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T H E S I S

for the Degree of M.D., EDINBURGH UNIVERSITY,

ACUTE ANTERIOR POLIOMYELITIS.

AN ANALYSIS of 62 Cases occurring in and around
EDINBURGH in the Epidemic of 1910.

BY

H. BRUCE LOW, M.B., Ch.B.,

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C O N T E N T S .

- I. Introduction.
 - II. Analysis of Cases.
 - III. Cases in Detail.
 - IV. Photographs.
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ACUTE ANTERIOR POLIOMYELITIS.

AN ANALYSIS of 62 Cases occurring in and around
EDINBURGH in the EPIDEMIC of 1910.

I. INTRODUCTION.

The object of this enquiry has been to investigate chiefly (1) the nature of the symptoms which may be present before the onset of paralysis in this disease of Acute Anterior Poliomyelitis. (2) Whether there is any evidence that the disease is communicable from one person to another.

The points actually enquired into are 13 in number, viz:-

1. The occupation of the father of the patient, with the object of discovering whether the disease is prevalent amongst the children of men engaged in any particular branch of employment.
- 2./ The number, sex, age and state of health of other members of the family at the time of the onset of the disease, so as to trace those types of cases which may be considered/
ed/

considered "abortive" and demonstrate any possible communication of the disease from one member of the family to another.

3. The Prodromal Symptoms - Symptoms of illness or ill-health present before the onset of paralysis - to discover whether there is any symptom or group of symptoms which would enable one to suspect an attack of Acute Anterior Poliomyelitis before the paralysis develops.
4. The duration of the prodromal symptoms.
5. The alleged cause, i.e. whether the parents of the patient are inclined to attribute his illness to any event or happening which may have befallen him.
6. The parts affected by the paralysis.
7. The degree of recovery from the paralysis, whether complete, partial, or none at all - with a view to being able to determine a prognosis.
8. The duration of the paralysis and the length of time which the parts affected by the paralysis took to recover - also with a view to prognosis.
9. The date of the onset of the paralysis.
We thus learn in what month of the year the greatest/

greatest number of cases occurred and can examine the state of weather which then prevailed, and can compare it with the weather of previous years.

10. The concomitant symptoms - those symptoms which were present along with the paralysis - in order to learn whether these cases which have occurred in what may be looked upon as an epidemic, show any difference in their symptomatology from the cases occurring sporadically.
11. The evidence of contact with other cases. Enquiry was made whether the patient or patient's parents knew of any other case: whether the doctor attending the patient knew of any other case: and whether there was any possibility of one case having come in contact with another either directly or by means of a third person.
12. The school which the patient, or patient's brothers and sisters attended - in order to discover whether the disease could be spread from one individual to another by the children attending school.
13. Whether there were any domestic animals belonging to the household, and whether there were/

were any signs of illness amongst these at the time of the onset of the paralysis.

THE SOURCES From which the cases are obtained are:-

1. The records of the Royal Hospital for Sick Children, Edinburgh. The permission to use these was kindly granted me by the Honorary Physicians, Dr Melville Dunlop, Dr John Thomson, and Dr T.S.Fowler.

2. Cases kindly supplied by medical practitioners of the district surrounding Edinburgh, and to whom I am indebted for permitting me to visit them.

3. Three cases occurring in the Royal Infirmary Edinburgh, for which I am indebted to Dr Philip and Dr Edwin Bramwell.

Royal Hospital for Sick Children:-

1910 - 44 Cases.	
1911 - 3 "	47 Cases
Out patients and private practitioners cases	12 "
Royal Infirmary, Edinburgh	3 "
	<hr/>
Total	62 Cases
	<hr/>

Forty-one/

Forty-one of the 62 Cases were seen personally.

Where the patients were sent in to Hospital by their own medical attendants, the doctor has been written to requesting information as to the existence of other cases and the possibility of contact and communication of the disease.

Those cases whom it was not possible to visit recently, were circularised in March 1911, in order to learn the amount of recovery which by that time had taken place.

II. ANALYSIS of CASES.

INCIDENCE of INFANTILE PARALYSIS in the ROYAL HOSPITAL for SICK CHILDREN, EDINBURGH.

A comparison of the number of Cases occurring during the past five years:-

1906	1907	1908	1909	1910
27	15	10	3	44

The last year in which there was anything akin to an epidemic of this disease is shown to be 1906.

LOCALITY/

LOCALITY FROM WHICH the CASES are DRAWN.

EDINBURGH - 15 Cases

Balbirnie Place	2
Stockbridge	2
Fountainbridge	2
Easter Road	1
Merchiston & Bruntsfield	2
St. Leonards	5
Cowgate	1

 15.

COUNTRY - 47 Cases.

North of the Forth.

Armadale, Sutherlandshire	1
Perth	1
Blackford	1
Cupar	1
Kelty	3
Kirkcaldy	4
Buckhaven	1
Inverkeithing	1

South of the Forth & West of
Edinburgh.

Bo'ness	2
S. Queensferry & Dalmeny	3
Bannockburn	1
Polmont Station	1
Denny Loanhead	1
Fauldhouse	1
Tarbrax	1
West Calder	1
Uphall	1
Broxburn	4
Winchburgh	2
Kirkliston	1
Slateford	1
Corstorphine	2
Castlemill, Dumfriesshire	1

Carry forward

36

DIAGRAM I. Age Incidence of the Cases.

Under 1 year.
Over 1 year.
Over 2 years.
Over 3 years.
Over 4 years.
Over 5 years.
Over 6 years.
Over 7 years.
Over 8 years.
Over 9 years.

No. of Cases.

35

30

25

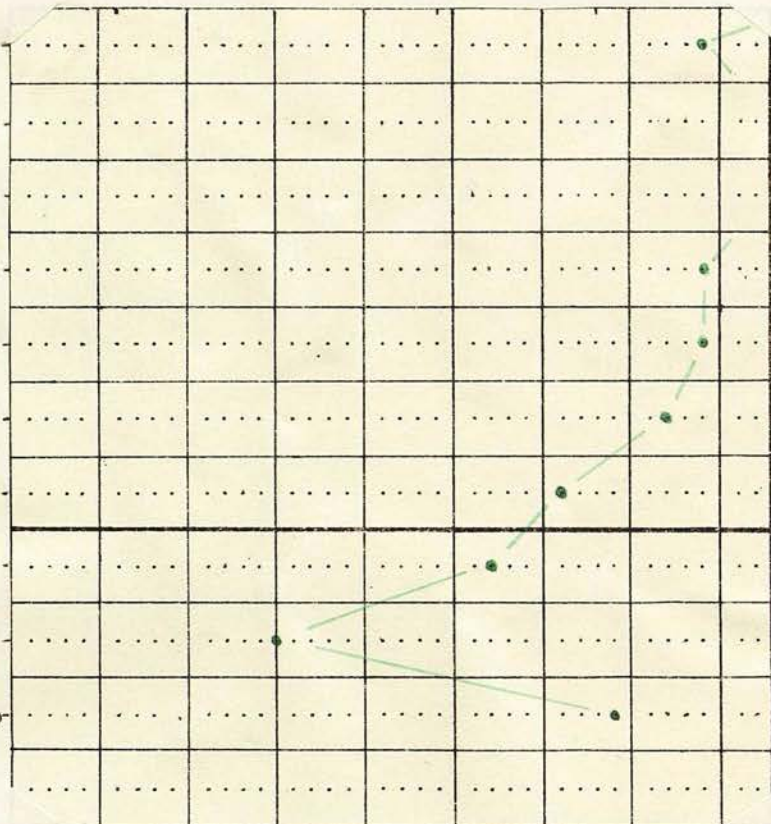
20

15

10

5

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Cases not shown on
the chart

18 years. . . 1 Case.

