

**Notes of lectures on Bacteriology by Edgar March Crookshank
[1858-1928], with other notes and extracts**

Publication/Creation

1895

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REPORTER'S
NOTE BOOK



MS. ~~457~~ 4587
ACCESSION NUMBER
54400
PRESS MARK

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Bacteriology May 9
Crockham K.

Microscopes & Staining
vibration
1 Spherical aberration
2 Chromatic aberration
3 Cover glass " Correcting
lenses
1 Compound lens
2 Apochromatic objectives (7x, 13x)
3 Screw collar adjustment
Immersion system. Cedar oil used
"Homogeneous immersion objective"

Simple & Compound Microscopes
Eyeglass + Field glass & Eyepiece
Rose model (aim) objection vibration
Jackson model. No aim + no vibration

Stand Tripod with corkpadded feet.
Ross model - 2 legs of brass/cork
Beek's - Single Column (Bad)
Horseshoe Jackson model
(best)

Inte. Draw tube shd not be used.

Triple Nosepiece - a Convenience -
1 inch $\frac{1}{8}$ in + $\frac{1}{2}$ in. desirable

Stage shd be large.

Diaphragm. His diaph. best

Substage Condenser - has to be brought up
very near the specimen -

Some microscopes have fine as well
as coarse adjustment to S Condenser.

Practical work

Blood of guinea pig with anthrax

- 1 Staphylococcus pyogenes aureus
- 2 Anthrax (Gentian violet)

Lect. 11 - 17 Aug.

Illumination of microscope

Paraffin lamp best 1 in.

Use edge of flame; not flat part

1st Remove mirror altogether & work
direct on flame. Use low power.
Place lamp in front of microscope
so that image of edge of flame
is in field

Shut diaphragm, & get edge
of flame exactly in centre of
field

Now use high power $\frac{1}{12}$ in.
Bring flame into centre of field -
Focus condenser

Leitz
Small Knicker stand lock
Screw adjustment T
Triple nose piece - £14
Leitz's model with rack &
pinion 16 Zeiss' - £24

Preparation of specimens for microscopy

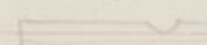
Coverglass preparation
1st Have clean slide
Requisites - 4 coverglass
1) Coverglass should be washed in
acid & kept in spirit.

Liquid specimen -
Solid specimen -

Put drop of sterilized water
on covered glass, & rub
Organism ^{Culture} on point of
inoculating needle
Then pass from below
upwards through the flame

Cover petri dish with 2 or 3 drops
of stain & wash off after
2 mins -

Examine microorganisms
in fresh state - under drop of
water or broth (sterilized)

Use slides  with
cell -

1. Sterilize slide
2. Sterilize culture

3 Deposit drop of broth on
Cover glass

4 Touch with inoculating
needle previously dipped
in culture -

5 So as not to disturb drop
make ring of vaseline around
it, & invert slide over it.

Microscope inside incubator
Cultivation

Koch's laws

1. Nutrient gelatin - BT + Gelatin

2. Agar agar - Jahnke's agar
edgewise less gelatin

Quant. of blood -

Solid Media
Potatoes sliced

Three cylinders oblique



Bacillus anthracis

Bacteriology - May 24

Modern methods of cultivation
Separating different microbes

Expts

(8 p.c. gelatin)

1. Inoculating tubes with liquefied jelly

1st dilution 2nd dilⁿ 3rd dilⁿ

In 3rd dilⁿ organisms will be separated

2. Sterilized glass plate (150 g.) Roll

rod (sterilized) dipped into tube

over plate - 1. 2. 3.

3. Put aside plates either in room or incubator

— colonies will develop — in 2 or 3 days

or 2 or 3 weeks

Appearance of colonies characteristic

Waterbury 1/20 c.c. 1 cone no. of colonies

Esmeralda Roll tube method

2 Streaking gelatine plates
by inoculation

Anthrax. more prevalent in
continent than in England -
Pastor & Koch's researches
Cultures on potatoes - creamy growths visible

Anthrax cause of sudden death
in animals

At PM - Spleen is enlarged

Drop of blood from spleen contains
enormous quantity

Cut off the ear or foot

Preventive measures - Remove
rest of stock & vicinity, & take temperature
every day if well

Preventive inoculation - Effect doubtful.
Disinfection of pasture by heavy topdressing
of lime, convert it into arable land,
or plant it -

What to do with Carcass? Burn it
or destroy it by chemical agents

- Bury it in lime if Corpse has not
been opened & remove off space -
put quicklime above & below -

Not however close to a stream.

Spasmodic outbreak Annual and
Sindurs - also a few days after -

Yeo (oil) outbreak - Wool factories

And the rare associated in pigs with
enormous swelling of throat

Sections from Guinea pig

Stain by Grammer's method -

1. Prepare Solⁿ Gentaian violet in
Aurine water (Aurine water + Gentaian Violet)

2. Place sections in Solⁿ for 10 min

3. Transfer them to Solⁿ Iodin in K₂ I. keep
them in 1 min (Mordant)

4. Transfer them in alcohol -
or Clove oil & alcohol.

5. Put them into eosine
Clove oil
alcohol.

Canadabalsam

Dilute pink {
Bailli blue }

Bacteriology May 31

Anthrax - Ulcerⁿ of tonsils }
 (in some) oedema of throat - }

Bacillus of malignant oedema

Differs from Anthrax -

In mal. oedema	Anthrax
Dark Zelenko	48 -
Spleen normal	Spleen enlarged
Cover glass.	Cover glass & 50x lens
In spleen	innumerable bacilli
absol ^y nothing	
except for green membrane	
longer, narrower &	
more curved	
Spoore form [?]	no spore form
Cultiv ^d in <u>mil</u>	Cultiv ^d <u>Copman</u>

Tuberculosis & Tubercle bacillus

Rod discovered bacillus in 1882.

Slender rods with granular (ovoid)
bodies within - really coagulated
protoplasm - (no spores)

To stain, heat is required -

To stain *Sputum*.

Boil fresh milk, float cover glass ^{500x}
wash in acid, stain with methylene

Cultiv - Difficult - Blood cell free

Sp. c. glycerine added to

Agar agar etc. produces cultures

Tuberculosis occurs in most warm

-blooded animals &

"Pearl-disease" *Opasella disease*

Rats. Dogs. Goats immune

Report of R. Comi on Tuberculosis
no good

Milk f. Tubercular cows containing
Communicable Tubercle bacilli

Case of Tubercular Cow.

2 or 3 drops of milk produced
Tuberculosis in other animals.

(Phys. Guinea pigs, Calves, rabbits)

Primary Tuberculosis in man
uncommon

Hardness of udder not characteristic
The last drops from affected quarters
full of bacilli - shd be taken in test tube

Examine sediment -

Tubercular disease propagated this
Sputum. Can be disinfected
by carbolic acid ^(1:40) Not by

Corrosive Sublimat (no good)

Guinea pigs inoculated with sputum
died by cancer no worse at
end of year

Intuberculosis of knee joint, Chronic
t. glands Difficult to demonstrate
tubercle, but can be propagated
if inoculated into Guinea pigs

Chemistry of products of
organisms (bacteria)

As far back as 1822 Caspar pointed
out that there was an intensely poisonous
principle in extract made from
bodies after death. - Ptomaine

Ptomaine - non oxygenous - liquid
" oxygenous - solid

^{1st} First researches in toxicology theoretical
produced by Dr. Salmon, in America
In 1827 Wooldridge investigated
humidity in rabbits, isolated
protein bodies
1829 Hankin

Work - Inbarale
depriving

Sputum.

Collect in glass capsules

Pick out yellowest or caseous
module -

Spread it out.

Squeeze it between 2 cover glasses
or with point of knife press it down
Dry

Pass through flame 3 times
Holding the cap when steam is rising
Holding the cap 3 mins -

Rinse in acid

Wash in water

Float in melting time glass

Sections to be left 10 mins
in hot solⁿ

Bacteriology June 7.

Leprosy, Glanders.

Actinomycosis.

Leprosy. Bacillus found in cutaneous lesions, practically identical with Tubercle bacillus so far as staining is concerned. Leprosy bacillus however resists attempts at Culture. Prof. of Jussieu however mistook Tubercle culture for leprosy. Indian Leprosy (Cramb) made a mistake in bacillus with which he cultivated. In Germany rabbit supposed to be inoculated with leprosy really inoculated with Tubercle

Glanders. Small slender rods
with rounded ends - resemble
Tubercle - but differ in their cul-
-turations. Culture on potato
characteristic (reddish brown)
Horse-pox may be mistaken for
Glanders - Bacillus prodigiosus in
Wallem used for diagnosis.

Actinomyces. Not investigated
much till lately, though known
to vets. in 1827. Called "Wens"
or "Sit-factis" etc. Prevalent in
Europe.

Actinomyces - attacks

(1) Digestive System attacks nasal
membranes - mucoid growths,
Fistulae on lips & palate.

(2) Upper & lower jaw - carious
teeth, & spreads to adjacent
cavities, turning bone into
"funicular stone". (3) Tongue - usually
nodules & ulcers called
"wooden tongue or Schirrons".

(4) Pharynx in form of
polyloid growths.

~~(5)~~ Respiratory System

1 Nasal cavities

2 Larynx & trachea

3. Lungs. (nodules may be

mistaken for tuberculosis)

Lungs & Diffusion actinomyces

C. Nervous System -

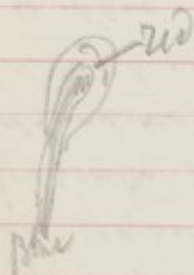
Rare - but Tumour of spinal
Cord has been found -

D Reproductive organs -
occasionally

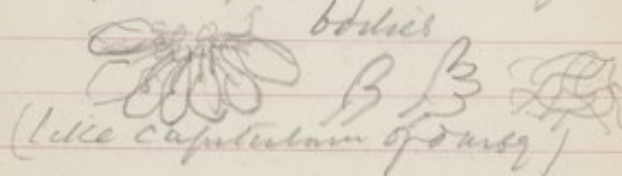
E. Skin & Subcutaneous tissue
as Wen - On section
characteristic honeycomb
appearance for fibrous
trabeculae -

Disease occurring in man -
may affect similar tissues
as above -

Noticed in lungs - producing
characters of bronchiectasis
Sometimes phthisis - Only



Inflo composed of club shaped
bodies



to be diagnosed by finding
fungus of actinomyces.
Tumour in brain described
by Dr Delaplane - Has been
found in bone -

Inflo figured in 1848, but
not recognised; cases now
frequently overlooked.

To diagnose, examine pus,
thoroughly spread out on slide
in test tube. You will

see yellowish granular spots
Granules round or ellipsoidal
Guttles in concentric lines seen.

By Gram's method you get
only filaments stained blue
orange red in Gram's stain

Origin of Spore wh. grows
into filament
Colonising different in man
& animals.

Source of disease - Probably
derived from cereals, e.g.
rye grass

Steaming Method

Gram's Methods (or Prints)

By S. J. S. J.

Typhoid & Diphtheria

June 14. 95

Drawing showing Horse-pot -

Typhoid b. first obs'd by Koch

Gaffke investigated it

Typh. b. increase rapidly in
Keep spleen a few hours then get
Colonies - also in inoculations.

Apes fed on bacilli don't get

typhoid - mice & guinea pigs ~~2~~
reproduce microbes & die, but no

characteristic symptoms.

Characteristic, numerous flagelli

from 1 or 2 to 20

in the lab

March 1883

1. Q. def. on a back of
2. Q. def. on a back of
3. Q. def. on a back of

Q. def.

Q. def. on a back of

Q. def. on a back of

To stain cultures

1. Water on cover glass.
2. Spread out trace of culture
3. Stain with gentian violet.

To demonstrate flagella

Gammin $\sim \frac{10}{10}$ + Carbazole Soda
Lime Sulfate 20

Thin out culture in pure water.

Take drop of sol. place on cover glass

with film; warm in flame -

hold it as usual; wash - stain

with fuchsine.

In sections use methylene blue.

On potat cultures have numerous
flagella.

Recent dangerous flood
in the district
bottom creek

3 hrs in many hours
in water, and perhaps
over he will as before
consider only the

From report:

the results
are complete

1. Stigmata he good
2. In this sign that
Magg

4 in covered

the getting

To distinguish from bacilli
Theobald Smith: (bact. coli commune)

Typhoid does not produce gas
in media containing sugar

Question whether ^{glucose} typh. fever
bacilli are found in water.

Typhoid fever b. inoculated does
not necessarily produce typh. fever.
Death due to septicemia from
toxins.

Exam. of water for the bacillus

Some other organisms - but
we will p.e. glabrous and dectrop
Other organisms

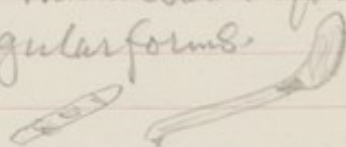
not intense -
Machly's test - in the air
to test of growth

Complete
Vibrio m. m.
! Count medium only

difficult
for further study
diff. between two

Diphtheria bacillus first
recognized by Klebs. more
fully described by Loeffler.
Pseudo-diphtheritic bacillus
to be distinguished from
Klebs-Loeffler bacillus.
Inoculate blood serum &
you get characteristic colonies.

Bacilli straight rods with rounded
ends. In culture you
find irregular forms.



Special medium for rapid
growth blood serum with broth
containing sugar, peptone & salt

Joe Knott Bower

Parvuli form -

in fallen goats

lady's room

Dr. Thelock -

Notes -

Notes

Report distributed

Received from Mr. 1914

8/11/14

Army of the Air

14/01 1914 for 1914

1914

1914


Cultures grow rapidly in milk.

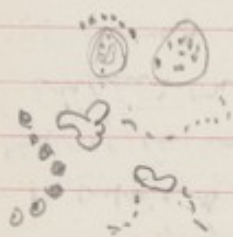
Final test in culture of *Grimmberg* kills it in 4 days.

Tell rate more effective than mixed fluid

Grimmberg rendered harmless by using cultures exposed to heat - attenuating them thus. (60 to 70 C.)

Houses infected with *Grimmberg* with various broths - Inoculating growing substance produced = and then test to efficacy reports conflicting

 Staphylo-coccus
aureus

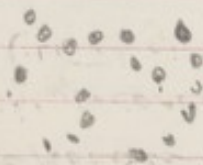


Streptococcus

Pyogenes

See sometimes large

chains
have
acidic
breath.



Pus - June 22. 95.
Erysipelas - Scarlatina

Suppur? mostly associated with

1. Streptococcus pyogenes
2. Staphylococcus py-aureus
(this liquefies gelatine)

1. resembles the microbe of
Erysipelas

In cultures in broth

Erysipelas culture deposit

chains on glass

Streptococcus sometimes produces

merely pus (suppur?)

Sometimes erysipelas

Dr. J. J. Jackson (Lancet)
 thought
 understanding of the
 fact is different
 subject with me
 from animal
 but he was 9 ft
 even less
 Dr. J. J. Jackson
 1. Confusion
 2. Refusal
 3. Sympathy for the cause
 again

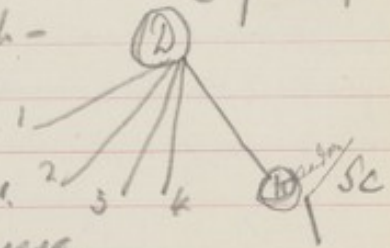
Scarlatina

Marybone outbreak (Etiology
 B. ph.)
 milk from Hendon farm
 Power was satisfied himself that
 there was no possible source
 of human infection; found
 vesicles in udder on teats of cows -
 W. Power argued was a form
 of scarlatina (bovine) Klein
 found *Streptococcus pyogenes*
 as characteristic of bovine
 scarlatina. In man however
 he failed to find the characteristic
Streptococcus except when
 there was suppuration. He concluded
 SC. was derived from bovine disease.

7.
 3 houses
 Dr. Weston
 Felling's
 at 11.30
 18.12.11
 Ch. of the
 Canon
 4 in of a
 1st hand
 9.11.11
 necessary to have
 18.12.11

Independent Enquiry ordered
 by P.C. brought out fact that
 Scarlatina had existed
 within 300 yds. of cowsheds,
 & that children ran in & out of
 sheds - Laundry near had
 to wash infectious clothes.
 In animals disease transmitted
 by hand alone - Source of
 ulcer traced to some new
 cows brot into dairy for a few
 in Derbysh -

Some sold
 also to
 4 other farms
 Venereal disease,
 but no scarlatina, resulted



Charles E. Hurst

Klein Valley Grand Staircase.
- *Colletes pygmaeus bovis*

2000

2000

Mean

Mean

Mean

Left
Mr. Langdon State
Disinfectant in place
of special character
2 for 100 9 in 100
lyse, in place of
- before treatment
- give test
- head: 1/2 in 1/2
be covered by shells
- sym-
- prostatic in
- head: 1/2 in 1/2

Cultures

Grammes method

Influenza bacillus

Nelson's method

+ Absolute alcohol,

(dyeing ground but not
bacillus)

CCC
Comme bacillus

~ ~ Spirillum

~~~~~ after some weeks

Gelatin

Liquefaction

flaming



Cultured

Colony

Nicholse asiatica -

Capping occurs in gelatin  
test tube culture -

Nicholera (Finkler)

nostris →



Granular

Colony

Inocul<sup>n</sup> for Cholera -

Anthrax. FID healthy blood

Serum is germicidal in

a high degree. Defensive

proteins.

Culture of "Exalted Virulence" used  
for inocul<sup>n</sup>.

*Tetanus bacillus*

1. Point of wound  
2. 1st. 2.  
3. Great majority of the points  
of wound  
4. 1st. 2.  
5. 1st. 2.  
6. 1st. 2.  
7. 1st. 2.  
8. 1st. 2.  
9. 1st. 2.  
10. 1st. 2.

Generalized Tetanus  
Tetanus -  
Tetanus -  
Tetanus -  
Tetanus -  
Tetanus -  
Tetanus -  
Tetanus -  
Tetanus -  
Tetanus -  
Tetanus -

Dr. Allen Lawrence  
Soluble Children  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus  
has a 4 tetanus

Tetanus.

*Tetanus* (Miesler 1884)  
Rabbits inoculated with  
garden soil develop  
tetanus.

Teeth melted.

Wip. momentarily into blood.

Characteristic radiate growth  
in gelatine, which is liquefied  
& gas develops -  
Much odour.

Bacillus not found in blood,  
yet blood will produce tetanus.  
Small quantity of blood 1:

Smith's Test  
Hand balance  
Western. 9.11.11  
Syringometer  
Tourniquet  
Amount of blood  
Osteoclasts  
In amount of

Immune rabbit produced  
immunity - 9.11.11  
Tetanus Antitoxin = 100<sup>5</sup>  
L. 11.11.11

13 summer  
 2 bottles  
 1-2-3-  
 3 bottles in front of  
 5th. Last 4 bottles  
 2 bottles in front of  
 5th. Last 4 bottles  
 2 bottles in front of  
 5th. Last 4 bottles  
 2 bottles in front of  
 5th. Last 4 bottles

Hydrophobia no organism  
 has been found -  
 Rabie virus inoculated thro'  
 Louis of rabbits - period of  
 incubation becomes chronic  
 4 hours - at last 6 days  
 Dry rabbit died for 10 days  
 I  
 10-9-7  
 4-3-1-  
 24th  
 11 course -  
 7- begins with





*En/ismos e Teoria*

Lench

Heeds always fear  
Images.

۱۷۰۵۷۹

19-32 caps & notes

Young recently.  
after a short interval

Results favour success  
Nihil hydrophobia occitales  
Severe.

Lot of fallacies in Statistics  
as to persons benefited

Several diseases of dogs  
Simulating hydrophobia

1886

7 226 - 5 drill

7387 - 2<sup>nd</sup> Mortality

8. 403 7 1.5 ✓

g. 388. 4 (5 or 20 or 20)

Pastor's treatment at present  
does no harm -

St. Petts  
 Insects full in  
 Infancy -  
 from after can come  
 1 per liter  
 2 / 1 temporary comites  
 a. Lenses of lenses &  
 very like a second  
 ability  
 strength of tooth  
 of the  
 patient  
 he is cannot afford  
 any hindrance -

*Cholera - motiglene rotel*

*Tetanus - mellea*  
*alcohol*  
*monumental*

Dr. Bollinger  
1 Brandy cabinet  
2 Trunks  
1 El. St. air  
2 Barrels  
1 Druggist's chest  
on 13 inch axle  
A spruce between  
Ang. door = in h. & c. room

Horse pox & guinea have  
nothing to do with each  
other - Vesicular morphology  
of horse is not guinea  
Whether horse pox &  
Cow pox are identical  
Sub judice -  
Cow pox is not equivalent  
to Small pox in man

In China half fox is  
used for race.

Sheep pox is infectious  
Cow pox is not

inferred basis for  
backward report.

7 days.

with much

but's offer cannot  
all be psychological

Benefit of character  
experiments  
to social studies

Experiments that could  
provide a supervisor  
can be done by teachers  
Guidance of teachers  
largely Holland

Mental tests for backward  
children.

Recent research by  
experiment.

3) mental tests

On the study

Genetic & environmental

Factors: Jack P. of

British - of Psychological

Bridge of Psychology

Reliability.



(D) Freeman read Dr. Hughes  
papers.

1 Means the employed

2 Treatment

S. M. & employing by

such as Stone.

Approved for exam. of

Sp. S. M. & Engage.

School choice including

Psychiatric Dept.

1. In P. Acc. & News.

School nurse would be

obtain from history

Dept. of Sp. S. M. & Engage.

Interchange of views

Outfit in lab 4

Memory - machines elaborate

Don't know & towards

at the moment

Memory from

to my list about 10th for teacher

2 fold - P. S.

(Teacher met page 1)

and (unconsciously)

Children not about 2 yrs.

Treatment

1. Medical

2. School

(Cotton?)

in 10 to 15 on early of

logic hypernatrism

10 - individuals

5 - for breadth

2 normal

Goldblatt -  
In Bryan's book

Opening remarks -  
Placental

Classification

It is a study

Suppression of testis and  
Mental does not mean  
but abnormal.

Test. Conduct in defective  
Moral Inst. Subclass of  
M.D.

Feeble mindedness -  
X 1010 of - Moron  
not identical with feeble  
Mental. Defective intellect  
but not conduct.  
Differentiation of Normal  
to abnormal

Normal do not want  
care & control.

Mental. d. not clear cut  
- d. of mind coupled with  
Conduct

Def. of Point  
Goldblatt - Intelligence  
Karl Pearson - mental

Intelligence

History - incapacity to  
adapt to social surroundings

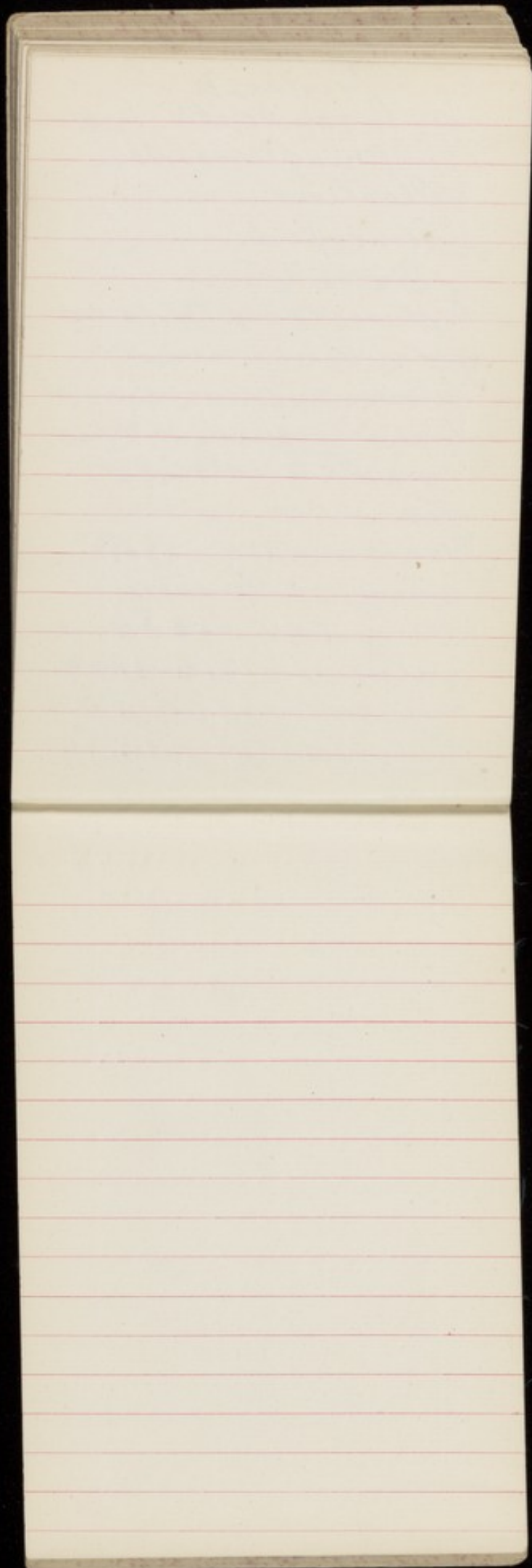
From birth to an early age

Not absolutely rigid &

Interpret. of test

Appearance of abnormal ch.

hypoth.



A number of blank pages follow  
and have not been photographed.



Did not talk till last March  
12 mos, when he was 4 years old.

to 10 or 12 in (4 times only) was  
continually struggling, turned black  
on chest.

He began to have these <sup>Kidney</sup> ~~casual~~ attacks  
6 or 8 months after first convulsions,  
but previous had terrible crying fits.  
He was crying nearly all day the day  
~~before~~ before he had 2nd convulsion.

For 9 months he had no power  
of standing, but one day quite  
suddenly he recovered his power  
of walking & began dancing about.  
Left in island 2<sup>nd</sup> July

Arrived in Eng - 23 March

Had attacks much as usual.

Sometimes 4 or 5 every day for  
a week.

Was lately had one or two a  
day - Had been in hospital

Brown & Brown  
Father - Mother  
|  
Father - Mother 1st Son

was in ~~the~~ church - now for good

Article <sup>alone</sup>  
Did not walk at all  
+ 15 m. -

Had a fall between 15 & 16 mos. old -  
fell & knocked his head against washstand.  
Had a convulsive attack was quite  
unconscious, legs & arms stiff, not  
convulsed - Had bath, & came out in  
about half an hour - foamed at mouth  
1 year old March 1890. <sup>Had convulsions</sup>  
2<sup>nd</sup> week in Nov<sup>r</sup> - had attack of infl.  
- lungs followed by inflam<sup>n</sup> of lungs -  
Had congest<sup>n</sup> of liver afterwards.  
Was ill till 16<sup>th</sup> Dec<sup>r</sup>. when he had  
severe attack from 3 am to 12 noon  
& convulsions of both sides of body.  
~~when~~ The paralysis of left side  
noticed after first attack.  
In March 94 had another  
severe convulsion for 6 hrs

12.60

1.50

2.27

T. Goughackin

T. Goughackin





