctuating swelling in the gluteal region which had commenced 4 weeks before.

had suffered for months from hip joint disease
The abscess was opened on the 4th & everything
went well the abscess being absolutely healed
on Dec. 19th

Fluid evacuated showed the pus to be
very granular & degenerated numerous
fat globules. No bacteria.

Dec. 8th Numerous fatty granules. No well
formed pus cells. No bacteria.

" 10th No pus cells. Some granules with
Brownian movements. No organisms
No smell.

" 12 (Discharge very slight & watery) Some
granular debris No pus cells No bacteria

" 17 No well formed pus cells Some
lumps of protoplasmic matter - No organisms

" 26 (Drainage tube removed) No pus cells
No bacteria.

IX

James Martin æt 14. Butcher
admitted Feb. 9th 1887
Large acute abscess in leg.
Opened drainage tubes introduced on
the day of admission. Wound progressed
rapidly & patient was dismissed cured
in the beginning of March.

Patient felt relief after the abscess
was opened & had no more pain or
constitutional disturbance

The pus evacuated consisted of well
formed pus cells some red corpuscles
a few very small granules. Nothing
having the least suspicious character.

Feb. 10th Altered blood and a little granular matter
" 11th No pus cells some granular matter

no appearance of organisms. No smell.
Feb. 12th Blood. much granular matter & a few white cells (not at all those from the blood) No bacteria
14th No well formed pus cells a few altered white cells & a little granular matter. No bacteria

I need not enumerate more examples from the numerous cases I have examined such as was a lumbar hip joint abscess where no more pus was found & no bacteria - where the discharge consisted for the most part of granular masses which when of any considerable size were seen to consist of masses of granules imbedded in a homogeneous substance & rolling about in the liquid. So in cases of free incision into knee joints the same appearance was present till such time as the superficial part of the incision had granulated from the irritation of the carbolic acid.

In several cases where pus in the patient had previously existed, of scraping the sinuses & applying the Chloride of Zinc solution under the spray pus in the patient has been overcome & the wound follows an aseptic course & no organisms being found in the discharges.

Thus in a callous ulcer of the leg treated on Feb 5th by Chloride of Zinc & dressed with Boracic acid

Feb 8th Numerous pus cells & few small granules. No appearance of bacteria.

So in a case where putrid sinuses of the ~~mamma~~ were present in the mamma which was on Feb. 8th treated by scraping & injection of Chloride of Zinc & antiseptic dressing.

Feb. 11th Pus cells some granular matter with no appearance of organisms. No smell. No blackening of the protective.

Smell & blackening of the protective are generally due to putrefaction but the protective may also be blackened from a new drainage tube. In one case this winter - a case of Excision of the breast & axillary glands, after the axillary incision was completely healed I found one day that the smell of the dressing at that part was very disagreeable & that the protective on the outer end of the scar was blackened while that covering the internal part of the scar & the small superficial granulating sore still remaining unhealed was not blackened & the examination of the discharge showed absence of bacteria - a most interesting & important fact as regards the value of blackening of the protective as a test for putrefaction.

As I am merely recording some of the results of my winter's work allow me before looking at the cases mentioned as to the question of bacteria to make one or two observations upon them.

As to the cases themselves I need say nothing - they are the ordinary run of cases in Mr. Lister's wards and are therefore not remarkable. To one not practising the antiseptic treatment however they

The Opinion of one who has had only a limited experience of Surgery. & who seems to have studied only one system. JS

University of Edinburgh

Had Mr Cheyne been more of an independent observer and less of a partizan the silly remarks at pages 22 & 23 would not have been made. for during the same period which this Thesis embraces and in which the cases occurred which according to him "must seem marvellous and in fact almost incredible" to those who do not use the so-called 'Antiseptic' System. there were treated in the same Hospital in the wards under my charge by my ordinary simple method of dressing -

13 Cases of the greater amputations with only one death - (a railway injury) The successful cases included 4 amputations of the thigh and a double primary amputation of both legs

9 Excisions of Joints - including Hip Shoulder - Elbow - Knee & Ankle joints with two deaths. One from pulmonary

consumption & diarrhea three months after operation

Fifteen Excisions of Tumours with one death — in an old man: suddenly after the wound had cicatrized: (He had suffered from erratic Erysipelas) The other cases included Excision of both upper & lower Jaws deep seated tumours of neck; Excision of tongue tumours from Sacrum & perineal & glutæal regions — Excisions of Breast

The successful miscellaneous operations included subperiosteal resection of half of tibia in acute necrosis. Chisel resection of distorted & partially united femur in an old man — Colotomy & Lithotomy — These cases were all within reach of Mr Cheyne for observation & comparison and a view of the results of different systems might have modified his opinions of "the Marvellous" and "Incredible"

J Spencer

must seem marvellous & in fact almost incredible. Nevertheless these are not a selected series of cases. It merely happens that I have examined them more regularly than I have others & therefore I give them.

As to the character of the discharge it bears out Mr Lister's statements that wounds & abscesses may heal without a drop of pus if treated antiseptically. I must confess that before making these examinations I thought that though to the naked eye discharges especially from abscesses did not seem to be purulent yet that when examined microscopically they would be found to contain pus cells. We however we see that in really aseptic cases not even pus cells are found unless indeed the very margin of the wound have granulated from the irritation of the carbolic acid or tension have occurred from imperfect drainage. (In cases healing by organisation of blood clot ~~white cells~~ without granulation white cells only appear when the clot has become organised to the surface). Instead of pus cells however we find masses granular in appearance & irregular in shape & connected in some way or other with pus cells as shown in M^c Phillips & other cases in which as the pus cells increased in number the granular mass of any size disappeared. Whether these are degenerated or abortive pus cells I am not ~~sure~~ at present prepared to say. The determination of that point is of great importance as regards the origin

pus cells because if they are degenerate cells then these cells may be white cells which have passed out of the blood vessels in small quantities & there have broken down whereas if they are abortive cells they could not have come from the blood - the white cells there being fully developed - but must have come from the tissues themselves. I do think that I have seen in some cases appearances which would almost imply that they were the result of degeneration; thus I have seen in the same specimen one or 2 imperfectly formed cells & then some more granular & then these bodies looking like a further advanced degenerative condition of the white cells. On the other hand however we have the fact that in cases where tension has occurred & we have undoubted pus cells in the discharge, these also being numerous, & the case has progressed without suppuration for some time these cells will be seen at first to be irregular in shape & to have an appearance as if imperfectly formed while if the irritation continues for some time these cells will be found in a day or two to be well formed & to present the appearance of normal pus cells. This is well seen in Eastman's case in which the results of the tension are very instructive as regards the occurrence of suppuration in abscess.

We have had an evacuation of the pus well formed pus cells. (18th Dec.) On 6th Jan. (pus cells having almost completely disappeared) tension having occurred pus was evacuated

?

Does Mr Cheyne consider the result of this case due to interference with the dressing, alone or chiefly? Does he make no account of the state of the blood, an dyscrasia in which there seems to exist such a general dissemination of malignant disease JS

the pus cells being "pretty well formed."
On the 16th only serum & the naked eye but microscopically some pus cells were found but "not well formed".
On the 17th Clear serum & on Examination microscopically only a few white cells such as may be found in any serous collection. Notice further the character of the fluid & its behaviour in coagulating round the drop of blood.

And now let us look at the cases individually & concisely with regard to the question of the occurrence of organisms.
We have as the first case that of a woman in whom the antiseptic treatment was frustrated by the patient herself & where the wound became fetid. Here on microscopic examination of the discharges there were found numerous bacteria large & small. some in extremely active movement. Here we had an extremely fetid smell & great constitutional disturbance. Here also we had no micrococci & no appearance of the ordinary granular matter found in the discharges from operation wounds. The bacteria had a finite regular sharp defined outline - they were not irregular in outline nor granular as the rod like granular matter is.
But we find that after amputation the bacteria disappear & we have the usual appearance of granular matter seen in other operation wounds.
Now we look at the cases of Finlay MacDonald, James Leeds & Edmund Lord

severe Operation ~~cases~~ wounds where there was much dissection crushing and tearing of the tissues we find a large amount of granular matter assuming all forms the granules not of the same size and disappearing on the addition of acetic acid & Glycerine.

In Mc Phillips case we had no bacteria although the limb was distended with putrid gases (the cellular tissue acted as a filter) Here we had the usual granular matter but as the pus increased the granular matter decreased in amount & in size.

Next look at Charles Needham. Here there was little cutting & there was little granular debris compared with the former cases. The same holds good with the other nevesstretching man.

No bacteria.

Now turn to the Abscesses & take first James Eastman in whose case there was great sloughing large portions of tissue coming away. Here of course there would also be microscopic sloughs. Here we have in the Ordinary discharge from the wound much granular matter, granular irregular pus cells.

In the fluid evacuated we have in the first a considerable Amount of granular matter but in the last the granular matter was much less & smaller.

In Walter Riley we have a subacute abscess & the granular matter at first consists of fatty granules. no arrangement of the granules as in Operation cases.

Energy - pus absent by the action of the carbolic acid - ?

By & bye on the 17th we have the granular matter as masses of homogeneous substance with granules & grains of various sizes imbedded in them & rolling about in the fluid.