21 " . . . 1 "

29 " . . . 1 "

Carry forward 36

South of the Forth & East of
Edinburgh.

Granton	3
Musselburgh	1
Millerhill	1
Newtongrange	1
New Craighall	1
Prestonpans	2
Tranent	2

Total 47

It will be noticed that the majority of the cases come from the shores or valley of the Forth. This should be explained on a basis of population rather than any geographical or climatic peculiarity.

THE AGE INCIDENCE of the CASES.

Under 1 year	6 Cases
Over 1 year	25 "
" 2 years	13 "
" 3	9 "
" 4	3 "
" 5	1 "
" 6	1 "
" 9	1 "
" 18	1 "
" 21	1 "
" 29	1 "

TOTAL 62 CASES.

Youngest patient 3/12 year.

Oldest " 29 Years.

Sex/

SEX INCIDENCE.

Male	28 Cases
Female	34 "
<hr/>	
TOTAL	62 Cases.

On referring to the Cases in detail, it will be seen that the three adult cases (CASES XIII. XVI. & XLVII.) are all males. Emerson (7) in reporting on the Massachusetts epidemic of 1908 notes that there were 7 cases of 18 years and over and all were males.

THE OCCUPATION of the PATIENT or PATIENT'S FATHER.

The diversity of occupations seen in the subjoined table shows, as was to be expected, that the nature of employment has no bearing on the causation of the disease nor in rendering one person more liable to be attacked than another.

The fact that there are a greater number of miners or workers who come in contact with coal, than of other occupations, is easily accounted for by remembering that the part of the country from which most of the cases at the Royal Hospital for Sick/

Sick Children are drawn, is to a great extent a coal producing district.

Miner	17	Gamekeeper	1
Colliery engineman	2	Policeman	1
Engineer	4	Vanman	2
Oilworker	2	Mason	2
Enginedriver	1	Traveller	1
" in India	1	Insurance Agent	1
Blacksmith	1	Woodcutter	1
Coal carter	1		
Pointsman	1		
Platelayer	1		
Telephone-linesman	1	Barman	1
Monotype operator	1	Warehouseman	1
Railway inspector	1	Waiter	1
Tramway servant	1	Baker	1
Farmer or farm servant	4	Dental student	1
Labourer	3		
Seaman	2		

THE OTHER MEMBERS of the FAMILY.

The number of other children in the family of the patient is indicated in the following table -

Where patient was the only child	9	households.
" there was 1 other	" 12	"
" " were 2	" children 14	"
" " " 3	" " 7	"
" " " 4	" " 8	"
" " " 5	" " 6	"
" " " 6	" " 3	"
" " " 7	" " 1	"

Total other children 148

It will be seen that the number of children who we may presume were certainly brought in contact/

contact with the patients is 148, but none of these, or possibly only one (the brother of CASE L.), showed any signs of being attacked by the disease. This possible case was attacked not contemporaneously but three months previously. We may assume that the number 148 does not represent the total of those that actually came in direct contact, for it is more than likely that the children would associate with others besides members of their own family; and a still greater number would run the risk of infection, if it is possible for the disease to be conveyed by means of a third person.

Each of the 62 cases occurred in a separate family.

No children and only one adult case (See CASE XLI.) were ill contemporaneously with the occurrence of the paralysis.

PRODROMAL SYMPTOMS.

From an examination of the table of prodromal symptoms it will be seen that in this epidemic there seems to be no outstanding symptom or group of symptoms present before the paralysis appears which gives any certain indication that the patient is suffering/

suffering from Acute Anterior Poliomyelitis.

(1)

Armstrong says that "keeping in mind the
" symptoms, such as somnolence, uneasiness, pain in
" head, neck and along spine and nerve trunks, to-
" gether with weakness, and slight spastic phenomena,
" accompanied by fever and vomiting, has enabled us
" to diagnose a number of cases before paralysis
" developed".

Comparing the symptoms mentioned by Armstrong with those of the present series, drowsiness and irritability (corresponding to "somnolence and uneasiness") each occurred in 12 cases or about $1/5$ th of the total number; pain whether along nerve trunks or otherwise, occurred in 16 cases or about $\frac{1}{4}$ of the total number in the prodromal period. None of the 62 cases are indicated as having had slight spastic phenomena. Fever occurred in 35 and vomiting in 27, or roughly, about half the cases.

To take another observer, Muller (2) -

"in spite of the great variety of the prodromal
" symptoms, thinks it is possible to make a correct
" diagnosis before the appearance of paralysis from
" the presence of 3 cardinal symptoms". viz:-

1. Profuse perspiration.
2. Hyperaesthesia
3. Leucopenia,

He gives other important symptoms as being:-
weakness/

weakness of the abdominal muscles
 meteorism
 loss of abdominal reflex.

Of the present series of cases 9 had sweating and 6 profuse sweating. Owing to the cases not having been seen at the time of the onset of the disease, it was impossible to obtain accurate observations as to the presence of the other two "cardinal symptoms". The same remark applies to two at anyrate of Muller's "other important symptoms".

If it is known that an epidemic is prevalent and one is, therefore, on the look out for such cases it will be possible to suspect an oncoming paralysis, but as a rule the diagnosis of these cases with such a group of symptoms represented in this table is still uncertain until the paralysis definitely develops.

The naso-pharynx and the alimentary canal have been suggested as possible paths of infection, and the evidence of previous epidemics in many instances supports this suggestion.

In an epidemic in Westphalia in 1909, gastrointestinal symptoms were observed in 90% of the cases.

(3)

Intestinal symptoms were exceptional in Muller's experience of the epidemic in Hesse, Nassau, (2) but very frequently there was 'initial angina, bronchitis or even broncho-pneumonia'.

Faucial inflammation is spoken of as "an initial/

initial symptom in many cases" in an epidemic in Rhenish Westphalia (4).

In more than half the cases in an epidemic at St. Paul, U.S.A. (5) Stomach or bowel troubles preceded the paralysis.

Of the 150 cases studied in the Massachusetts epidemic of 1909, 126 had digestive disturbances. (6).

To compare the above experiences with these Edinburgh cases - It will be noticed that 5 of the 62 cases gave a history of naso-pharyngeal symptoms, such as nasal catarrh; and 17 cases gave alimentary symptoms such as constipation or diarrhoea.

Three cases had meningeal symptoms in the prodromal period; and six cases had no prodromal symptoms.

TABLE of PRODRIMAL SYMPTOMS.

Fever	35	Cases
Vomiting	27	"
Malaise	25	"
Pain and tenderness	16	"
Drowsiness	12	"
Irritability	12	"
Constipation	10	"
Slight constipation	2	"
Diarrhoea	3	"
Indigestion	1	"
Thirst	1	"

Profuse/

Profuse sweating	6	Cases
Sweating	9	"
Slight sweating	2	"
Shivering	3	"
Rigor	2	"
Headache	3	"
Severe headache	2	"
Severe frontal headache	1	"
Delirium	1	"
Meningeal Symptoms	3	"
Twitchings of limbs & muscles	4	"
Cough	1	"
Nasal Catarrh	4	"
Swelling of foot	1	"
Right eye closed	1	"
Gradual onset of weakness	1	"
Sudden rigidity while patient was running about	1	"
Feeling "as if there were stones in her shoes"	1	"
No prodromal symptoms	6	"

DURATION of PRODROMAL PERIOD.

In the Massachusetts epidemics of 1908 and 1909, the period of time between the onset of the fever which in most of the cases appears to have been the first symptom, and the appearance of the paralysis varied from hours to 16 days. (6).

In the present 62 cases, the period of illness/

illness before the onset of paralysis varies from 12 hours to 2 months. Only three of the cases, however, are over the 16 days, so that the prodromal period in this epidemic practically corresponds with that of the Massachusetts

In 6 cases the paralysis came on without any previous sign of illness.

DURATION of PRODROMAL PERIOD.

No prodromal period =				6	Cases
12 hours	"	"		2	"
1 day	"	"		8	"
2 days	"	"		8	"
3 "	"	"		11	"
4 "	"	"		1	"
5 "	"	"		3	"
6 "	"	"		1	"
1 week	"	"		13	"
9 days	"	"		1	"
10 "	"	"		1	"
2 weeks	"	"		4	"
3 "	"	"		1	"
1 month	"	"		1	"
2 "	"	"		1	"

TOTAL 62 CASES.

THE ALLEGED CAUSE.

In some epidemics it has been noticed that frequently there is a history.

- (1). of the patient having been swimming or wading
 or (2). of a fall
 or (3). that he has been exposed to cold or caught a "chill".

In many cases the paralysis has been attributed to "teething"

In the Massachusetts epidemic of 1909, nearly half of the cases had been swimming or wading in water contaminated by sewage; of the 150 cases studied in this epidemic, 100 had been exposed to heat, cold or dampness, while 34 cases had a history of a fall(6).

In the present series a history of a fall is given in seven cases; of chill in seven cases; and of teething in four. None of the cases had been swimming or wading so far as is known.

THE ALLEGED CAUSE.

A fall	4 Cases
A fall & exposure to cold	1
A fall & fright	1
A fall upon the arm which was subsequently affected	1
Chill	4
Chill after a wetting	3
Teething	4

	CASES
	18
Blow on the nose	1
Extraction of teeth under gas the previous day	1
No cause given	42
	<hr/>
TOTAL	62 CASES.
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THE PARTS AFFECTED by the PARALYSIS: The DEGREE of
RECOVERY: and the DURATION of the PARALYSIS.

The following Table indicates:-

1. The parts which were paralysed.
2. The number of cases who had the same parts paralysed.
3. The parts which showed any recovery.
4. The time taken to recover completely.

TABLE/

PARTS AFFECTED by PARALYSIS.	NO. of CASES AFFECT- ED.	PARTS which COMPLETELY RECOVERED.	, TIME TAKEN to RECOVER.	PARTS which partially RECOVERED.	PARTS in which there was no RECOVERY.
Both legs, both arms, back 2 & neck	2	1. Neck Both arms 2. Both arms) Left leg) Back&neck)	3 weeks 2 months 1 month	Back, both legs Right leg	
Both legs, both arms & 3 back.	3	1. 2. Back Both legs. 3. Both arms Back	1 month 3 months 4 days 8 days	Both arms, both legs & back Both arms Both legs	
Both legs, both arms, & 1 neck.	1	Neck Left hand Both legs	2 weeks 4 weeks 6 weeks	Both arms	
Both legs, back, left 1 arm and left face.	1	Back Both legs) Left arm) Left face) Back	2 weeks 4 months	Both legs, right arm & abdominal muscles.	
Both legs, back, abdo- 1 minal muscles, right arm.	1	Left arm Bladder Right arm	3 days 8 weeks	Left leg Both legs	Right leg.
Both legs, left arm & 1 bladder.	1	Right arm Back	2 months 4 months	Left leg	
Both legs, both arms 1 right arm.	1	Both arms Right leg Right arm	4 months	Right leg	
Both legs, right arm 1	1	Left leg			

PARTS AFFECTED by PARALYSIS.	NO. OF CASES AFFECTED	PARTS WHICH COMPLETELY RECOVERED	TIME TAKEN to RECOVER.	PARTS WHICH partially RECOVERED.	Parts in which there was NO RECOVERY.
Both legs, left arm Both legs	1 13	Left arm 1. Left leg 2. Left leg 3. 4. Right leg 5. 6. & 7. 8. & 9. Right leg 10. 11. 12. 13 1. 2. 3. Back	5 months 9 weeks 6 months 5 days 1 week	Both legs Right leg Right leg Left leg Left leg Right leg	Both legs. Right leg Left leg
Both legs & back.	6	4. Back 5. Back Right leg 6. Both legs) Back	3 months 1 week 2 months	Both legs Left leg	
Both legs, and both hands	1	Both hands Right leg Right leg	3 weeks 4 months 4 months	Left leg	
Both legs, and left face.	1	Right leg Face	4 months	Face & left leg.	
Both arms & neck	2	1. Right arm) Neck 2, Neck	3 months 4 months	Left arm Both arms	
Left leg, left arm & left face	1	Left leg) Left face Neck	1 month		Left arm
Left leg, back & neck	1	Back	4 weeks 6 weeks	Left leg	

PARTS AFFECTED by PARALYSIS.	NO. OF CASES AFFECTED	PARTS WHICH COMPLETELY RECOVERED	TIME TAKEN to RECOVER	PARTS WHICH PARTIALLY RECOVERED	PARTS IN WHICH there was NO RECOVERY.
Left leg, left arm	2	1.		Left leg left arm	
Left leg	4	2. Left leg 1 & 2	1 week	Left arm Left leg	
Left arm	3	3 & 4 1 & 2 3.		Left arm	Left arm, <u>Death</u>
Right arm	2	1. 2.		Right arm	Right arm
Right leg	3	1. 2. 3. 4. 5. 6. 7.		Right leg	Right leg Right leg (1 mo. after onset)
Right leg & right arm & Right leg, right arm & back	1	8. Right leg Right leg	3 weeks 5 months	Right arm	
Right foot	1	Back Right arm	3 months 4 months	Right leg Right foot	
Right leg (except foot) left arm except hand) neck & back	1	Back Neck	1 month	Right leg left arm	Abdominal muscles
Abdominal muscles (circumscribed area)	1				

Total number of Cases. 62

RECOVERY is SUMMARISED in the FOLLOWING TABLE:-

Partial recovery	50 Cases
Complete "	3
No recovery	8
Death	1
	<hr/>
TOTAL	62
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THE DISTRIBUTION of the PARALYSIS is summarised in
THE FOLLOWING TABLE:-

Both sides of body affected	36 Cases
Left side chiefly affected	11 "
Right side chiefly affected	13 "
Crossed paralysis	1 "
Abdominal muscles (circumscribed area)	1 "
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TOTAL	62.
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The/

THE DATE OF ONSET.

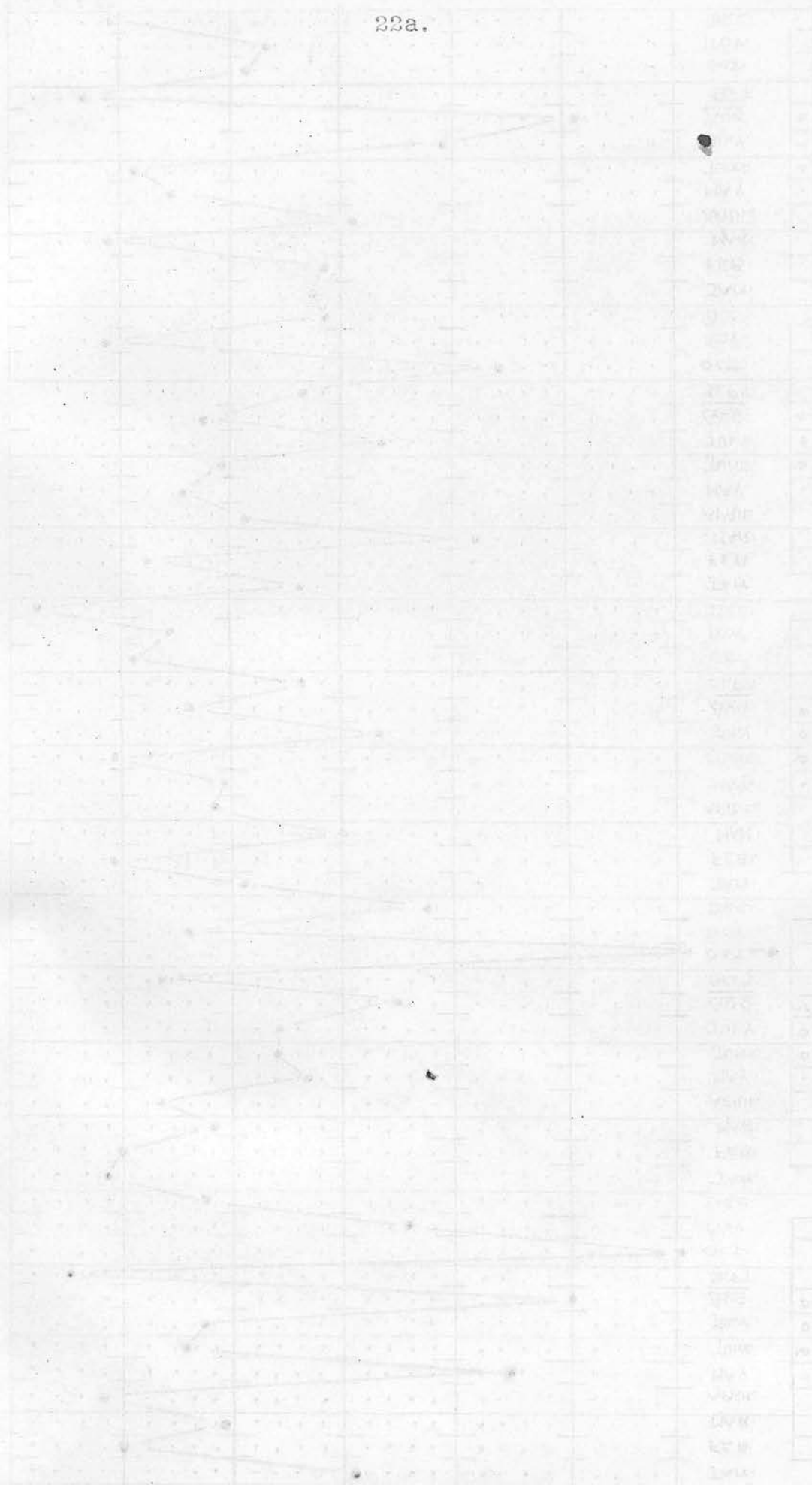
The following table shows the monthly incidence of the 62 Cases:-

MONTH.	NO. of CASES.
1910 Feb.	1
Mar.	0
April	0
May	1
June	0
July	5
August	25
Septr.	9
October	13
November	3
December	2
1911 January	1
February	1
March	1

Total 62

July, August, September and October are the four months during which the disease was most prevalent; 52 cases occurring during these months, leaving only 10 cases to be distributed over the remaining 10 months of the whole period considered. Of these 4 months the number of cases which occurred in August very nearly equals the numbers added together which occurred in the other three months. This incidence corresponds closely with the seasonal incidence of the epidemics which have occurred/

22a.

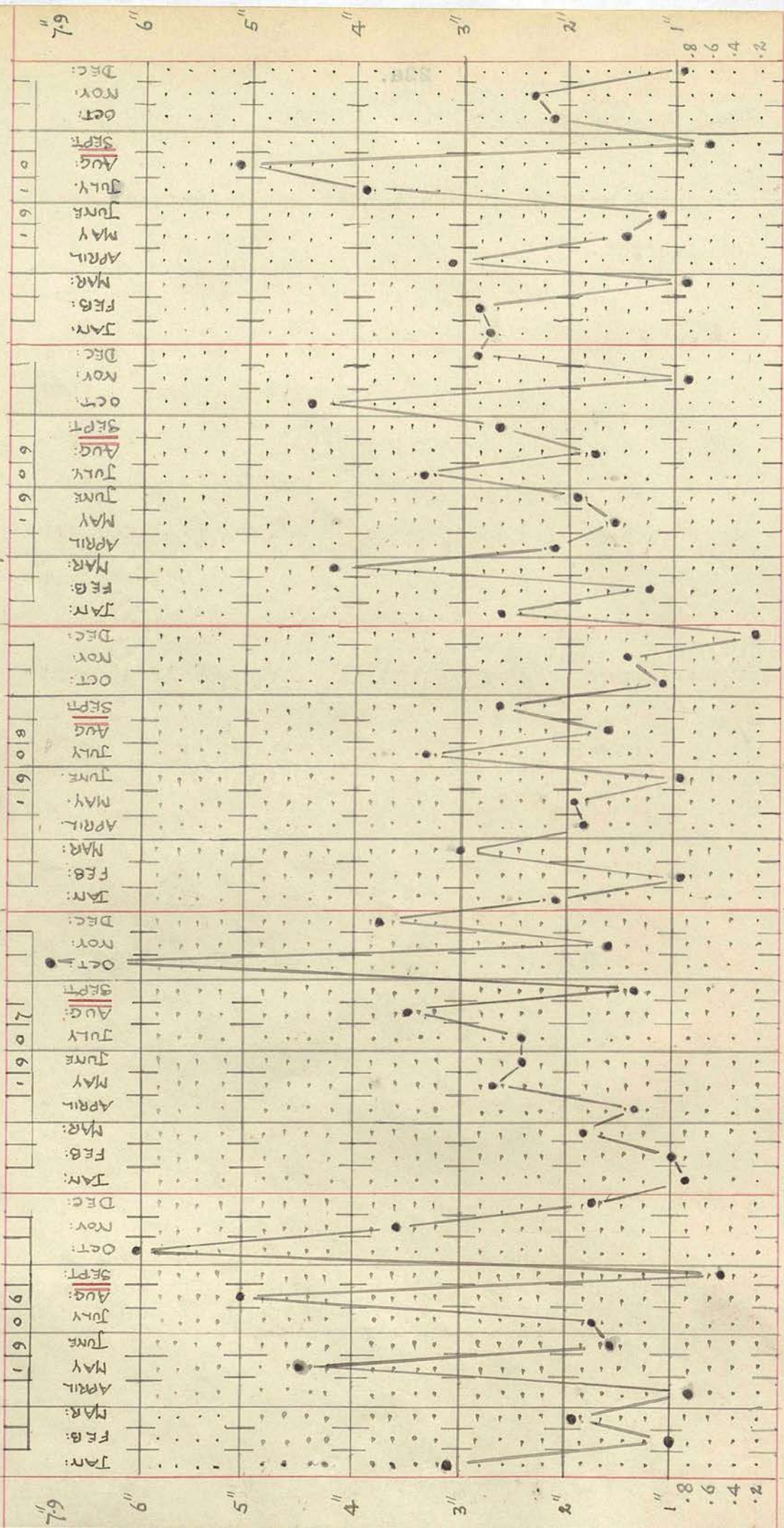


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Diagram II — *Graph of Experiment III*

DIAGRAM. III. — Rainfall at Edinburgh, Blackford Hill.



occurred both on the Continent and in United States of America.

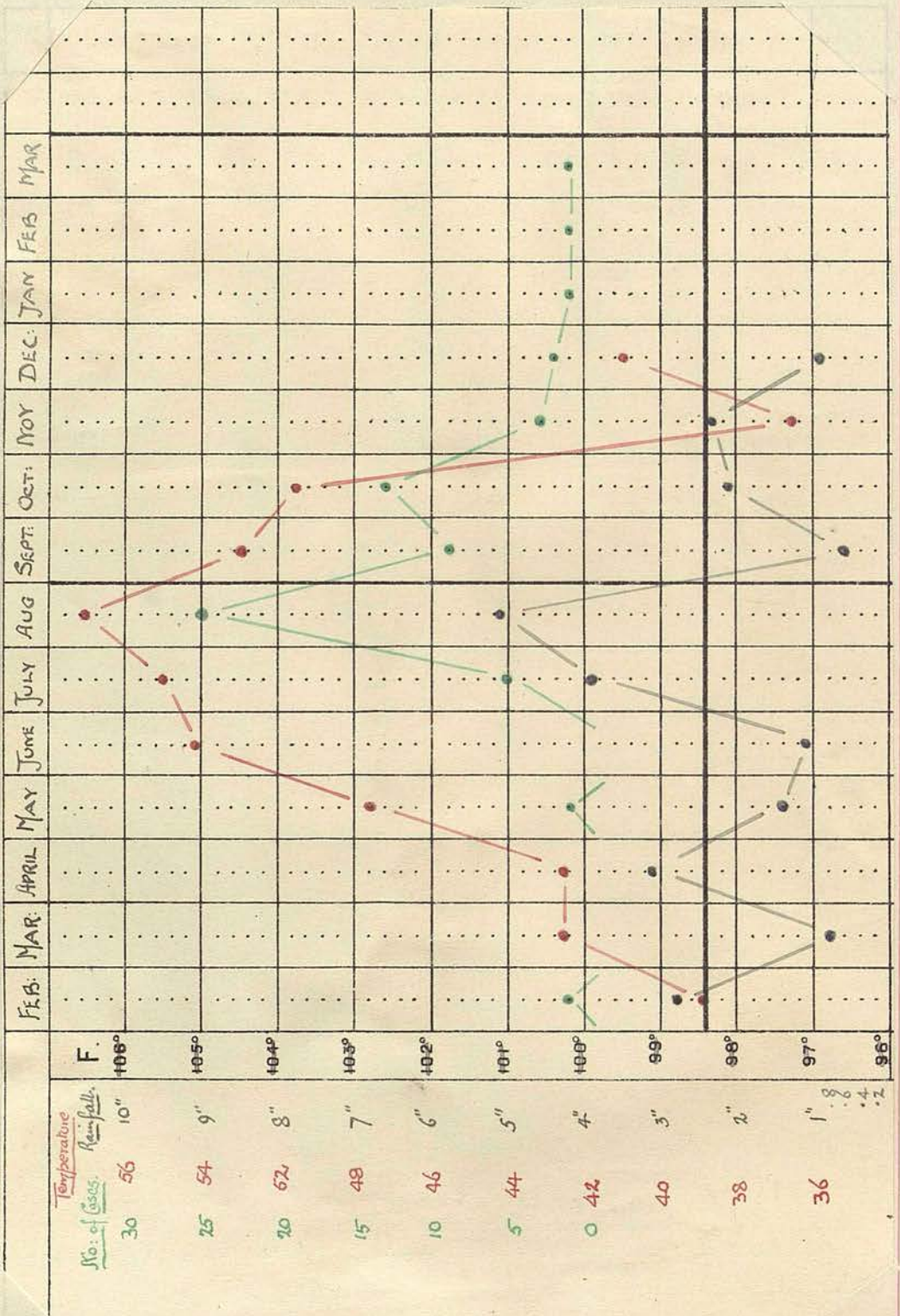
A point of difference is found when the weather conditions are examined.

It has already been noted (page 5) that the last year before 1910 in which there was anything akin to an epidemic of Acute Poliomyelitis in Edinburgh was 1906. The table of rainfall for the past 10 years for Edinburgh, shows that, taking the months of August, the wettest years were 1906 and 1910. * When we look for which was the wettest month we find that there was more rain in August 1906 than in any other month of the same year, except October and that of all the 12 months of 1910 most rain fell in August. The greater incidence of cases thus appears to correspond with the increased rainfall.

A contrary condition appears to have been more common in America and elsewhere. In Pennsylvania, 1907, when there was an epidemic of Acute Poliomyelitis, the season is described as being "one of the driest in the history of the State". In Victoria/

* In August 1906 there were 5.08 inches of rain and in August 1910 there were 5.18 . The nearest approach to this figure for the month of August was in 1904 when there were 4.3 inches.

DIAGRAM II. Showing Rainfall, Temperature, and Incidence of Cases by Months.



Victoria, Australia, 1908, the epidemic occurred in a 'very warm, dry season' (9). In New York, 1908, the disease was most prevalent in August and September, but the season is said to have been 'cool and extremely dry'. In Massachusetts there was a deficiency of rainfall in 1908 of 7 inches and in 1909 of 3 inches on the whole year. The chart of the rainfall of Massachusetts in 1909, arranged by months does not correspond with the prevalence of the disease in the State, arranged also by months, the driest month preceding the month of greatest frequency of the disease(6).

An examination of the table of mean temperature for Edinburgh does not show that the year 1906 or 1910 differed markedly in temperature from the other years of the decade.

Diagram II. is intended to show in a graphic form that:-

1. The highest rainfall for the year 1910 occurred in the month of August.
2. The same month had the highest mean temperature.
3. The greatest number of the cases occurred during this month.

.CONCOMITANT/

RAINFALL AT EDINBURGH, BLACKFORD HILL.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1901	1.83	.99	1.52	1.38	1.95	2.10	.96	3.59	.92	1.52	3.47	2.47	22.70
1902	.89	.82	.82	1.05	2.11	2.33	2.43	1.30	1.40	1.06	.60	1.63	16.44
1903	3.96	3.99	4.10	1.06	1.17	1.09	3.82	2.56	2.03	5.72	1.47	1.08	32.05
1904	2.87	2.33	1.07	1.69	2.88	2.12	1.13	4.30	1.55	.54	1.06	2.40	24.04
1905	.76	1.34	2.41	1.43	.55	.91	1.45	2.46	1.24	2.20	3.36	1.27	19.43
1906	3.11	1.01	1.97	.81	4.53	1.50	1.79	5.03	.55	6.11	3.61	1.17	31.24
1907	.84	1.01	1.83	1.31	2.75	2.41	2.49	3.52	1.30	7.90	1.06	3.77	30.19
1908	2.17	.96	3.07	1.87	1.92	.96	3.32	1.68	2.60	1.10	1.40	.23	21.28
1909	2.61	1.23	4.20	2.14	1.59	1.91	3.32	1.72	2.64	4.49	.85	2.87	29.57
1910	2.73	2.84	.85	3.15	1.46	1.13	3.92	5.18	.69	2.16	2.33	.99	27.53

MEAN TEMPERATURE AT EDINBURGH, BLACKFORD HILL.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1901	38.2	36.7	38.3	45.6	50.4	54.8	61.0	58.9	55.6	48.3	42.2	37.1
1902	38.4	34.3	42.5	44.2	45.2	51.4	54.6	54.2	53.3	47.4	44.7	39.4
1903	37.3	42.9	41.9	40.8	47.5	53.2	56.5	55.4	53.0	47.3	42.4	37.2
1904	39.4	36.3	38.6	45.5	49.0	52.6	57.0	57.1	53.4	43.5	41.6	39.4
1905	39.5	39.5	42.3	42.2	49.4	54.4	59.9	56.2	52.5	44.6	40.7	42.4
1906	39.8	36.8	39.3	44.1	46.8	55.6	56.4	57.9	55.2	48.8	45.0	37.9
1907	38.7	37.2	43.5	44.1	46.3	51.3	54.6	54.6	54.1	47.7	42.7	39.3
1908	37.7	40.7	38.5	41.1	50.9	54.6	57.5	56.7	53.7	53.3	44.4	38.9
1909	39.3	38.7	35.9	45.6	49.4	51.8	56.0	57.3	51.0	48.2	39.7	36.7
1910	36.7	33.9	42.5	42.5	47.5	54.2	55.2	57.1	53.3	49.3	36.6	41.7

CONCOMITANT SYMPTOMS.

This table shows the symptoms which were present along with the paralysis:--

SYMPTOMS	NO. of CASES.
Pain or tenderness or both	32
Constipation	7
Irritability	7
Sweating - profuse	5
Fever	3
Drowsiness	3
Thirst	4
Difficulty with micturition	3
Sore throat and rash	1
Emaciation	3
Loss of sensation	3
Cerebral symptoms	3
Vomiting	1
Epistaxis	1
Malaise	62

It is a point of interest that though it has been stated "there is no complaint of numbness, and there is never any loss of sensation " in this disease(3), three of the present series complained of loss of sensation; that is to say, ordinary sensation/

sensation of the skin was lost, but at the same time there was pain in the limbs, particularly when moved.

The pathology of Acute Poliomyelitis and Herpes Zoster being analagous, it has been suggested that in an epidemic of the former it would be found that the incidence of Herpes was also greater. None of the 62 cases under consideration suffered from Herpes and the incidence of herpes at the Royal Hospital for Sick Children, Edinburgh in 1910 was not strikingly different from that of the previous four years.

INCIDENCE of HERPES ZOSTER in the ROYAL HOSPITAL
for SICK CHILDREN, EDINBURGH.

YEAR	NO. of CASES.
1906	6
1907	6
1908	8
1909	11
1910	12

EVIDENCE/

EVIDENCE of CONTACT.

The apparent communicability of this disease from one patient to another, either directly or through the medium of a healthy person who acted as 'carrier,' has been a striking feature of many of the epidemics which have been investigated. In the cases under consideration the evidence that the disease was communicated to any patient from some other case is very meagre. In forty instances the parents of the patient had not heard of any other child who had been similarly affected by paralysis. Nineteen had heard of other cases, in most instances after their own child had become paralysed; usually they knew of them only by hearsay and were not personally acquainted with the families. In only one instance (CASE XXXV) was the patient known definitely to have been in indirect contact with another case: in one instance (CASE XXXVII) there is doubtful evidence of indirect contact, and there is one instance where a patient (CASE XLIX) was directly in contact with a case which possibly may have been one of Acute Poliomyelitis.

The tracing of the occurrence of contact is/

is naturally more easy in the country districts than in the town. In one or two of the cases occurring in the country it has been possible, by obtaining information from the medical men, to learn that the patient was the only case of Acute Poliomyelitis which occurred in that place. In country places also, where the inhabitants are all more or less known to each other, if the disease had spread from one child to another, the parents would have been able to give the information that the children of their neighbours had been attacked. In the city, on the other hand, where there is a much greater intermingling of children it would be impossible to trace definitely that a child had not been in contact with another case unless all the cases which occurred were notified. Only 15, however, of the cases belong to the city of Edinburgh and 47 are country cases.

No other case known	40
Other case known, but no contact	19
Contact - Direct -	? 1
" - Indirect	1 & ?1
	<hr/>
Total	62.
	<hr/>

SCHOOL/

S C H O O L

In many instances in other epidemics contact through attendance at the same School seems to have been the only possible means by which the disease could have been spread. A notable example of this is the Tröstena epidemic. In this district the inhabitants lived in peculiarly isolated circumstances, in detached farms between which there was very little intercommunication. Within a period of 6 weeks there occurred 49 cases and "the spread of the infection" says Holt, "seemed clearly traceable to the parish school".(9)

This table gives the number of patients whose brothers or sisters attended the same school, and where it is possible, therefore, the infection might have been spread indirectly by this means.

In 28 cases no children of the family were old enough to attend school.

SCHOOL	NO. of CASES Attending the School.
Bruntsfield, Edinburgh	2
Abbotshall, Kirkcaldy	2
Kelty Public School	3
Broxburn "	2
Corstorphine"	2
Granton, (the sisters of the patients were in the same class)	2
Tranent	2
No School	28

DOMESTIC ANIMALS.

An epidemic of Acute Poliomyelitis is reported as having occurred in Vermont U.S.A., in 1894. At the same time animals were affected with paralysis particularly horses and also dogs and fowls. (10). In Pennsylvania in 1907 during an epidemic, pigs and chickens were also affected (9). Since then a number of medical men throughout the United States have reported the occurrence of the disease in horses. Krause of Bonn reports the occurrence of a paralytic affection in chickens (11). During the outbreak in Massachusetts in 1909, this subject was thoroughly investigated and it was found that in 34 out of 87 families having domestic animals, sickness paralysis or death occurred in these animals about the time of the paralysis in human beings.

The relative distribution of the reported cases in animals was compared on the map with the distribution of the human cases and the investigators came to the conclusion that no obvious connection existed between the 2 classes of cases in Massachusetts in 1909.

In these 62 Edinburgh cases inquiry was made for signs of illness amongst the domestic animals/

animals. Fourteen of the families possessed animals and in none of these were there any cases of illness, paralysis or death occurring about the time that the children were attacked by Acute Poliomyelitis.

CONCLUSIONS.

The CHIEF conclusions arrived at from a consideration of the 62 cases collected in this investigation are: -

- (1). The cases did not present any symptom or group of symptoms in the prodromal period which could be considered peculiar to the disease of Acute Anterior Poliomyelitis.
- (2). There is practically no evidence to show that any of these cases here considered were infected by contact with another patient.

Other points brought out by the investigation are as follows: -

- I. The nature of the employment of the patient or patient's father has no relation to the disease.
- II. Abortive cases were not common.
- III./

- III. The duration of the prodromal period varied from 12 hours to 2 months.
- IV. In comparatively few cases was the attack attributed to any definite cause.
- V. The distribution of the paralysis in the majority of cases was bilateral.
- VI. 5% of the cases completely recovered and in 14.5% there was no recovery.
- VII.. The duration of the paralysis in the parts which recovered completely varied from 3 days to 6 months, but there were parts which were still improving 7 months after the onset of the paralysis.
- VIII. The month in which there were the greatest number of cases was also the hottest month of the year and the month in which there was the highest rainfall.
- IX. Concomitant Symptoms were similar to those in other epidemics.
- X. There is practically no evidence that schools were responsible for the spread of the disease.
- XI. There was no contemporaneous paralysis amongst domestic animals.

CASE I.

Cerebral symptoms in the prodromal period.

Loss of sensation in the left leg as a concomitant symptom.

Sensation completely recovered.

MURIEL C. (f.) 1 $\frac{1}{4}$, Viewforth, Edinburgh.

Father - traveller.

Four other children, all healthy. Go to Bruntsfield School. No abortive cases.

Prodromal Period - 10 days.

" Symptoms - Vomiting, fever, 102-103°F.
Drowsiness, Malaise. Weakness of back after 3 days.

Cerebral Symptoms - Rigidity of limbs; retraction of head for 24 hours.

Alleged Cause - "Teething".

Parts affected. Left leg, right leg above the knee.

Date of onset of paralysis, Octr. 12th 1910.

Concomitant Symptoms - Malaise. Loss of sensation in left leg.

Evidence of Contact - There was one other case on the other side of the road 2 years ago. No contact. The mother knows of 2 recent cases in the district of Merchiston, but there has been no contact.

Recovery. Sensation has returned completely to left leg. No recovery from paralysis in left leg; partial recovery of right leg, 5 months after onset.

No domestic animals.

CASE II.

Retention of urine as a concomitant symptom.

BRIAN K. (m.) $3\frac{1}{2}$. Bonaly Road, North Merchiston,
Edinburgh
Father - Van-builder.

Two other children, healthy. Too young
for school. No abortive cases.

Prodromal Period - 2 days.

" Symptoms - Vomiting during first 24 hours.
Rigor, fever, delirium, constipation.

No alleged cause -

Parts affected - Both legs and the back.

Date of onset of paralysis - Aug. 19th 1910.

Concomitant Symptoms - Pain in the legs. Retention
of urine. Appetite poor. Malaise.

Evidence of contact. The mother has heard of four
other recent cases since her own child
took ill, but there was no contact
with any of them.

Degree of recovery - Both legs have only partially
recovered but are still improving, 7
months after the onset of the paraly-
sis.

No domestic animals.

CASE III.

Complete recovery in 2 months.

EMILY C. (f.) $1\frac{1}{2}$. Home Street, Edinburgh.

Father - Barman.

Six/

CASE III. (Contd.)

Six other children - all healthy. No abortive cases. Four eldest go to Sciennes School, one goes to Bruntsfield.

Prodromal Period - 5 days.

" Symptoms - Vomiting, fever, drowsiness, irritability and sweating.

Alleged Cause - A fall off a barrow and exposure to cold an hour previous to the commencement of the vomiting.

Parts affected - Right arm paralysed. Both legs and back weak but not paralysed.

Date of onset of paralysis - Septr.23rd 1910.

Concomitant symptoms - Pain in the right arm. Malaise

Evidence of Contact - The mother knows of one other case at Blackhall where the paralysis came on about the same time as this patient. There was no contact, except by a letter through the post.

Recovery. Patient could raise her arm to the level of the shoulder and could walk by swinging the body, one month after the onset.

Recovery was complete 2 months after the onset.

Domestic Animals - one canary which showed no sign of illness or paralysis.

CASE IV.

WILLIAM B. (M). 1&11/12, Tay Street, Edinburgh.

Father - blacksmith.

Five other children all healthy. No abortive cases. Go to Merchiston Board School.

Prodromal period - 1 day.

" Symptoms. Vomiting, fever. Twitching of the limbs.

Alleged Cause - A fall occurring two months before onset of illness.

Parts affected - Both legs.

Date of onset of paralysis - Septr. 2nd 1910.

Concomitant Symptoms - Malaise.

Evidence of contact - Mother has heard of one other case since her own child took ill.
No contact.

Recovery - Right leg complete recovery in less than a week. Left leg incomplete recovery but still improving 6 months after the onset of the paralysis.

Domestic Animals - one canary, which showed no sign of paralysis or illness.

The next two cases (CASES V. & VI.) occurred in the same street and almost next door, but though the question of contact was carefully inquired into, no evidence could be obtained of any possibility of the disease having been communicated from one patient to the other.

CASE V.

Progressive onset of the paralysis, 11 days being taken to establish the full extent of the loss of muscular power.

Paralysis of bladder sphincter.

THOMAS O. (M.) 1 & 10/12, 34 Balbirnie Place,
Edinburgh.

Father - Monotype-operator.

One other child, healthy. No abortive cases. No school.

Prodromal Period - 1 day, before onset of paresis
2 days, before onset of paralysis.

" Symptoms - Vomiting, fever, irritability.
Screaming fits.

Alleged Cause - None.

Parts affected and Date of onset - Paresis of left leg Aug.4th.
Paralysis of right and left legs Augt.5th
Left arm partially paralysed Aug.8th
Paralysis of bladder sphincter, with dribbling of urine Aug.15th.

Concomitant Symptoms - Malaise. Slight sweating.

Evidence of Contact. None - No contact with Case VI. so far as is known, though both took ill about the same time.

Recovery/

Recovery - Left arm completely recovered one month after onset. Right leg no recovery: Left leg slight movement of toes 7 months after onset.

No domestic animals.

CASE VI.

Head retraction as a concomitant symptom.

Alexander R. (M.) 1 $\frac{1}{4}$, 31 Balbirnie Place, Edinburgh.

Father - Coal carter.

One other child, healthy. Does not go to school. No abortive cases.

Prodromal Period - 5 days.

" Symptoms - Vomiting, irritability, pain, sweating greatly - emaciation.

Alleged Cause - Teething.

Parts affected - Left arm, which became paralysed on Aug. 13th Right leg paralysed the next day, back and neck.

Date of onset August 13th 1910.

Concomitant Symptoms - Pain - head retraction - Malaise.

Evidence of Contact - None. The mother of this patient did not know the parents of Case V. till after the paralysis came on and there was no one going between the two houses.

Recovery - Back and neck had recovered completely in 2 months. Legs only partially, 7 months after onset.

Domestic Animals - one canary. No sign of illness.

CASE VII.

GEORGE E. (M.) 1&4/12, Dean Street Edinburgh.

Father - Coachman.

Two other children healthy. No abortive cases. Patient's sister goes to Flora Stevenson's School, Comely Bank.

Prodromal Period - Two weeks before the onset of the paralysis, patient had diarrhoea which lasted a week. Except for this attack, he had no prodromal symptoms.

Alleged Cause - A fall.

Parts affected - Left leg.

Date of onset of paralysis - Octr. 12th 1910.

Concomitant Symptoms - Bowels a little loose.
Malaise.

No evidence of contact. The mother knows of no other case.

Recovery - None, 5 months after onset of paralysis.

No domestic animals.

CASE VIII.

DAVID G. (M). 2 & 7/12. India Place, Edinburgh.

Father works with the Tramway Company.

Five other children all healthy. No abortive cases. Go to St. Bernards School.

Prodromal period - 24 hours.

" Symptoms. Vomiting, fever, drowsiness, twitching and incoordination of arms, eyes and legs.

Alleged Cause - None.

Parts affected - Left arm and leg.

Date of onset of paralysis. Aug. 12th 1910.

Concomitant Symptoms - Irritability. Malaise.

Evidence of Contact - The mother knows of no other case.

Recovery - Arm almost completely recovered and is still improving; leg only partially recovered but is also still improving, 7 months after onset of paralysis.

No domestic animals.

CASE IX.

Epistaxis as a prodromal symptom.

MONA R. (F.) 6. West Causeway, Edinburgh.

Father - platelayer.

Two other children, healthy. No abortive cases. Go to Forbes Street School in St. Leonards district.

Prodromal Period - 3 days.

" Symptoms - Vomiting, fever, heavy sweating
constipation - Epistaxis.

Alleged Cause - Left arm was bruised in July through patient being knocked over by a bicycle.
Part affected - Left arm.

Date of onset of paralysis. Aug. 11th 1910.

Concomitant Symptoms - Malaise.

Contact. Mother knows of no other case. No evidence of contact.

Recovery - Patient could perform all the normal movements of her left arm, but the arm was weak, 4 months after onset of paralysis. Arm in much the same condition except that there was not quite so much weakness, 8 months after onset of paralysis.

No domestic Animals.

The next two cases (CASE X & XI.) live in the same house but with a flat between. CASE XI. was not born till one month after CASE X. took ill and did not become paralysed till 7 months after. The mothers of the two children spoke to each other as they passed going up and down the stairs. There was no other contact.

CASE X.

Loss of ordinary sensation in the lower limbs.

ADAM W. (M). 1 & 8/12 - 10 N. Richmond Street, Edinburgh.

Father - Labourer.

Two other children, healthy. No abortive cases. No school.

Prodromal Period. None.

" Symptoms None. On waking one morning it was found that patient was ill and that his legs were paralysed.

Alleged Cause - None.

Parts affected - Both legs, right leg only slightly.

Date of onset of paralysis - July 3rd 1910.

Concomitant symptoms - Muscular pain and tenderness.
Loss of ordinary sensation - Malaise.

Evidence of contact - no other case known at the time of onset of the paralysis. Case XI. lives in the same house 2 flats lower down, but she was not born when this patient took ill.

Recovery/

Recovery - Right leg completely recovered in one week. Left leg partially recovered in 5 months, but there has been no improvement for 3 months.

No domestic animals.

CASE XI.

ELLEN T. (F.) 6/12, 10 N. Richmond Street, Edinburgh.

Father - baker.

No other children. No abortive cases.

Prodromal Period - None.

" Symptoms - None. A general weakness was the first sign of illness to be noticed, most pronounced in the legs. No vomiting. No fever. Patient lay prostrated for four days.

Alleged Cause - A fall a week previously.

Parts affected - Both arms, both legs and back.

Date of onset of paralysis. Feb. 18th 1911.

Concomitant Symptoms. Malaise and prostration.

Evidence of Contact. Another patient living in the same house, 2 flats higher up. (CASE X.) developed paralysis 7 months previously, that is, before this patient was born. No evidence of contact.

Recovery - Arms recovered completely in 4 days.
 Back " " 8 "
 Legs have partially recovered and are still improving $1\frac{1}{2}$ months after onset of paralysis.

No domestic animals.

CASE XII.

Has congenital syphilis and was being treated at the Medical out-patient Department, Royal Hospital for Sick Children, for some considerable time before the onset of the paralysis.

Limited paralysis of abdominal muscles.

GEORGE M. (M.) 14/12. St. Leonards Street, Edinburgh.

Father - Sailor.

No other children. No abortive cases.

Prodromal Period - one week.

" Symptoms - Fever, drowsiness, constipation.

Alleged Cause - None.

Parts affected - Abdominal muscles in circumscribed area of left iliac region.

Date of onset of paralysis - Decr. 6th 1911.

Concomitant Symptoms - Malaise.

Recovery - None, three months after onset of paralysis.

No domestic animals.

CASE XIII.

An adult.

Abdominal muscles affected.

ARTHUR C. (M.) 21 Dental Student. Dalkeith Road, