Creator(s)

Burnet, Sir Frank Macfarlane

Title

Epidemiology Notebook - Infectious diseases in childhood

Date

1951-1952

Description

Item: 1986.0107.00012

Yellow fever Stegomyia.

Work on Epidemiology.

V/2.5

Four cases.

Age incidence &c

1951-52

-5	15	0	7	1.6	1.0
-10	5	3	0	5	3.2
-15	11	7	2	5	2.4
-20	24	15	14	23	7.12
-30	50	18	11	19	23 41
-40	57	35	10	17	24 17
40+	69	57	16	26	24 23

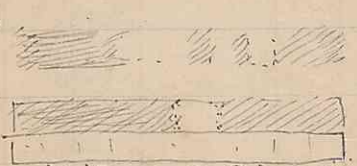
0 32 % of community above under 20. 16½% deaths

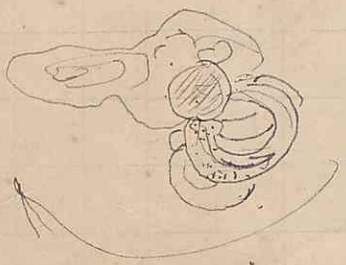
68 % " over 20. 83% of deaths.

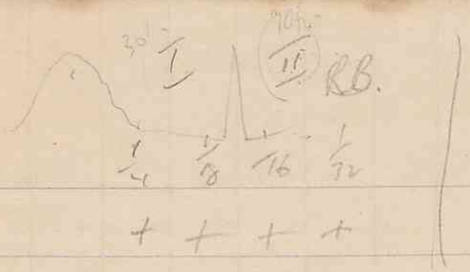
Stegomyia. Y.f. has a lower death rate in children than in adults.

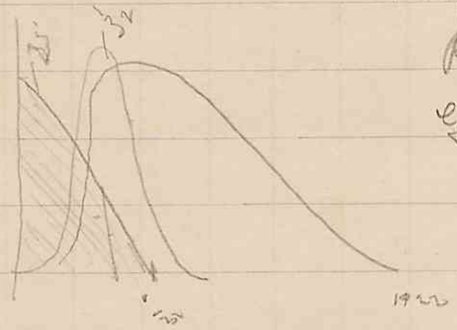
Martinique 1908. In children the course was very mild.

Summary: Analysis of the data in regard to percentage immune as compared with incidence of death suggests that under 20 the death rate is about half that over 20.









J Roy Statistical Soc

Registrar Gen Stats
Rev Eng & W.

Gunn JA The problems
of time
115 · G95

0	5.1	.1745	0
1	2.5	.1430	.225
2	3.5	.1654	.495
3	4.5	.1752	.675
4	5.5	.1781	.595
5	6.5	.1821	.553
10	11.5	.1906	.828
15	16.5	.1975	1.035

Outline for possible Harben lectures.

Influenza viruses as a microcosm of general biology.

Whatever one is studying has the potentiality of being the best available material for the demonstr. of some general scientific principle.

.. bounded in a nutshell yet count myself a king of infinite space...

were it not that I have bad dreams.

Concerned strictly with the influenza virus but will try to treat it as a text toward the understanding of broader topics.

Avoid main topics of V. as organism: Epidem. O.D. and immunization

I Ecological aspects.

II Reproduction and variation

III Interaction with the cell.

All are necessarily interwoven — Primary concern is the human disease.

Start with isolation from throat = Amniotic inoculation. Infective fluids.

The concept of a clone - adaptive variation - adsorption to red cells.

changing enzymic activity all immediately arise →

Particular question of the infective fluid which is the working material of the virologist

I Haemagglutination and its implications - - - - - - - - - -

Lecture I.

A The reception gradient and the changes in electrophoretic mobility.

B. de Burgh + Bovarnicks reception substance.

C RDE and its action on organism etc.

D. The indication state and the inhibition gradient.

E Protective action of RDE against infection

Immunology of universality - RDE on gonadotrophins. French's group expts. Interaction of enzyme + substrate both on surfaces.

2nd lecture Reproduction and Variation

Nature of a fluid in terms of clones. The O D story

Reinterpretation of O.D. on enzyme adsorption level.

Generalization of O D with NWS example.

Provides a more effective approach to problems of variation

Where do variations arise No doubt in the cell. Atlantic cell physiology. Bates. story of ribose + accumulation.

Evidence that interference is intracellular phenomenon.

Disappearance of qualities of infective virus. Hoyles phenomenon.

Hypothesis of decomposition to smaller units re constitution to virus.

Long forms as argument. Recombination of characters. or partial virus

Sendwey's vessels. Recombinations in mouse brain.

3rd Ecology.

Culture of the process of protection + infection in the mouse following Fay.

Probably that in the human we may be concerned with something different equivalent to lungs in which of antigen produced. unless bad. infection.

Repeated infection in man with basic immunity

Possibly that successive immunological change is necessary for survival.

Andersons phenomenon. of appropriate strains finland possible cyclic situation. Are there persistent carriers. Ocean Island Fin.

Slope suggestion as in V. as Org.

Boulenger dozen 1 mgm = 20×10^6 MLDs for mouse.

20 gm mouse 60.000 gm man. 3×10^3 mice = 1 man.

1 mgm = 6×10^3 Human LDs

1 gm = 6 million lethal doses.

Age Incidence of the common communicable diseases of children

. G. D. Collis Pub. Hlth Rep. 44 763. April 5 1929.

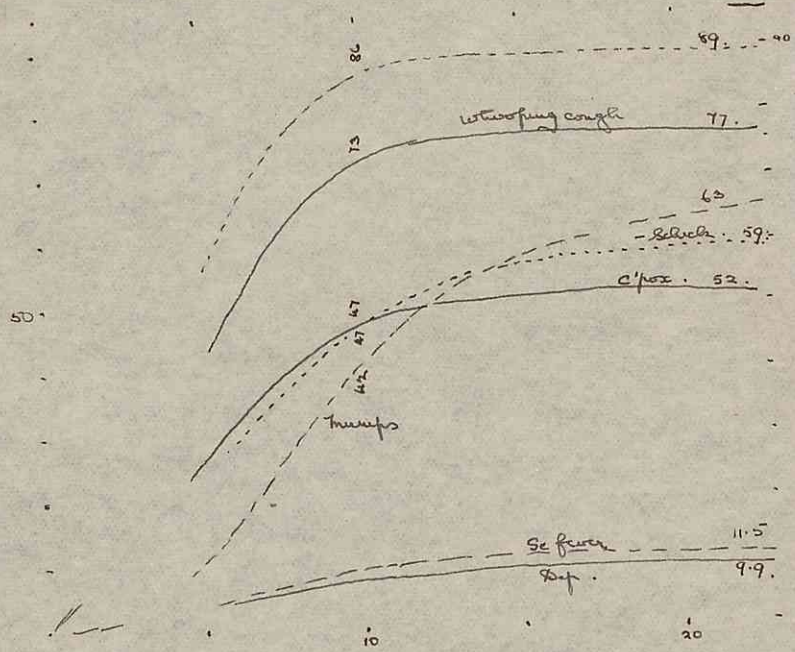


Fig 5. % of population of specific ages who have at some time in their lives suffered attacks of the communicable diseases of childhood.

Peaks of incidence. A per 1000 all children

B " 1000 not fives attached.

Measles A 3-4 (132.6)

B. 6-7 (236)

Whooping cough. 4-5 (101.6)

5-6 (160.6)

Mumps. 7-8. (66.0)

8-9 (89.0)

Chicken pox. 4-5 (61.8)

5-6. (78.9)

Scarlet fever 5-6. (12.2)

5-6 (12.7)

Diphtheria. A. 2-3. (9.4)

B. 3-4 (9.56)

B' Schools + . 5-6 [11.81]

If it is assumed that there are 23% of people who are naturally immune to whooping cough and consider only the 77% who at some time will get it the incidence rate increases considerably from birth to 16 years for all diseases except mumps.

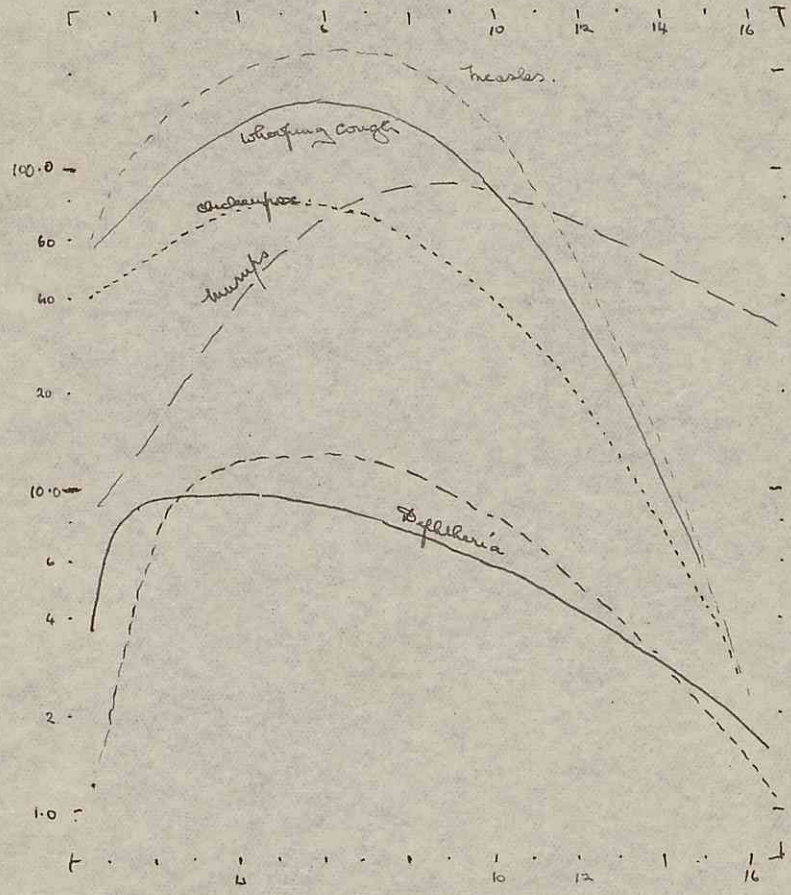
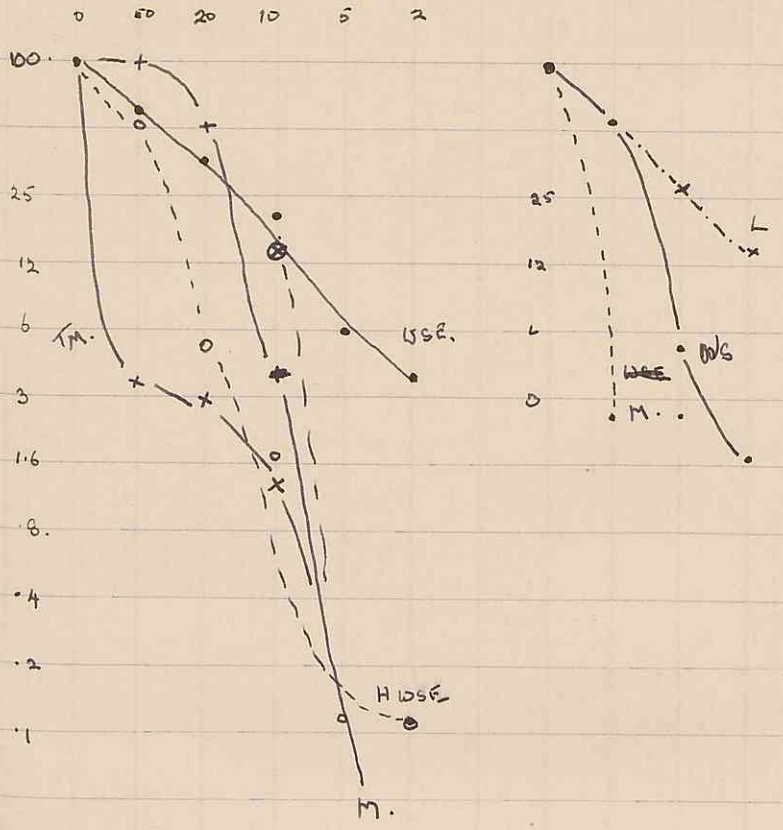


Fig 12 Relative change in the age incidence amongst persons not previously attacked.

Davis + Dalton. JEM 86. 215.

F.G. Young Univ Coll. working on growth. hormone of pituitary which is diabetogenic for some animals but not rat.



M WS L.

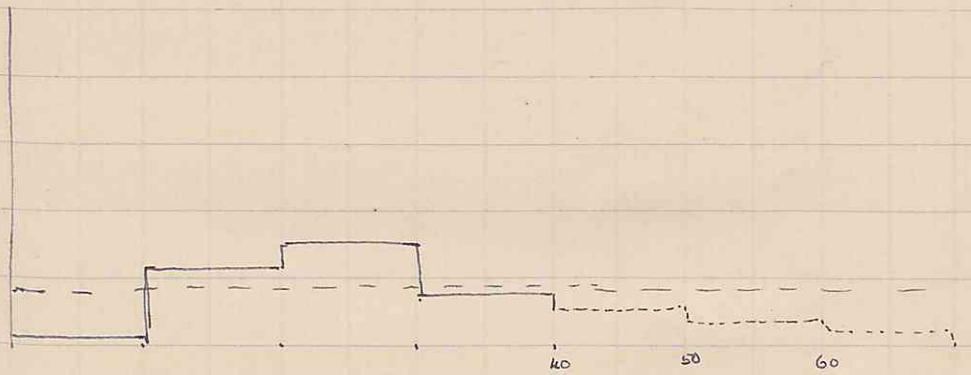
RDE 10

		· 2 ·	5	Pmw. 32
HWS	16000.	700.	2000.	7·2%.
TM	40000	150.	350.	40.
HL	26000.	300.	2000.	23.%.
M	8000.	150.	260.	
WS.	>.	20000.	40000.	

Actinomycosis Poulen I A BMJ. 1951 June 16. 1360.

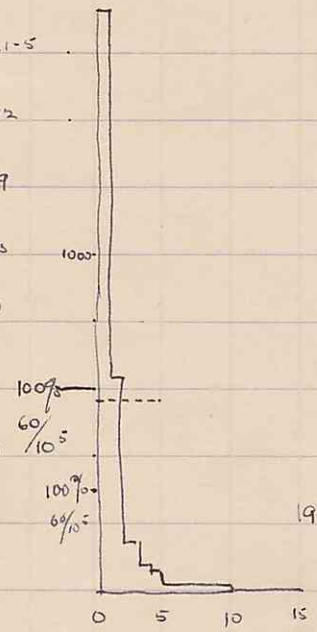
2 - 80 yrs.

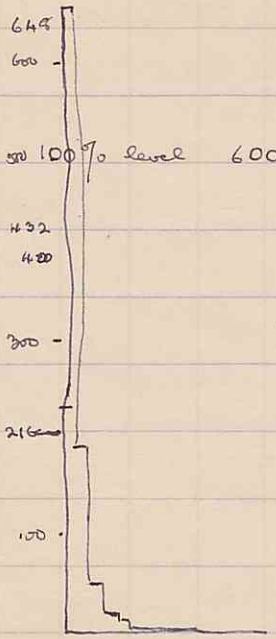
1 – 10	3	
– 20	23 (? – 11 military)	? due to caries.
30	30	
– 40.	16.	
50	diminishing. (26 all told).	
	98.	



Pertussis

	Males 1908-10	1941-5
0	1735	672
1	640	179
2	147	53
3	55	20
4	71	13
0-4	573	208
5-9	24	7
10-14	2.	1





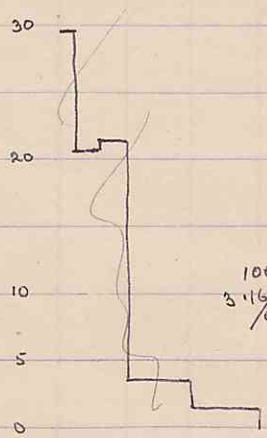
Of. 1908-10 and 1941-5 graphs are adjusted to same 100% level

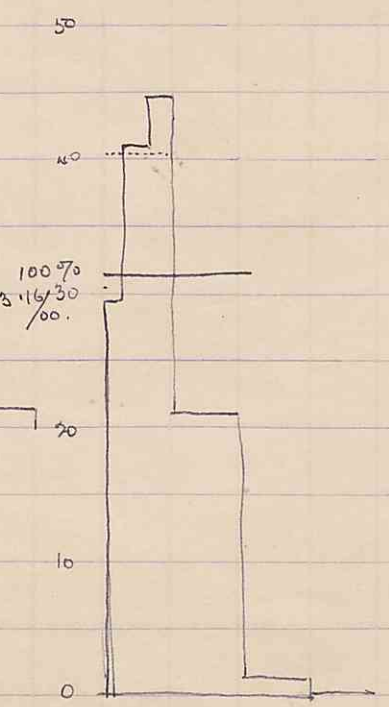
there is evidence that the mortality is still more concentrated in the 0-1 group

Notification per 1000. E+W.

	M	F	
0-1	14.5	15.1	29.6.
1-3	19.4	22.0	41.4
3-5	20.7	24.1	44.8
5-10	9.8	11.2	21.0.
10-15.	0.8	1.0.	1.8.
			138.6

29.6.
41.4
41.4
89.6
5) 202.0
40.4
21.0
1.8
63.3





12/3/52.

Notifications Eng + W.

0-1	29.6	93.
1-3	41.4	132
3-5	44.8	155
5-10	21.0	67
10-15	1.8.	5.7
0-5	40.4	128
100%	31.6.	100.

$31.6/10^3$.

1000
100
10
1

Mortality. ~~1908~~ 1941-5 Australia

0	~~1735~~ 672	624
1	174	162
2	53	49
3	20	19
4	13	12
0-4	206	192
5-9	7	7
10-14	1	1
100%	108.	

624

Note that if total incidence is in first year the height of the peak will be 1000%.

100% = either total no of cases / total population concerned.
or. the rate which would be shown if all cases occurred in one 10 year interval. assuming each decade has the same number of people.

Age incidence of pertussis

" " mortality.

100%

$300/10^5$ Data from Lancaster MJA. 9/2/52.

$10.8/10^5$ mortality.

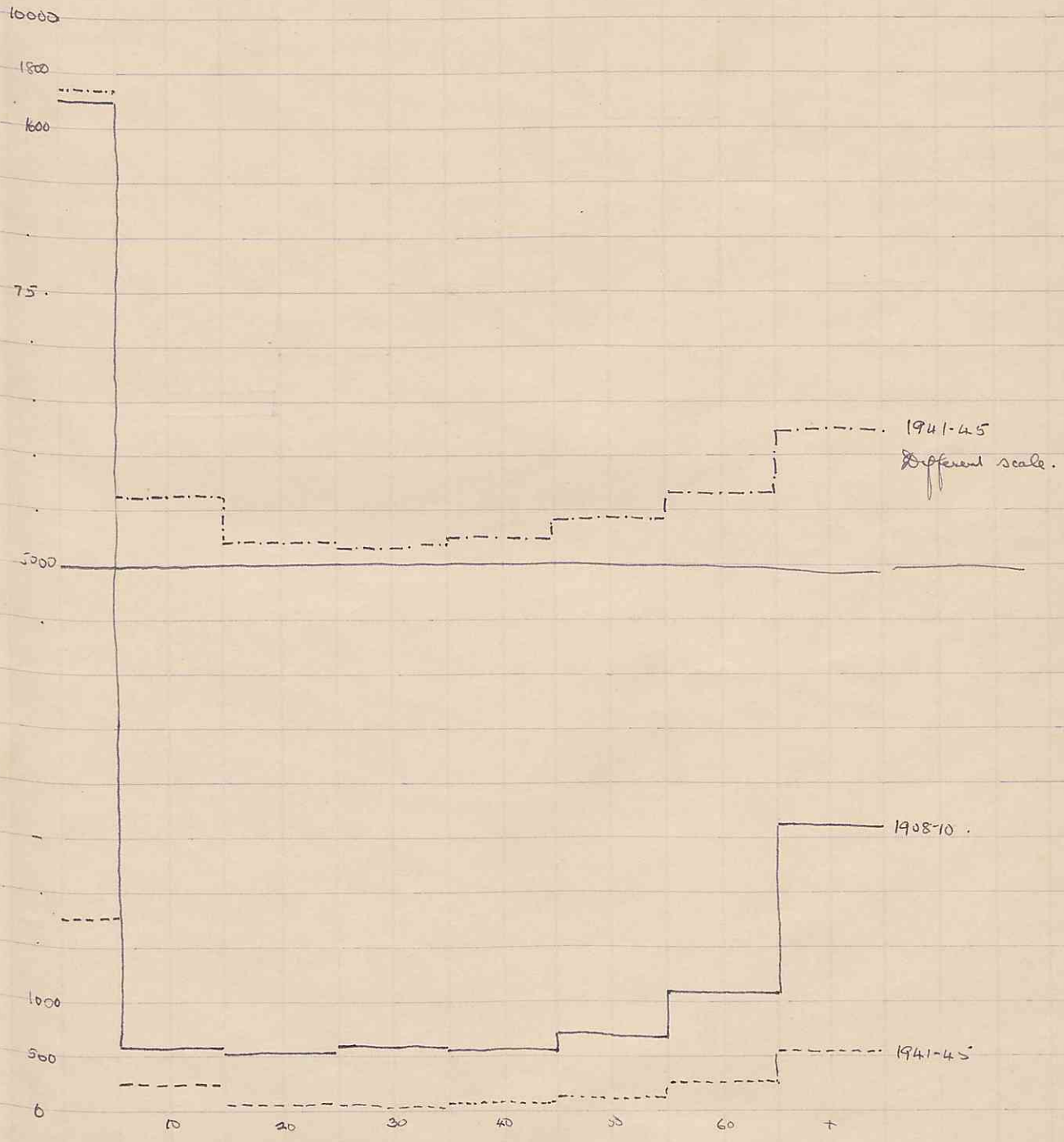
Uniform distribution

0

Rushabia

Lancaster MJA. 9/2/52.

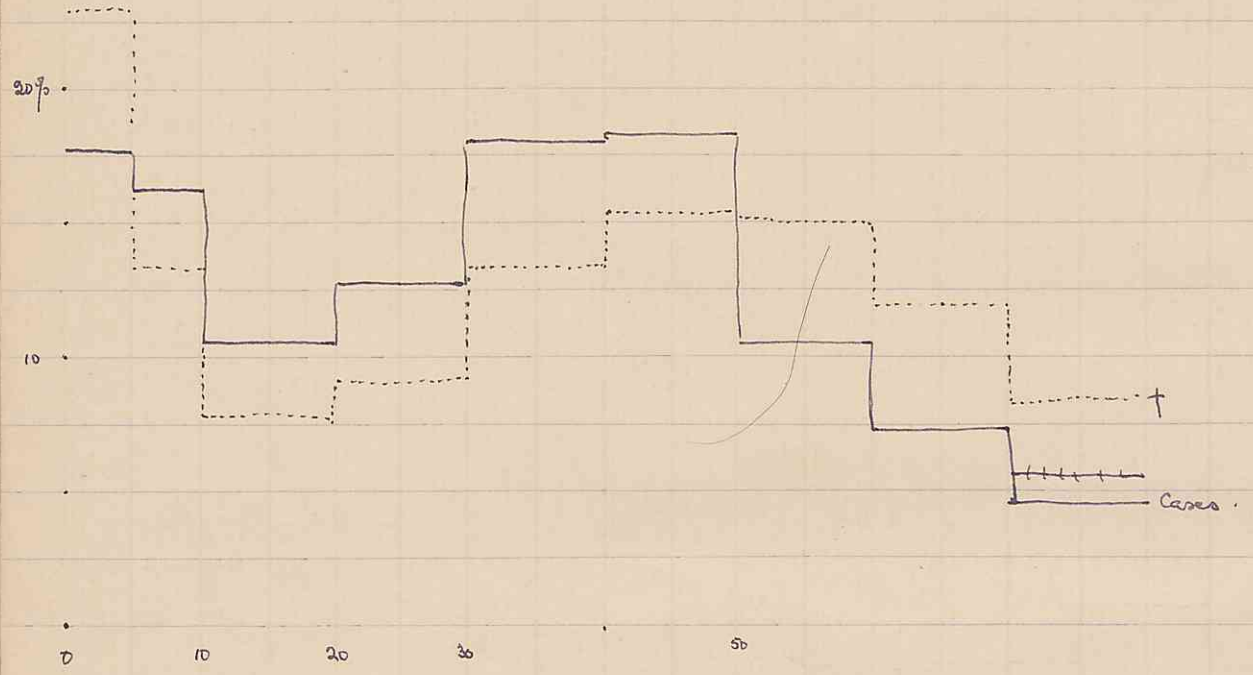
Death rates per million per annum at ages. All acute infective diseases.



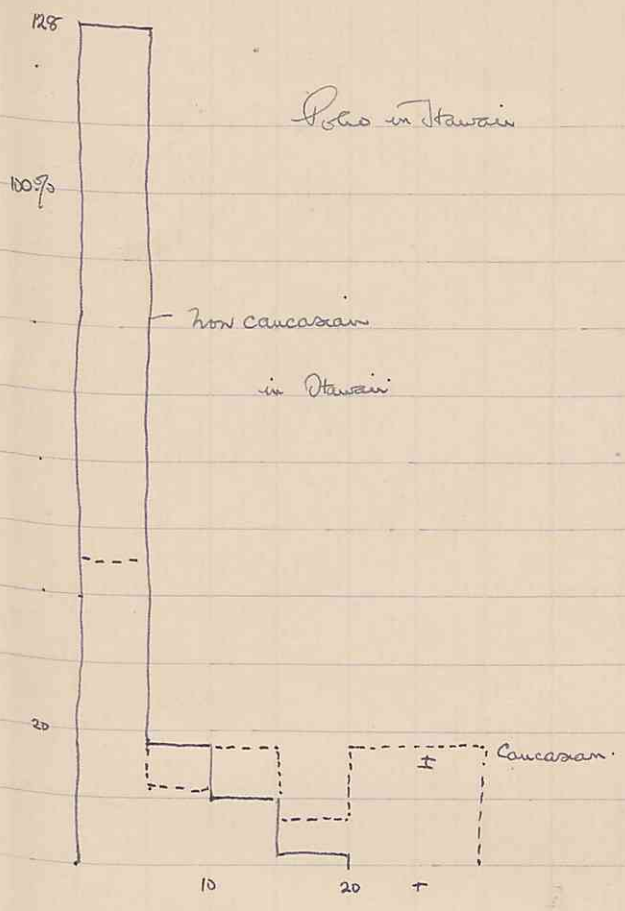
Underwood & A

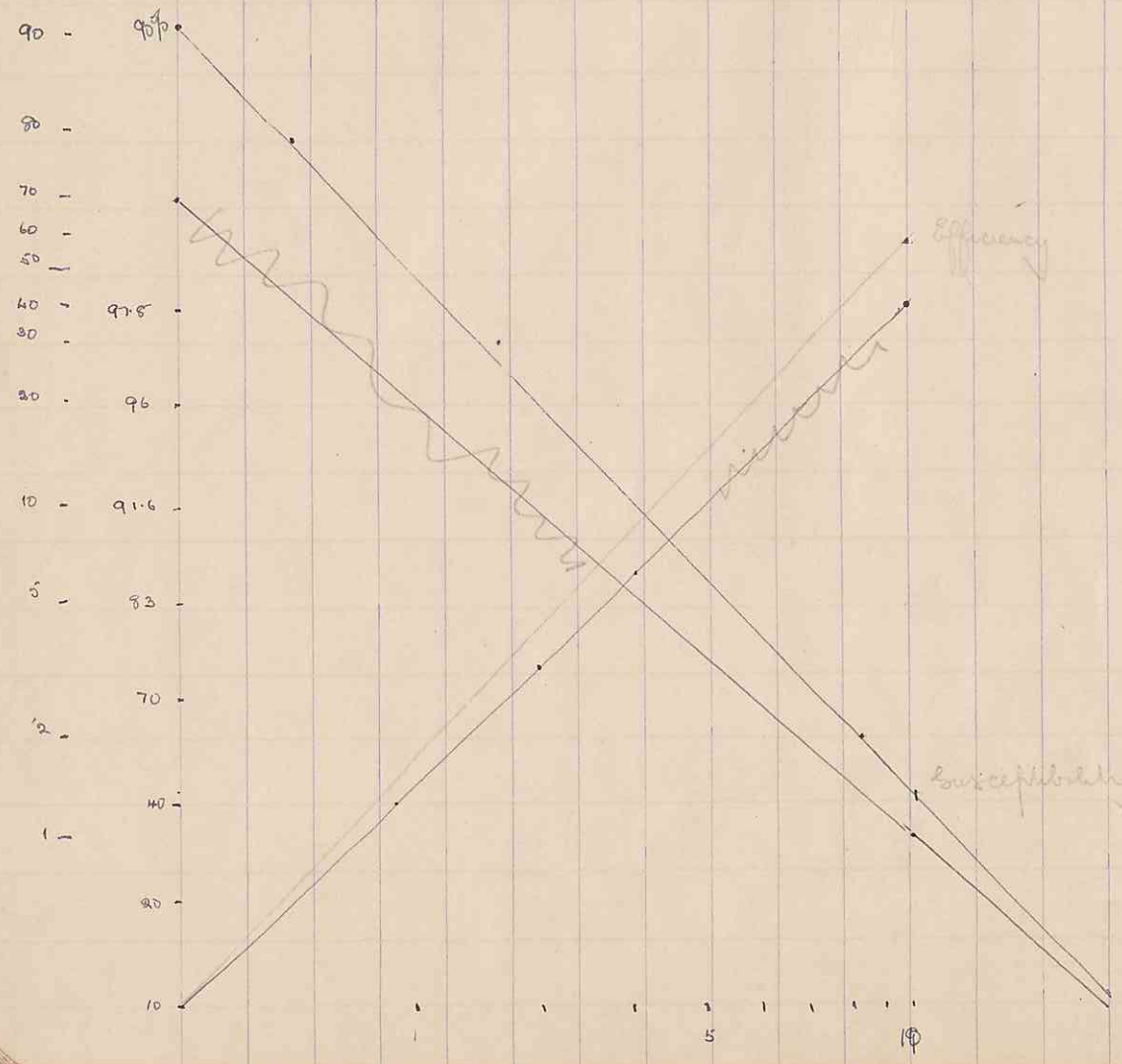
PRS Med. 28 603 1934-5

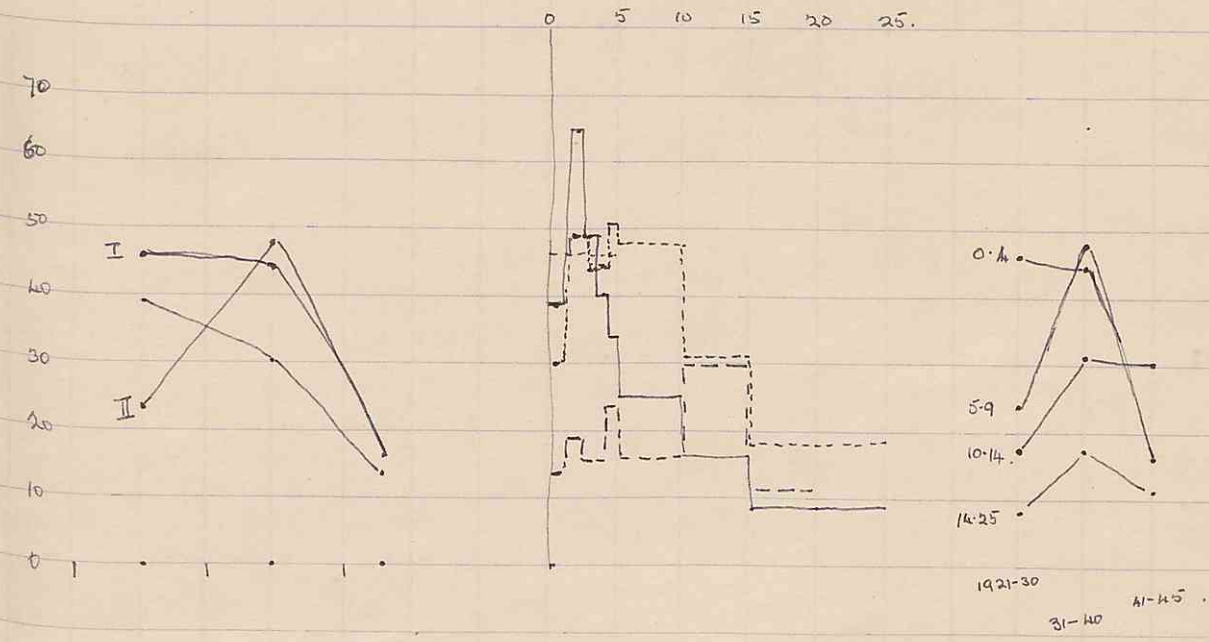
1832 Cholera epidemic in Yorkshire



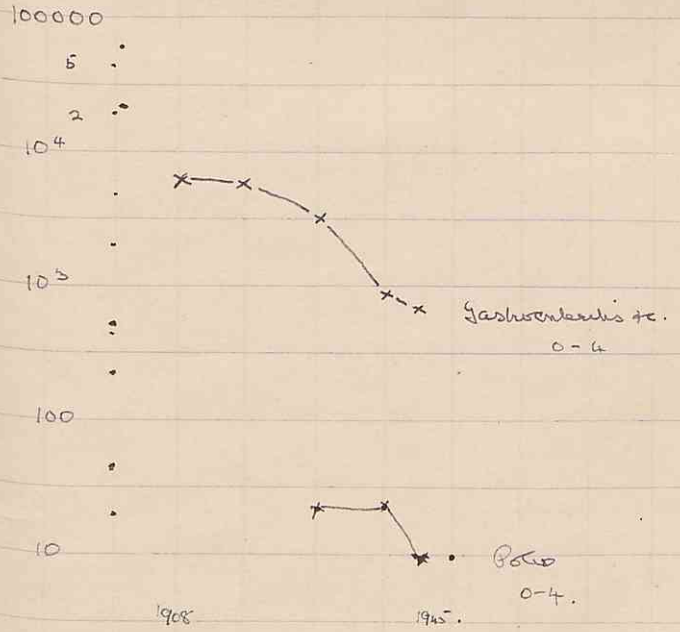
1696 cases 661 deaths by %'s

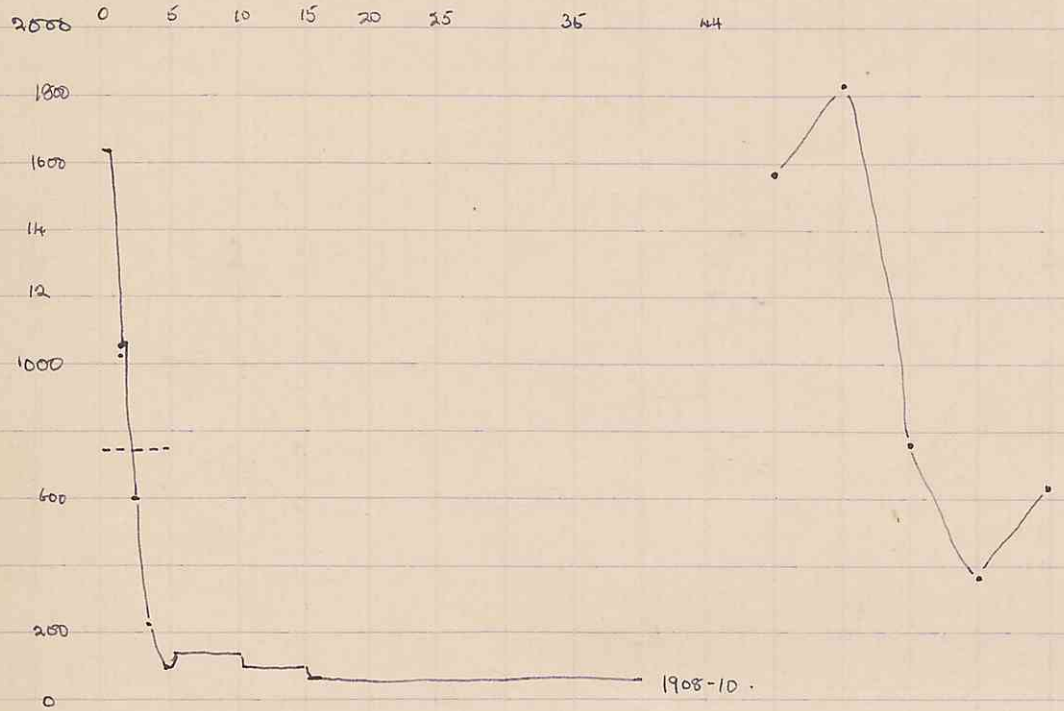

128
100%
20
10
20
Non caucasian
in Hawaii
Caucasian

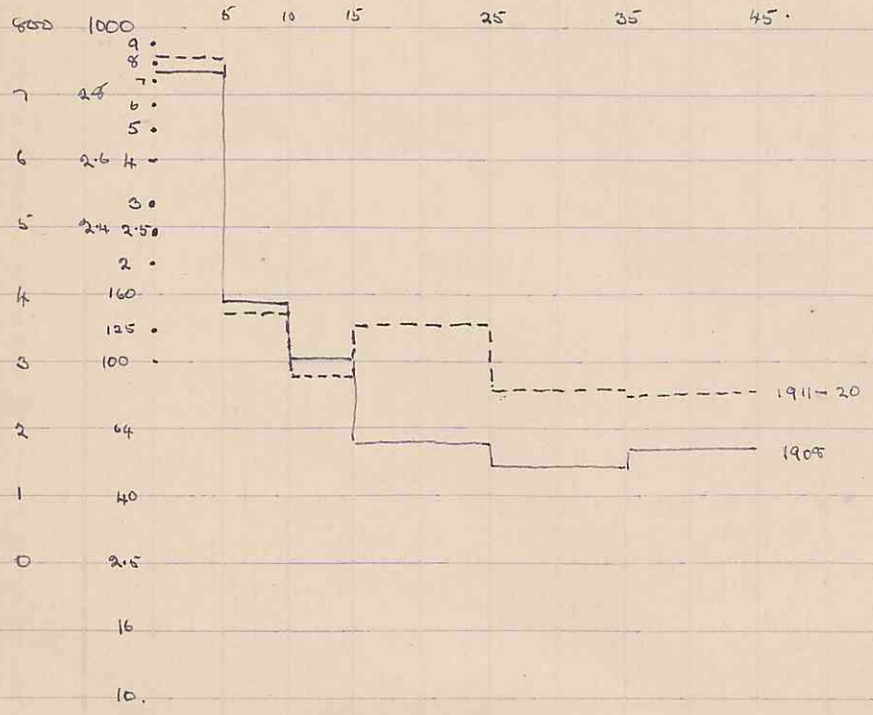

90
80
70
60
50
40
30
20
10
5
2
1
95%
97.8
96
91.6
83
70
40
20
10
Efficiency
susceptibility
1
5
10



Polio morbidity. per million per annum Australia.



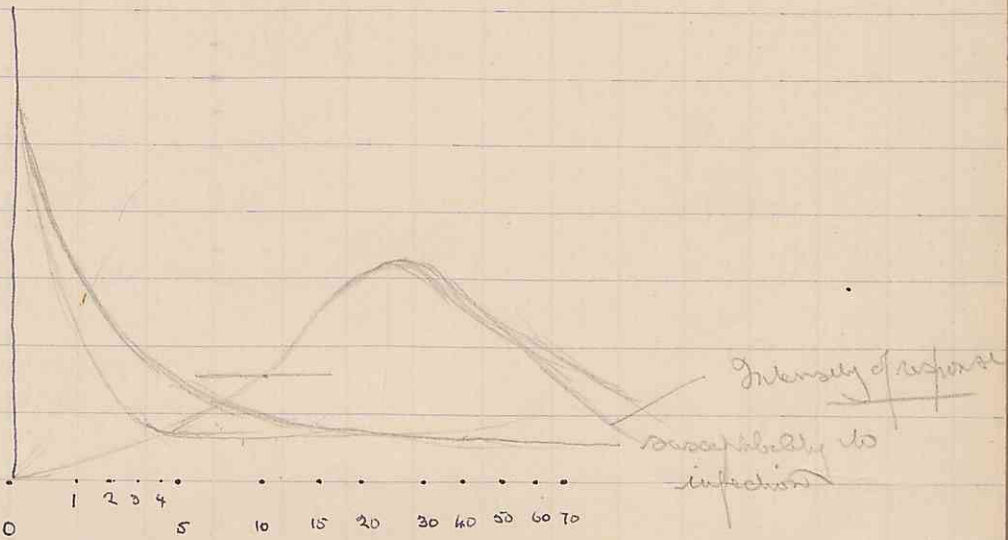




Mennyglis Lancaster

Using histogram line in which each 5 years is given a duration equivalent to the fraction it is of the amount of life that has been experienced

0·5	5	
5-10	2·5	7·5
10-15	1·67	9·17
15-20	1·25	10·42
20-30	1·83.	12·25
30-40	1·33	13·58
40·50	1·10	14·68
50-60	0·88.	15·56
	0·74	16·30



Age changers.

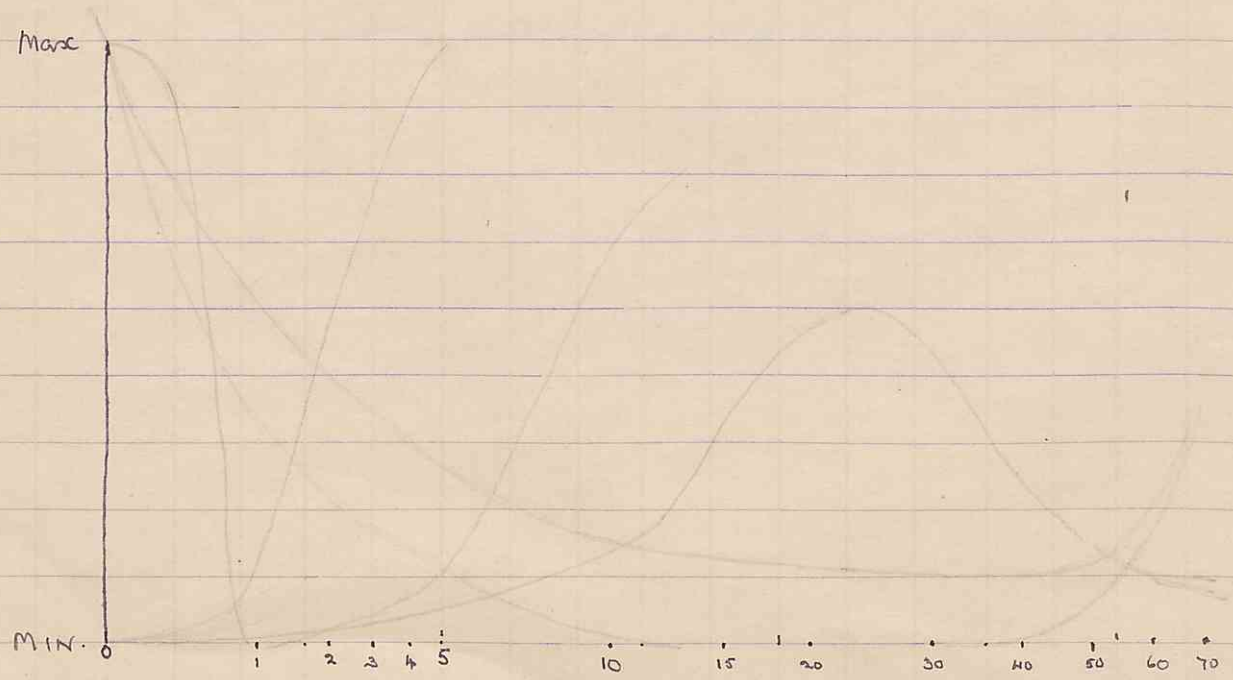
1) Susceptibility of superficial tissues to be invaded.
2) Ease with which generalization follows superficial infection
3) Intensity of inflammatory response to infection

} In the non immune

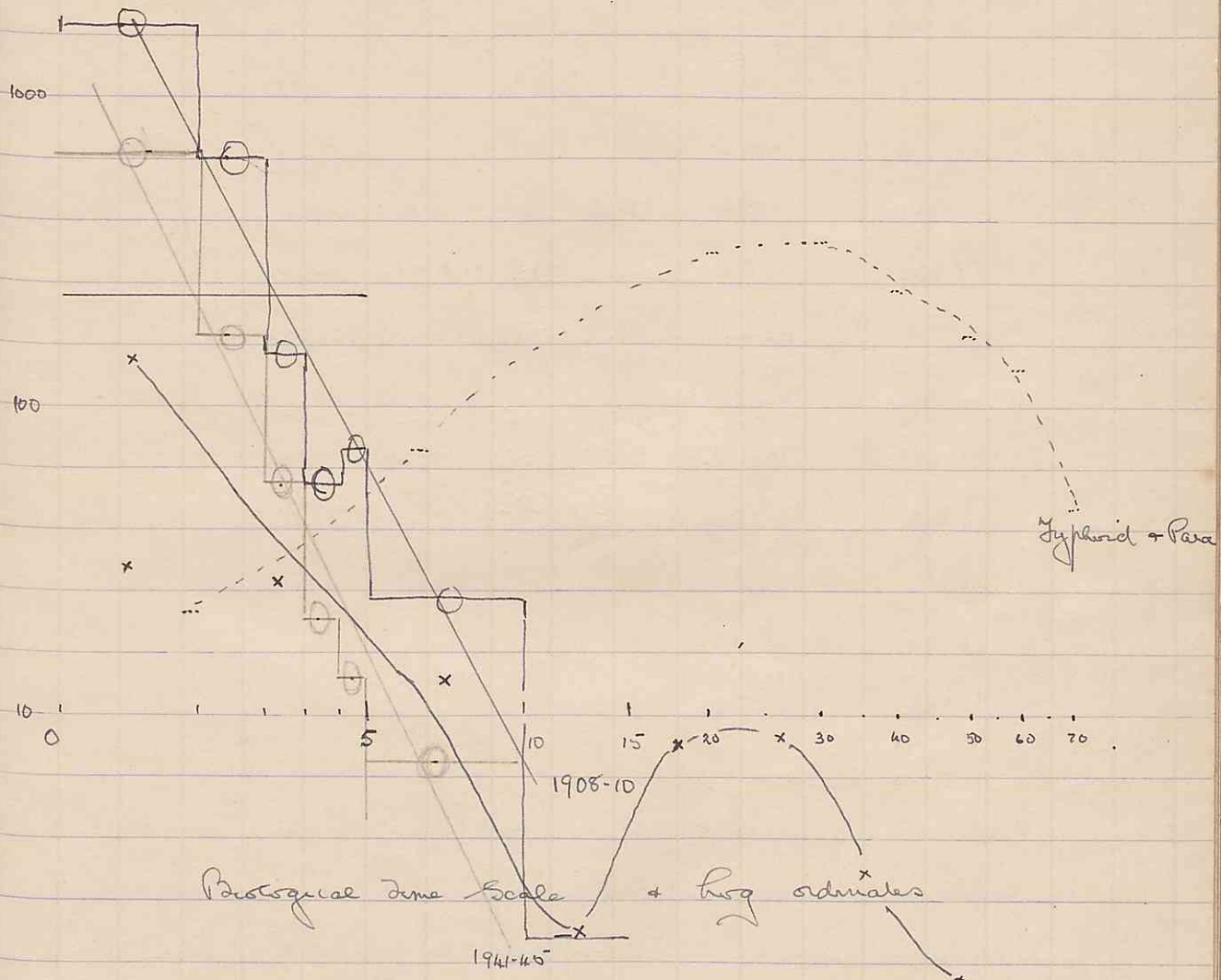
4) Disappearance of maternal immunity
5) Active immunity persistent or fading

0·1	2·20	
1-2	1·10	3·30
2-3	0·73	4·01
3-4	0·55	4·56
4·5	0·44	5·0
5-10	2·5'	7·5
10-15	1·67	9·17
15-20	1·25	10·42
20-30	1·83	12·25
30-40	1·33	13·58
40-50	1·10	14·68
50-60	0·88	15·56
60-70.	0·74.	16·30

20.	·317
25	·412
30	·488·
35	·553
40	·610·
45	·660·
50	·704·
55	·747.
60	·783·
65	·818·
70	·849.
75	·878·
80	·907



Pertussis Mortality (Males) Australia per 10^6 per annum at ages. Lancaster.



Biological time Scale + log ordinates

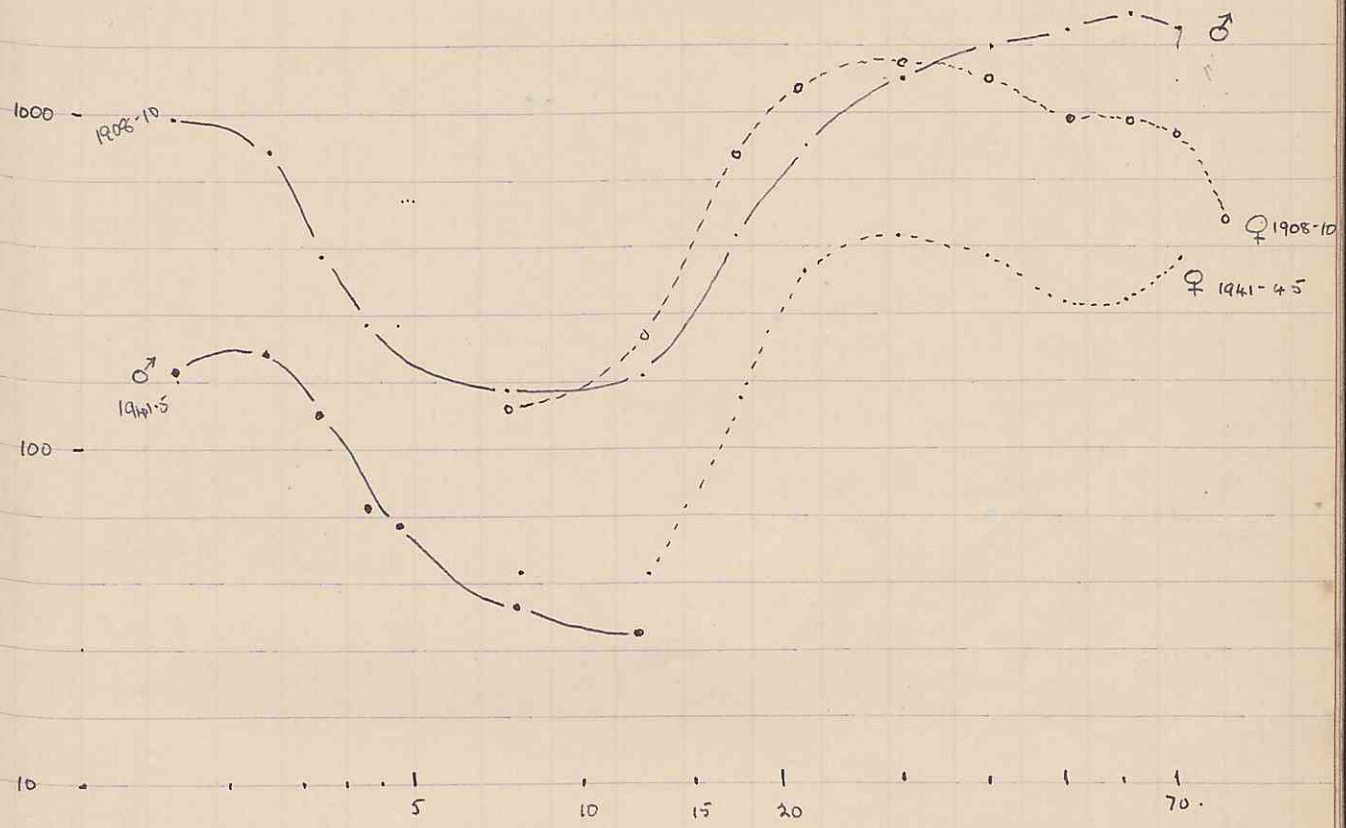
0	0·75.	T·874	0		6·75	·776. ·828	·952.
1	1·75	0·242	0·368		7·75	~~·789~~. ·889.	1·015
2	2·75	0·439	0·565		8·75	·942.	1·068.
	3·25	·512	·638				
3	3·75	·574	0·700.		9·75	·989	1·115.
4	4·75	·676.	·802				
5	5·75.	·760.	·886.	3 mths	1·0.	0·0	0·126.
10		1·032.	1·158.	6	1·25	0·096.	0·222
	13·25.	122	248				
15		1·195	1·321	9.	1·50.	0·176.	0·302
17·5	18·25	·262	1·388				
20		1·317.	1·443.				
25	25·75	·41	536	1·5	2·25	·353	·479
30		1·488	1·614	2·5	3·25	·512.	·638
35		·552	·678	3·5	4·25	·628.	·754
40		1·610.	1·736.	4·5	5·25	·720.	·846
45		·660	·786				
50		1·705.	1·834.				
55		·746.	·872				
60		1·784.	1·910				
65		·818	·944.				
70.		1·850.	1·976.				

Logarithmic time scale.

This is based essentially on the fact that growth is at a maximum at the beginning of embryonic development and slows down progressively

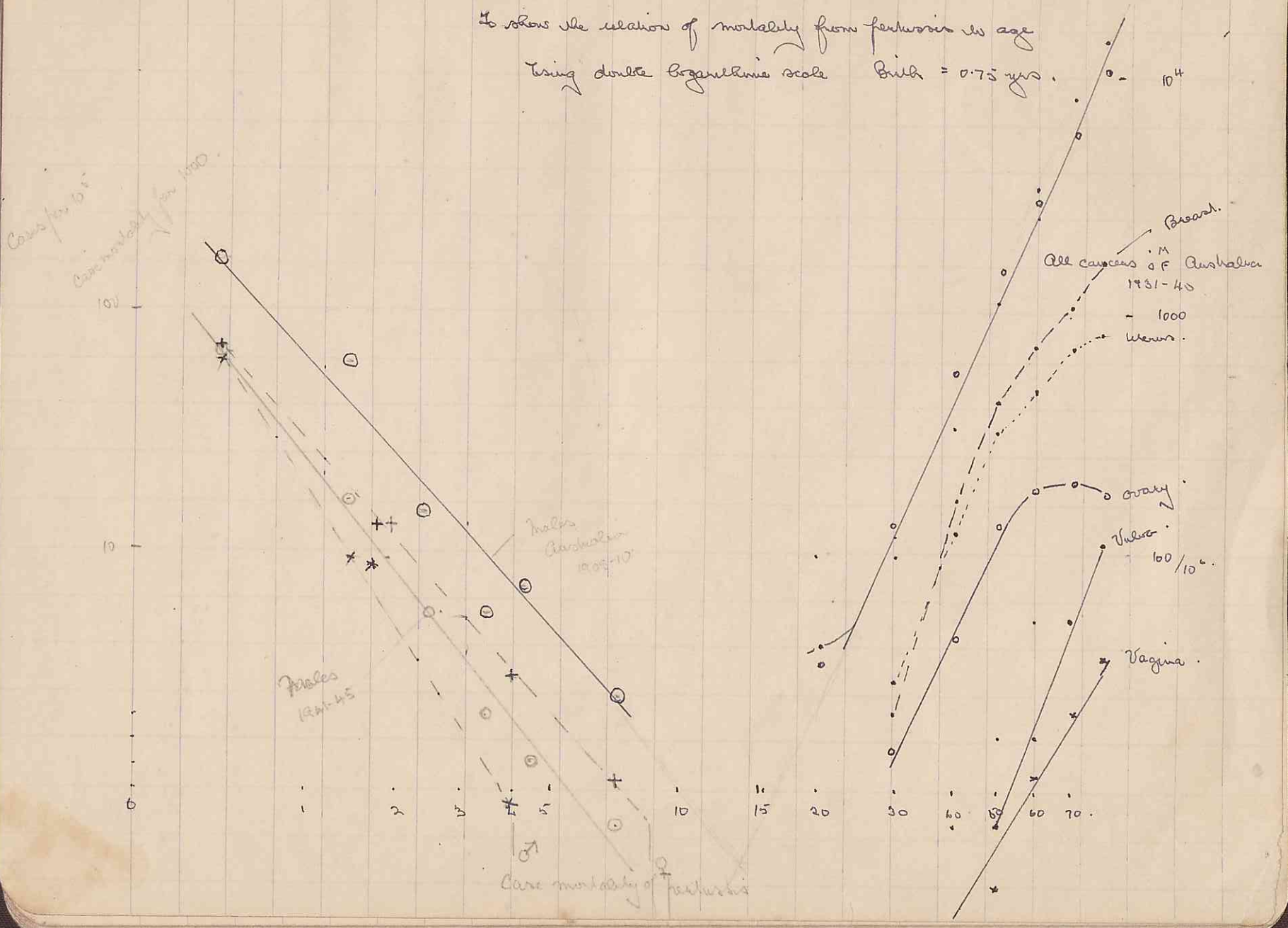
A logarithmic scale is the simplest device to provide a uniform change in the time scale. The extent of the slowing down can be adjusted by the value chosen as zero. Again the simplest convention is to take birth as 0·75 years

TB all forms Cuchabia

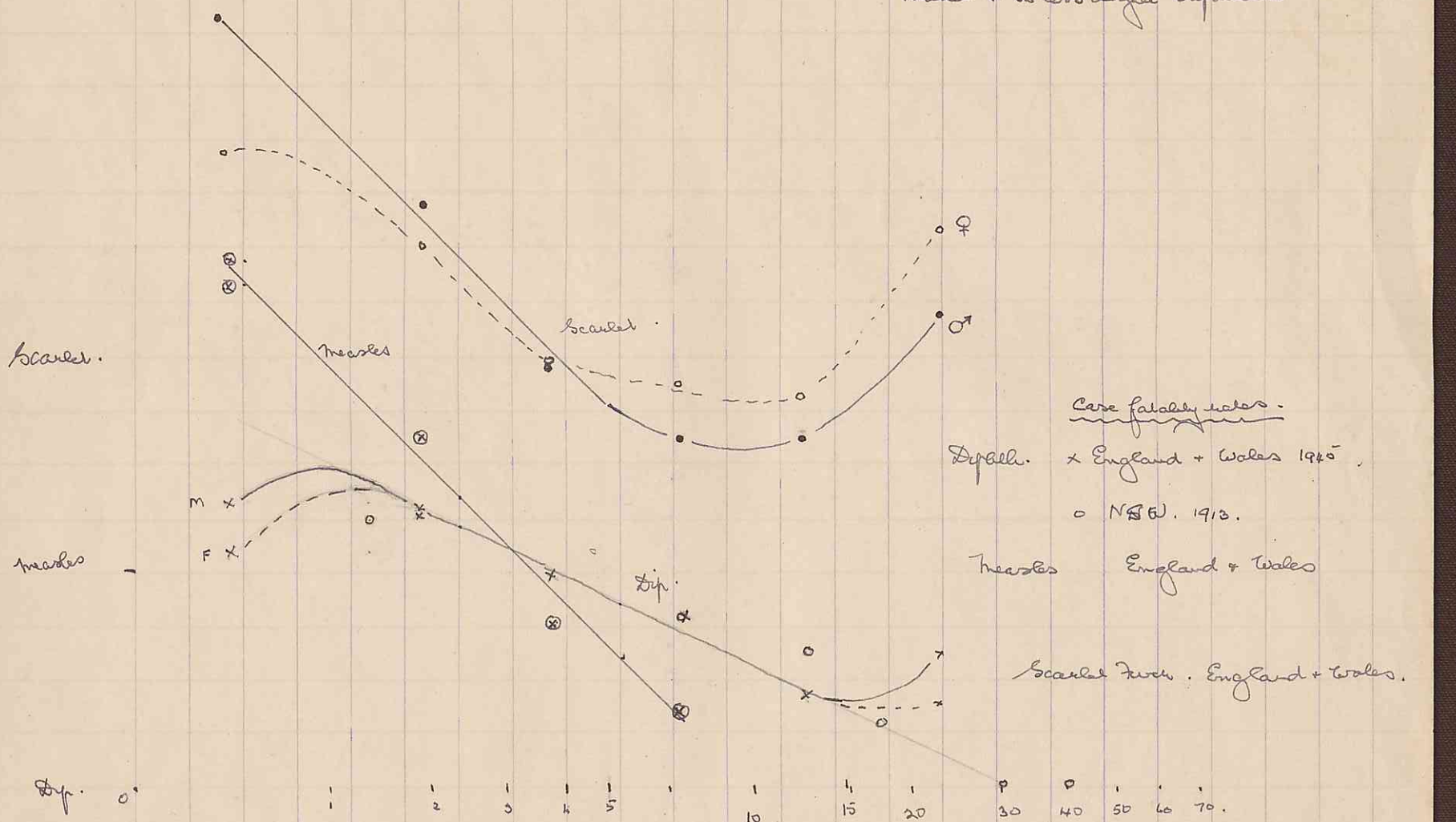


To show the relation of mortality from perversion to age

Using double logarithmic scale Birth = 0·75 yrs.



Note apparent effect of maternal antibody in girls but not in boys with scarlet + to less degree diphtheria



Case fatality rates.

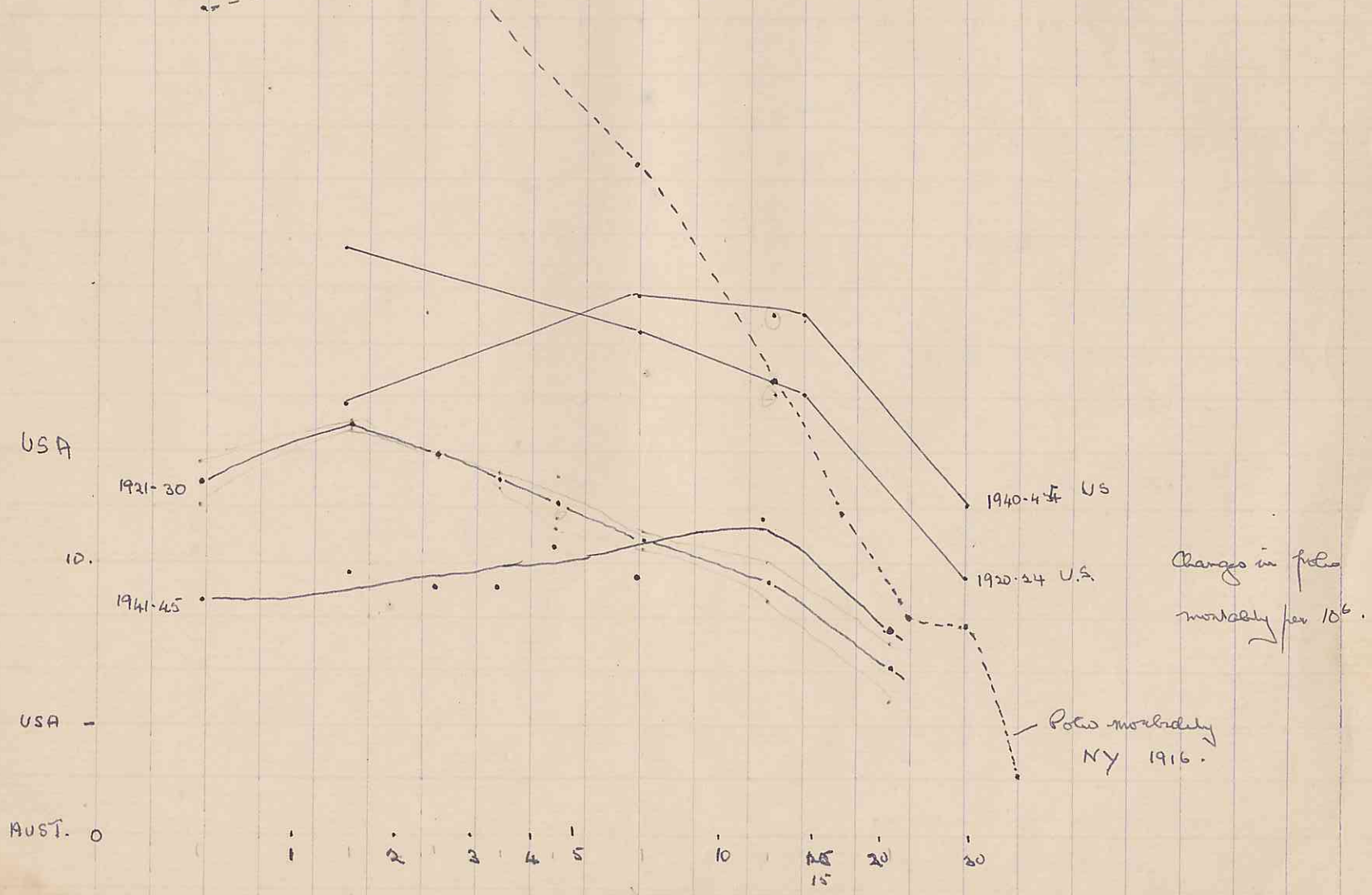
Diphth. × England + Wales 1940.

○ NSW. 1913.

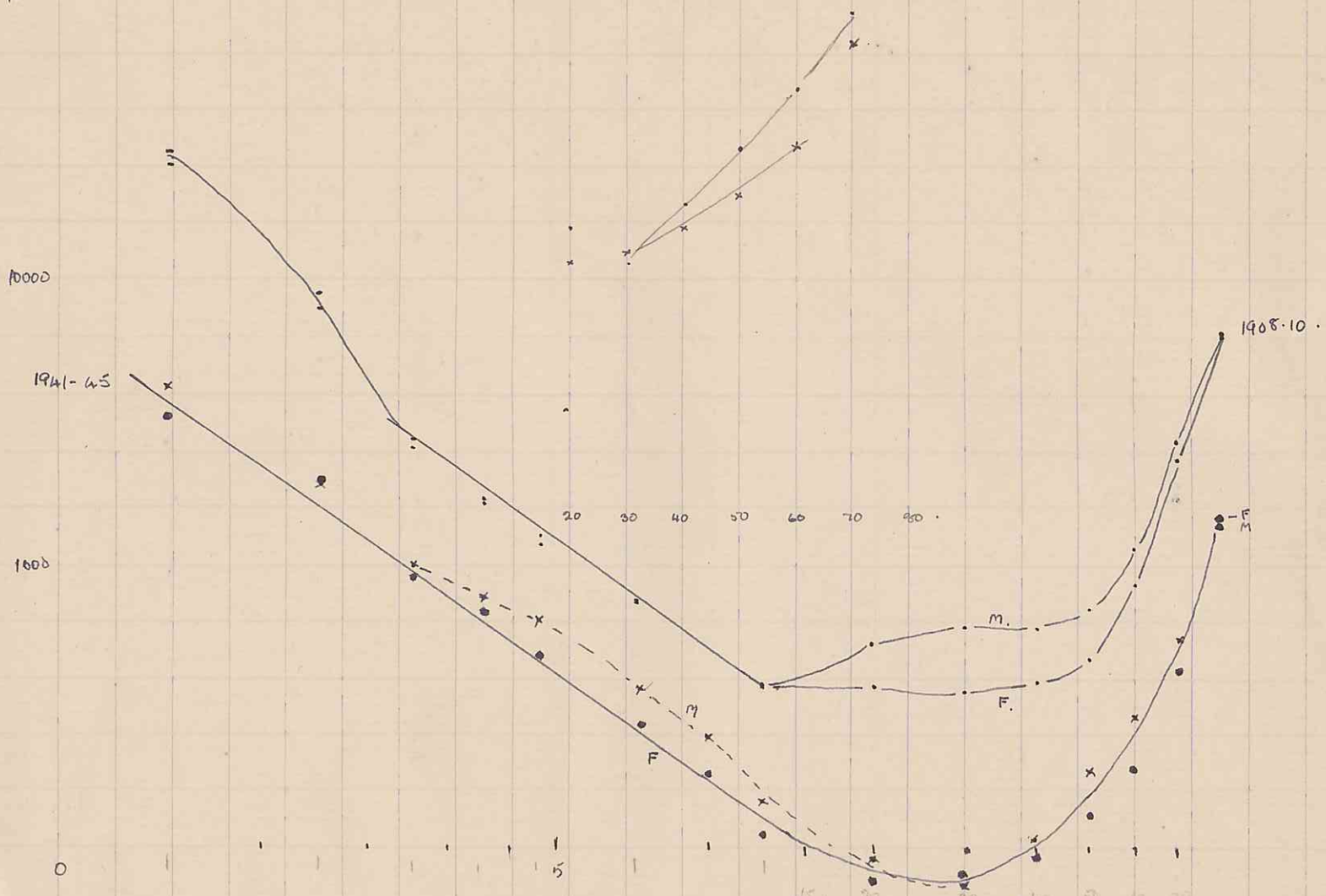
Measles England + Wales

Scarlet Fever. England + Wales.

Poliomyelitis mortality per million at ages. Changes in USA and Australia.



Mortality from all acute infective diseases in Australia Lancaster.



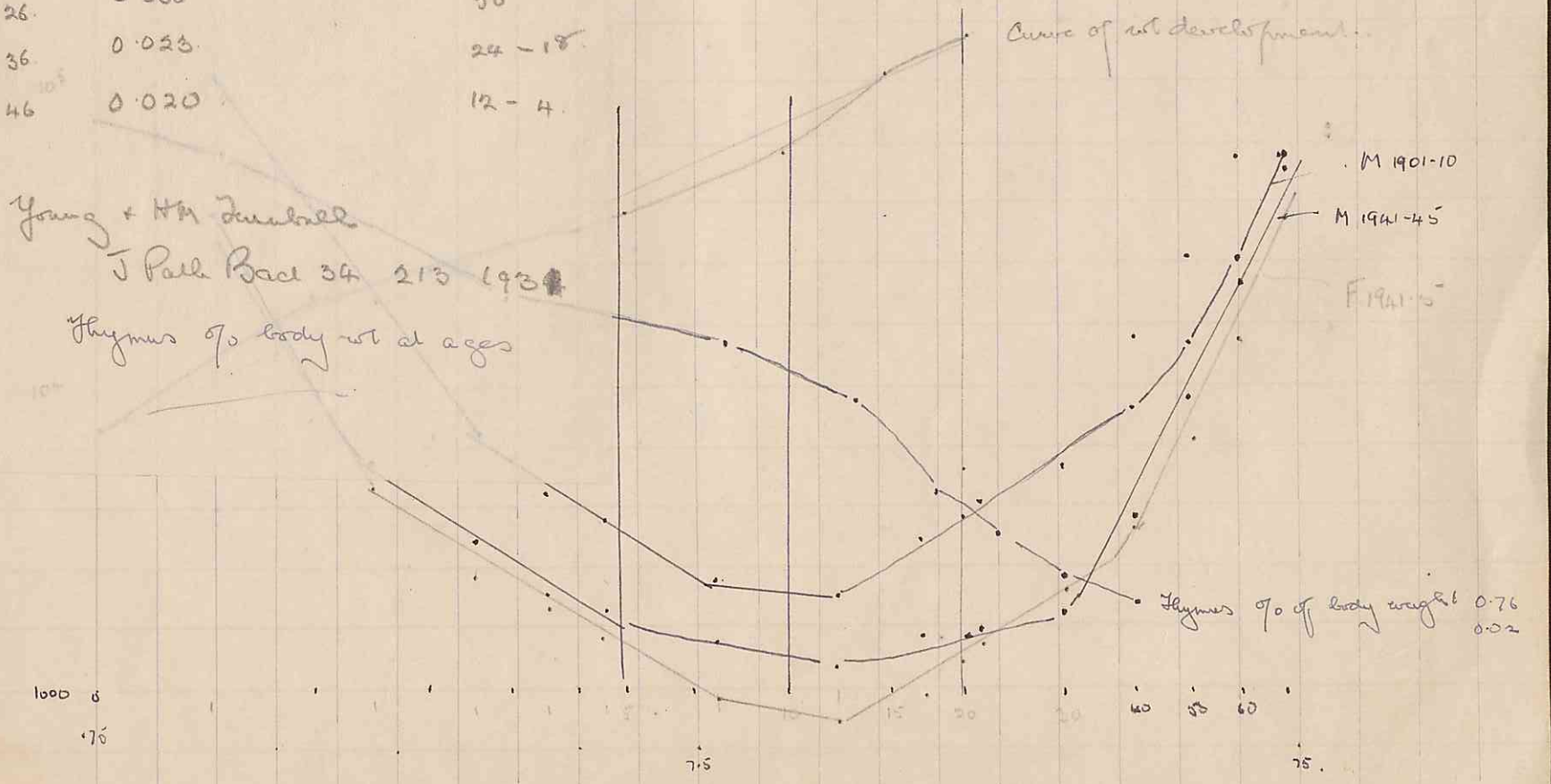
	% Bwt of	Proportion of liver
-0-	0·76	·345
0-1	0·57	·418
1-6	0·19	·197
6-11	0·137	·136
11-16	0·055	·081
16-21	0·042	
21-26	0·030	
26-36	0·023	
36-46	0·020	

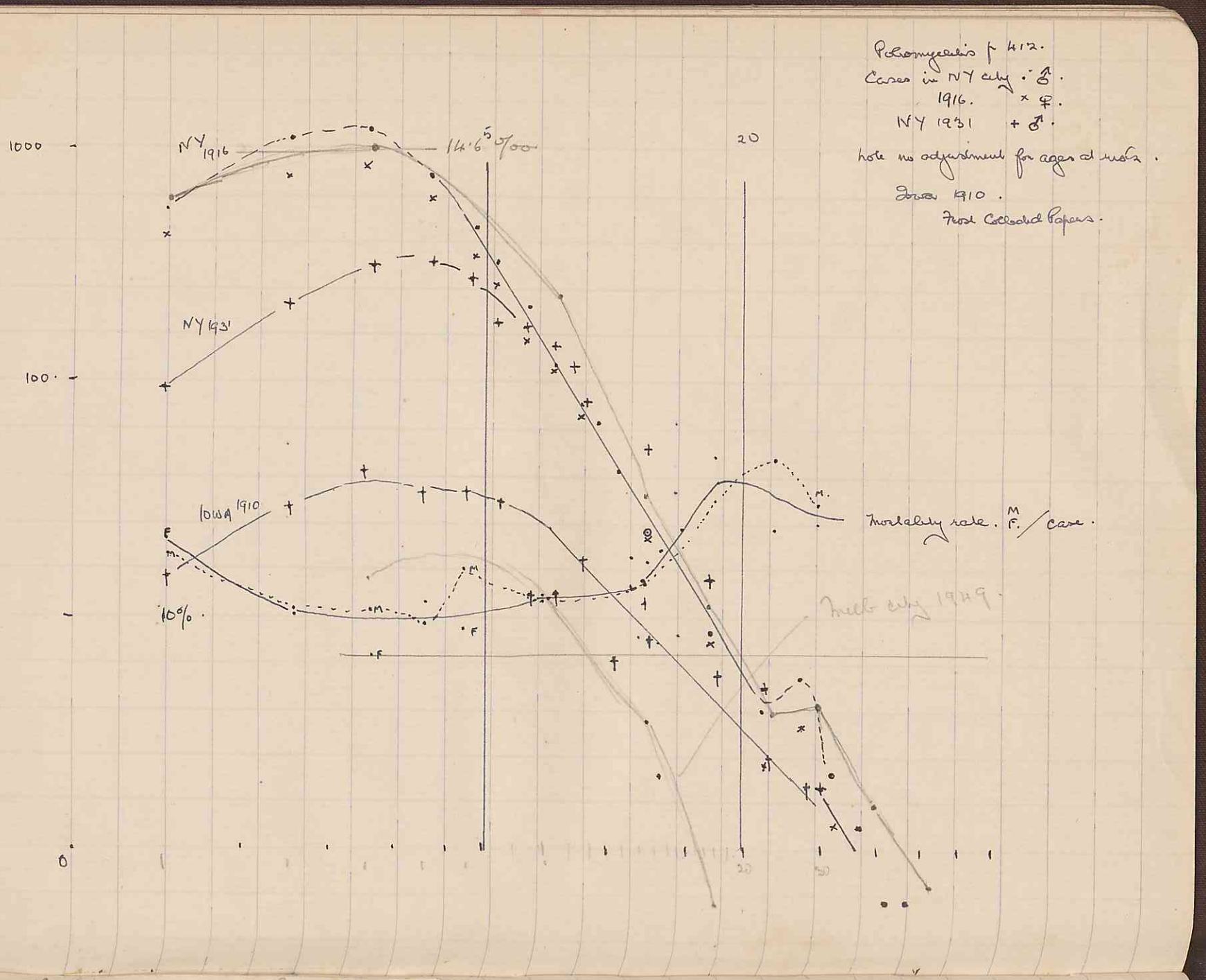
M Young + HM Turnbull
J Path Bact 34 213 1931

Thymus % body wt at ages

million at ages per annum Australia Lancaster

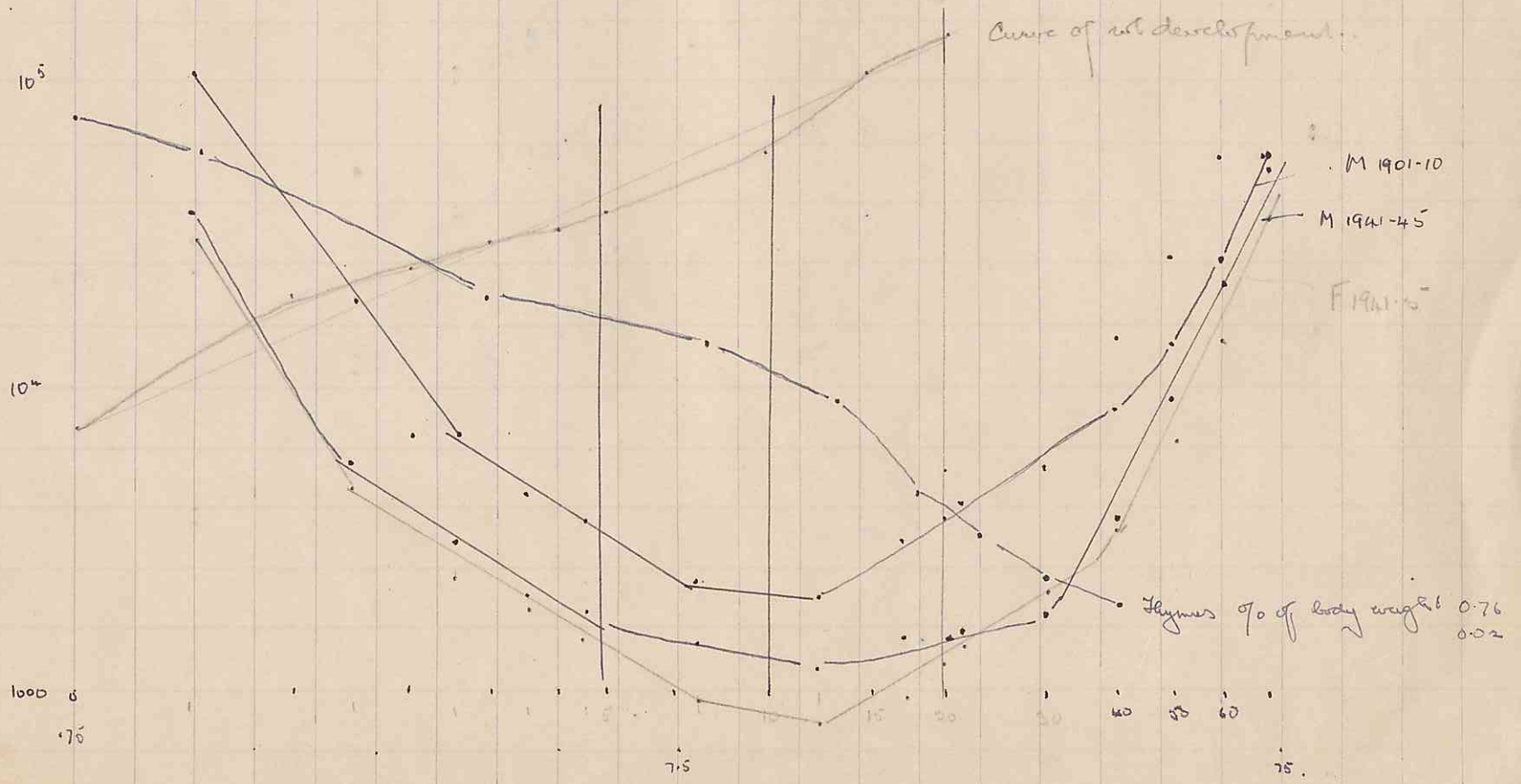
96
95
92
90
73
50
24 - 18
12 - 4

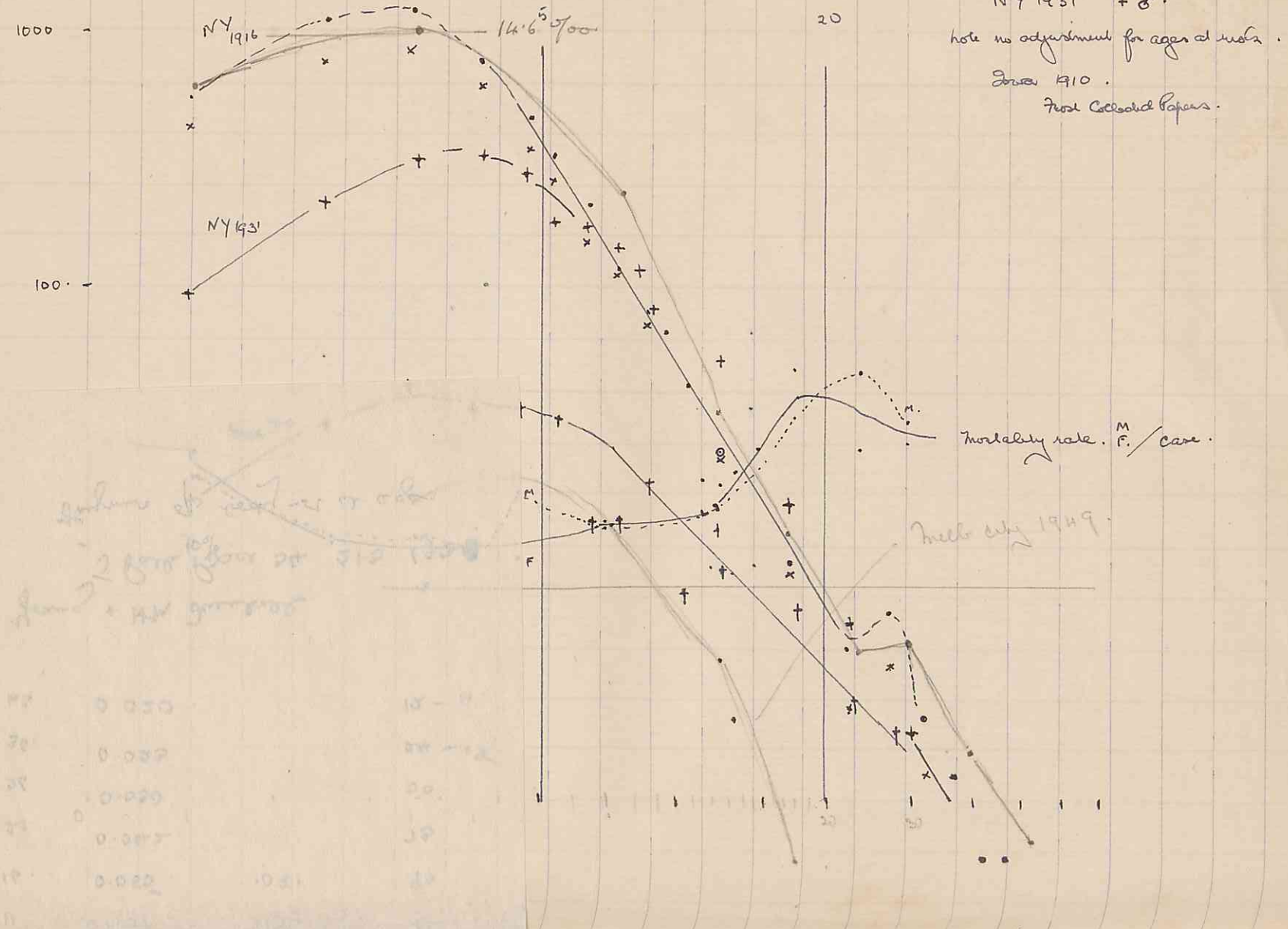



Poliomyelitis p 412.
Cases in NY city ♂.
1916. × ♀.
NY 1931 + ♂.
note no adjustment for ages at risk.
Iowa 1910.
From Collected Papers.
1000
100.
10%.
0
20
NY 1916
14.6⁵ o/oo
NY 1931
IOWA 1910
M
F
Mortality rate. M F / Case.
Milk city 1949.

Mortality per million at ages per annum Australasia Lancaster.

See Greenwood
J Hyg. 28 267
1928.

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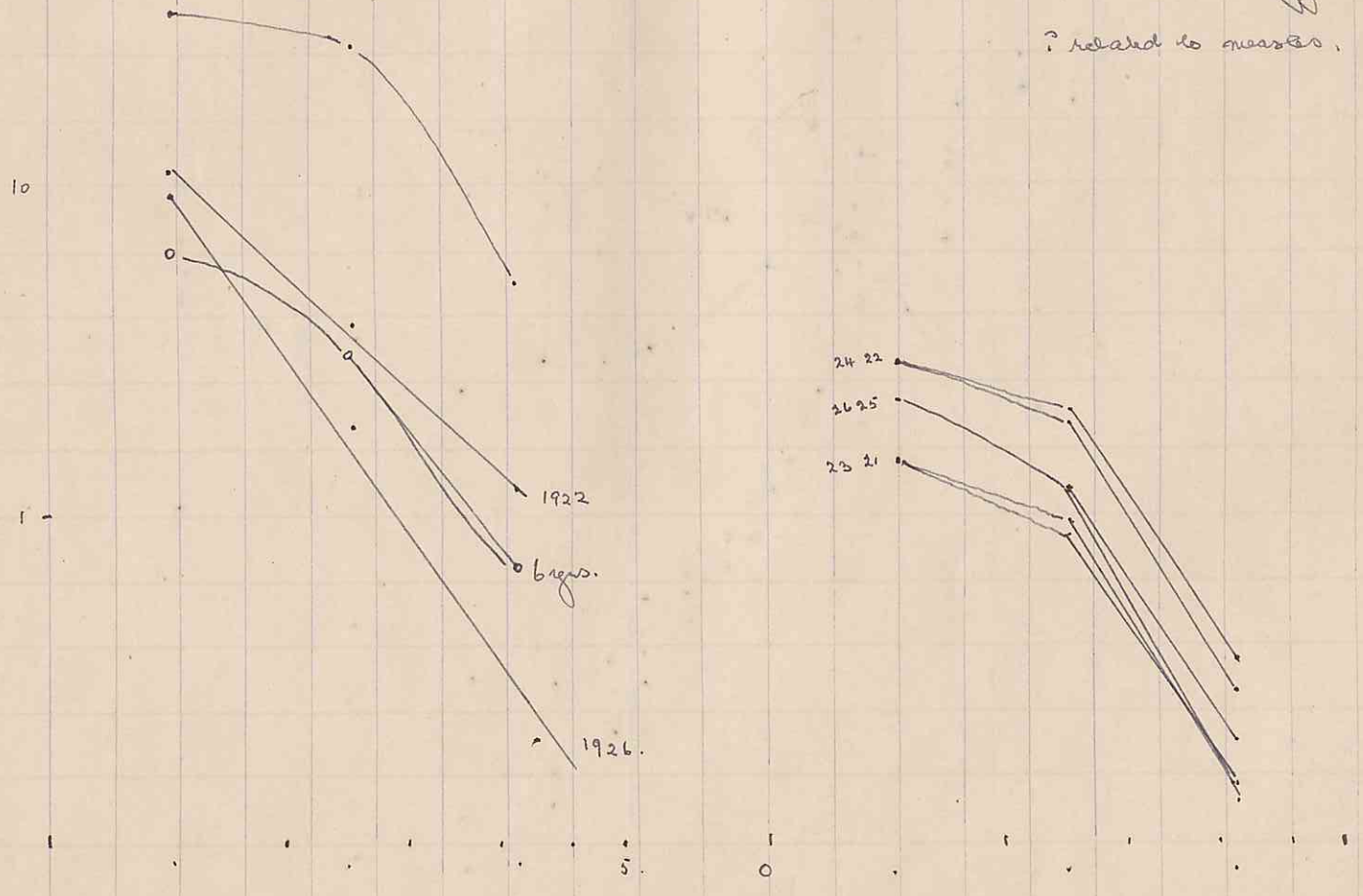
Cases in NY city ♂.
1916. × ♀.
NY 1931 + ♂.
Note no adjustment for ages at risk.
Jones 1910.
Frost Collected Papers.
1000
100
NY 1916
14·6 5/00
NY 1931
20
Mortality rate. M F. / case.
M
F
Mich city 1949.

Pneumonia in children in Glasgow 1921-1926.

Death rates per 1000.

C M Smith J Hyg 1928. p 88 V 27.

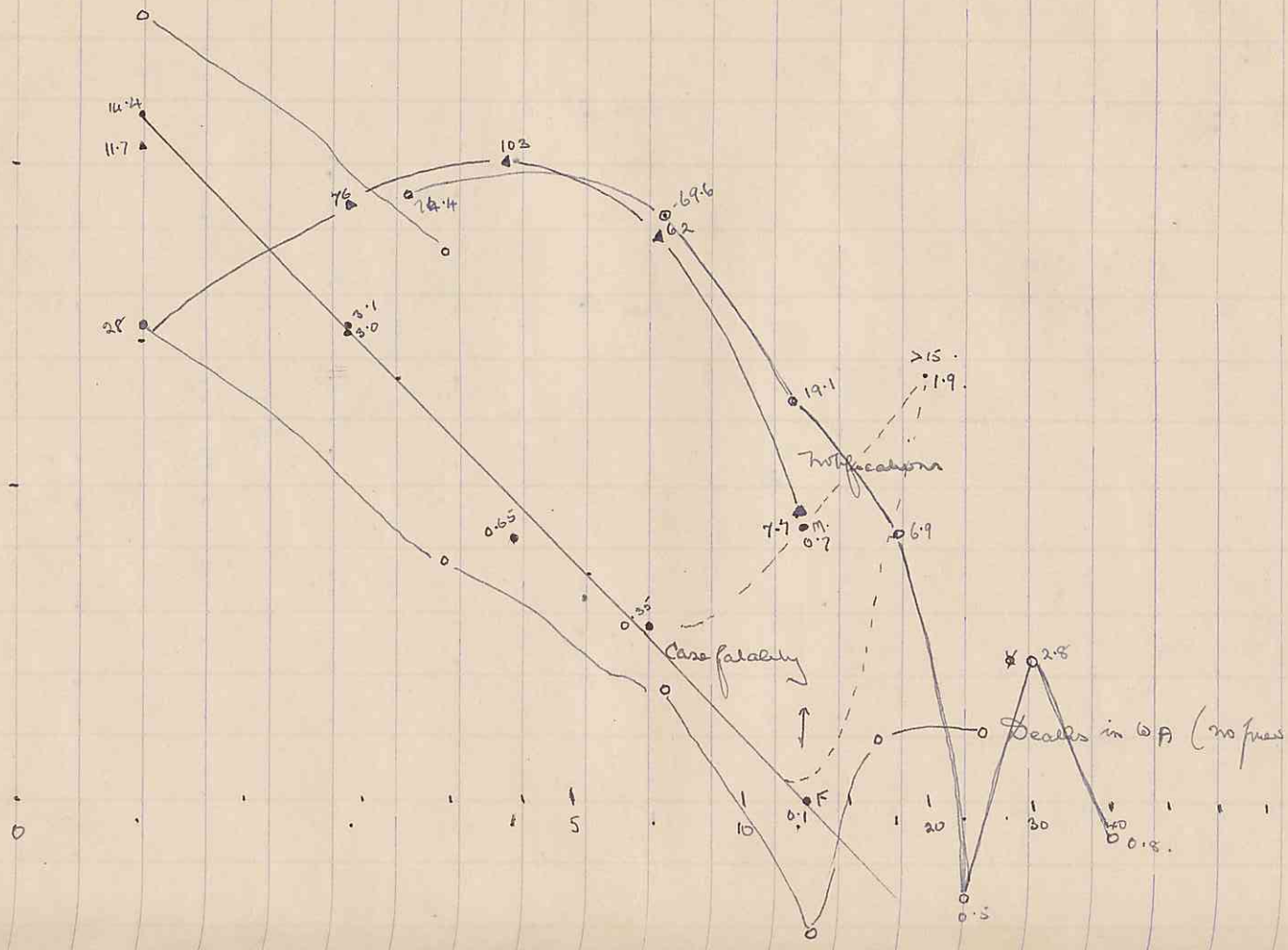
? related to measles.

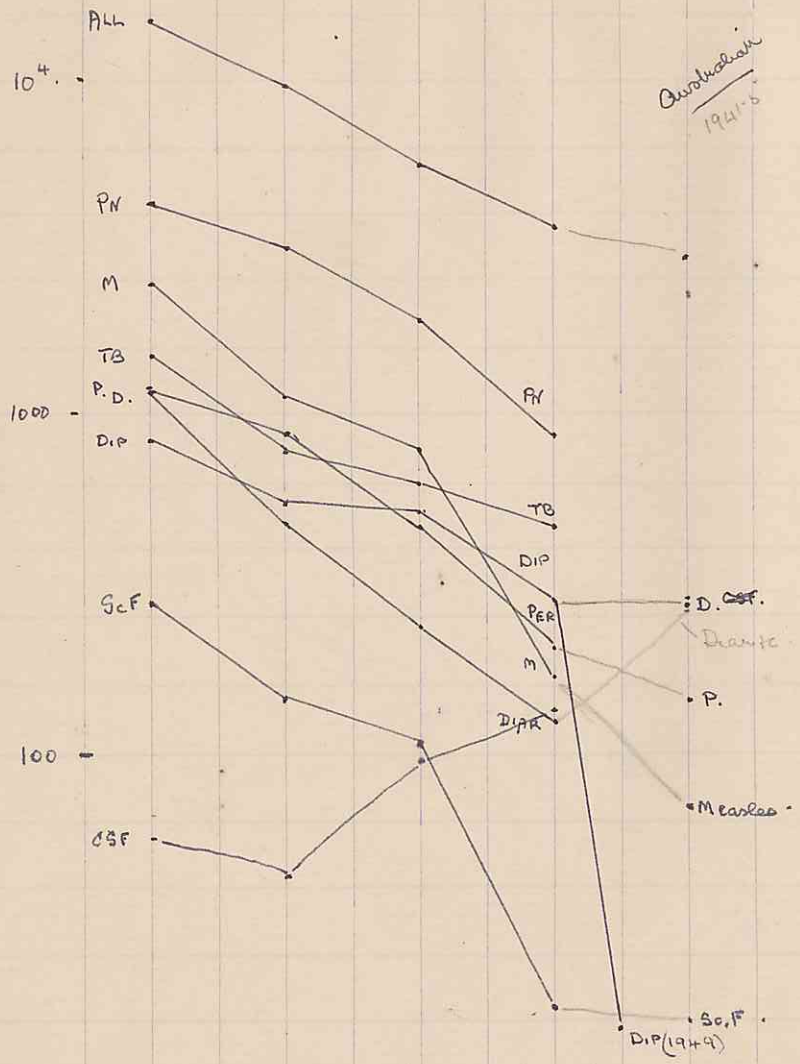


Measles (Eng + W) 1941-45.

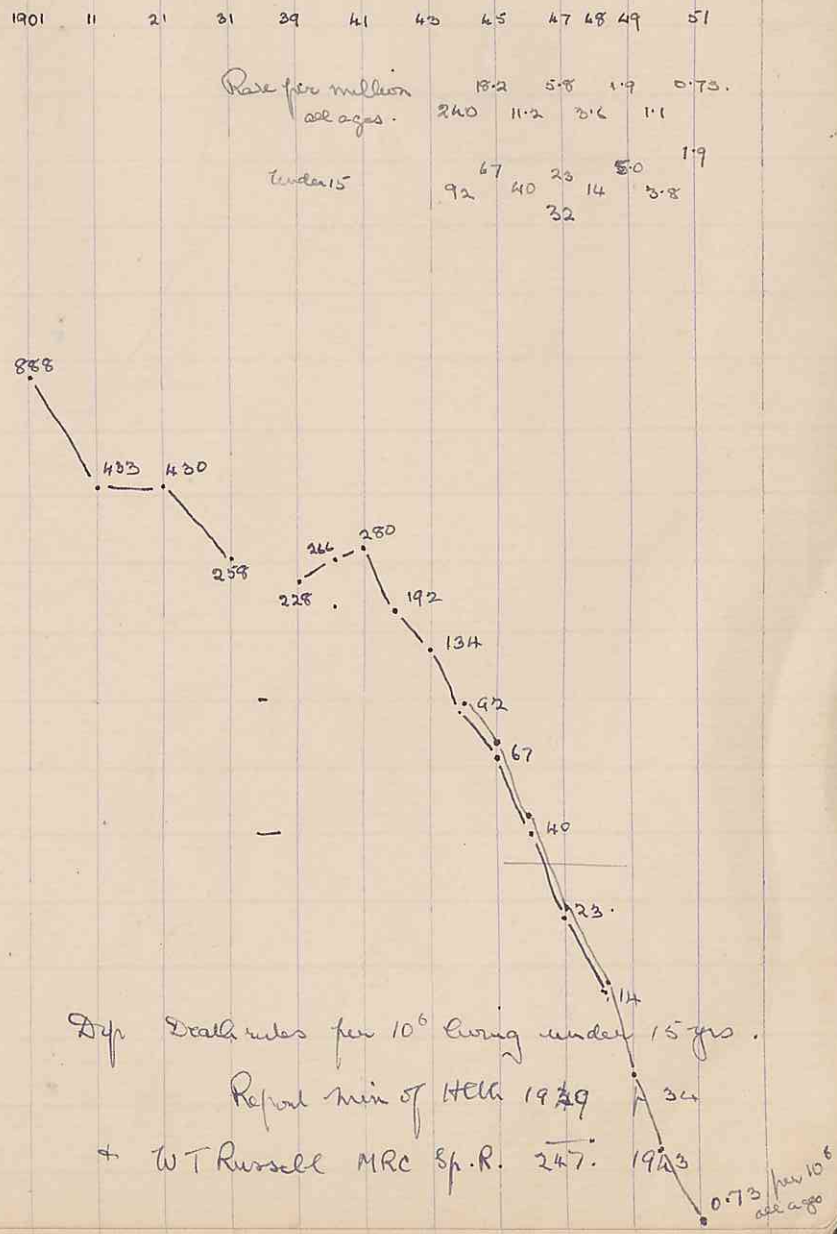
Age incidence of measles. England + Wales 1945 Lancaster

Cockin's P.H Rep.





Deaths per 10^6 of children (1–5).

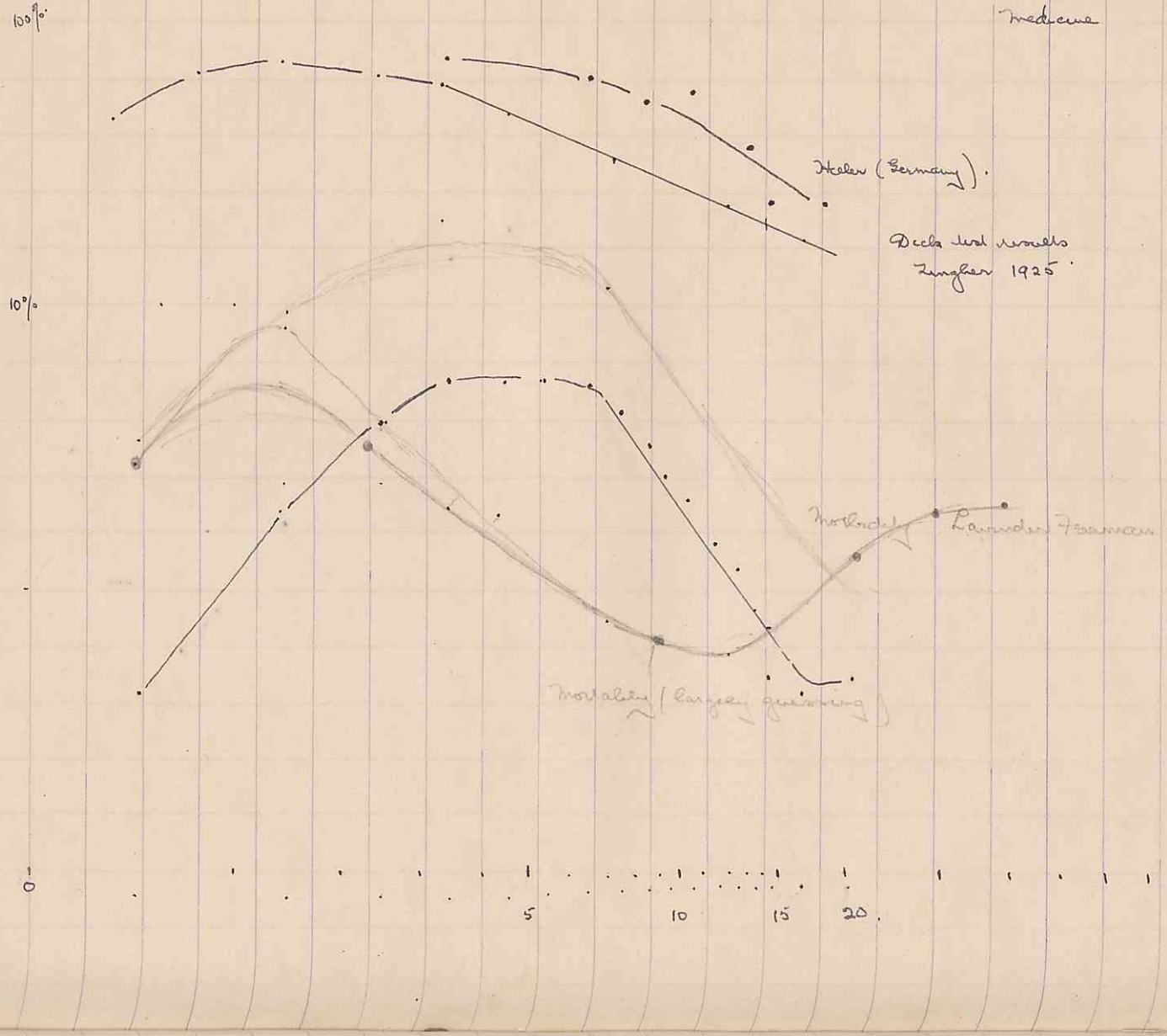


Dyp Death rates per 10^6 living under 15 yrs.

Report min of Hlth 1939 p 34

+ W T Russell MRC Sp. R. 247. 1943

Scarlet Fever J H Mc Cotham
5000 cases in Cohens
Medicine

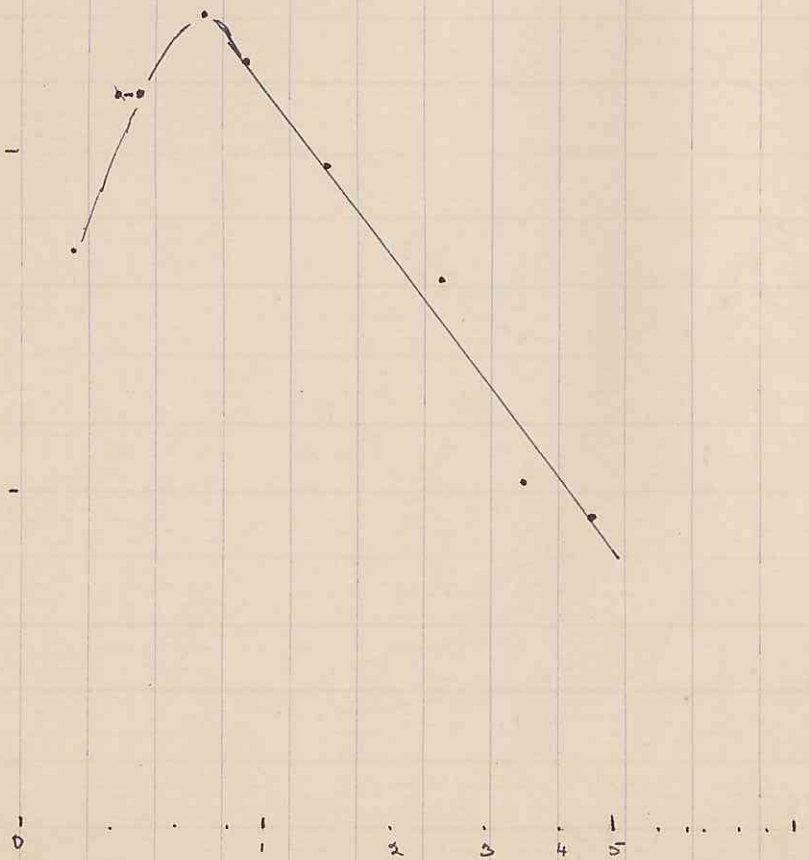


H. Influenzae meningitis Alexander Rad & Myc Dis Rev.

See Falkenheim. J Imm 16 273. 1933.

Rivers Am J Dis Ch. 54 102 1938

Graph drawn only from measurements of figure.



Pertussis

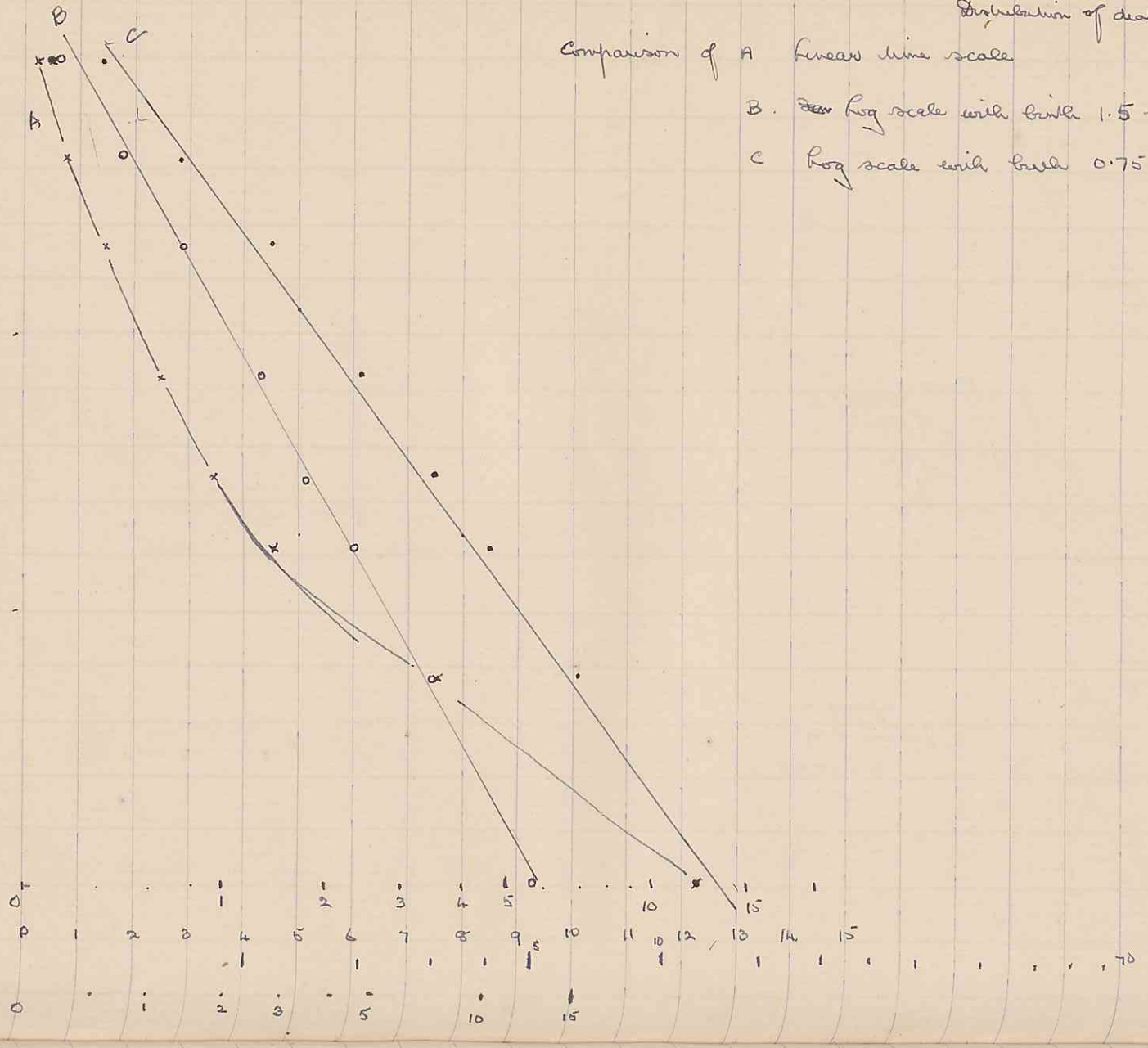
Dauer PH Rep. 58 661.

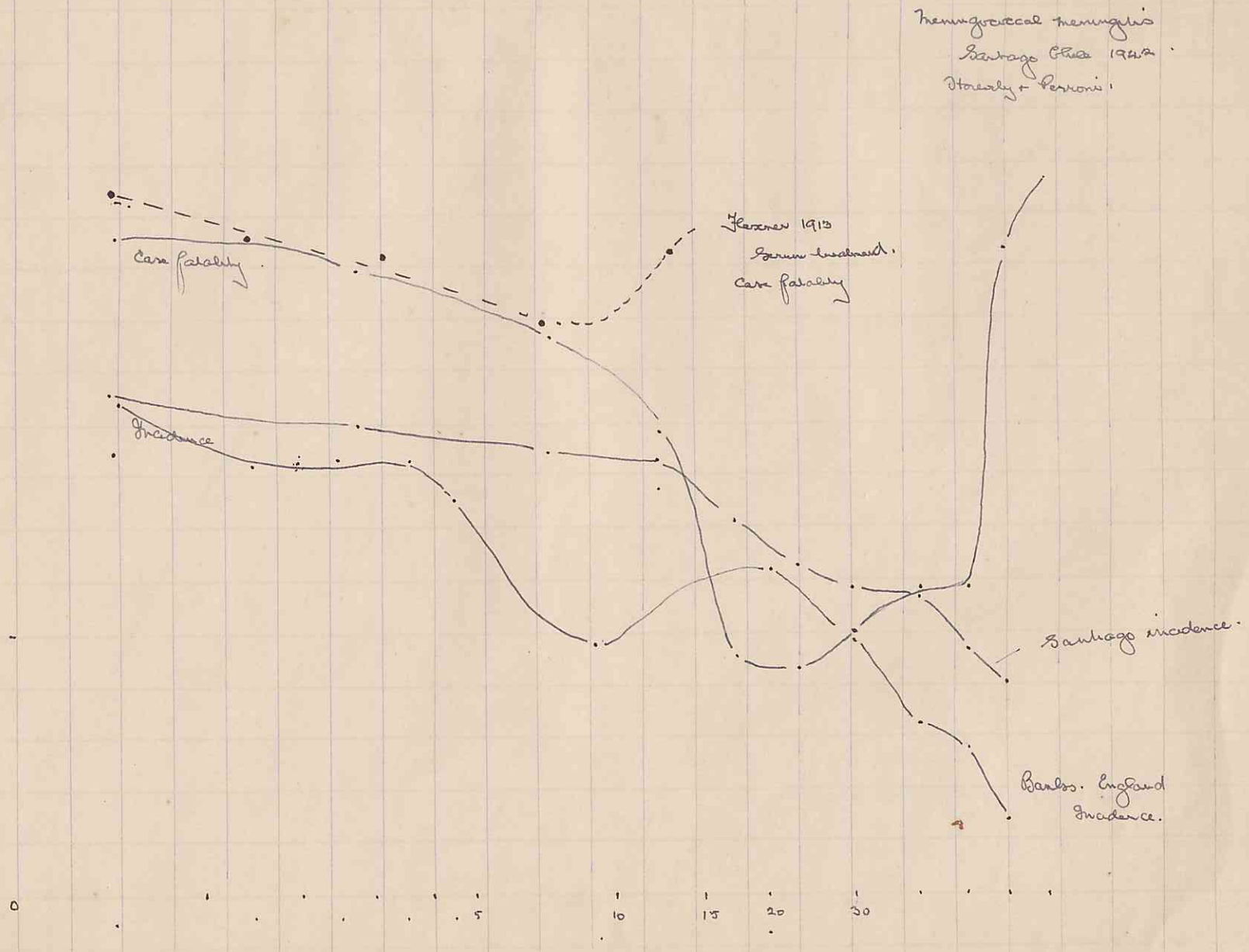
Distribution of deaths U.S. 1935-39.

Comparison of A Linear time scale

B. Log scale with basis 1.5 yrs

C Log scale with basis 0.75 yrs.




Meningococcal meningitis
Santiago Chile 1948
Horsley + Perroni.
Case fatality.
Incidence
Flexner 1913
Germ-bearers.
Case fatality
Santiago incidence.
Barbs. England
Incidence.
0
5
10
15
20
30

Age & sex distribution of Brucella. Dalrymple-Champneys. Bombay Med practice

	M	F	T
0-4	4	3	7
5-9	25	14	39
10	21	19	40
15	46	19	65
20	38	19	57
25	53	24	77
30	74	36	110
35	68	41	109.
40	71	32	103
45	53	30	83
50.	61	34	95
55	30	27	57
60	26	35	61
65+	22	24	46.

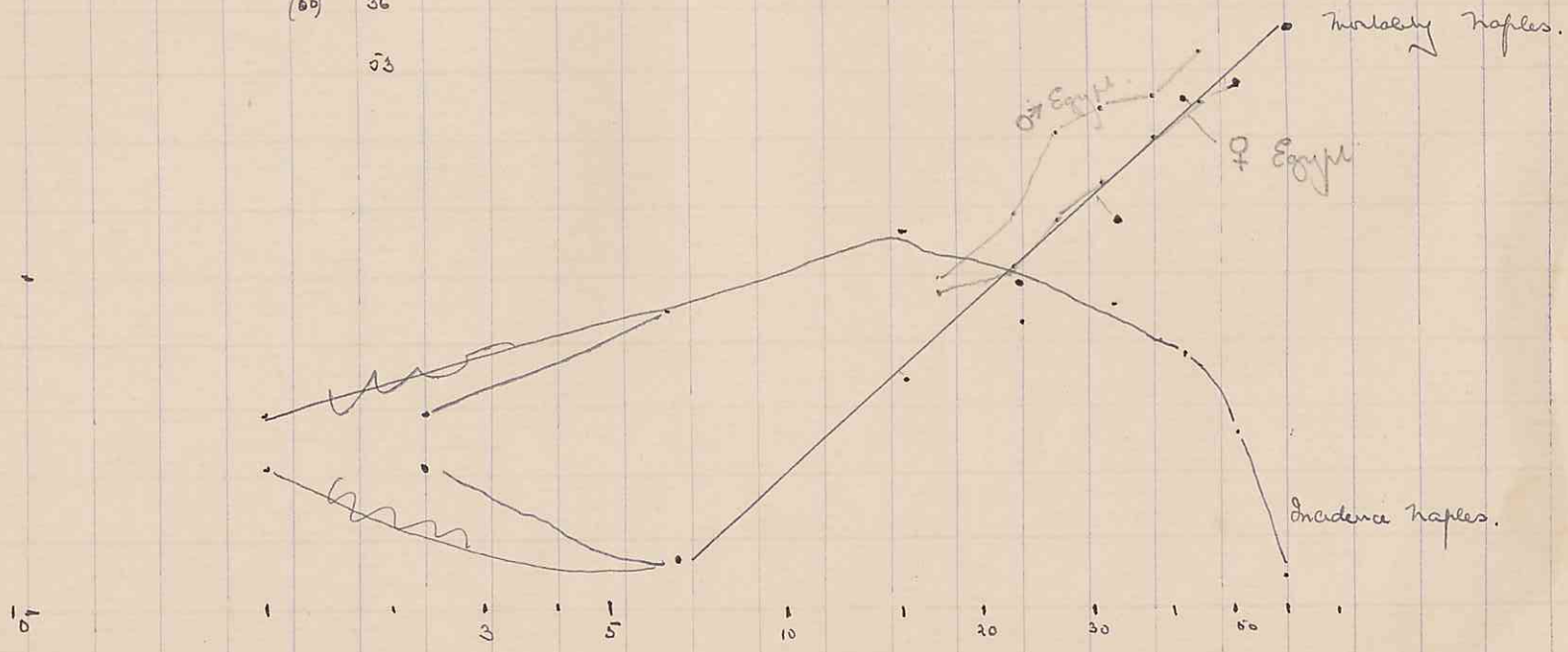
. Here we have a marked unsusceptibility of children with more or less uniform incidence at later ages. Also a marked excess of males even when possibilities of occupation are considered.

Naples van der Ende 1946.

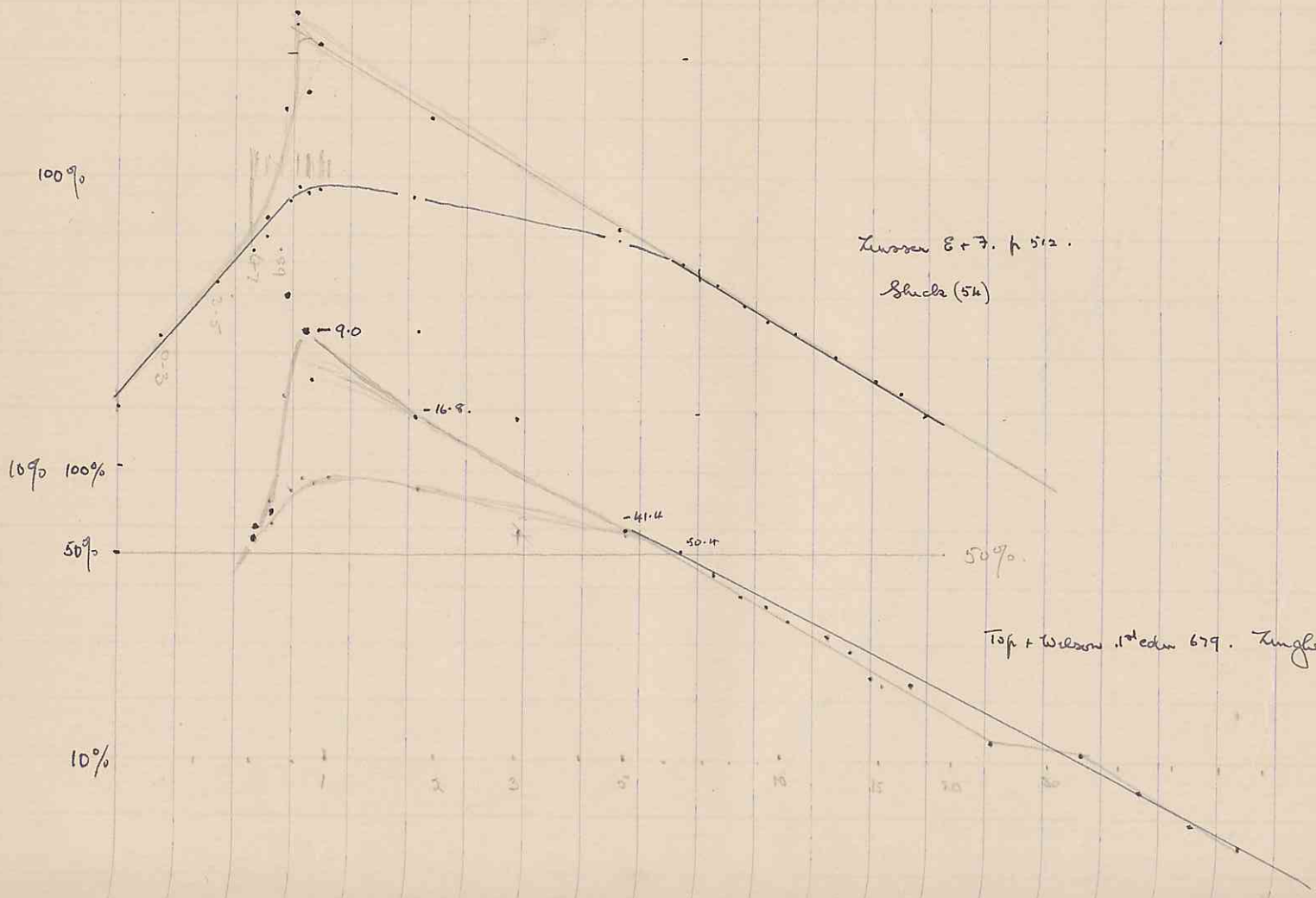
Epidemic typhus.

Cairo Echo 1945

0·5	2·7
5-10	1·14
15	5·0
25	9·3
35	14·5
45	32
(60)	36
	53



Change of Shock reaction with age. 1



Lusser E+7. p 512.
Shock (54)

Top + Wilson. 1st edn 679. Zinglen 1923.

Case rate per million living.

10^4

10^3

100

10

1901

1916

Incidence.

Scarlet Fever. Topley + Wilson 1st ed p 98

E+W figures 1901-5 1916-20.

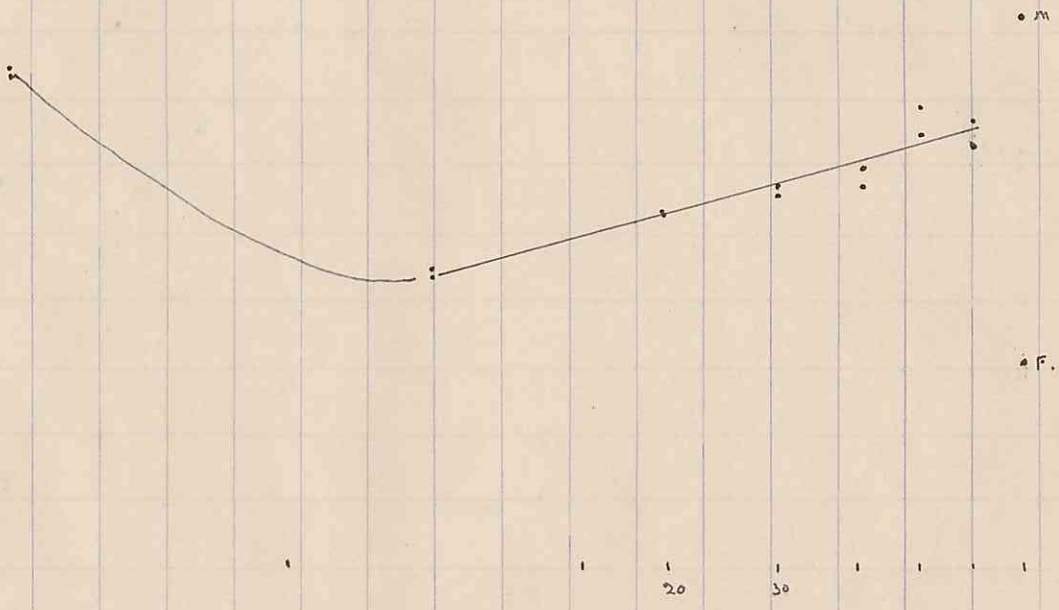
Note comparison with linear time scale suggesting that after 25-30 linear is better than log.

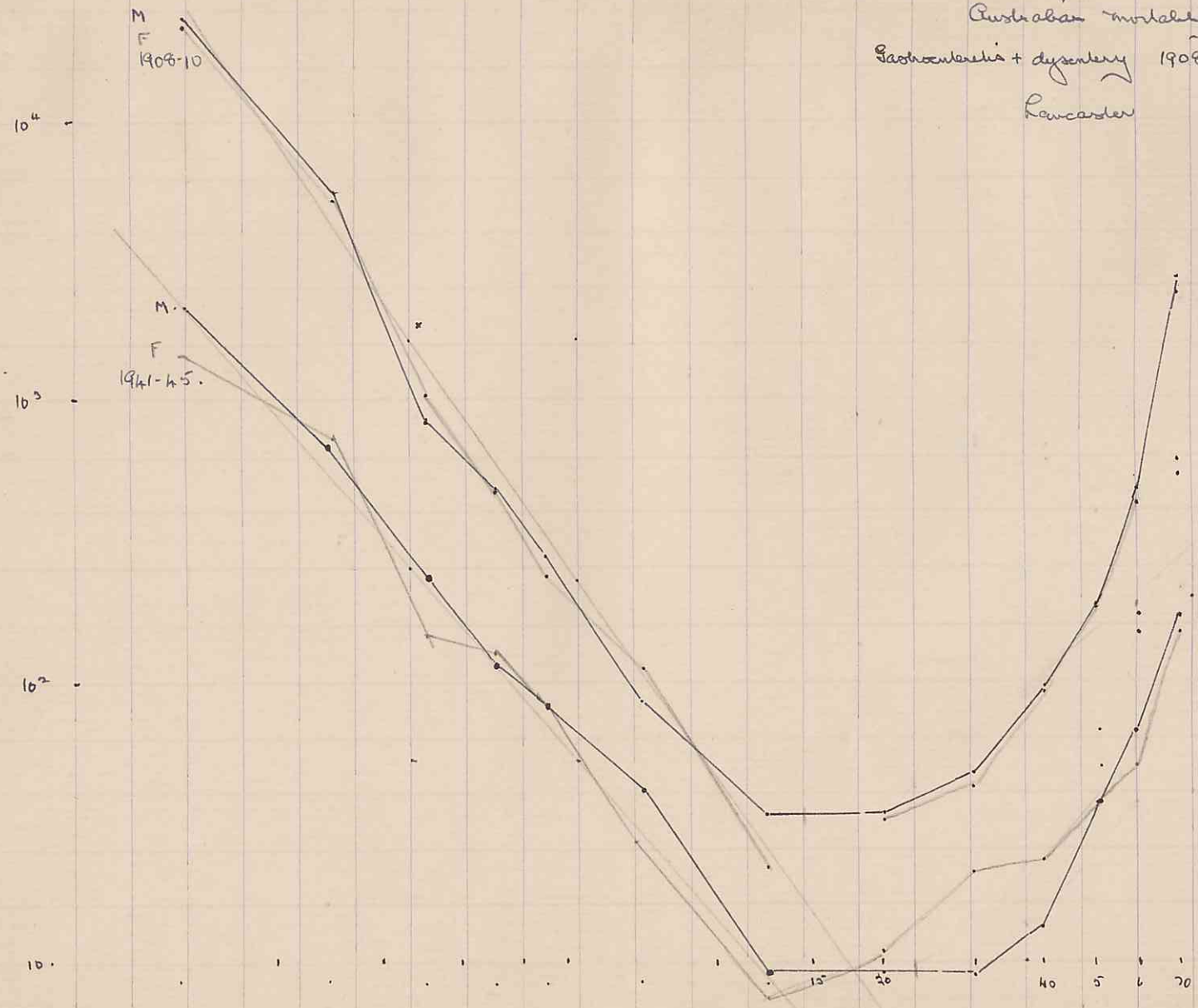
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 10 15 20 3 5 5 40

Incidence of mortality.

? Encephalitis Lethargica Australia 1920-30.

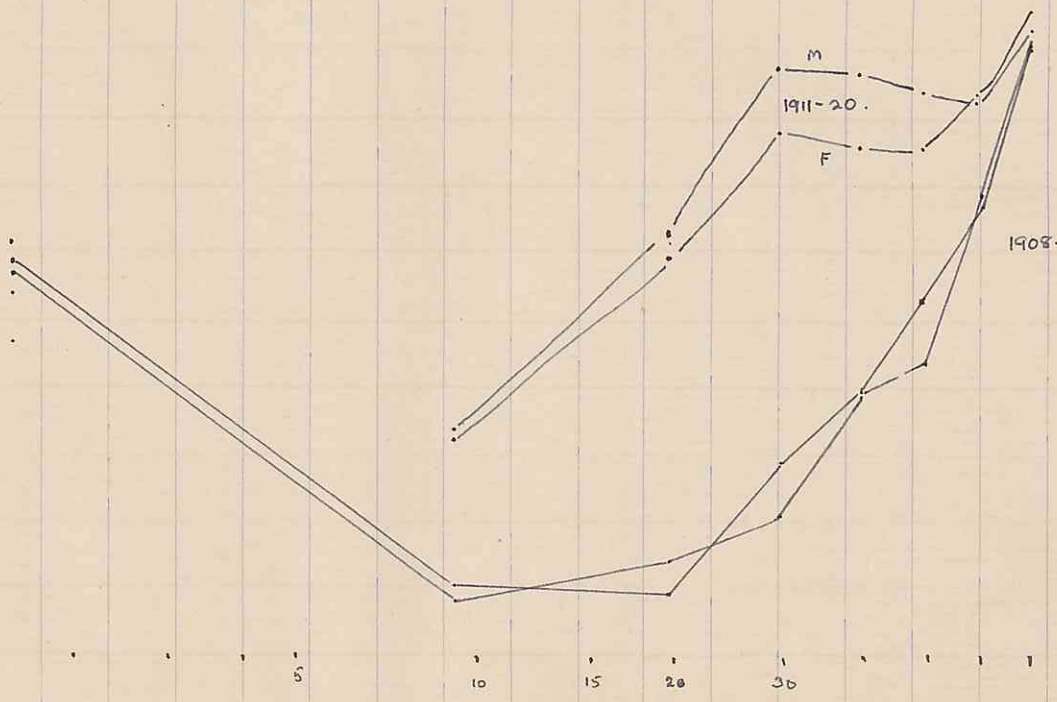
Diff from average of 1931-40 + 1941-45 Lancaster




Australian mortality.
Gastroenteritis + dysentery 1908-10 + 1941-5
Lancaster
M
F
1908-10
M
F
1941-45.
10^4
10^3
10^2
10
15
20
40
50
60
70

Australasian mortality from influenza.

Lancaster.



Lecomte du Noüy scale.

—	1	1	1	3·55
	2	0·5	1·5	5·35
	3	0·33	1·83	6·51
	4	0·25	2·08	7·40
	5	0·2	2·28.	8·10
	6	0·17	2·45	8·7.
	7	0·14	2·59	9·2
	8	0·125	2·71	9·65
	9	0·111	2·83	10·05
—	10	0·1	2·93.	10·28.
—	15	0·40.	3·33	11·8 ·
—	20	·29	3·62	12·86.
—	25	·22	3·84	13·6 ·
—	30	·19	4·03	14·35
—	40	·286	4·32	15·4.
—	50	·22	4·54	16·2.
—	60	·18	4·72	16·8.
—	70	·104	4·87.	17·3 cm

Total —

The process of infection

1. Existence of the microorganism in the environment and opportunity for it to reach the tissue at which infection is initiated.

Factor 1 = opportunity for infection.

2/ The tissue of initiation may vary in susceptibility with age as in staphylococcal infections of the skin, herpes simplex and diphtheria

Factor 2 = resistance of tissue of primary infection

3/ Symptoms will depend either 1) on extension through the system involved with damage to its physiological functioning and repercussions on the general homeostasis of the body. Pneumonia enteritis

Factor 3. = Resistance to disturbance of homeostasis (~~is~~ poorest at the extremes of life).

4) Symptoms may depend 2) on extension from the primary focus to some vital organ especially the C.N.S. The existence of e.g. blood-brain barriers has been demonstrated experimentally.

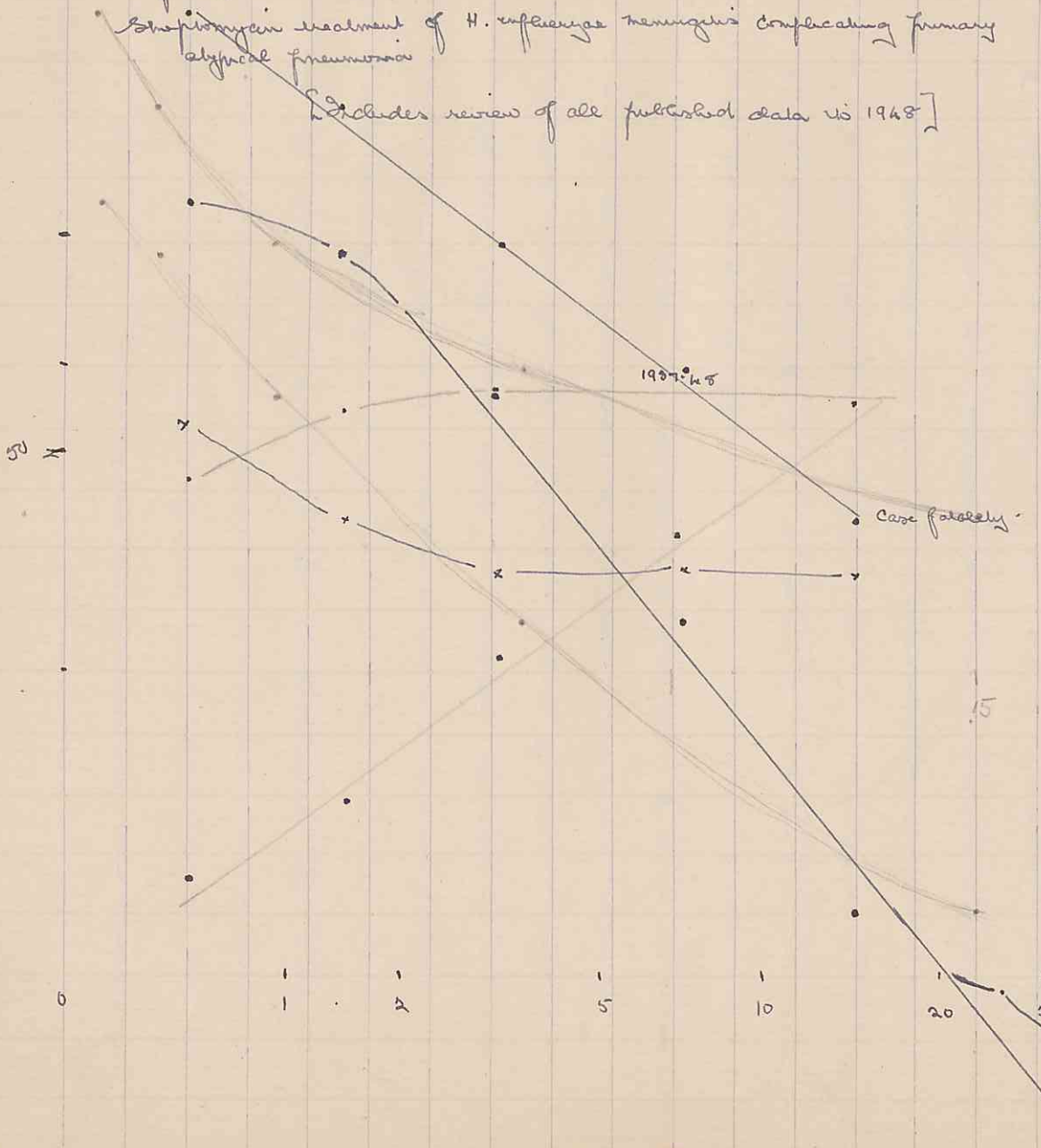
Factor 4 = resistance to spread to a vital organ

5) Symptoms may depend not so much on intrinsic damage produced by the microorganism as on the intensity of the inflammatory response which becomes evident after puberty.

Influenzal meningitis A. DOLPHIN + R D POPHAM Lancet 15/9/51 p472.

Streptomycin treatment of H. influenzae meningitis complicating primary atypical pneumonia

[Includes review of all published data to 1948]



	Total cases	Case fatality. 1937	37-48.
0-1	322	98.0	58.97
1-2	238	96.4	29.81
2-5	78	89.4	21.12
5/10	15	72.4	21.7.
10-20	10.	27.5	20.
20-	0.9		
30	0.6		
40.	0.3.		

Sulphadiazine + streptomycin cured.

Hypothetical case of changing case fatality with age.

0 –	1·1%.		
1 –	4·0.		
2 –	9·1		
3 –	16.		16
4 –	25		25
5 –	55	45	55
10 –		14	86
15 –		7	93
20 –		3·4	96·6
30 –		1·7.	98·3
40 –		1·1.	98·9.
50 –			
60 –			
70			

100%

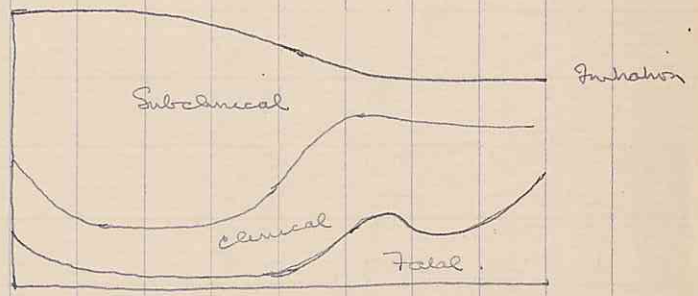
50%

10

5

10

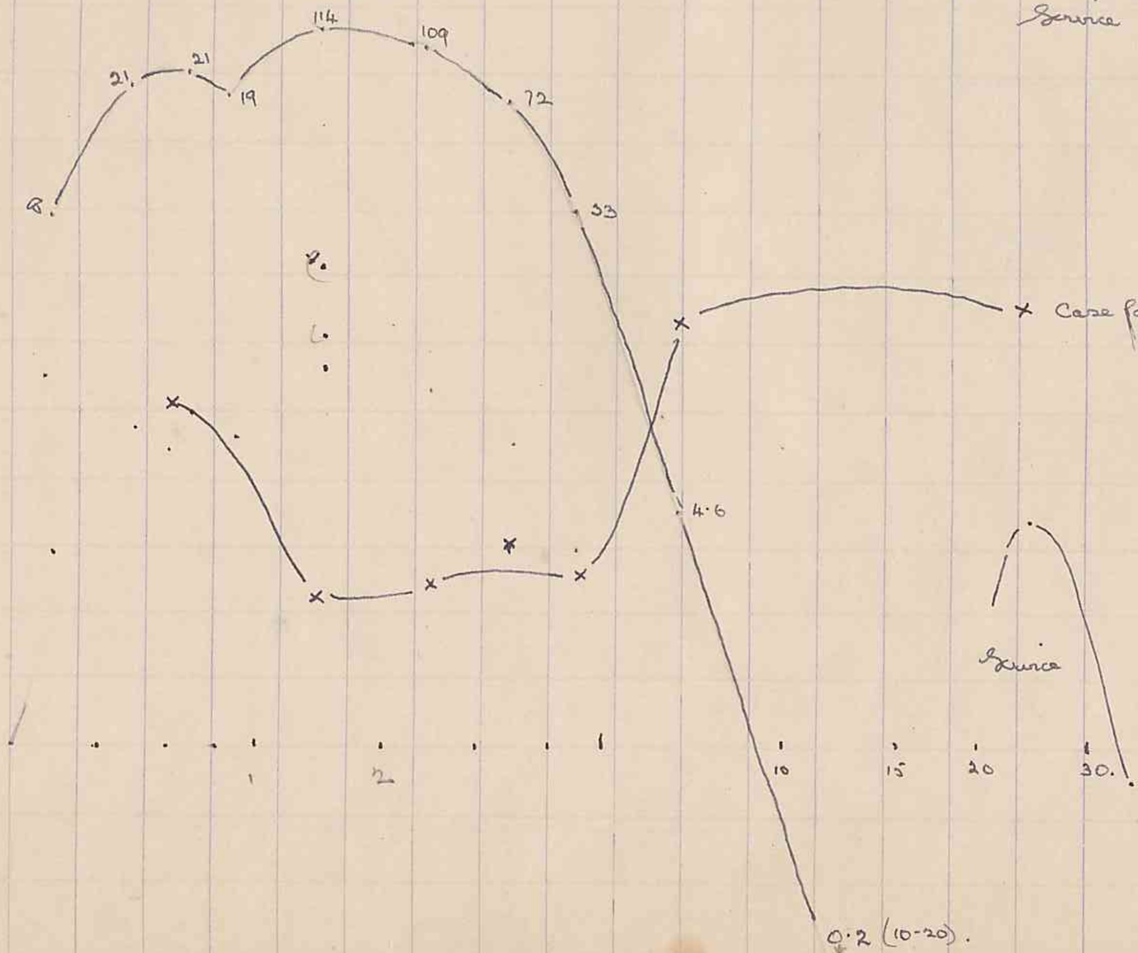
15



Malta . 1942-3. H J Seddon + al. Quart J. Exp. M. 14 . 1 1945

Case fatality (incl deaths of ? polio ? not directly due to polio

		%		
	0 - 1	10.1	7/69	
Civilian	1 - 2	2.7	3/114.	
	2 - 3	2.8	3/109	
	3 - 4	4.1	3/72	
	4 - 5	3.0	1/33	
	5 - 10.	17.4.	4/23	420
Service	20-30.	19	9/47.	
	30+	20.	2/10.	



In prev years.

	Cases.
1932.	3
3	3
4	2
5	1
6	3
7	6
8	5
9	2
1940	0
41	1

In different communities on Malta. the incidence varied from ·2 - 50% of children 0-4.

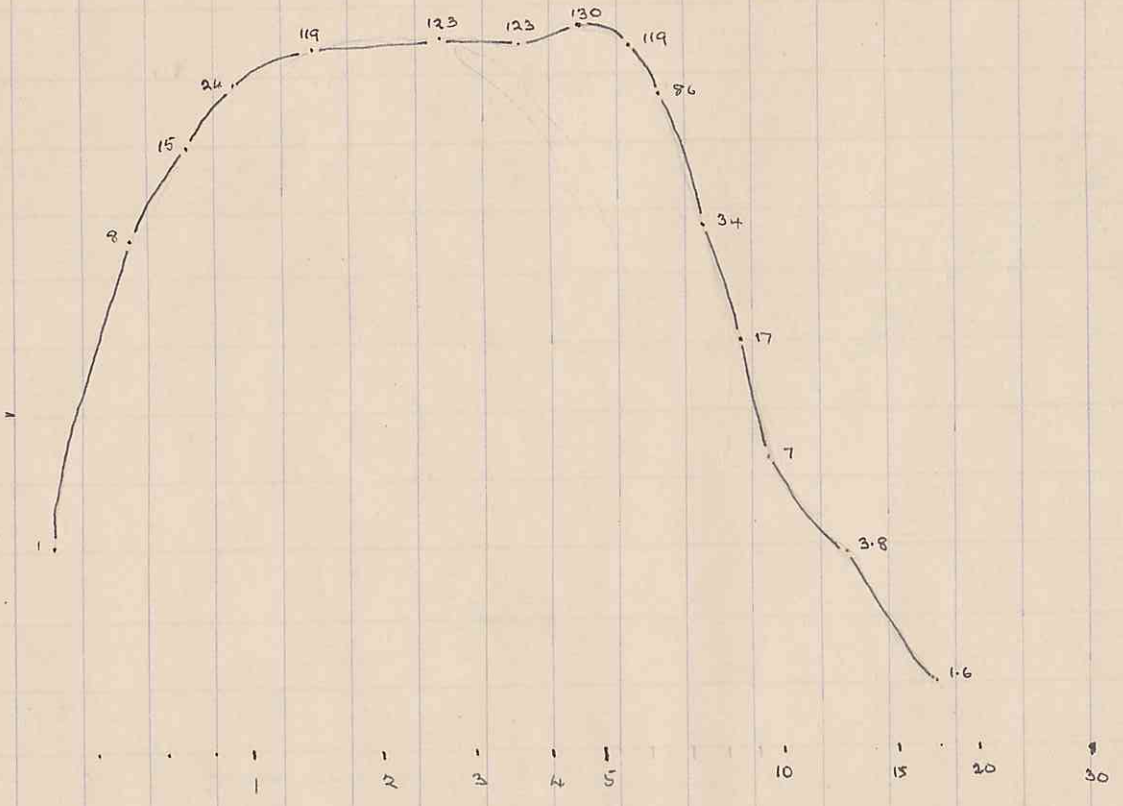
Mauritius 1945. Am Macfarlan & W A Dick + J J Seddon Quart J Med 15 183. 1946.

Note this is a combination of rural + urban epidemics

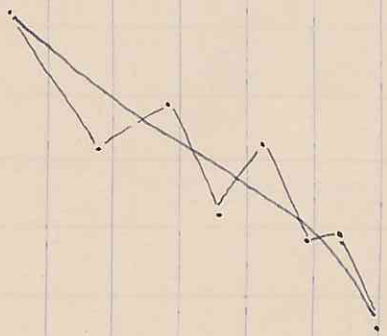
Attack rates. 0-4 5-9.

	0-4	5-9
Urban	8.1	3.2
Rural	23.0	11.2

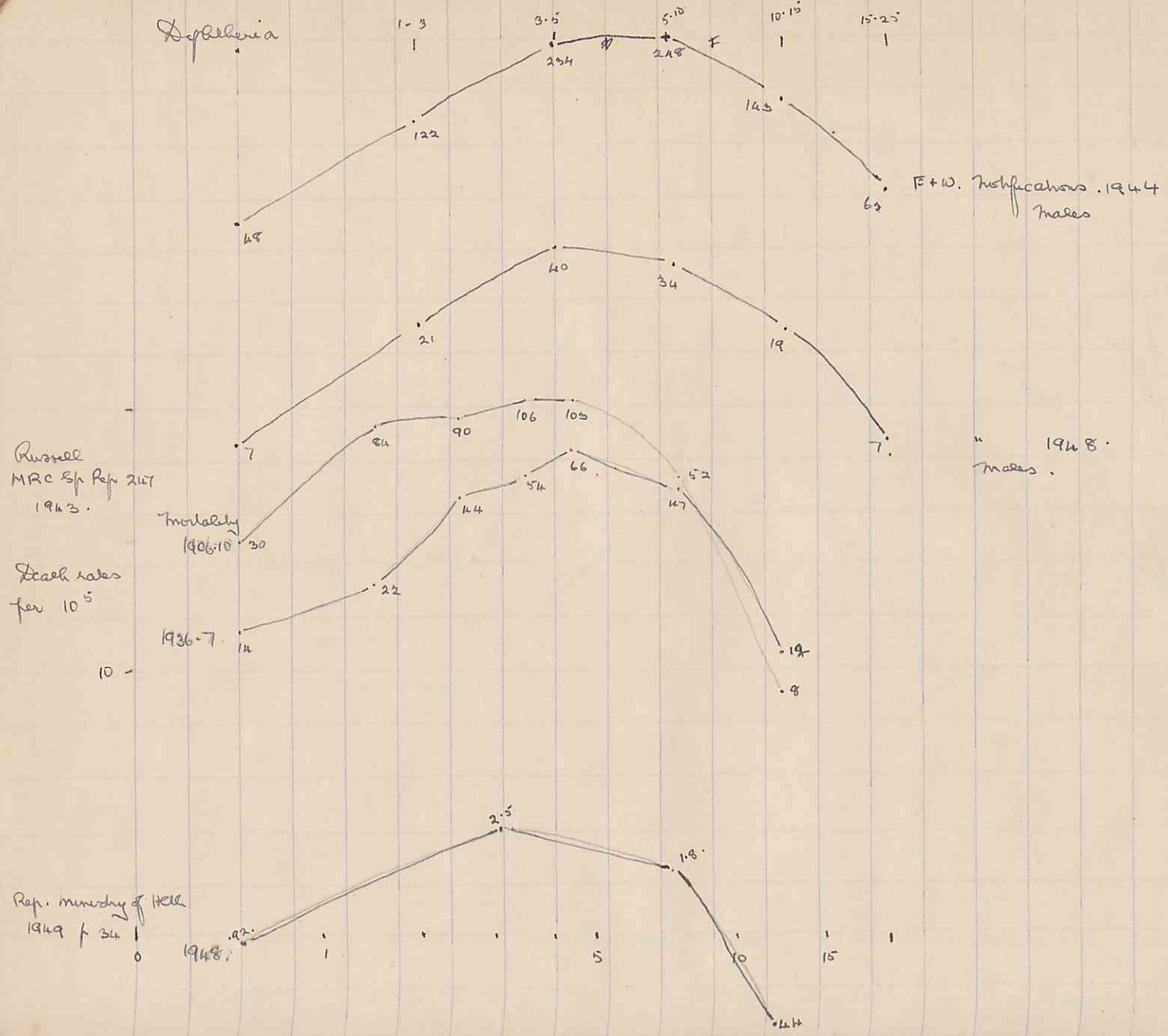
Fatality rate about 6% but no breakdown by ages.



Selander P. Acta pæd. Scand. 23 Suppl IV — Epidemic Hepatitis. Iceland.
Quoted Macfarlane. B.J.M. 14 1945.

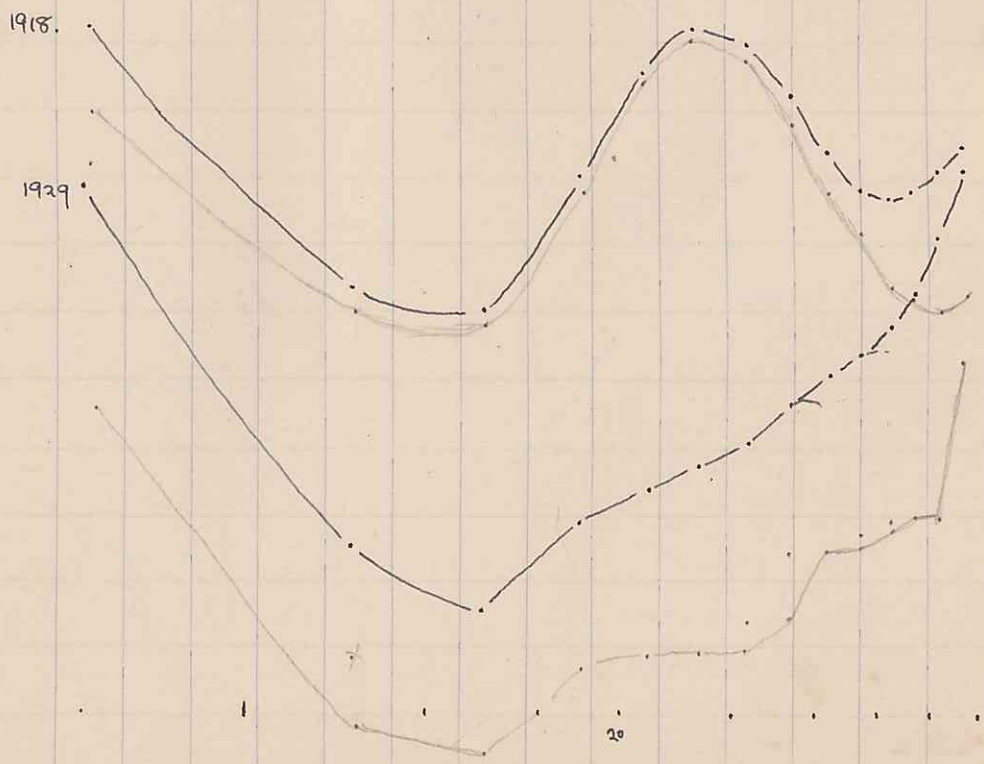


1/5 1/10 1/15 1/20 1/30 1 1 1/60


Diphtheria
1-3
3-5
5-10
10-15
15-25
48
122
234
248
143
63
E+W. Notifications. 1944
Males
21
40
34
19
7
7
" 1948.
Males.
Russell
MRC S/p Rep 247
1943.
Mortality
1906-10
30
84
90
106
105
57
Death rates
per 10^5
1936-7
14
22
44
54
66
47
19
8
10
Rep. Ministry of Health
1949 p 34
0
1948.
1
5
10
15
2·5
1·8
·44

Influenza in U.S. Registration states Dawes U S P H Rep. 27/7/52 p 856'7

Deaths from Influenza + all pneumonia + excess such deaths over base year

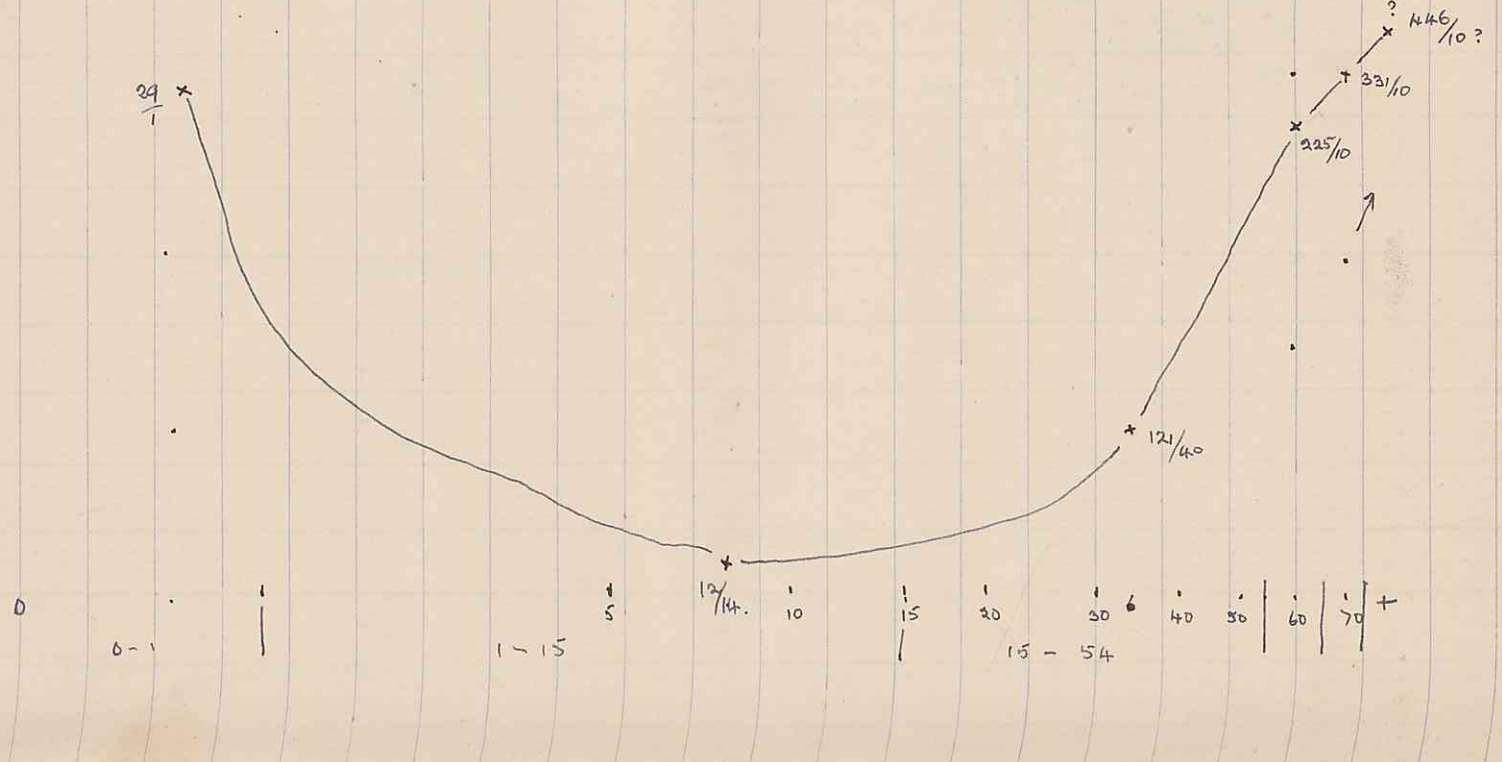


Influenza.

QB Samples. Prov RSM. 44 794. Discussion

Liverpool deaths from respiratory disease Jan 1951

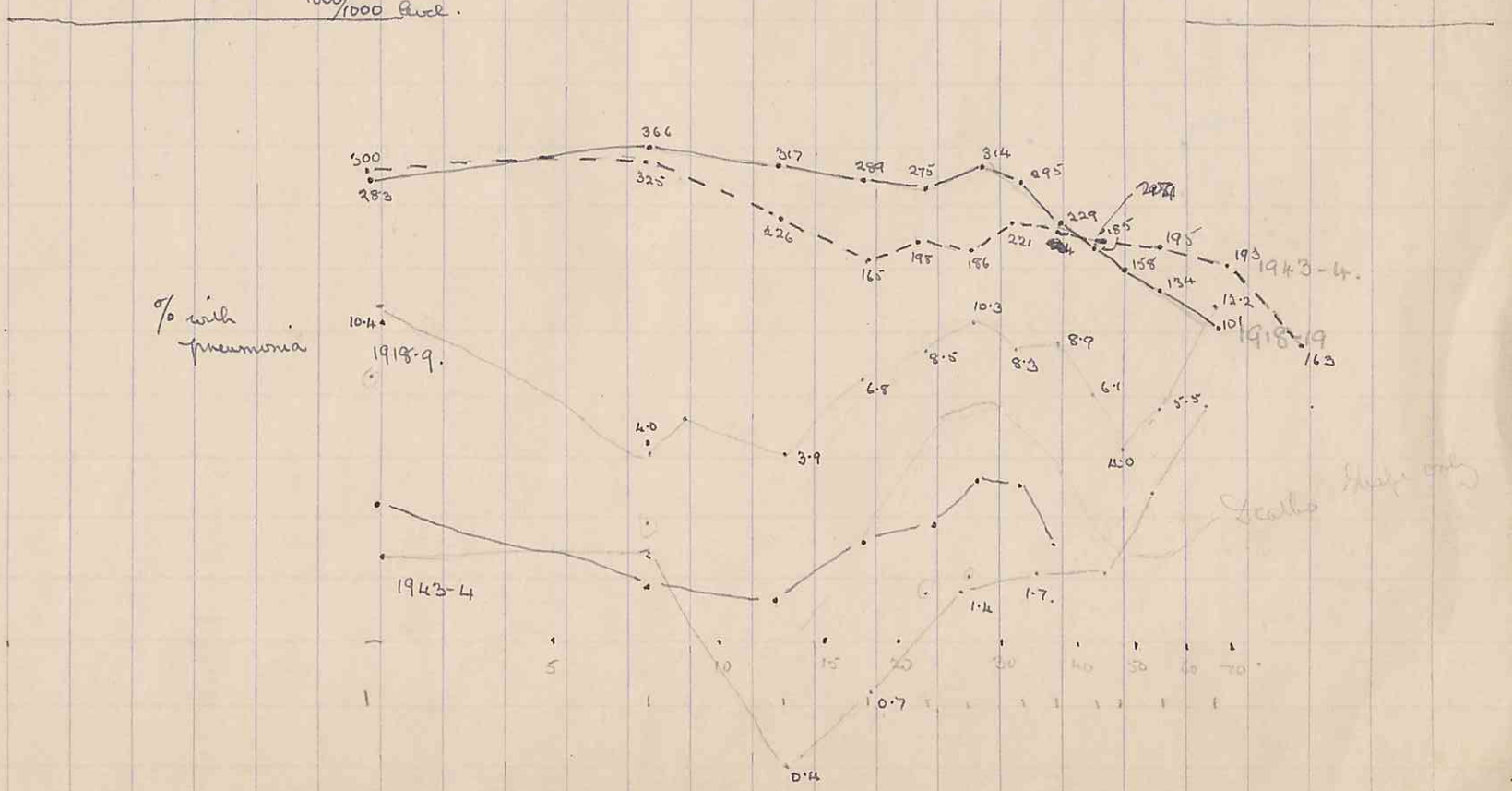
Note crude data only.



Incidence of pandemic flu in Baltimore 1918-19. [Resp. disease sending to Hosp] + percent with pneumonia

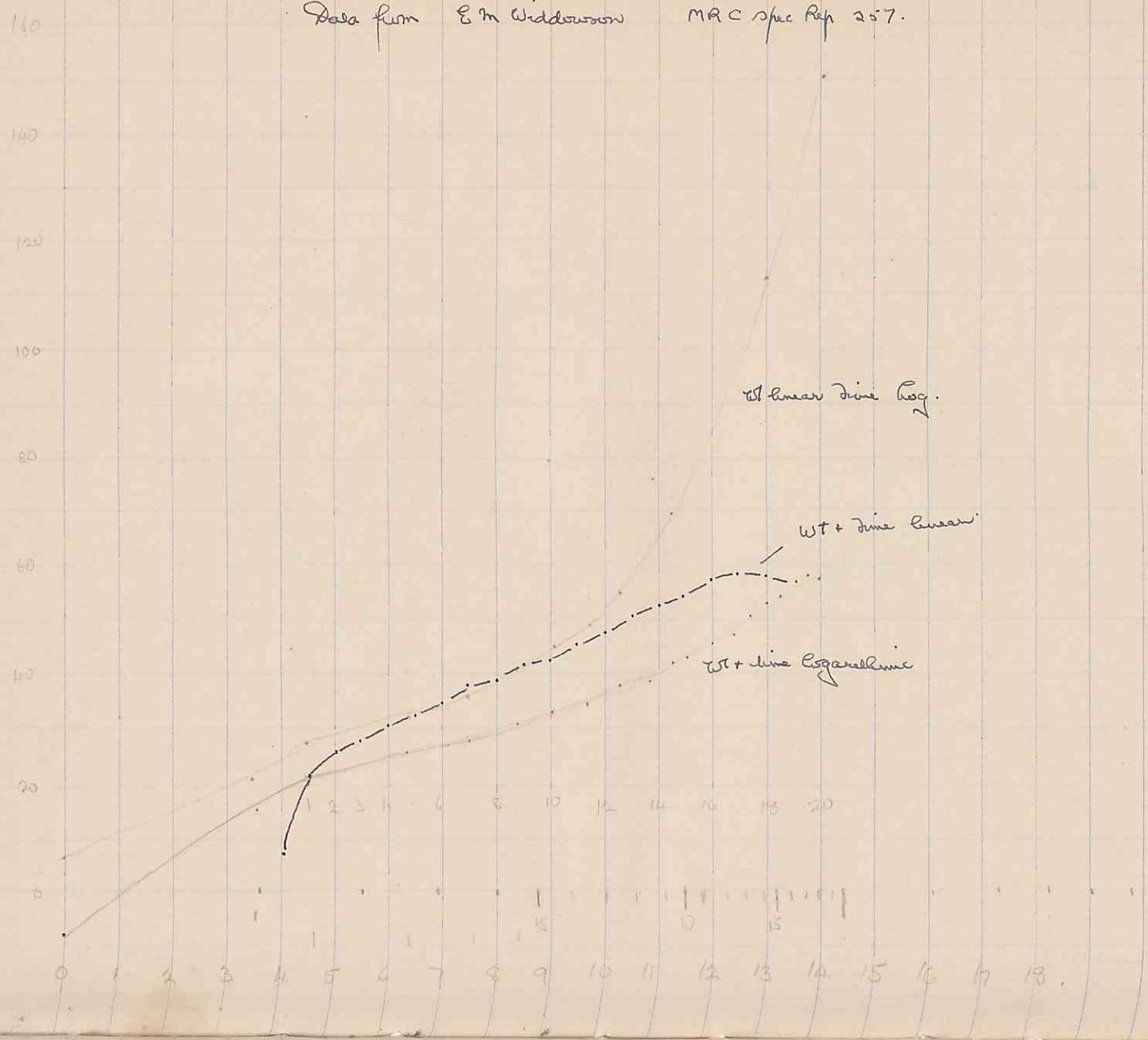
Rate per 1000 in flu epidemics of 1918-19 + 1943-4

S. D Collins US. Pub. Hlth Rep. 59. 1483 Table I p 1485.



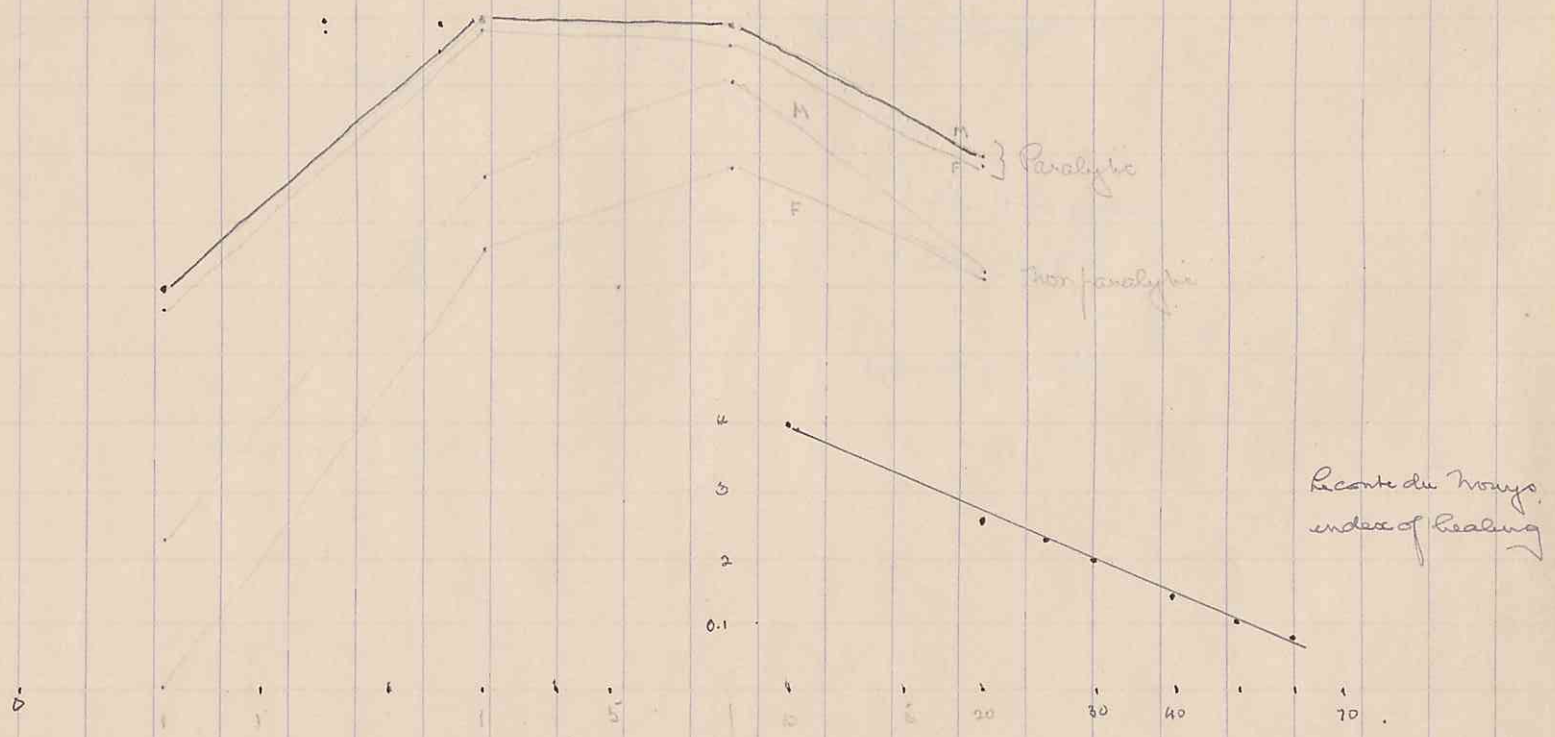
Attempt to fit obedrons weights to three time scales.

Data from E M Widdowson MRC spec Rep 257.

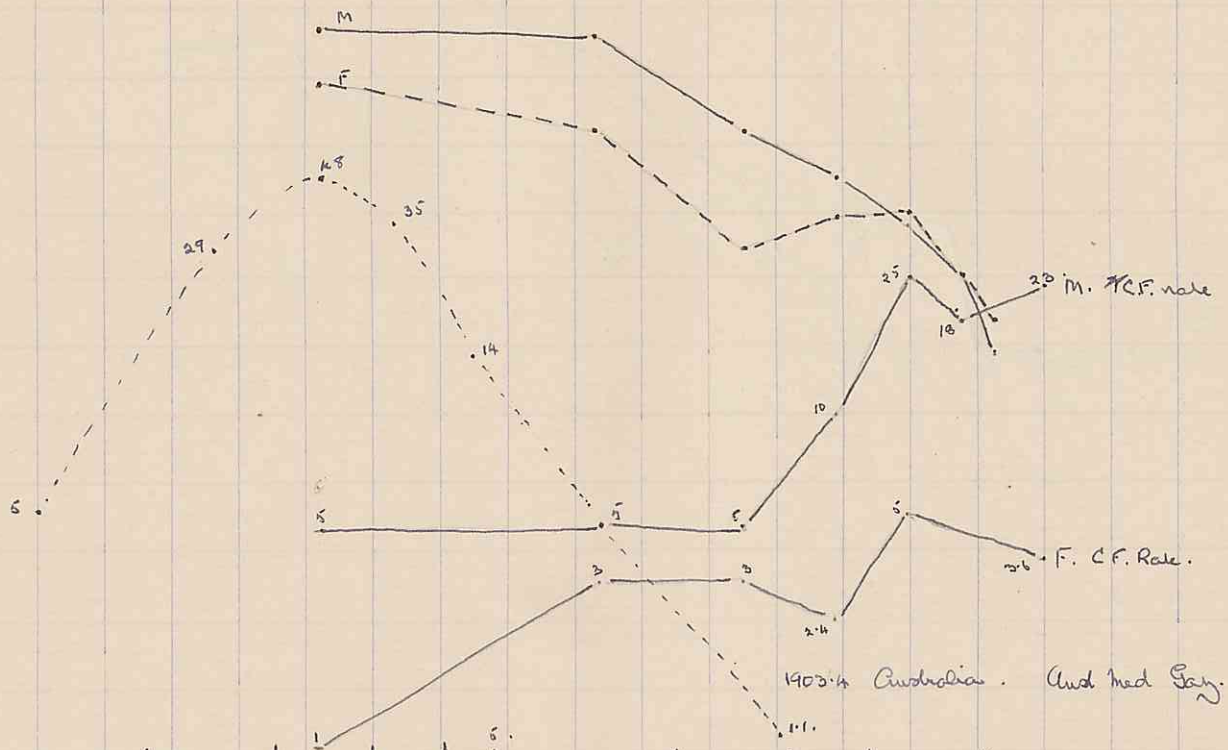


Polio incidence. B Benjamin & Ian Taylor. Lancet 13/10/51. 689. E+W Metropolitan 1950.

Paralytic + non-paralytic.



Victoria 1909. Mc Eldowney. Health Ball. (Prewar figures.

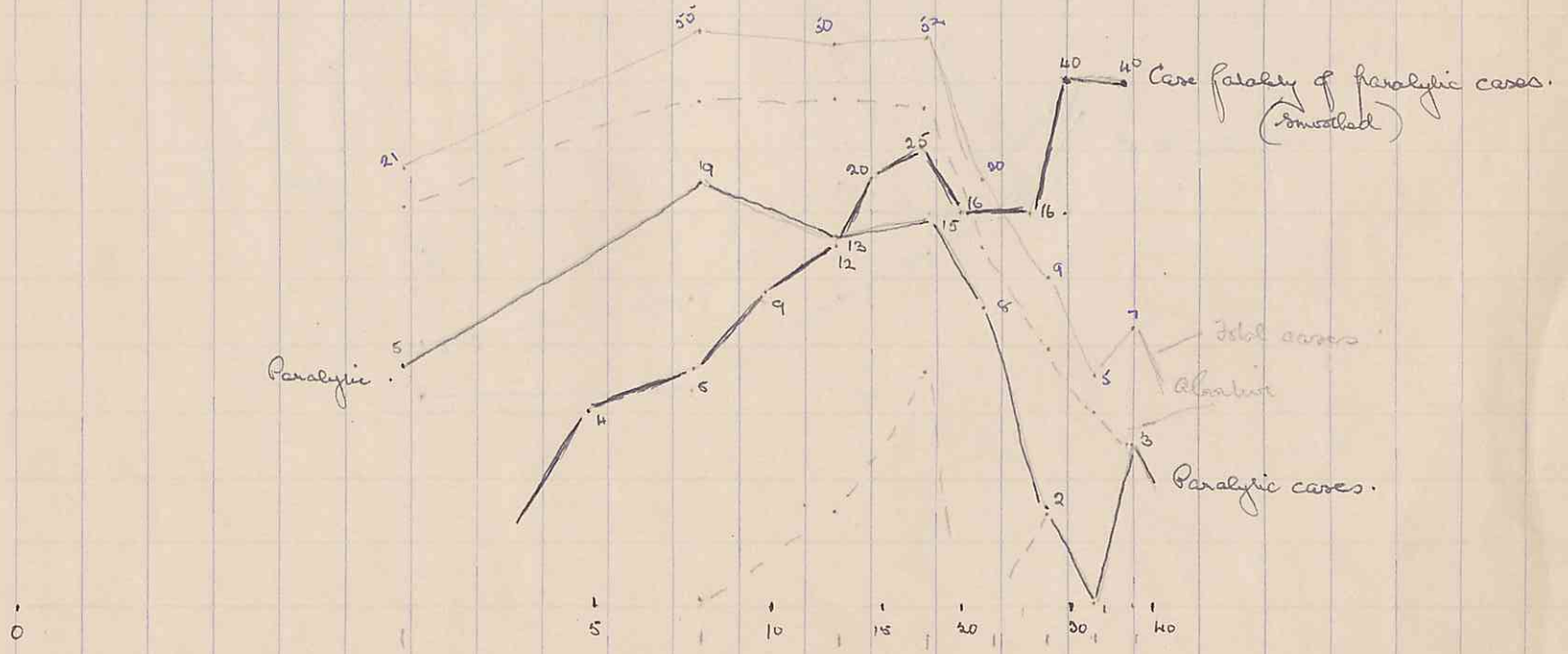


1903-4 Australia. Aust Med Gaz. Vol 23 + 24.

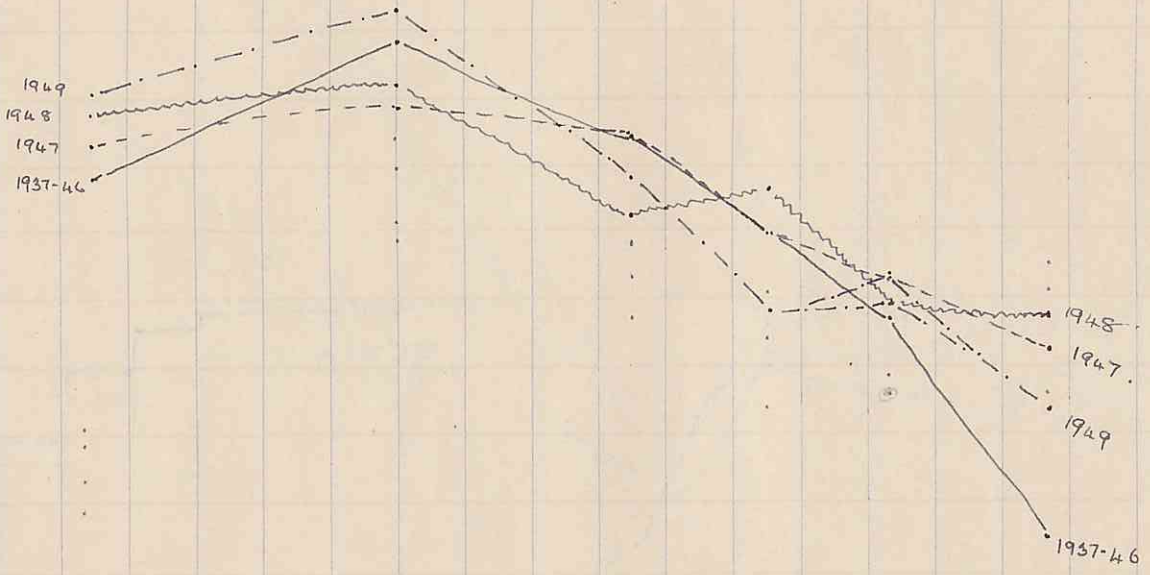
St Helena 1947. K.I. Russell Proc RSM. 14 923 1947.

7000. 140. 19 = 14%.
219 = 3.3%.

[NB. 1836 epidemic Boer]



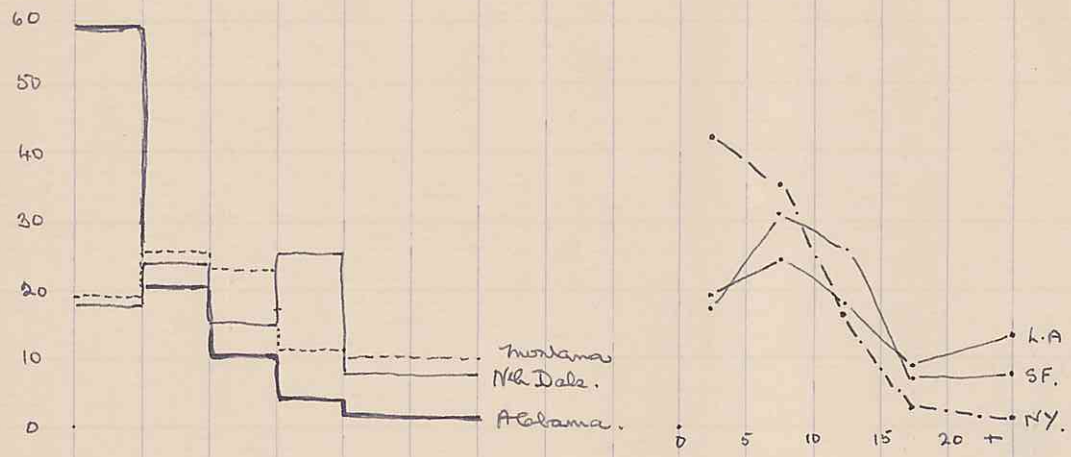
£ London. Polio incidence Breen G E and Benjamin B. BMJ. II 1473 1950.

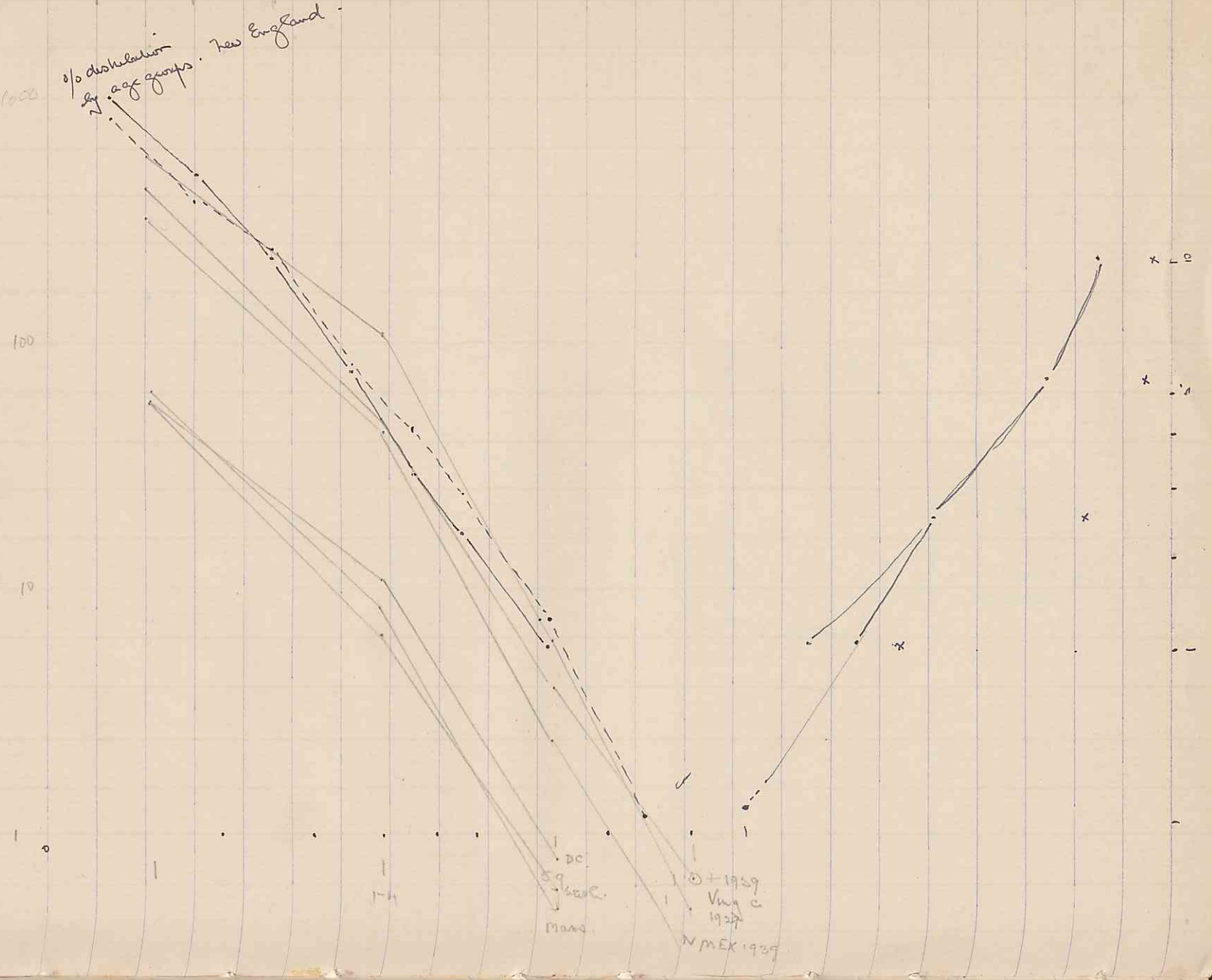


0-5 5-9 10-14 15-19 20+.

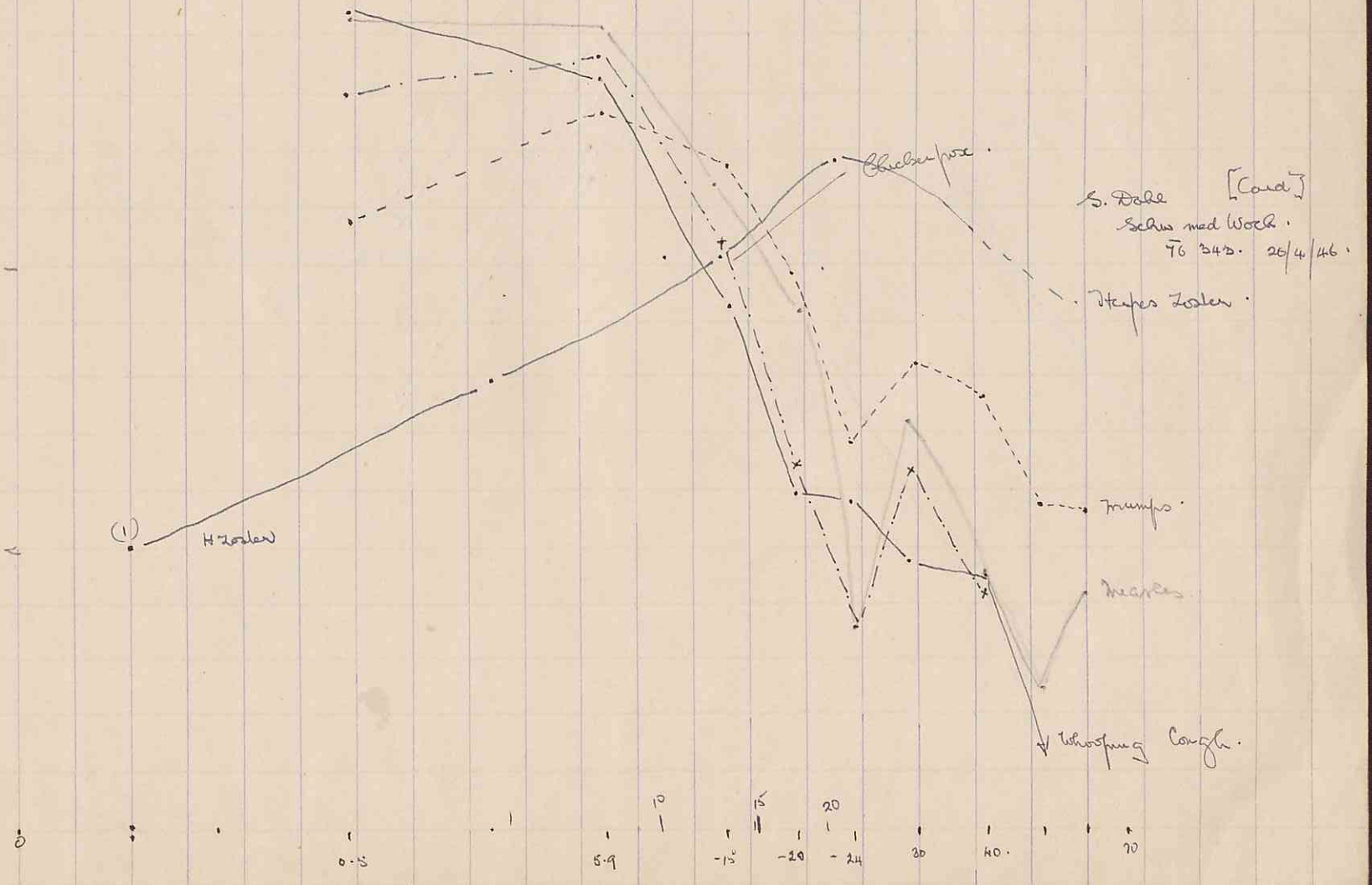
American figures 1930-41. cc Dauer. U.S.P.H. Reports 58 937.
18/6/43.

Polio incidence




% distribution
by age groups. New England.
1000
100
10
1
DC
59 Cases
Mass.
1939
Virg C
1939
NMEX 1939

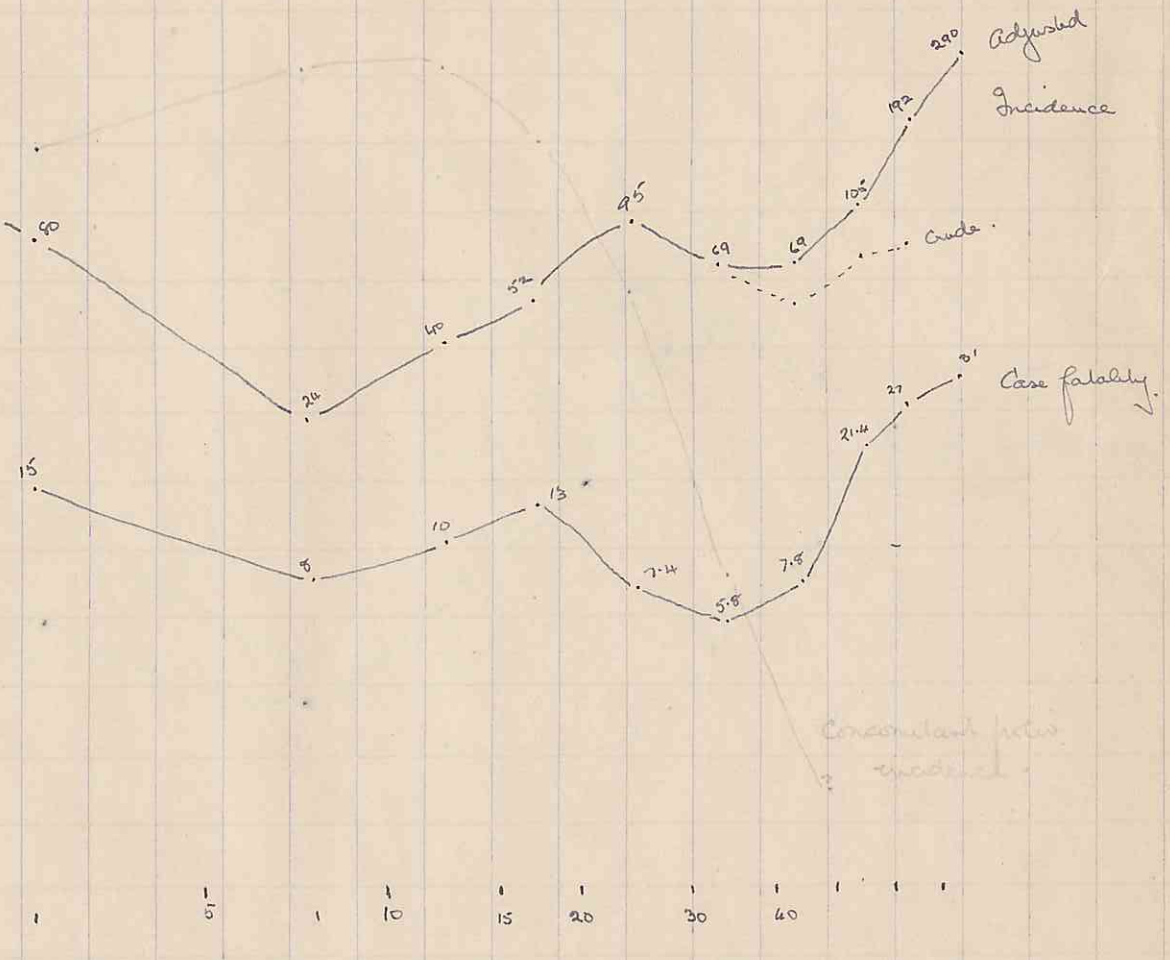
S. D. Collins Pub Hlth Rep 50 1404-27 1935



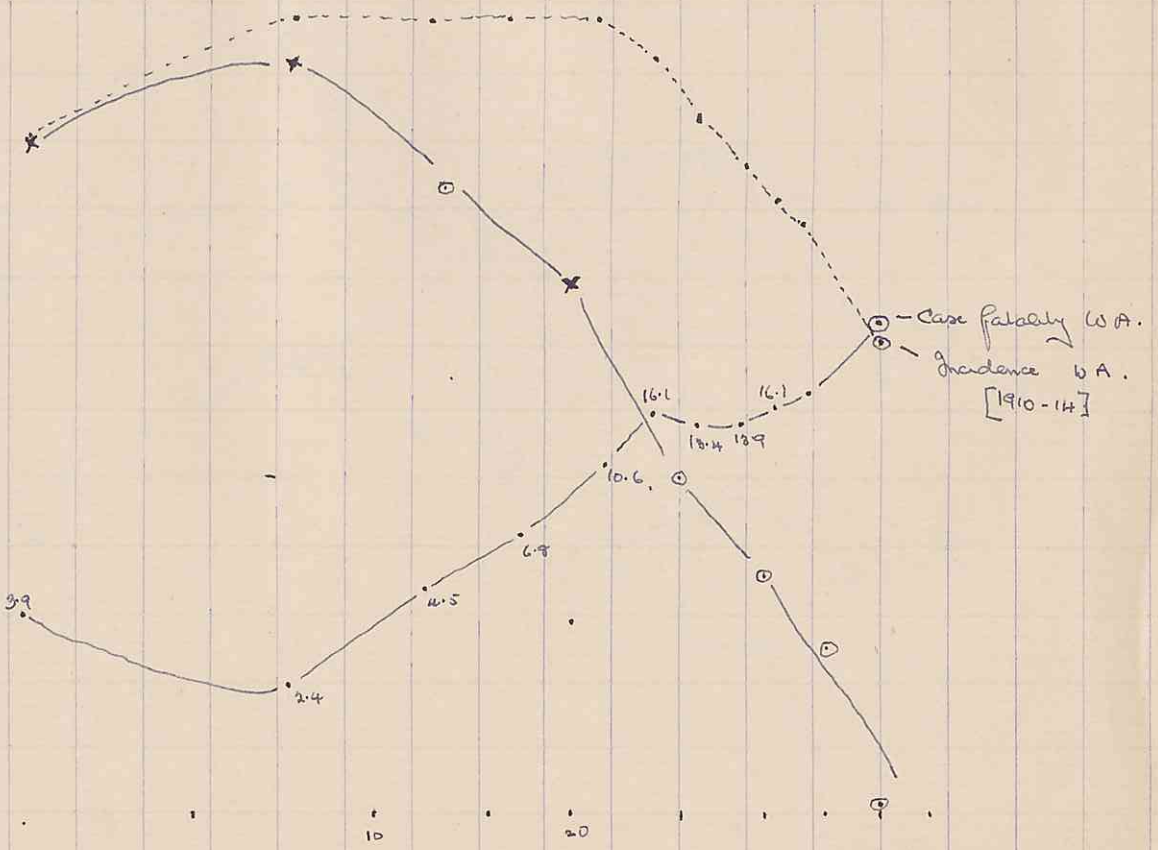
S. Dakk [Contd]
Schw med Work.
76 343. 26/4/46.

Western Equine Encephalitis Manitoba 1941 509 cases ♂/♀ 351/158. Canad J. Pub Hlth. 33 346 1942

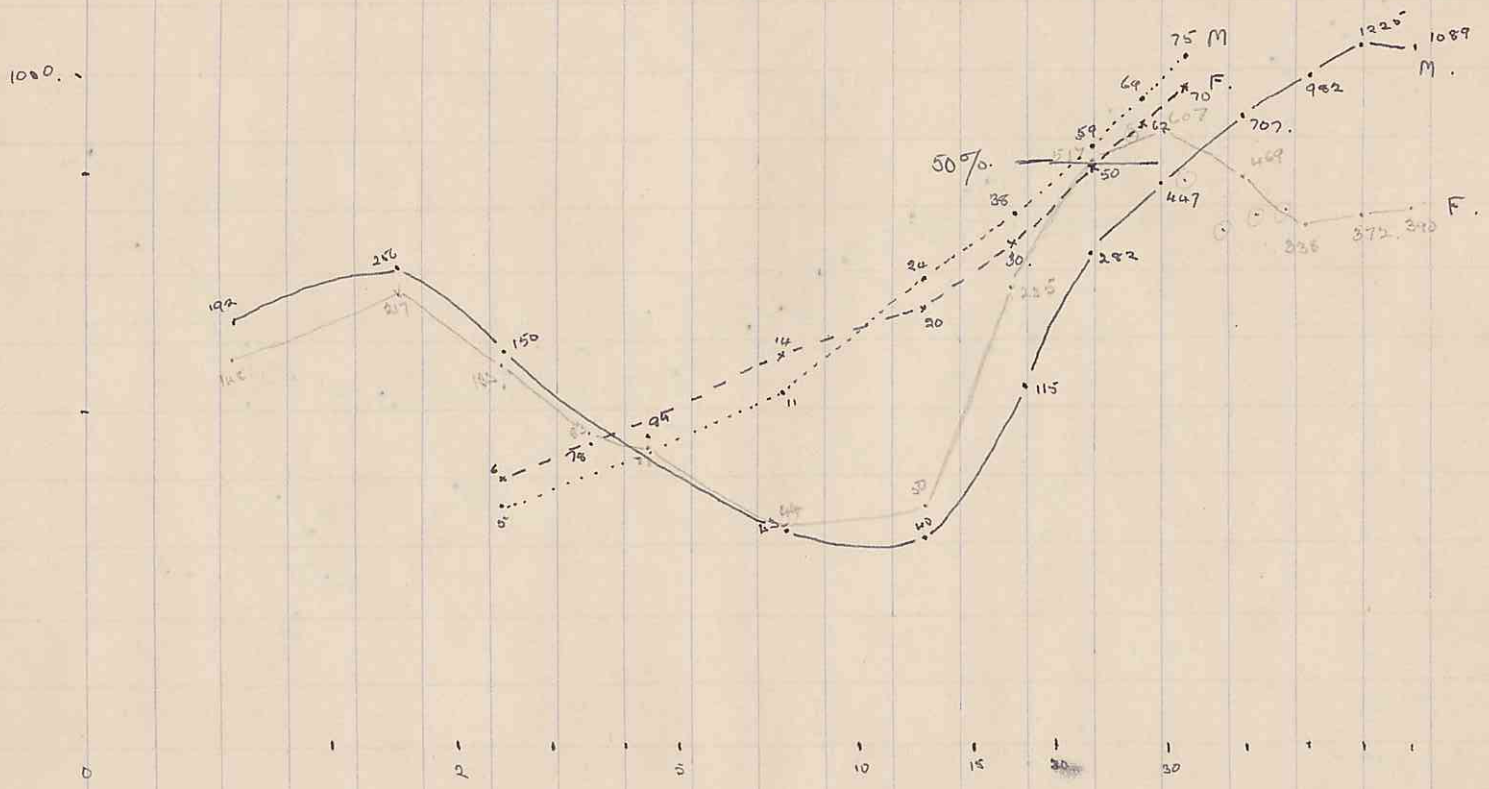
[Card]

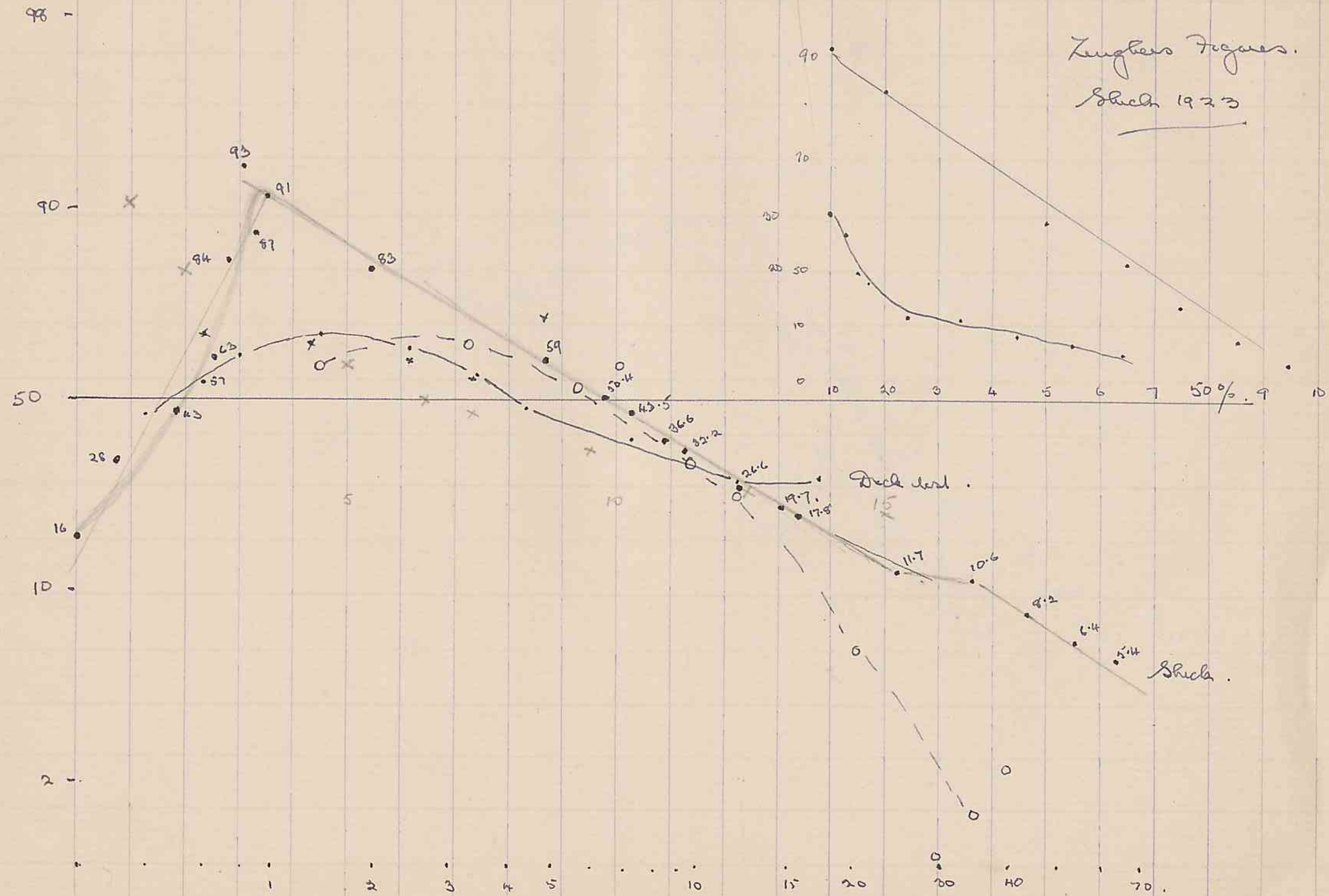


Enteric Fever. Journ. Hyg. & Trop. Dis. 1904 Brit. Hyg. II 369 1936 WA figures from Crumpton.



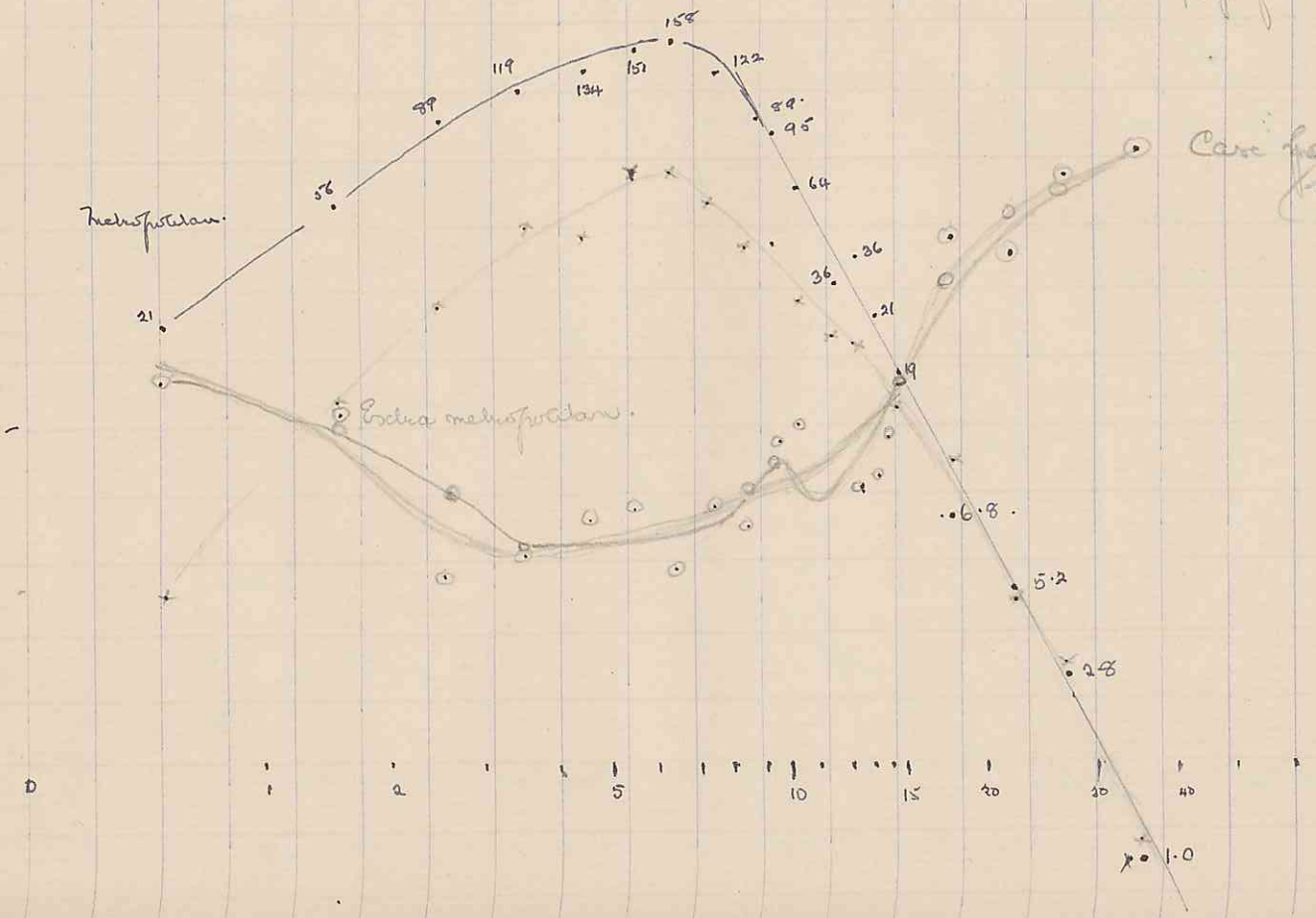
Tuberculosis Mortality in Australia 1931-40. Lancaster
+ Manhouse survey of Sydney in 1938.




Zunglers Figures.
Stuck 1923
Dud test.
Stuck.
50 %

Poliomyelitis Melbourne 1937 July-Dec. J. Dale.
MJA 1938 i 404.

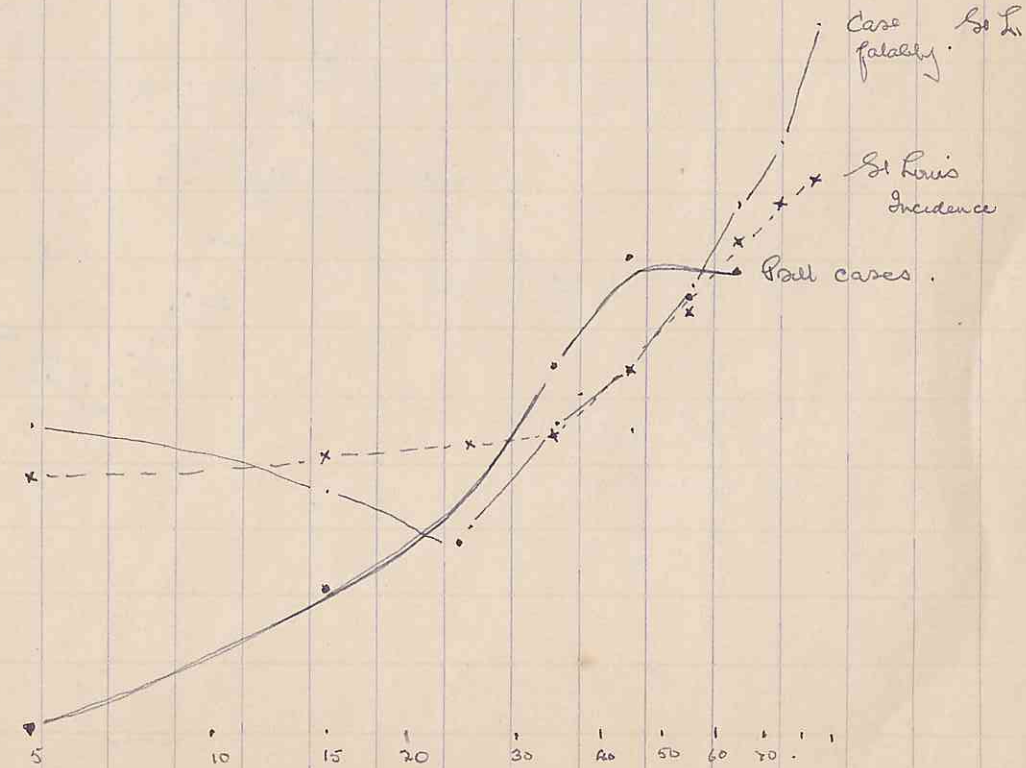
Corrected figures for Melbop cases 1937-8 shown

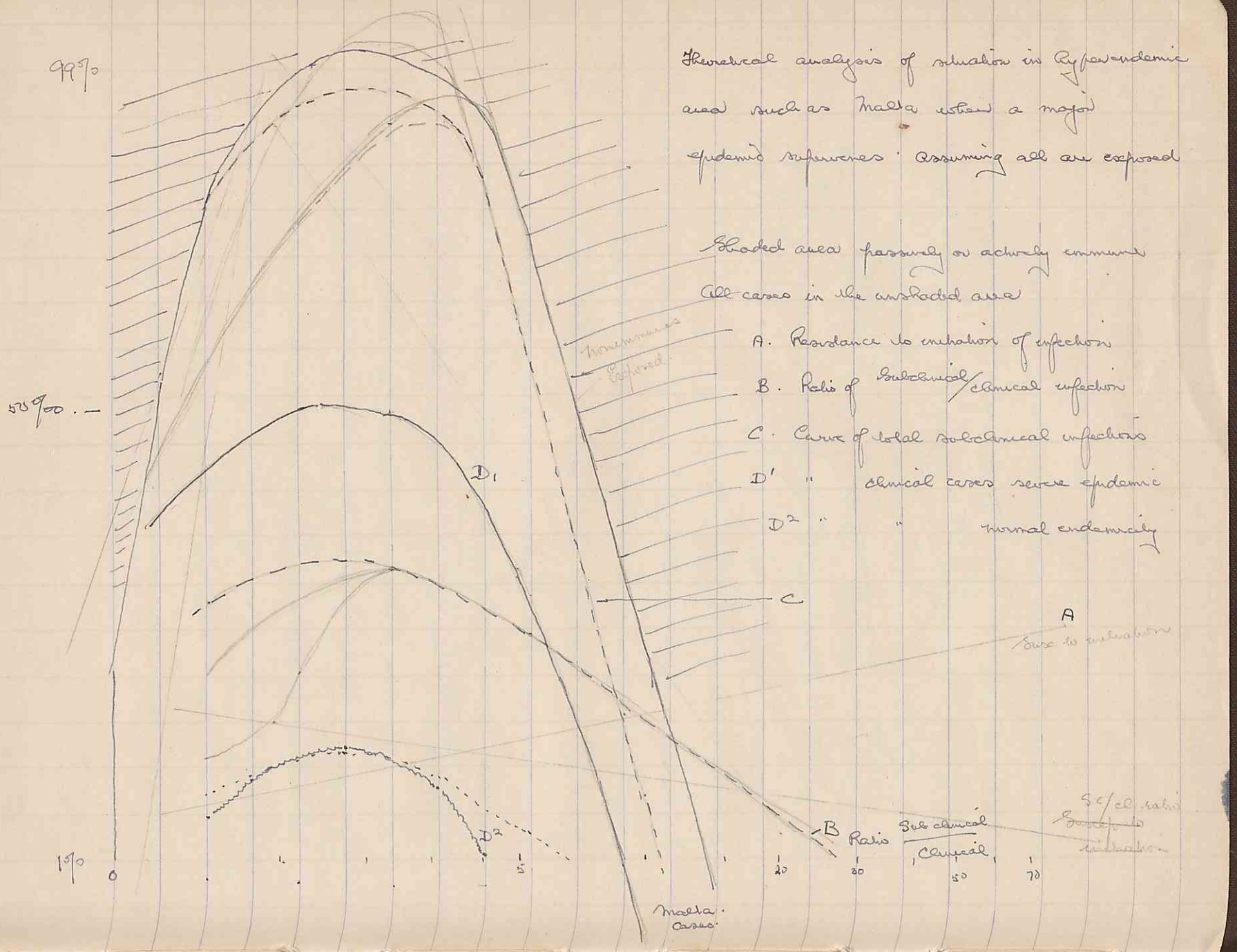


Psittacosis   K.F. Meyer. Proc 12th Internal vet. congress. 3 182 1935

Hutchinson Rowlands + Georg Simpson   St Louis. Black notebook

0-10	2	20	0·1
-20	5	18	0·26
-30	6	17	0·35
-40	17	15	1·13
-50	29.	11·5	2·5
-60	19	10	1·9
-70	12	5·5	2·2
70+	4.	2·0.	2·0.





Theoretical analysis of situation in hyperendemic area such as Malta when a major epidemic supervenes. Assuming all are exposed

Shaded area passively or actively immune

All cases in the unshaded area

A. Resistance to infection of infection

B. Ratio of Subclinical/clinical infection

C. Curve of total subclinical infections

D' " clinical cases severe epidemic

D² " " normal endemicity

Biological Time P. Records du Travail Melheuen 1936 London

Cicatrisation of surface wounds Carrel in 14-18 war.

Carrels work. Healing of wounds. 1) Crescent called period – granulation begins 2.) period of granular contracture. rate depending on the extent of surface of the wound and not on its age. This goes on sufficiently to bring the edges of a wound in the dog to within 10-15 mm (a distance capable of being covered by epithelial regeneration. 3 Period of epithelialization. Cicatrical period

R. du Ns work on war wound. plotting area of wound against time.

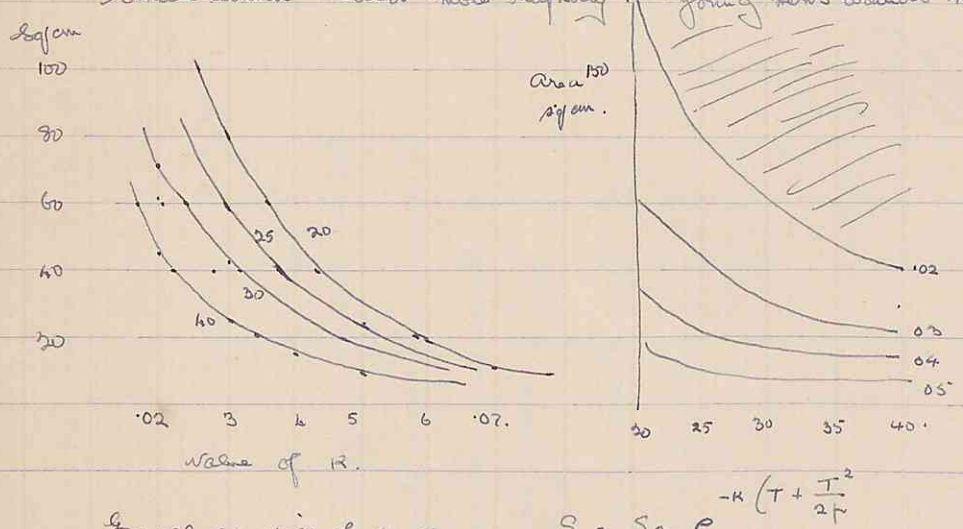
$$\frac{S - S'}{S(t + \sqrt{T})} = k \text{ or } i$$

S S1 being areas at beginning and end of time t while T is the time that has elapsed since the wound induced.

or $S'' = S'\left[1 - k\left(t + \sqrt{T'}\right)\right]$ - (4) t normally in days.

k varies from person to person. Call it i cicatrisation index

Small wounds healed more rapidly: young new wounds more rapidly than old.



General equation of curve $S = S_0 e^{-K\left(T + \frac{T^2}{2r}\right)}$

Carrel + Ebeling JEM 34 599 1921. Duration of life of fibroblasts as function of the age of the animal from which plasma was taken.

There are two kinds of time. One corresponding to the classical notion the ~~ideal~~ physical time evident beginning and end and flowing in a continuous uniform rigid fashion. The other the physiological time the duration of our organism which begins and ends with us and which does not affect identically in our youth and our old age the phenomena of which we are the seat.

The time machine : There is no difference between time and any of the 3 dimensions of space except that our consciousness moves along it.

The only time which counts for a man is his own time the time which extends between a cradle and a tomb.

$A_{20} = i\sqrt{5}$. is a constant 0.260. constant of separation

10	0.4
20	0.260
25	0.225
30	0.198
32	0.188
40	0.144.
50	0.103.
60	0.08.

The effect of temperature in dilating time for ants.

Excludes notion of physiological time in appreciation of time

of A with the value of a year expressed in fractions of the age of a man. $y = \frac{1}{x}$ rectangular hyperbola.

Young & old united in the same space live in a separate universe where the notion of time is radically different.

The Biology of Death Raymond Pearl. Lippincott 1922. 577.7 P31.

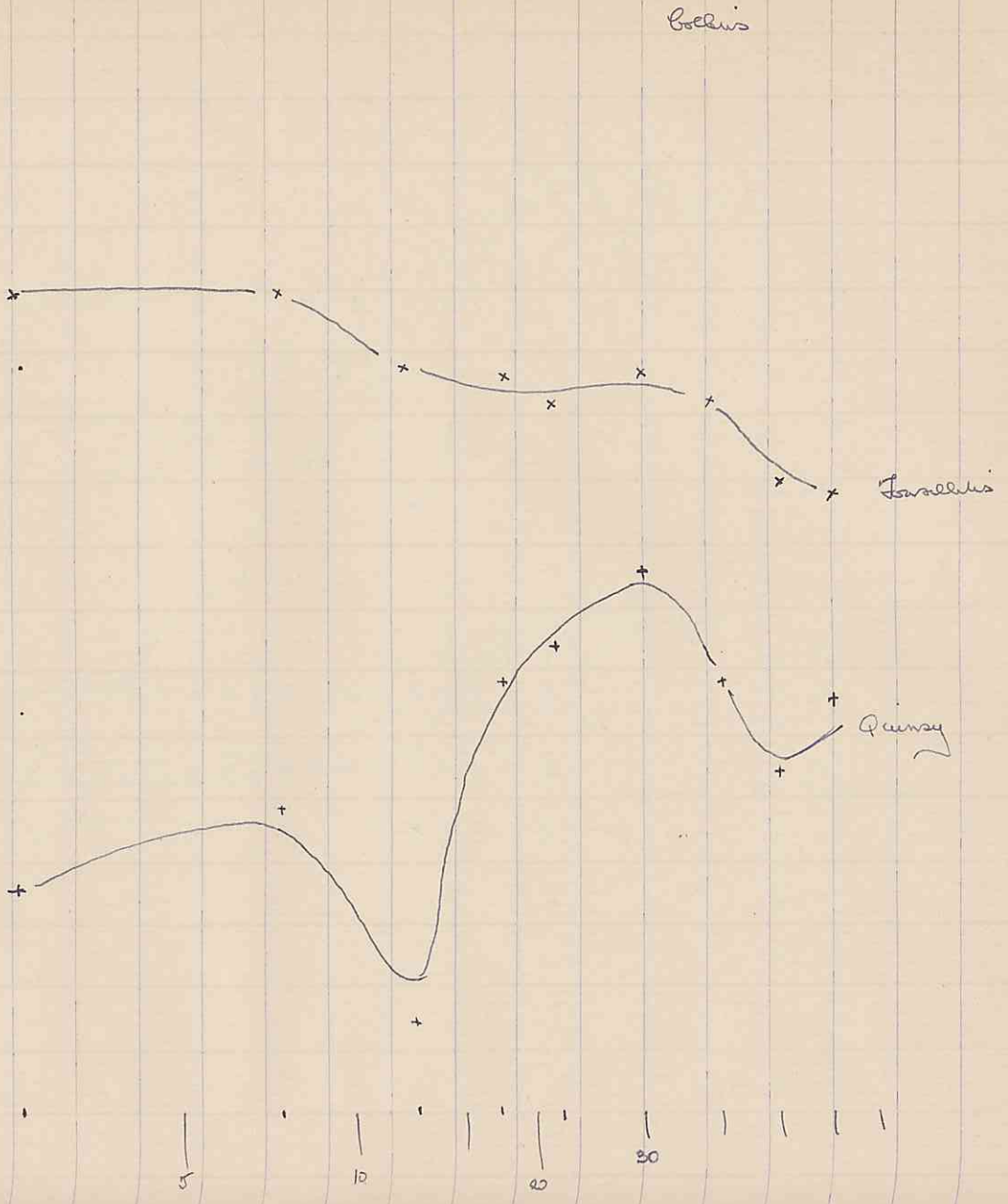
Breslau 17th century. Birth 33.5 Masc. 6-7. 41.62
London 18th " 38.72 " 5-6. 51.24.
51.49. 2-3 57.72
USA 1910.

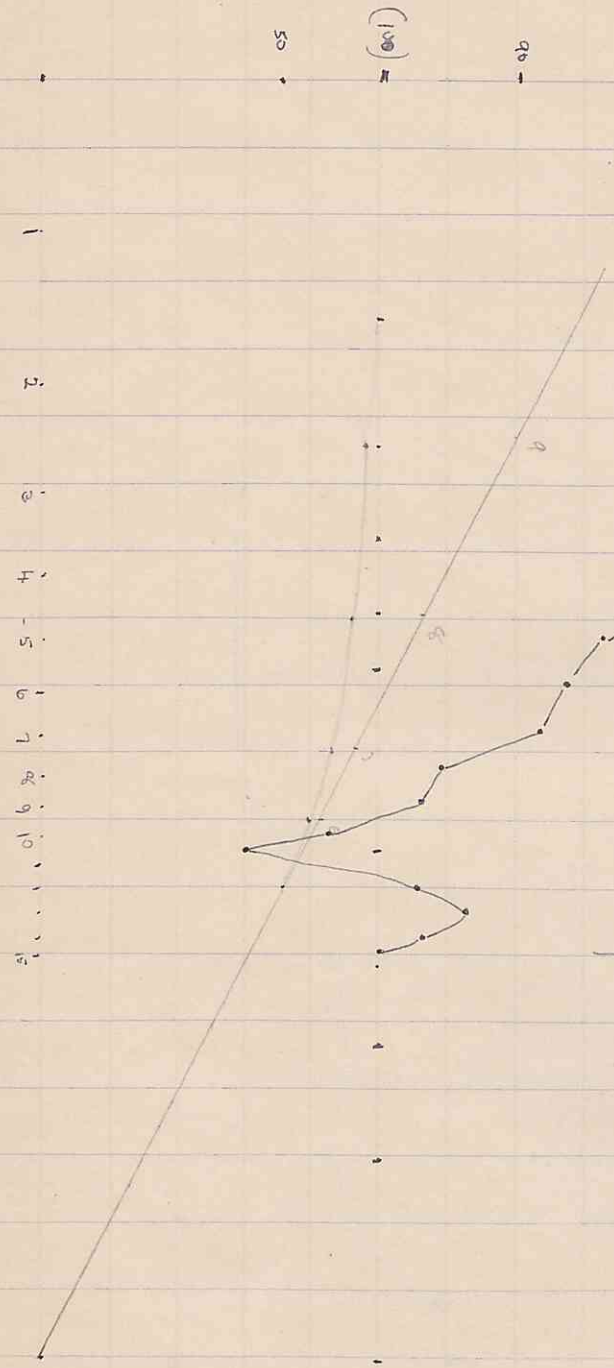
K Pearson : 5 components "Organically we no longer think of death as striking chaotically : we regard his aim as perfectly regular in the mass if unpredictable in the individual instance."

	I		II		III		IV		V		VI		VII		VIII		IX		X		all causes	
	M	F																			M	F
0-1	6.87	5.13	30.1	24.7	1.74	43.2	0.93	0.63	0.40	0.34	66.3	54.2	5.46	4.58							124.38	143.43
1-4	1.00	1.00																			15.1	13.8
5-9																					3.7	3.5
10-																					2.5	2.4
15																					4.1	3.7.
20																					6.0	5.2
25																					6.8	6.1
30																					8.0	6.8
35																					9.7	7.8.
40																					11.6	8.9
45																					14.5	11.0.
50																					18.51	14.6.
55																					25.7	20.6.
60																					36.1	29.4
65 - 70.																					51.4	44.3.
70																					75.1	66.8.
75.	Circulatory syst.		Resp.		Urin + sex sex.																112	101.
80 - 84	Be +																				168	155.

Specific death rates per 1000 living of each age
and sex in U.S. registration area 1910
R. Pearl Biology of Death.

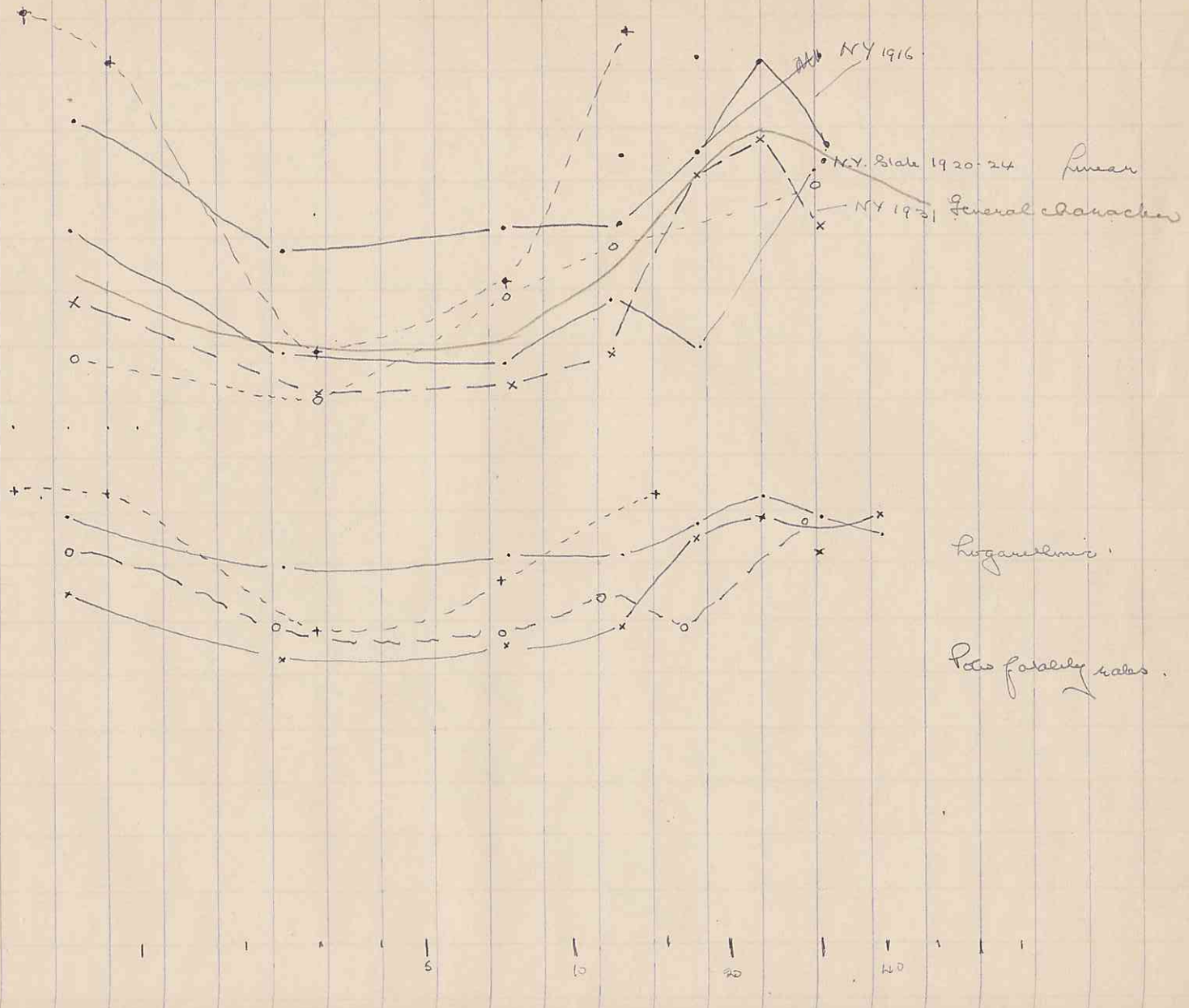
Death rate in the earliest period of life is selective eliminating
the weak and leaving the strong ?

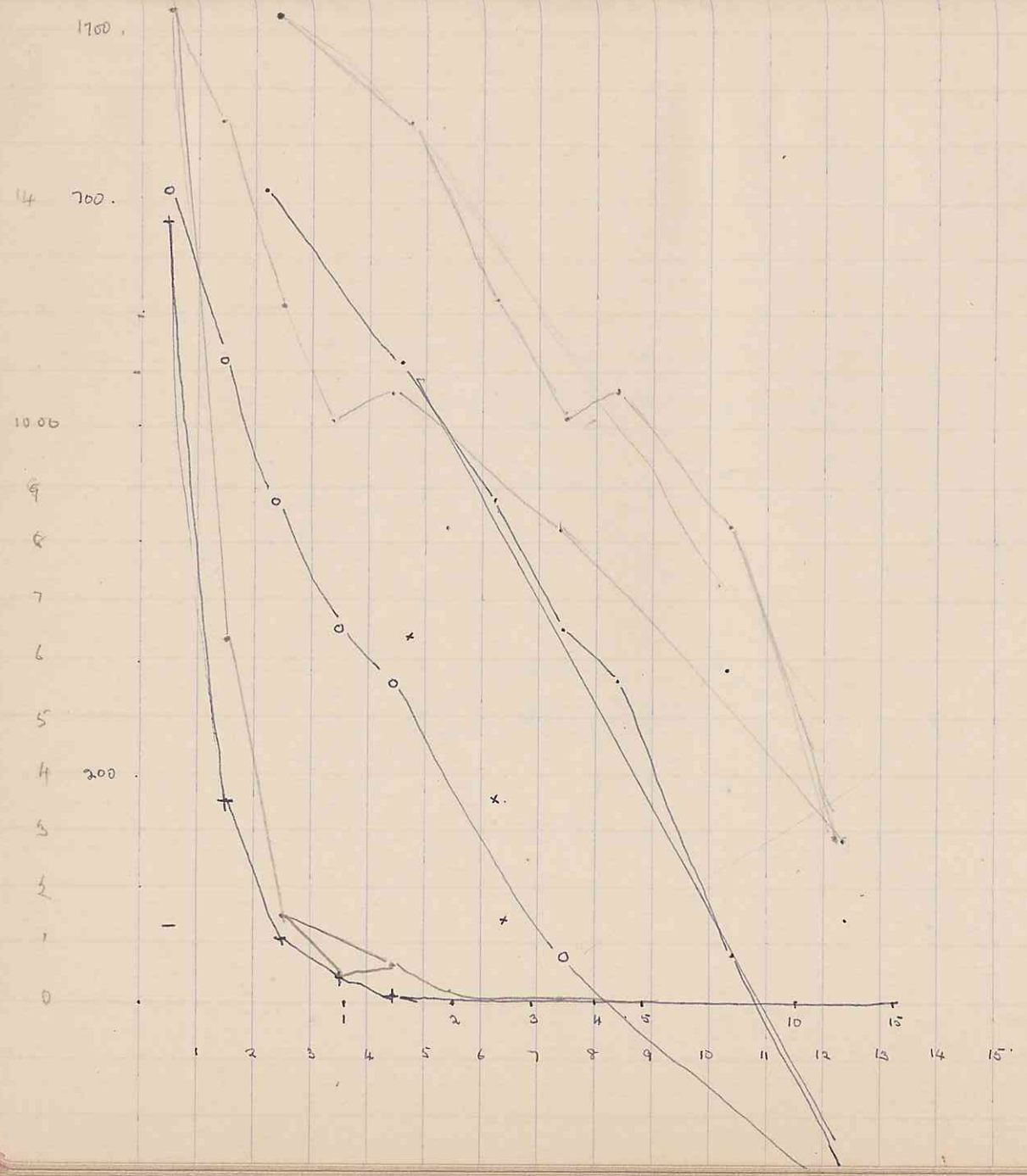

Bacillus
Parabacillus
Quinsy
5
10
20
30



Polio
Frieslandt 1927
(monograph)

	C	D
0 1	83	4
2	88	4
3	75	8
4	73	10
5	63	7
6	34	4
7	29	3
8	15	1
9	13	2
10	4	1
11	4	
12	14	3
13	18	1
14	14	4
15	10	3
16	1	
17	6	
18	8	3
19	3	2
– 20	1	1
– 25	10	3
– 30	4	
– 40.	7	3


45
40
35
30
25
20
15
10
0
NY 1916.
N.Y. State 1920-24
NY 1931
Linear
General Canadian
Logarithmic.
Pois fatality rates.
5
10
20
40

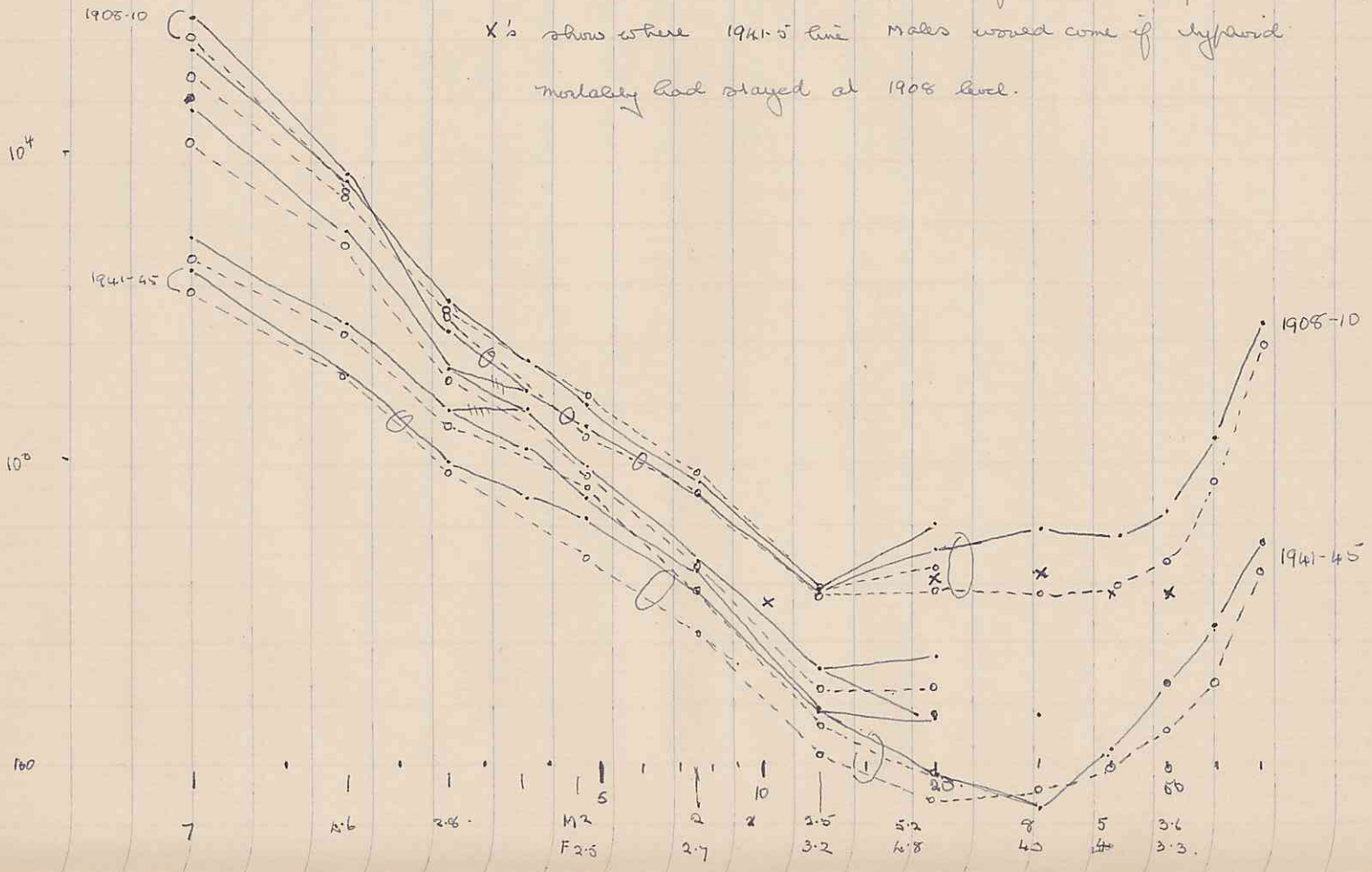

1700.
700.
200.
14
10.00
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
1 2 3 4 5 10 15

Mortality from Acute infective diseases Lancaster MOH 9/2/52.

Use only 1908-10 and 1941-45 figures both M + F.

Note the relative reduction of the infantile level from 12.
the deferment of the burning point to 30 years

X's show where 1941-45 line Males would come if hypothetical mortality had stayed at 1908 level.



1908-10 — 41-45

25-34

	M	F
Typhoid.	345 - 4.	183 - 2.
Dys.	12 - 1	5 - 2
Meningitis	47 - 28.	34 - 16.
Influenza	57 - 7	25 - 9
Gastroent.	36 - 8	

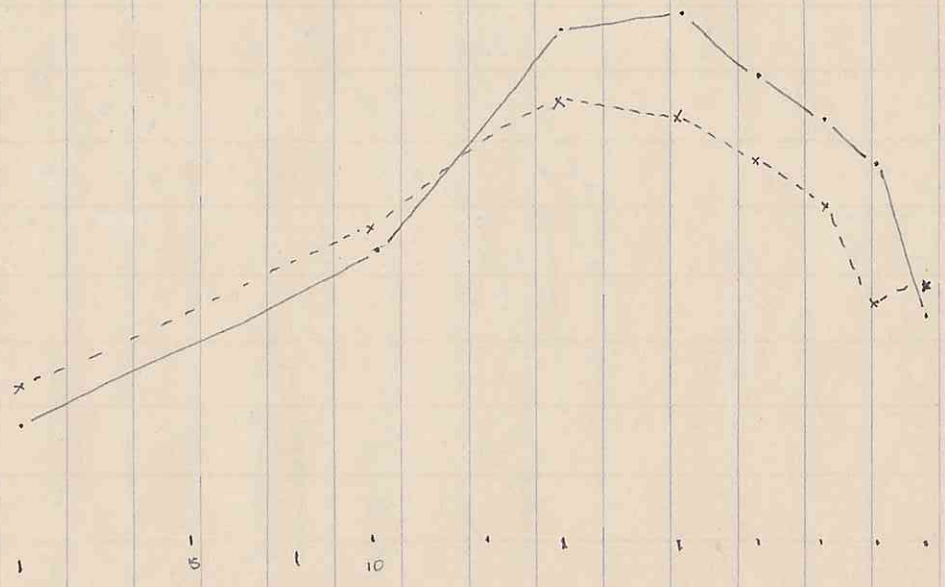
393 out of 581 due to enteric infection

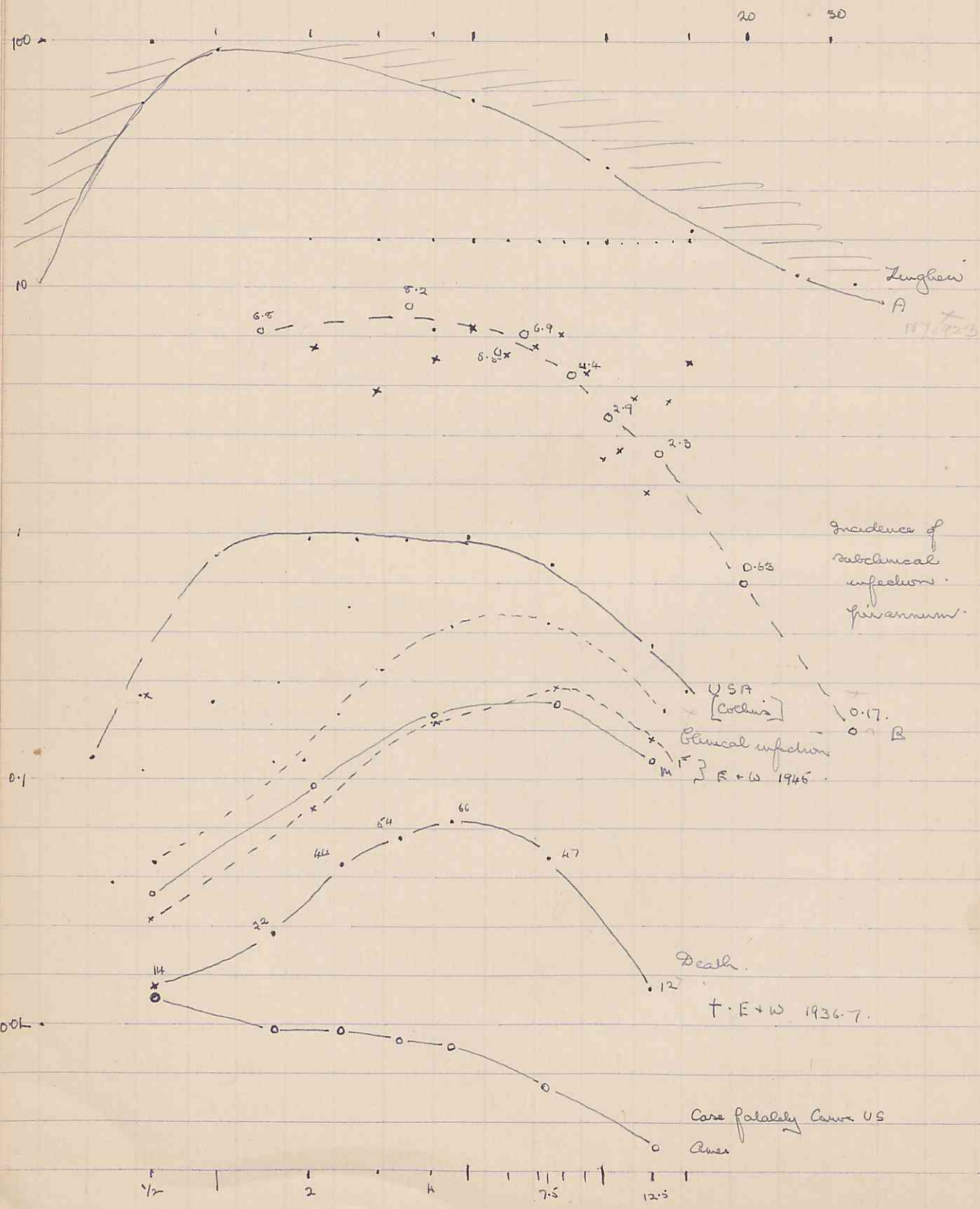
188

If typhoid had remained at 1908-10 level.

		10	20	30	40	50
M						
Add to 1941-5		73	303	341	257	164
		249	94	72	110	187.
		322	397	413	347	351
F		86.	200	181	129	95
		183	73	80	95	127
		269	273	261	224	222

Typhoid fever 10^6 p.a., Australia 1908-10




100
10
1
0·1
0·01
20
30
Loughrew
A
117/123
6·8
8·2
6·9
8·6
4·4
2·9
2·3
0·63
0·17.
B
Incidence of subclinical infection per annum.
USA [Cochin]
Clinical infection
M
F
E + W 1946.
66
64
44
47
22
14
12
Death.
† E + W 1936-7.
Case fatality Curve US
Amer
1/2
2
4
7·5
12·5

Analysis of diphtheria in New York 1923.

Curves A + B from Hughes figures in Topley + Wilson 1st Edn p 679.

Amer J. Dis Children. 22 392 1923.

Figures for age incidence of Diphtheria in New York before 1929 and mortality are needed. The curves given are from deaths in E+W per 10^5 at ages. and incidence is derived from that by case fatality ratio at ages.

See S.D. Cochin Publ. Hlth Rep 44 763. April 5 1929.

9.9% of people have had dip by age of 20

Peak of incidence for all children is 2-3 9.4 %oo.

Case fatality 0-1 1 2 3- 4- 5-9 10-14

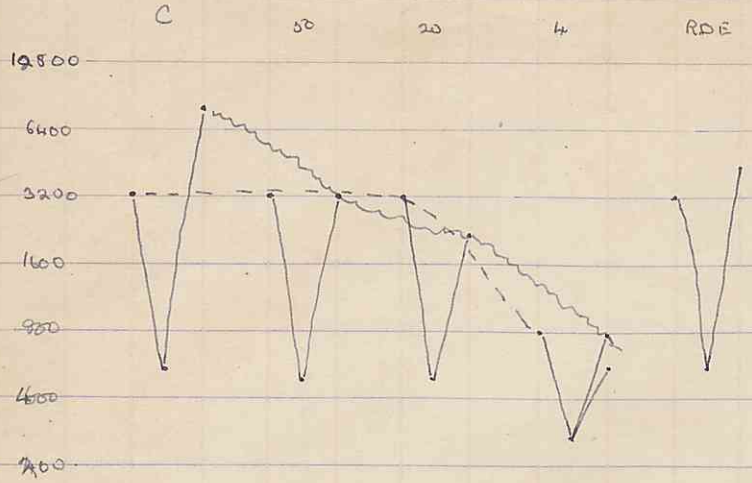
12.4 9.8 9.6 8.8 8.1 5.7 5.2.

By the graph as it stands there is a strong indication that there is a higher proportion of subclinical / clinical infections in children under 5 but it is obviously necessary to get New York figures at about the same period.

RS Langworth. BMJ. i 96 1850.

	Boys		Girls			Kg.
Birth	7.4	3.29	7.4	3.29	1 month	4.5
1 yr	22.5	10.12	21.3	9.89	2 "	5.2
1½	24.2	11.85	24.13	11.25	4 "	6.6
2	26.8	12.02	27.	12.25	6 "	7.9
2½	~~12.3~~				8 "	9.1
3	14.7					
4	17.6					
4½	18.4		17.3			
5	18.7		18.2			
5½	20.2		19.1			
6	21.2		19.9			
6½	21.4		21.0			
7	23.1		21.5			
7½	24.1		23.0			
8	25.4		24.7			
8½	26.0		26.0			
9	28.9		26.4			
9½	28.2		29.0			
10	30.7		30.0			
10½	31.5		3.6			
11	34.4		32.1			
11½	34.9		33.8			
12	36.3		37.2			
12½	37.8		38.1			
13	40.0		43.6			


30
40
50
60
70
80.



The fall on cooling indicates only very partial removal of receptors which become accessible again on cooling. The difference between the two cold readings depends on continuing action of RDE at RT where denaturation can apparently be much more readily demonstrated.

577. L49 H44793. Biological Time Lond 1936.

Paul Janet. Revue Philosophique Vol III suggested that to a child a year represents a much longer time in relation to the rest of its life than it does to an adult.

Polio 1937 Vic. MJA 1938 1. p404

Metropolitan.

	M	F	Total.	Scale
0-1	15	6	21.	3
2	26	20	46	5
3	55	27	82	3
4	60.	42.	102	4
5	70	49	119.	6
6	84.	48.	132	7
7	76.	60.	136.	5
8	56.	52	108	6
9	50	31	81	4
10	55	22	77	7
11	36.	15	51	5
12	14	11	26	0
13	15	16	31	2
14	15	7	22	2
15	6	9	15	2
16	18.	1		
17	4	0		
18	4	2	20/6	9
19	1	3		26.
20	1	0		
21	1	2		
22	0	4	4/12.	6
23	1	4		
24	1	0		16
25	1	2		
26	2	0		
27	0	2	7/25	
28	2			9
29	3			
30	0			
31	0			
32	0			
33	2			
34	0		4/1.	3
35	0			
36	1	1		5
~~40~~	0	0		
~~41~~	1	1		
	0			

Case Fatality. Metrop. Cases

Crude %	Smoothed.	
0-5	14.	~~12.5~~ 14.
	11.	9.8.
	3.6	6.2.
	4.	4.2.
	5.0	4.7
10	5.3.	4.6.
	3.7.	4.8.
	5.5.	4.7.
	4.9.	6.5
	9.1.	7.9.
15	9.8.	6.3.
	—	5.4.
	6.5	5.3.
	9.1.	9.5
	13.	13.
	35.	27.
	31.	40
	55	49.
	60	60.