James Martin had also at first only a few very small granules afterwards he had more granular matter & these masses of protoplasm seen in former case.

From these cases therefore we see that in antiseptic cases after an operation the discharge contains much granular matter grouped together & maybe the granules sometimes arranged in somewhat elongated form & long well defined rods jointed & not unlike very seldom found & can easily be shown by more careful examination & the use of tests not to be of a bacteric nature.

The question thus comes to be What is this granular matter? Does it consist of some form of organisms or only of portions of tissue? A careful examination of the cases & the following considerations may help us to a conclusion.

I. The appearance of the granular matter. In the cases where it forms rod like bodies these are irregular & ragged in outline — Bacteria are regular in outline (of course they may be jointed & the pieces small but there is no ragged outline granules not being stuck on at the side &c). The bodies found in wounds may be seen when large to consist of protoplasmic matter in which the granules are imbedded

These granules not being equal in size
are closely aggregated ~~[illegible]~~ (the masses being
acted on by
acetic acid & glycerine. I have found
long thin rods & pretty well defined outline
but these are chiefly in the discharges
from very chronic & old abscesses when
first fixed & they dissolve readily in
glycerine showing that they are not fat
crystals.

II. The motion of these granular rods is
merely oscillating no forward movement
The oscillation is merely a Brownian movement
Although Bacteria may possess it yet the
great majority of Bacteria have an
onward wriggling movement.

III. The granular matter is more abundant
in a wound than in an abscess & is
least abundant in the acute abscess.
The less extensive the wound & the less
violence used in making it the less
will be the granular matter.

The granular matter in an abscess
& in a wound has not the same ap-
-pearance - the smaller & rod like ar-
-rangements not generally being present
in an abscess (If these were due to
the development of Organisms we
should expect them to be equally
present in both & to have the same
appearance). Further the granular
matter disappears as the muscells increase.

IV In a wound the granular matter is most
abundant the first day & gradually gets
less. (This is not a constant fact).
If the granular matter consisted of
Organisms we should expect it to

at least the first day and afterwards at least for a few days & incase.

I If we keep pus in a vessel for a length of time allowing the entrance of organisms we may have bacteria developed in it but generally we have micrococci. These micrococci conform to the definition before given but we have no granular matter resembling that found in wounds. We had like arrangements much patches of micrococci - minute granules all of the same size & not acted on by agents.

Thus pus from a Lumbar abscess opened Jan. 28th Examined then & found to consist of fatty degenerated pus cells not well formed & well & numerous fatty granules some of the ordinary granular debris of wounds.

Examined again March 3rd (having been kept in the meantime in an inverted test tube covered a cap the cap being occasionally removed for a short time to allow the entrance of dust.) was found to have separated into 2 layers - a dark thick lower layer and a small clear port wine coloured upper layer. Under Microscope in the fluid were found clumps of micrococci (staphylococci).

This was much better seen in a clear fluid (Hydrocele fluid) which was evacuated Jan. 11th was put into an inverted vessel as the last & examined Jan 28 was found to be full of micrococci in clumps they marked after the addition of acetic acid & glycerine. No bacteria

and no appearance of granular matter as in wounds.

VI When we consider that in wounds where the blood clot becomes organised, organisation does not generally advance completely to the surface but that we can often peel off a superficial layer of old blood clot & find a clean partial or complete beneath & also that the very surface which is not becoming organised is subject to constant friction from the movements of the dressings we can easily understand the fact that in a wound healing without suppuration by organisation of the blood clot we have proportionally more granular matter than in other wounds & that the granular matter is longer present. The friction in fact breaks off pieces of the non living blood clot.

VII. Lastly consider what takes place in an operation. We have a knife really a microscopic saw sawing through the tissues - we have also tearing of the tissues with the finger instruments & the greatest violence is done to a microscopic layer of the tissues which layer may become necrotic. I have many times when making sections especially of soft tissues with a somewhat blunt knife found on examination of the section that the fluid around it was full of granular matter that granular matter having all forms & quite resembling that found in wounds. We must see that part of the granular matter is so to speak the sawdust caused by the knife & that it also arises from molecular

necrosis of the tissues (of course where 2 cut surfaces lie in apposition. These portions would be absorbed but wherever there is a pus opening they are liable to be swept away in the discharge).

This suggestion is borne out by the fact that in cases where the operation is accompanied with almost no cutting as in the nerve stretching cases there is much less granular matter than usual.

From carefully weighing these considerations we are led to the following conclusions

I. That bacteria do not occur in wounds treated carefully antiseptically. Nor do micrococci or other organisms occur.

II. That the granular matter found in wounds does not consist of or contain organisms but may be sufficiently explained by the action of the knife as a saw, by the necrosis of a microscopic layer of the tissues, portions of blood clot, fibrinous & protoplasmic masses, degenerated & abortive muscells &c. &c.

But while these observations are I believe satisfactory & sufficient proof that bacteria do not occur under antiseptic dressings still it may be objected that although undoubtedly the greater part of the granular matter has its origin as stated yet part especially the smaller dyed granules may be some form of organism.

I am ready to admit this objection as worthy of attention as it is very difficult to state with certainty that an isolated minute round granule is or is not a micro-organism.

To settle this point we must have recourse to quite a different method of investigation

Let us assume that changes in milk & other fluids are due to the development of organisms & that by inoculating a fluid pure & free from organisms with some material containing organisms organisms of the same kind will form in it if it is at all a suitable pabulum assuming this to be proved, theoretically one would only require to inoculate some suitable pabulum with various discharges on the one hand to get a development of organisms - on the other to find the fluid remain free from organisms & unchanged. That these assumptions are true has been shown by numerous investigators & the present series of Experiments though incomplete & not undertaken for the purpose of proving this point are of themselves sufficient proof of it.

In the present investigations some suitable pabulum must be taken, purified, and inoculated under proper precautions with discharges from wounds. If we have a really pure pabulum & true inoculation has been carried out in such a way as to prevent the entrance of any extraneous organisms the inference that development occurs would naturally be that ~~the~~ organisms have been present in the fluid from which inoculation occured. If on the other hand the same method has been employed & no organisms develope the inference would be that no organisms existed in the fluid. Of course this is merely a rough statement of what is ~~was~~ intended & the following experiments ~~& are made~~ to arrive at any accurate results one must feel one's way very carefully.

I will first describe concisely the apparatus & methods of preparation employed.

As glasses I had a number of short wide test tubes made with a loose fitting glass cap. These are arranged in a series of stands each stand containing three glasses & each stand being covered with a glass shade.

For the purposes of inoculation I used needles somewhat flattened at the point, fixed in a handle and bent at right angles to the handle.

As Pabulum I used Milk - that being apparently the most difficult fluid to preserve from the development of organisms

or in other words that being the most suitable pabulum for the greatest number of organisms.

So much for the apparatus. Next for the methods of preparation.

Purification of the flasks for boiling the milk in.

These flasks were ordinary new necked flasks. I could not get any flask made in time according to Mr Coles pattern.

The flasks were washed in and filled with 1-20 carbolic acid which was emptied out under the spray (carbolic) & through a long filler still under the spray some distilled water (later alcohol) was introduced still under the spray a cap of carbolized cotton wool (carbolized in a solution of carbolic acid in ether 5 p.c) surrounded by unprepared gauze was applied & fixed over & then the water was completely boiled off & the flask allowed to cool.

The reason of this performance was that I had no proper box for heating the apparatus & in trying to heat the flasks over a spirit lamp they cracked. The carbolic acid would have purified them sufficiently but it might have been said that the carbolic acid was afterwards mixed with the milk and prevented development. Whilst the carbolic acid was boiled off with water. The hot water found to be inconvenient as after the flask cooled the steam inside condensed & there was always a few drops of water left in the bottom of the flask. This was avoided by using

alcohol instead of water

The tubes were treated in the same way first with carbolic acid then ~~with~~ water & spirit boiled off in them carbolised cotton wool being placed over the junction of cap & tube & kept there till completely cool.

The milk was introduced through a long funnel into a pint flask which was boiled for a length of time care being taken to avoid spotting over & in some cases it was also immersed in boiling water for an hour & more.

The milk after having been allowed to cool was then decanted under a very fine spray into these tubes - the decanting being done as quickly as possible. (Before decanting out of the flask or removing the cotton cap the rim of the mouth of the flask was damped with carbolic lotion)

Inoculation of the milks.

The needles were heated red hot after being previously thoroughly washed in 1-20 carbolic lotion & were allowed to cool in a very fine & distant spray. The wound was then exposed under the spray a piece of cloth dipped in carbolic lotion was held up as a veil between the spray & the wound; the glasses were then rapidly passed behind this veil, cap removed needle picked up some discharge & rapidly passed into the milk. The spray was kept as far away as possible & the needle was 20 to 30 times washed in the discharge so as to remove any particle of spray adherent

to it & then it was again washed in the milk to get as much of the discharge as possible into the milk. (The handles of the needles & the hands of the operator were sterilized in 1-20 carbolic solution)

The decanting & inoculation took place under the spray because it was found that milk exposed under the spray developed no organisms (i.e. the spray killed the organisms falling into the milk) & thus I could be sure of all these precautions that if developement of organisms occurred in the milk they could not have got in accidentally during decanting & inoculating. Also in an antiseptic case I could not expose the wound without danger to the patient & so using it in a septic case I made sure that I should only get such organisms as previously existed in the wound.

And now before passing on to the experiments with discharges several questions arise

I Does milk so prepared and preserved remain unchanged and free from organic development? The answer is Yes as shown by the following experiments. (In the experiments the sets are spoken of as Set I or II & under that title the same set is meant all through)

Set I. Jan. 29th Tubes prepared
Jan. 30th All 3 tubes charged (half filled) under the spray with milk prepared the same day.
Feb. 6th No external change in any. Examined microscopically (the cap being removed under

the spray & some needles dipped into the milk) there was no evidence of bacteria or other organisms of any kind; the milk globules also remaining perfect as when fresh.

Feb. 11th Examined as before. No change either Externally or microscopically.

" 14th No 1. Of the set Examined immediately after Examination of one of the test tubes to be mentioned afterwards which was swarming with bacteria. no change Externally; quite a different appearance microscopically from the test tube; no muddiness & nothing to indicate the presence of bacteria or other organisms.

March 3rd Still all right both Externally and Microscopically (Nos. 1 & 2 used for purposes of inoculation)

April 11th Still no change in No 3. (reserved for inoculation)

Set VI

Feb. 14th Tubes prepared

" 16th Charged with milk prepared to night

" 27th No change Externally or Microscopically on careful Examination no organisms in any tube - the milk globules also remaining as at first.

April 2nd No 2. Cap removed ~~but~~ under the spray of the milk carefully Examined. No change whatever in External appearance to be detected. no smell. no taste. ~~to~~ almost neutral in reaction if anything very slightly acid. Microscopically no Organisms can be detected.

" 21st Nos 1 & 2 also perfect right to the naked eye & Microscopically nothing in the slightest

degree suspicious

Set VIII

Feb^y 14^th Prepared

" 16^th Charged with milk

" 28^th No change Ext remains microscopically

April 4^th Still no change. used for inoculation.

And so might go on giving set after set in which I have been able by preparing the milk in the manner described to be practically certain of its remaining pure. One has merely to examine the following Experiments carefully to see that this is the fact.

II A second question now arising is Is this milk so prepared a good pabulum for bacteria or is it so altered as to be unfit for the growth of bacteria or so as to be not such a universal pabulum.

The answer to this is yes. The milk so prepared even after long preservation rapidly becomes the seat of the development of ordinary bacteria when the access of these is permitted. To show that it still remains a ready pabulum for different kinds of organisms I will relate a number of Experiments.

Set I (See reference page 36.)

March 3^d No 1. impregnated with milk from test tube II (See ante) in which Ext remains there was great change & numerous bacteria. Done under the mercury

In 3 or 4 days the milk had begun to separate into 2 layers & when Examined

April 9^th it was swarming with bacteria which as a rule were very small & inactive motion

Set VII (see page 37)

April 2nd No 3 Examined as described but under the spray in some needles being used & the cap left off for about ¼ of an hour.

April 21st Putrid smell. Has separated into 2 layers - a clear upper & thicker lower. A small blue mould seen on the surface & the round spores of this as also numerous small actively moving bacteria found in the fluid.

Set VIII (page 38)

April 4th No 1. had a piece of German yeast put into it

No 2. 4 drops of ordinary brewers yeast put in

" 3. inoculated with a fine needle from wet yeast just as in inoculating from a wound.

All done under the spray.

Apr. 9th No 1. Numerous various shaped bacteria in extreme active motion. Some very large.

No 2. Numerous oval bodies with smaller buds & sometimes ranged in chains ⊙⊙⊙ &c.

No 3. Has some of the same bodies as the last.

(all Examined under the spray.)

Apr. 21st No 1. No bacteria groups of round bodies aggregated & separated ⊛⊛. Fluid separated into 2 layers clear above thick below & a brown layer on the top.

No 2. External looks pretty natural Some oval bodies as before Numerous very small bacteria. Some clumps of staphylococci & some groups of the round bodies in No 1.

No 3. Oval bodies as in last but layers with great tendency to lie side by side ⊙⊙ & some minute bacteria.

Set XI.

Feb 14th Prepared.

" 16th Charged with milk of the same day.

" 28th External & microscopically quite right.

April 5th Still remains without change (inoculated as follows

April 5th No. 1 inoculated with 2 drops of tap water
No 2 " " some dust from the table
No 3. Walked through the room once with it without the cap (Exposed about one minute) It must be mentioned that the spray had been used in the room immediately before for some time & also that the dust in the room is rarely disturbed.
Nos 1 & 2 under the spray.

Apl. 21st No 1. altered much in appearance separating into layers numerous bacteria chiefly small.
No 2. covered with Penicillium glaucum. Fluid kept to taste.
No 3. not very definite. Some suspicious bodies.

Set XII
Feb 14th Prepared
Feb 16th Charged with Milk prepared the same day.
" 28th No change in any either Extenal or Microsp.
Apl. 5th No Ext change.
No 1. had a drop of tap water added under the Spray with a needle pumped & carbolic acid.
No 2. left exposed to the air for 10 minutes.
No 3. had a drop of tap water added without the Spray.

Apl. 21st No 1. altered in appearance disagreeable smell swarming with minute bacteria
No 2. No bacteria No Ext change. Some large round bodies in clumps & (not oil globules). The oil globules are present as in fresh Milk.
No 3. No visible Extenal change swarming with minute bacteria in active movement. No Micrococci. Smaller milk globules much fewer in number.

Set XIII Prepared same day as former remained unchanged till April 5th when it was inoculated No 1 & 2 with a mould growing on wine (under the spray) & 3 kept pour to the air for 2½ hours

Apl. 21st No 1 & 2 full of beautiful fungus filaments

also patches of blue mould at the sides. Fluid contains micrococci & spores of Bacillus subtilis & bacteria.

No 2. has a few small bacteria. Milk & Whey seems unaltered.

These Experiments are sufficient to show that this milk is readily inoculated with organisms of very different kinds.

III. Does the carbolic acid which may get in from the spray during decanting & inoculation hinder development. (The strength of the spray is about 1-25 to 1-40). This has perhaps been sufficiently answered in the negative by the previous Experiments but it may be said that the carbolic acid had all evaporated before inoculation. Hence I have made the following Experiments.

Feb. 1st 5 pure test tubes were taken. In each was placed 100 minims parts of boiled milk & to each a certain number of minims of carbolic acid (1-20) were added. No spray used.

To No I. were added 2 minims
" " II. " " 5 "
" " III. " " 10 "
" " IV. " " 20 "
" " V. " " 50 "

They were shaken up & left Exposed to the air all night then covered very loosely & cap with very loose fitting caps. These caps were removed occasionally during the following day.

Feb. 2nd No change External in any. On Examining No I (two drops being taken with an impure needle) nothing definite is seen.

" 5th No External change in any. Examined microscopically

No I. contains multitudes of small bacteria. no motion
" II. Numerous bacteria some in a state of motion others not
" III Contains a few bacteria without motion
" IV contains active bacteria very small
" V Some very suspicious bodies nothing definite
Feb. 6th No V Some bacteria in active movement
milk beginning to alter in appearance & to
separate into layers.
Feb. 19th oil globules much fewer very muddy appearance
due to minute bacteria in active motion.
Sep. 19th All have separated into layers. At
the bottom a clear fluid in which are coagula
above, the fluid is of a greenish colour ~~with~~
~~at~~ No I. at one part a blue mould. Numerous
bacteria micrococci &c.
No II. Numerous small bacteria some extremely
long delicate filaments wriggling about like
Eels. ~~Greenish~~
No III. Mould as in I Numerous small bacteria
" IV. Numerous small bacteria
" V Numerous large & beautiful crystals of
Oxalate of Lime (octahedral) a mould growing
on the ~~top~~ top. Numerous bacteria &
micrococci. Fluid not greenish
In No VI test tube milk was charged with milk
at the same time as the others, but without
the addition of carbolic acid, the fluid has separated
slightly into layers. No clear fluid nor
greenish appearance. Full of bacteria
& micrococci.
In all these the oil globules had almost
entirely disappeared.
IV One experiment to show that when the
Carbolic lotion is added & the fluid preserved
under the usual precautions the fluid remains

free from the development of organisms.
or in other words the organisms are not
alive in the carbolic solution.

Tube VII.

Feb 8th prepared & charged. 1/3 part of Carb. Solution being added.
April 19th no alteration either externally or
microscopically. The Brunonian movements
of the oil globules are rather more
active than usual.

From these Experiments we see that all
the carbolic acid which can get in from
the Spray will have no effect in preventing
the development of organisms.

V Now lastly can the bacteriabe transferred
from one vessel to another under the
Spray without being destroyed?
To show that they can look at the
~~following~~ notes of Set I (page 38)
Set VIII (page 39) Set XI (page 40)
Set XII (page 40 bottom) Set XIII (page 40)
but I may add that I have several times
cated inoculated urine Pasteur Colin
Solutions from altered milk under the
Spray just as if from a wound & have not
failed to get a corresponding development
Further to guard against this fallacy I
have a veil held between the Spray & the
wound so as to allow the ~~the~~ Spray com-
-pletely to ~~soon~~ surround the wound at
the same time clearing the part around
the wound, where the needle is, free from
the Spray.

That the Spray is a sufficient guard
against the entrance of Septic particles

I have found by exposing milk to the air for a long time under the Spray even in a very dusty room without any alteration occuring in the milk.

Having thus found that milk can be preserved pure, that this milk is quite ready to be the seat of development of organisms in spite of the minute amount of carbolic acid which may have got into it, & that the inoculation can be successfully performed under the Spray I am now in a position to proceed further & to relate the few experiments which I have already performed with regard to the occurrence of organisms under antiseptic dressing. I will relate all the experiments in order that if any conclusion can be drawn from them it may be done fairly.

Set II

Feb 7th Prepared

" 8th Charged with milk prepared yesterday.

" 18th Inoculated with discharge from Marion Wilson who was admitted Feb 15th with a small wound in the thigh which had since admission been dressed with Boracic lint & which was soundly healed in a few days. The discharge had no smell whatever & when examined Microscopically showed well formed pus cells a small amount of granular matter but no evidence of the existence of Bacteria.

As to the milk No change Exam or Microscopically

Nos 1 & 2 were inoculated. No 3 was opened and the needle just in just as in the other 2 cases only it was not previously dipped in the discharge.

It may be stated once for all that this has been the method pursued in all cases 2 tubes being inoculated & 1 tube opened &c. but no discharge put in. In all cases portion of not the inoculation was done with the spray as before described

Feb 25th Opened under spray & examined. no change.
Apl. 3d no change & Re opened today for purposes of inoculation (other experiments) done under spray.
" 4th - Opened again for inoculation (It may be said that the inoculation of the milk was into Pasteur's or cohn's sol. ~~to~~ mixed)
" 16th Kept for 4 days at about the temperature of the human body (for other experiments).
" 21st Milk seems in good preservation. In none of the 3 are organisms to be found though no 1. is somewhat suspicious.

Set IV

Feb 8th set prepared & charged with milk purified yesterday.
" 20th Inoculated with discharge from Alex Shand. who had syphilitic ulcers on his leg. He also had an abscess below the knee communicating with an ulcer. The abscess cavity was daily syringed out with Carbolic Wash & dressed with Iodoform Lint. The inoculation was performed 24 hours after last dressing. No distinct foetid smell.
Discharge showed pus cells generally muddy appearance due to presence of minute bodies. No definite bacteria of any size seen though one or 2 suspicious rods were present.

Milk all right

Nos 1 & 2 ~~no~~ inoculated No. 3. test.

Opened April 3rd & 4th for purposes of inoculation at that time the milk to external appearance seemed right but was not examined Microscopically

April 19th No 1. Bacteria large & small but not very numerous

Morn. Numerous oil globules. On looking into the tube the surface ~~appears~~ has a somewhat watery appearance. External no change to be observed.

No 2. Not altered externally. a few bacteria in active motion & very numerous clumps of Micrococci.

No 3. Seems all right no bacteria no micrococci

Set VII

Feb 14th Purified

" 16th Charged with Milk prepared tonight.

" 28th All right Externally & Microscopically

March 1st Inoculated with discharge from Thomas - a case of incisions into the knee joint which went on well for a time but lately the discharge has become more copious & has a disagreable smell. Numerous pus cells some granular matter some minute rods.

Nos 1 & 2 inoculated No 3. ~~the~~ test

Apl. 3rd & 4th Opened for inoculation

" 20th Seem all right no bacteria or micrococci can be detected. Externally it has a normal appearance.

Set IX

Feb 14th Prepared

" 16th Charged

" 28th No change Externally or Microscopically

March 5th Inoculated with discharge from Lizzie Thomas - from abscess of the last digit no 2.

On the 13th of October the note entered is that

a/
today There was a very bad smell of the dressings & blackening of the protective" This peculiar ammons odour of the dressings had been present more or less all winter. Hence I selected this case for inoculation. There was also generally a marked green colour of the fauge. Microscopically (with a low power) pus cells some small granular bodies & a general muddy appearance of the discharge.

Nos 1 & 2 inoculated No. 3. test.

April 3rd & 4th joined for inoculation. Up to this time there was no distinct change externally.

April 20th No. 1. has a reddish appearance on the top like the test tubes & the general colour of the fluid is more reddish than natural. Some distinct bacteria - very small & some of them very minute. Milk globules still present.

No. 2. Also changed brownished on the ~~top~~ surface & the fluid is paler than natural with a tendency to deposit at the bottom. Swarming with bacteria for the most part very minute. Oil globules few.

No. 3. unchanged by test & microscopically.

Set VII

Feb 7th Tubes prepared

" 8th - Charged with Milk prepared yesterday.

" 10th - Inoculated with discharge from John Brown's abscess of Feb 11th & following an aseptic course.

Discharge shows one or two pus cells a little granular matter. Nothing suspicious. Milk all right

Nos 1 & 2 inoculated No. 3. test.

Opened on April 3rd & 4th for purpose of inoculation
Apl. 16th kept for 4 days at temperature of the body
in arranging the tubes No. 2. fell Cap came
off & some milk was spilt.
Apl. 21st No's 1 & 3 all right but No 2 has a few
bacteria.

Set. V.

Feb. 8th Prepared & charged with Milk boiled yesterday
" 19th Examined. No organisms to be found no
External change
" 21st Inoculated with discharge from Agnes Morton
who had the axillary glands removed a week
before the wound being now nearly healed
& not having been dressed for 3 days.
a few white cells a little granular matter
no bacteria.
No. 1 inoculate from drainage tube.
No. 2 from axilla scraping the epidermis
between the folds.
No. 3 test
April 3rd Opened for inoculation
" 19th All seem in good preservation. Oil
globules just as in fresh milk. No bacteria
or micrococci in any.

Set X

Feb. 14th Purified
" 16th Charged with Milk of the same day.
" 28th Unchanged.
March 4th Inoculated with discharge from an outpatient
whose little finger was amputated the day before
The wound covered with normal blackening
of protective or. a few white cells but
otherwise the usual appearance of granular
matter the day after operation.
No's 2 & 3 inoculated from drainage tube No 1. test

April 4th Placed for inoculation.
April 20th In none are bacteria or micrococci present. No external change.

Set XVI
March 9th Prepared & charged with milk prepared today.
" 22nd Inoculated from McKenzie – a man who had an abscess of the shoulder joint (Head) some time ago. Sinus not yet healed & now a partial excision has been performed No smell nor blackening of the protective No 1 inoculated from the wound for excision No 3. from the old sinus. No 2 Test.
Milks all right.
Discharge from wound shows pus cells no bacteria. From sinus nothing special some granular matter no pus no bacteria

April 4th & 6th Placed for inoculation purposes.
" 20th No external change in any nor microscopically are any organisms to be detected.

Set XVII
March 9th Pupils charged with Milk of the same day
" 11th Large acute abscess of jaw (Jones) & the discharge allowed to run through a funnel (Jones) into tubes 1 & 2 No 3 not touched.
Discharge shows pus cells no bacteria.
Ap. 4th Placed for inoculation.
" 20th Nos 1 & 2 show externally a dark red ~~colour~~ of the fluid at the top (Howard) of the tube but microscopically no bacteria nor micrococci.
No 3 unchanged

Set XVIII
March 9th Pupils charged

March 28th Inoculated from a man's hand who had a compound dislocation of 3 fingers following an aseptic course. No flakes of pus present but a peculiar smell such as is found on the hands & feet when the dressing is kept on long. Nos 1 & 2 inoculated. No 3 test. Discharge had epithel. & granular matter no bacteria. Milk seemed all right.

April 4 & 6th Selected for inoculation

April 20th Nos 1 & 2 seem all right (No 3 was all right & used 203 days ago for inoculating)

In selecting these cases for inoculation I have tried to ~~obtain~~ have got the discharge under a variety of circumstances I have taken the discharge from pus sacks from old cases - from a case the day after operation - from other cases some time after operation - from abscesses when opened the pallaq of the spray kill the bacteria by time avoided & getting the discharge in quantity - from abscesses after having been opened some time from cases which have been long under treatment - from cases where there is a tendency to bad smell &c.

In looking at the results we find that as regards the inoculation from really antiseptic cases they are quite satisfactory. On inoculating an antiseptic discharge from an antiseptic case into pure milk no development occurs. Hence

x It should be mentioned as to the cases themselves that Lizzie Thomas (Set IX) was by themselves suspicious & there little doubt in my own mind from the appearance of the dressings or the without further examination that some form of organism was present
The other (Set IV) was a case of unhealthy abscess where the causes of putrefaction were undoubtedly present and where the injection of Carbolic acid into the cavity 24 hours before inoculation could not render the case aseptic judging from former experience

we would conclude from former Experiences that no bacteria existed in the discharge but the question arises.

Do foetid discharges inoculated into milk give rise to development of organisms in the milk? We have in this respect unfortunately not had any real foetid foetid case since I began these Experiments. We have however had one or two cases which we could hardly consider sweet & inoculation from which one would expect to get development of bacteria

I have inoculated from 4 such cases sets II. IV. VII & IX. Of these in 2 cases development has occurred in 2 the milk has remained apparently unaffected.

Let us look first at the 2 Experiments in which development occurred. They were cases in which it was expected that development ought to occur.

Another question however arises. Have the organisms found in the milk been derived from the wound or have they got in at some subsequent period? for it must be observed that before the final Examination the caps had been removed & heated needles introduced under the spray & it may be said that the organisms got in at that time.

In judging of this the following points must be noted.

1. The Inoculation of the tubes on April 30th 4th was conducted under the spray & as

seen in other cases the spray is thoroughly trustworthy.

2. A number of sets were treated in the same way at the same time & none of the antiseptic sets went wrong.

3. Of either only those tubes in really inoculated from the discharges went wrong. No. 3 of both sets remained perfectly right. If it had been some fault of the spray & it is hardly likely that No. 3 of both sets should have escaped in fact according to the laws of probabilities there was a very great chance that one of the number 3's should go wrong & one of the others remain sweet.

4. Lastly the needles used were carefully washed in 1-20 carbolic lotion & heated before use & they had not that might have been used in any fluid containing bacteria.

5. Then the fact that nearly 3 weeks have elapsed since that time & the bacteria are still not so numerous as after 3 days in ordinary cases & also that no material change has occurred in the milks seems to point to these bacteria being some different kind of bacteria which for some reason or other do not multiply very fast nor produce quick changes in milk.

I therefore think that these 2 cases must be accepted as cases in which development of bacteria in milk occurred from inoculation with discharges containing them. (It would be interesting to know if

any relation exists between the green colour of the fauces in Lizzie Thomas's case & the green colour of the fluids in the test tubes containing carbolic acid!)

In the other 2 cases no development occurred. The one was that of a sinus in the thigh which healed in a few days. There was no smell very little discharge & no definite appearance of organisms under the microscope. Here the thought arises; were organisms really present in this discharge? In a rapidly healing sore where the discharge is constantly removed or absorbed, some material in which it cannot putrefy as Bracic lint. There is no smell nor other evidence of Putrefaction. May it not be that such cases are counterparts of the case of the healthy urethra or of wounds healing by first intention which have not been treated antiseptically? In these last cases organic development does not occur although at the orifice of the urethra there are organisms & although undoubtedly numerous septic particles fall into the wound?

As to the knee the smell and general appearances were such as to render it probable that putrefaction had occurred and here I took special care in inoculating to let as little as possible of the spray on the needle. Nevertheless

no development occured
In the discharge there was nothing absolutely certain as to the existence of bacteria still in this instance the bacteria may have been so small & delicate as not to be readily recognisable on rapid examination with a low power. It must be mentioned that the smell was much less when inoculated than it was when the case was declared putrid.

Several solutions ~~of~~ suggest themselves.

1. Bacteria (organisms) may not have been present. On this point I will not be positive.
2. These particular organisms may not have found milk a suitable pabulum. This is however not very likely as milk is so readily the seat of development of all kinds of organisms.
3. Perhaps the organisms were destroyed in their transit. In this case I took particular care that this should not occur & this supposition may I think be dismissed.
4. The change of temperature may have an influence. A bacterium living & developing in a fluid at the temperature of the human body may not be able to develope in a fluid at the winter temperature. This I believe especially from some experiments I am now making to be a very valid objection in some cases. At any rate organisms kept after leaving the body at the body temperature develope more quickly than those kept in the cold.

(This may perhaps account for the slow development in the 2 cases which went wrong) Nevertheless considering the various antiseptic cases used and the fact that in none did development occur I think we may consider it likely that there were no organisms in these discharges I have already commenced further investigations on these points but I am not at present able to give the results.

In these experiments we have another strong proof of the truth of the germ theory and the assurance that this method of investigation is trustworthy and will ultimately lead to definite results.

Rise of temperature occurs from shock of injury without wound - apparently due to affection of the vaso-motor nerves. J.S.

Some remarks on Temperature after wounds.

From Experiments on animals and from clinical observations of temperature Billroth concludes that Elevations of temperature after operations are due to absorption of pyrogenic products which products are formed in the wound. The temperature according to him begins to rise about the 2d day and remains high for 6 or 7 days. Apart from Elevation of temperature from absorption of acid products he does not recognise any other cause. Elevation of temperature due to distinbance of the Nervous System he dismisses on the very fallacious Experiments of Breun and Chwostak who show that Even after section of nerves which would conduct the irritation to the nerve centres Elevation of temperature still occurs.
That Billroth is wrong in this will be readily seen from the following charts & a careful Examination of these will show that we have two distinct Sources of Elevation of temperature.

1. Absorption of pyrogenic Materials
2. Nervous disturbance. This Nervous disturbance may be either ~~from~~ in the shape of tension from confinement of discharges &c. or Injury to the tissues in the Operation.

* due to absorption of putrid materials & what Elevation is due to other causes.

Boiling is superadded in the antiseptic treatment mens putrefaction is avoided.

Where does Mr Cheyne shew this comparison of the temperature between what he calls Antiseptic & non-antiseptic cases - Assertion is not proof - H.

As in the antiseptic treatment we ~~exclude~~ the prevent the occurrence of putrefaction & thus exclude the initiation and absorption of putrid materials as an elevator of temperature so by careful comparison of antiseptic and non antiseptic cases we can judge what elevation of temperature is ~~due to the various causes and what is due to absorption of acid materials~~ as in the antiseptic treatment of putrefaction is avoided the difference of temperature in an antiseptic and non antiseptic case (where free drainage exists in both) can only be due to the absence of putrefaction in the one case & its presence in the other.

The case of Finlay McDonald (I) may be taken as typical of the temperature curve after a severe operation done antiseptically. Here we had from both tibia & fibula portions of the whole thickness of the bones removed. The wound was not stitched up but instead drainage tubes were introduced. Here there was no putrefaction (See case in Mr Essay). - no alteration in the discharge - the blood clot lay exposed in the wound for weeks till it became organised. - no production of acid materials - no inflammation & no formation or absorption of pyogenic products. Here also there was no tension - the discharge escaping freely through the wound & through the drainage tubes.

But here it will be noted that there

was slight Elevation of temperature - that this elevation began immediately after the operation & began to fall again after 24 hours. There being no irritating products to be absorbed - no inflammation & no tension this Elevation of temperature can only have been the result of the operation - the result of the nervous disturbance caused by the operation.

This slight Elevation of temperature is present in all operations antiseptically performed of any severity. In such cases it seldom rises above 100° & attains its highest point either on the morning after the operation or on the following evening & then begins to fall. It is not present in minor operations & in opening abscesses. In opening abscesses there is no appreciable nervous injury in the operation & the tension which has kept up & the presence of the pus is relieved - there is no putrefaction - no fresh irritation & the temperature if high before generally begins to fall immediately after the opening of the abscess.

I add 2 more antiseptic cases as illustrations.

That of Tamar Allanson II who suffered from Gelatinous degeneration of the knee joint with pain where 2 long incisions were made into the knee joint & drainage tubes inserted. The case progressed favourably, pain at once disappeared - no constitutional disturbance

and the wound had healed in about 6 weeks - the pusfiness of the knee having then much diminished

III The other case is that of Robert Russel who had Bursitis of the flexor tendons the fluid existing both in the palm and above the wrist. An opening was made above the wrist antiseptically. Fluid was evacuated containing numerous small solid fibrinous particles - An Eyelet tube carrying horse hair was passed in & out in the palm. The horse hair was used as a drain. Soon the discharge became nil. The drains were pulled out at each dressing & he was discharged in 3 or 4 weeks quite healed & cured. He came back after 6 weeks & was still well. Here the temperature once rose above the normal limits (99.5° about).

IV The next case is that of Laines Low & it illustrates a rise of temperature due solely to tension. Here there was no putrefaction (see essay I) & no absorption of acid products. It was a case of old standing dislocation of the elbow reduced after incision. There was considerable difficulty in reduction & great tension of the parts & hence the height and continuance of the primary rise of temperature not due alone to the operation but to the operation & the tension of the parts. This was decreasing when hemorrhage

See statement at page 61, that no putrid case had occurred to enable the essayist to compare —

See date of putrid case. Exp. ~~not commenced till~~ Feb. twice. JS

case of Dickson was not a pure putrid case & his T. is given.

occurred (on the 6th day) Extensively into the limb causing great swelling pain & tension. Incisions were made to relieve the tension on the 8th day blood clots were evacuated & soon there was a fall of temperature but for a few days there was much bloody discharge & the swelling of the limb did not subside for some time. Suppuration did not occur.

This case then shows firstly tension combined with the nervous disturbance consequent on the operation & secondly tension pure & simple - uncomplicated

In James Dickson's case (V) we have side by side the temperature after incision into the wrist joint ~~without~~ without putrefaction & that with putrefaction.

The patient had suffered for some time from disease of the wrist joint with great pain. On the 7th Dec. incisions were made into the joint. All went well but as the pain was not completely relieved & the tubes were constantly slipping out on the 13th the incisions were enlarged & to keep the drainage tubes in position pads of gauze were placed over them. This gauze had not been well worked & was undoubtedly the cause of the putrefaction for on this date the wound was found to be putrid. It may be mentioned that the products of the fermentation in this case were not by acid but some mild form of bacteria probably being present.

* Assumes that pulmonary occurs in all wounds not treated on the so called antiseptic method. As the Essayist had opportunities of seeing other methods of dressing he sh'd have compared them with the cases he has recorded instead of referring to the observations of another. JS

It will be seen that after the first operation there was no rise of temperature just as in other minor operations. No new irritation was caused & the existing was somewhat relieved. On the 2nd occasion the operation was not more severe than on the first but it was followed by immediate rise of temperature & a continued high temperature. This was the result of the fermentation.

As to putrid cases here of course all operations are performed antiseptically & we use as antiseptic Chloride of Zinc solution is applied. Hence I have not a pure putrid temperature to show but the rare chart of these will be found in Billroth's "Allgemeine Chirurgische Pathologie & Therapie" 4te Liefernte Auflage. 1875.

The 2 following cases had Chloride of Zinc applied but still the effects of putrefaction tell on the temperature.

John Gordon (VI) was admitted with a very large malignant tumour of the upper jaw involving the eye eyelids eyebrows adherent to the bone at the supra orbital ridge & involving also the skin of the cheek. A very extensive operation was therefore required & a very large raw surface was left. This was touched with Chloride of Zinc. The temperature chart shows continued high temperature with apparently no other cause to account for it than the

Does Mr Cheyne ignore other causes of increased temperature, than that which he calls putrefaction? Has the effect of such an operation on the organic & cerebro-spinal nervous system nothing to do with rise of temperature? — If

portrefaction of this large surface

Wm Dochart (VII) had the whole of the lower lip removed for epithelioma & a plastic operation was required to fill up the gap. Of course a large raw surface being in the mouth portrefaction occurred there & we have a corresponding rise of temperature however very marked.

I could give other cases illustrating of antiseptic temperatures but that would only be tiresome

We thus find the results to be as formerly stated.

I. After any severe operation there is a rise of temperature consequent on the injury done to the tissues & due to nervous action. This does not attain a height on an average above 100° attains its maximum usually within 36 hours then begins to fall & does not rise again.

II. Confinement of discharges - blood &c giving rise to tension cause a rise of temperature in proportion to the tension. This rise is higher & more rapid than the former & subsides when the tension is relieved. This rise of temperature is brought about through the medium of the nervous system.

III. When portrefaction occurs in a wound of any size there is a rise of temperature which rise is progressive superseding or no I. & increasing & remaining

high for 5 or 6 days or more.

Before leaving this subject it may be mentioned that rise of temperature after operations may be due to other causes besides those mentioned. Thus in women menstruation has been noticed here to affect the temperature & in several cases this counter where the temperature was found to be high or variable it was found on enquiring that the patient at the time was menstruating.

Another Example may be given - that of Thomas Williamson VIII admitted with a carbuncle on the front of the abdomen. This was incised & progressed remarkably well but even though the wound was quite sweet no tension & healing occurring rapidly & the patient stated that he felt well the temperature was found to vary in a most remarkable manner. On careful enquiry however it was found that the patient had suffered from ague in India & still had daily or almost daily slight shivering attacks. Spleen somewhat enlarged. He was treated with Quinine as detailed in the chart & the result may be there seen.

The increased temperature of the aneurismal limb some hours after ligature of the femoral has been long observed & the cause is very obvious. If Mr Cheyne had studied the subject of the effects of ligature he would scarcely have been surprized at the circumstance

Some interesting temperatures after ligature of the femoral artery seem worth while recording.

Wm Cargill (IX) was admitted with a rapidly increasing popliteal aneurism of the left leg. The left leg was also more swollen than the right & the veins were somewhat distended. Temperature of both legs was taken behind the calf (a mass of cotton wool among both legs outside the thermometer & both legs being taken at the same time. After the operation the left leg was of course enveloped in cotton wool - the other was only enveloped for ½ hour ~~and~~ before taking the temperature but on the 15th the right leg was also permanently enveloped & it will be seen that there is a rise of temperature that evening.

The results are seen on the chart. It will be seen that immediately after the operation the temperature of the left leg fell but the following evening it had risen very high & was still higher on the morning of the 3rd day; then it gradually began to fall.

As to the cause of this I am only disposed one case I would not venture an opinion. However we see that after removal of the elastic band the limb flushes. After ligature of the femoral artery it is some time before the blood gets through the anastomotic

branches but when it does there is in-
-creased circulation so to speak to
make up for lost time & the result
is a rise of temperature. This seems to
be the most feasible explanation but
it may have been due to the enlargement
of the superficial veins in this case
or from increased cutaneous circulation
from the stoppage of the main branch.

1877

Feb.

Date	Jan. 16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	8	4	5	6
Day of Disease	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Temp. F. M.	64	68	76	76	96	76	80	80	68	76		72	68	76	80	80	68	76	72	72	68	72
Temp. F. E.																						
Pulse	64	68	76	76	96	76	80	80	68	76		72	68	76	80	80	68	76	72	72	68	72
Respr																						

Remarks.

As to the elevation of T. on the 14th day no cause could be made out. He felt a little out of sorts that night got a dose of Castor oil & felt quite well in the morning. The T. also began again to fall

I

Name Finlay McDonald Occupation Joiner Residence Inverness

age 29 {S M} Disease Badly united fracture of Tibia & operation Termination Cured

1544

1876

Date Oct 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Day of Disease

Temp. F.

M. E. M. E.

108° 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°

Operation

Pulse 72 72 64

Respr

Name Louisa Allinson Occupation Dressmaker Residence Smedley Fold

Age 22 S M Disease Gelatinous degen. of knee Joint Termination Cured

Remarks.

It may be mentioned that she was menstruating when the incisions were made & that it has been found that there is disturbance of T. in the way of elevation during the menstrual period.

II

MACLACHLAN & STEWART 64 SOUTH BRIDGE EDINBURGH

1877

Date Sept. 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

Day of Disease

Temp. F. — M. E. for each date

108° 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°

Operation (Incision Elbow Joint)

D D D D

Pulse 88

Respr

Remarks.

D = Dressed

III

Name Robert Russel Occupation Farm Servant Residence

age 40 {S M Disease Bursitis of Hexa Tendons Termination Cured

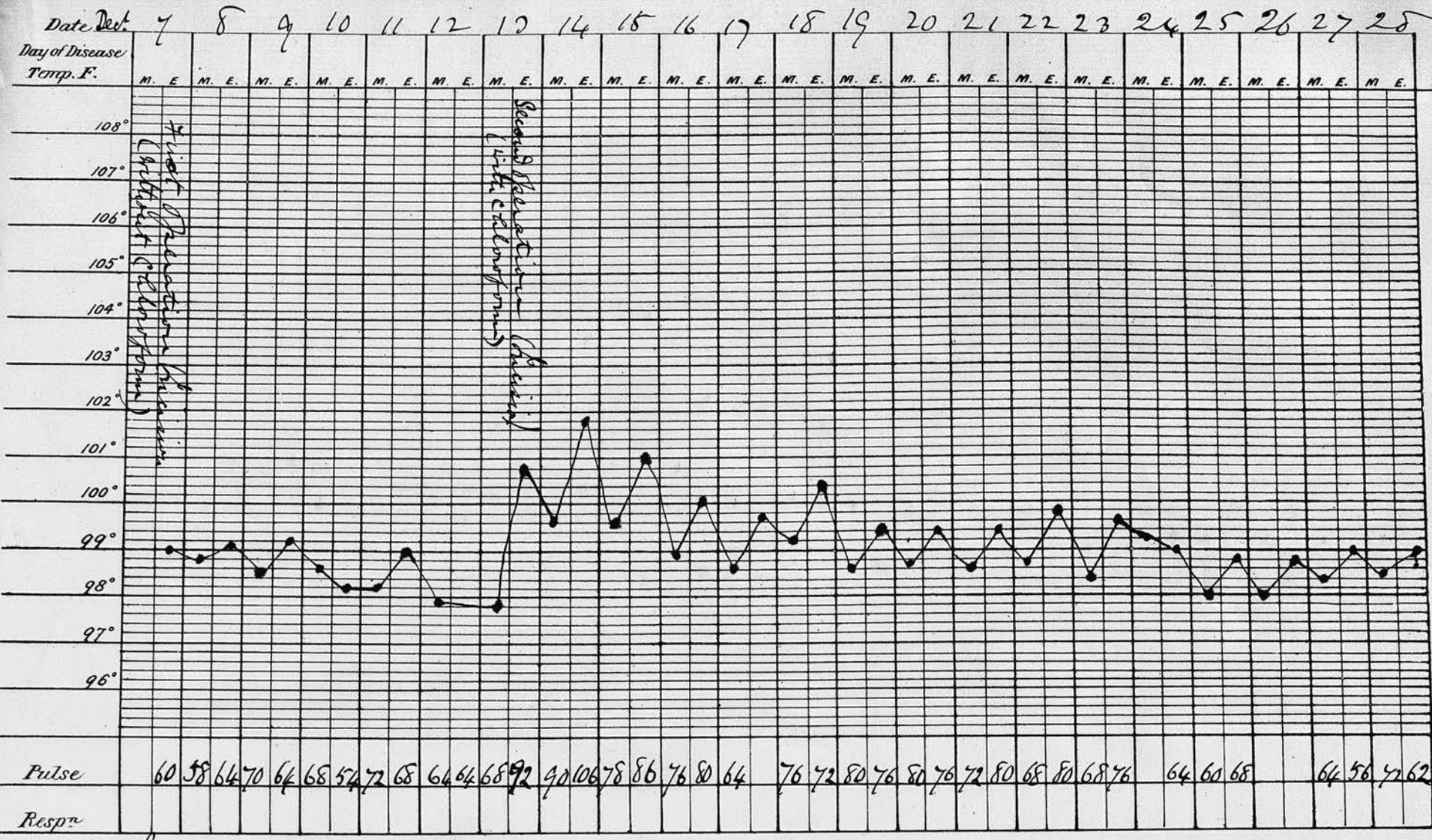
Horse Hair drain

IV.

Name James Low Occupation Millworker Residence Dundee

Age 12 {S M Disease Unreduced dislocation of Elbow + 6 weeks standing Termination Cured

Reduced after free incision



Remarks.

V

Name James Dickson Occupation Blacksmith Residence Campsie

Age 57 {S M Disease Disease of Wristjoint Termination

Incisions

1876 Dec. — Jan. 1877

Date	Dec. 16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	0	4	5	6
Day of Disease																						
Temp. F. M.																						
Temp. F. E.																						
Pulse		64	76		80	88				72												
Respr																						

Operation

Normal

Remarks

VI

Name John Gordon Occupation Gardener Residence Row

Age 66 {S M Disease Malignant tumour Termination

Upper jaw Removed

Date March 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Day of Disease

Temp. F. M. E.

Remarks

VII

Name Wm Dochart Occupation Gamekeeper Residence Kelton

Age 50 {S M Disease Removal of Lower Lip & Plastic Operation (Epithelioma) Termination Cured

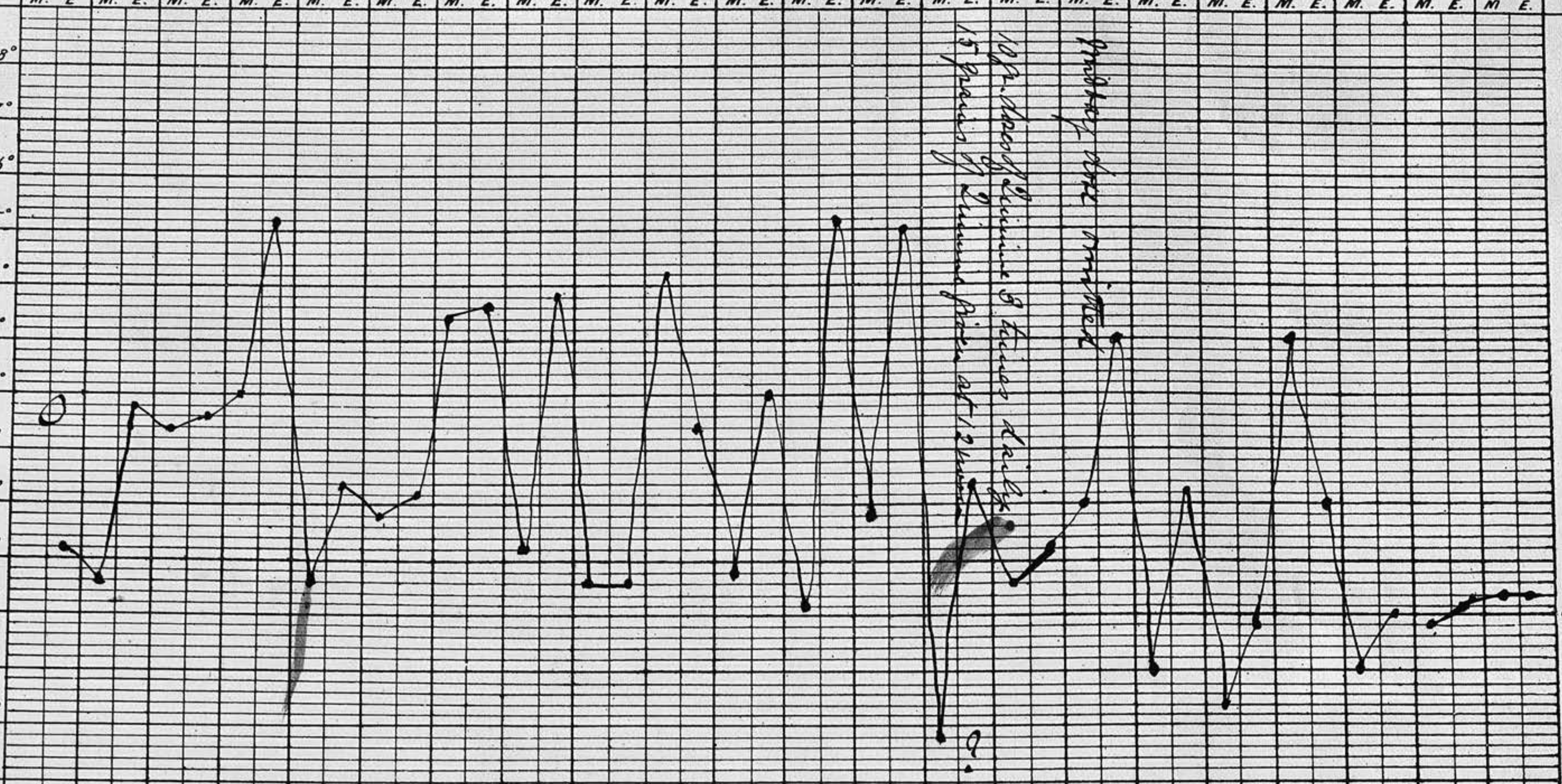
1846 Jany 1877

Date Decr. 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Day of Disease

Temp. F. M. E. (each day)

108° 107° 106° 105° 104° 103° 102° 101° 100° 99° 98° 97° 96°



Pulse 88 88 92 100 96 92 108 96 80 100 100 96 96 96 100 84 112 88 92 112 84 124 120 112 96 96 92 84 84 80 84 84 108 84 84 92 88 72 84 84

Respn.

Remarks

VIII

In future normal. In Hospital till 23rd Jany. Temp never again higher than 99·8 generally about normal

Name Thomas Williamson Occupation Labourer Residence Leith

age 35 {S M Disease Carbuncle on anterior wall of abdomen Termination Cured

Date	Nov 11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2
Day of Disease			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Temp. F.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.
Pulse			68	68	70	84		78	80	78	76	72		72								
Respr.																						

Remarks.

IX

Name Wm Cargill Occupation Industrious Worker Residence 15 Innerdock Terrace

Age 32 {S M} Disease Ligature of femoral Termination Cure - Dec 4th 1876
& Popliteal aneurism

Interesting Tumours

Case 1. Adventitious. Thyroid gland becoming portions without enlargement of the normal Thyroid.

Removal.

Agnes Harley æt 29. Dollar admitted November 23rd 1876

History. Patient states that she first noticed a small swelling over the upper part of the thyroid cartilage 6 years ago which swelling has since gradually increased in size. It caused her no inconvenience either as regards breathing or swallowing. A seton was once introduced & some fluid escaped but no permanent improvement followed.

On admission a tumour about the size of a hen's egg was seen situated in the middle line over the top of the thyroid cartilage; superficially circumscribed soft & fluctuating. The skin was freely moveable over it and it was moveable though not very freely on the thyroid cartilage. The lower border of the thyroid cartilage could be distinctly felt below the swelling & no connection could be traced between the tumour & the thyroid gland either in front or laterally - the thyroid gland being apparently normal as regards size consistence & position. The tumour moved along with the larynx in swallowing.

On Nov. 23rd Mr. Lister made an incision longitudinally over the tumour & proceeded to dissect it out. In dissecting down deeply there was a considerable amount of hemorrhage

some some large veins connected with the tumour. Nothing remarkable in the progress of the case the wound healing rapidly & the patient being dismissed on the 26th of Dec.

Examination of the tumour showed it to be completely surrounded & distinct from fibrous capsule & on section it presented to the naked eye the appearance of normal thyroid gland.

Microscopically it showed the well known structure of thyroid gland - the sacs being very numerous and for the most part very small while in some places they were large & both large & small contained colloid material

Points of interest.

1. It was a distinct adventitious thyroid. This is shown by its position - situated in the middle line far distant from the normal thyroid & with no apparent connection between them. (2) It was surrounded by a distinct capsule complete at all parts at no point showing connection to the gland by a pedicle while in malignant portions of the thyroid there is general though not always a pedicle connecting the tumour with the rest of the gland. (The nature of the degeneration (hyperplasia with colloid degeneration) is also against its being merely a developed lobule in which cases the change is generally more of a fibrous nature.

2. A 2nd point of interest is that the adventitious thyroid should become fibrous (in this case hyperplasia with colloid degeneration) while the

normal thyroid undergoes no change.
That cases of adventitious thyroids ~~do occur~~ ~~along with Injury~~ becoming fibrous along with enlargement of the normal gland do occur is mentioned by Paget in his book on Surgical pathology but no where in there have I can find ~~I can~~ any instance of an adventitious thyroid becoming fibrous while the normal thyroid remained unchanged.

2. As to the growth of the thyroid gland Billroth in a paper "Ueber Fatales Driisengewebe in Schilddrüsen Geschwulst (Müllers Archiv 1856 states as the result of observations made in a case of cysto sarcoma of the thyroid gland that the new formation of thyroid structure (cavities) takes place either by the penetration of a column of cylindrical cells from pre existing cavities into the fibrous tissue these columns becoming constricted at various points forming the commencement of new cavities or of the cells of the mother cavity increasing at one part in number & this mass becoming hollowed in centre by third new cavity

In this case there was hyperperplasia of the thyroid tissue occuring comparatively rapidly

The largest cavities containing colloid material were not larger than the normal thyroid structure. There were also numerous smaller cavities some containing colloid material but the very smallest of these when examined fresh under a high power seemed to consist merely of round cells having all the appearance of leucocytes. When slightly larger the cav-

-tral cells began to undergo colloid degeneration
There was no appearance whatever of
~~to~~ tubes or other ~~structures~~ structures mentioned
by Billroth.

Case of Atheromatous cyst under the tongue in the position of a Ranula.

Wm Douglas ætat. 23. admitted Dec^r 1876
For 3 years patient has noticed a swelling
under her tongue. This has been twice
incised when greyish material escaped.
The swelling returned again soon after each
operation.

On opening the mouth a prominent
swelling is seen under the tongue which
swelling is of a somewhat firm consistence
& pagne & without any distinct fluctuation
Dec^r 21^st Mr Lister dissects out the tumour
carefully with a probe pointed knife &
using his finger as a guide he succeeds
in removing the tumour entire without
opening into it. Patient did well.

The ~~fluid in~~ cyst was found to con-
tain a thick greyish material which
under the microscope showed epithelium
& fat globules. no ~~cholesterine~~ cholesterine.

Sections of the wall of the cyst show
almost all the appearances of sections of skin.
Internally we have papillæ first as in skin
covered by layers of epithelium which gets
flattened towards the surface. The rest of
the wall consists of fibrous tissue ~~with~~.
Hair & there a few hair bulbs & hairs were found.
These were few & the hairs did not project

beyond the surface. Connected with these hairs were indistinct D&C like structures which formerly were some form of sebaceous glands. The occurrence of sebaceous cysts under the tongue is very rare though mentioned by various writers.

As to the origin of the present cyst it is evidently of new formation. It could not have arisen from dilatation of glands in the mouth because of its structure more especially of the presence of hairs. It is evidently a new formation. As to its being congenital the fact that it did not develope for 20 years seems to be against that & such a theory in connection with many tumours seems to be untenable.

While speaking of atheromatous cysts another case may be mentioned of a large cyst over the sternum in which numerous hairs were found of extreme length & exactly the same character as the hairs of the skin over the sternum which were also very long.

Case 2 Chondrome of the 2nd toe with stellate branching and tumour cells.

Donald MacKie æt. 64 Carpenter admitted Dec. 21st 1876. Had his toe 6 years ago & ever since has observed the 2nd toe of his left foot getting more & more swollen. On admission there was a swelling — irregular in shape, in some parts hard in others more elastic almost fluctuating — of the proximal phalanx of the 2nd toe

itself innocent but the skin freely ulcerates on it.

For amputated & patient dismissed Jan. 12th with the wound almost entirely healed.

The 1st phalanx has converted into a tumour about the size of a duck's egg - the only part of the phalanx unaffected being the socket for the head of the metatarsal bone. The tumour was irregular in form - nodulated on the surface, the most projecting parts being soft almost fluctuating while the other parts externally are pretty firm.

A section through the tumour shows it to be externally covered by a layer of dense bone about $\frac{1}{8}$ of an inch thick except in some places (the most prominent) where the tumour is soft almost diffluent. Towards the centre the tumour is softer.

Under the microscope it is found that the tumour consists of a number of lobules aggregated together without any well defined interlobular substance. The part between the lobules is not stained by hæmatoxylin except a few nucleated it is however highly stained by carmine has rounded patches in it which on closer examination are found to consist of small branching cells - commencing lobules.

Close examination of the lobules shows them to consist of cells imbedded in a homogeneous substance. These cells are branching & anastomosing and are

most numerous towards the centre of each lobule.

In some places the cells are surrounded distinct capsules in others only a partial capsule & for the most part no capsule is apparent or only very faint tracing in the intercellular substance round the cells.

No tendency to ossification in the interior of the tumour. No blood vessels could be seen in the interior of the lobules (distinguishing it from osteosarkoma) though blood vessels were found between the lobules. The layer of bone surrounding the tumour was much thicker than could be explained merely by expansion of the original dense tissue of the bone - there must also have been new formation of bone on the surface.

A case of multilocular ganglion excised by Mr Lister is of great interest on account of its rarity. The ganglion had existed for some months had been treated in all possible ways & lastly the patient was sent to the Lister for excision of the ganglion It was found after dissecting it out that from a slight puncture made at one part only a comparatively small quantity of plain material was evacuated & the cyst could not be emptied. Microscopical Examination made showed that there were at least 2 if not more distinct cavities separated by complete fibrous septa. Want of time prevents me mentioning many more interesting microscopical

observations made this winter but I cannot refrain from shortly describing an interesting case of dislocation at the elbow joint.

Robert Munro ætat. 38 Boatbuilder admitted March 1st 1877

Ten months before admission he fell striking the inner side of the forearm against a sleeper. The present condition of affairs was the result.

In looking at the arm the anterior surface of the humerus looking directly forwards the forearm is seen to be deflected outwards forming with the shaft of the humerus externally an angle of about 120°. There is slight upward & downward but no forward motion.

The internal condyle & articular surface of the humerus can be felt subcutaneously at the inner side of the arm. All the natural markings of the articular surface can be distinctly made out. Posteriorly the projection of the olecranon process is marked at the outer side of the arm somewhat above the radial articular surface of the humerus. The head of the radius is also marked (a projection & a hollow above it - the head of the radius being in natural relation to the ulna and apparently conical with the apex upwards. On attempted pronation & supination the head is felt to move slightly.

On flexion of the fingers and attempted pronation of the arm three muscles seem to be attached to the

External condyle of the humerus
On making the patient extend the fingers and attempt supination of the forearm the muscles seem to be attached to the head of the radius.

Ulnar nerve can be felt distinctly over the middle of the posterior surface of the humerus

March 16th Operation.

Mr Lister made a longitudinal incision over the tip of the external condyle extending the lower end of the humerus. The cartilage was found to be covered with a layer of fibrous tissue but this could in most places be peeled off leaving the articular surface covered with a thin layer of apparently healthy cartilage. In one part a drop of synovial fluid escaped. In one or 2 places the fibrous tissue was very adherent & had to be scraped or cut off. Dissecting it was found that there was a small projection of bone above the articular surface for the radius. This was clipped off.

On the outer part of the articular surface muscular fibres were found attached to the fibrous tissue covering it. These were found to be part of the attachments of the flexors &c.

The articular surface of the humerus of the forearm having thus been properly shaped Mr Lister proceeded to dissect down deeply till he came to the articular surface of the Ulna. This as in the last case was found covered by fibrous tissue which was peeled off.

As the head of the radius could not be got at

from the internal incision an external one was made & the head of the radius exposed when the conical shape was found to be due to a small portion of the epiphyse of the humerus having been broken off & remaining in contact with the head of the radius. This was removed & the fibrous tissue covering the head of the radius removed.

There was great difficulty in accomplishing reduction on account of the shortening of the muscles & in the attempts a portion of the cartilaginous surface was broken off from the articular surface of the Humerus. After removing the elastic band reduction was satisfactorily accomplished.

Upto the present date (April 28th) the case has progressed rapidly & satisfactorily. The wounds are now almost entirely healed the blood clot having lain in the wound all this time. No suppuration no inflammation no pain except on extreme movement

After the operation the arm was paralysed partially from long continued pressure of the elastic band during the operation. This he has now almost completely recovered from & by ~~degrees~~ for instance he moved his elbow through a complete right angle without any pain.

Passive motion has been carried on from the first & almost the full extent of all the normal movements.

There was no constitutional disturbance in the way of feverishness loss of appetite

This is by no means a unique form of dislocation. It is the form which ~~lateral~~ dislocation outwards & backwards almost invariably assumes when left unreduced.

JV

the temperature rose after operation to 101° or the following evening but fell rapidly after that & the normal limits were not disturbed. (That the temperature after operation should be a little higher than normal is explained by the great tension of the joints after reduction of the dislocation).

The points of interest in this case are;

I. The form of dislocation - a dislocation outwards & backwards. As to the mechanism of this dislocation it is difficult now to say in all probability it was at first a simple dislocation outwards & slightly backwards. Muscular action of the triceps especially of the Biceps which had probably remained entire would draw the radius & ulna upwards & backwards & at the same time that the Biceps drew upwards it would produce the outward deflexion. This latter would also be in part due to the direction of the force. The fracture of the external epicondyle seems to have been an accidental occurrence.

II. The condition of the articular surfaces. Covered by a layer of fibrous tissue which could be peeled off leaving a cartilage covered articular surface. Microscopically the tissue over the cartilage consisted of small white fibrous tissue with deposits of adipose tissue interspersed. No cartilage cells could be seen in it.

III. The operation itself. That a joint can be treated as this one was, the articular surfaces cut & shaped & the natural

form so as to have at the same time a perfect muscle joint & also not the slightest red eruption is something quite new in surgery & a convincing proof of the efficacy of the Antiseptic treatment when properly used.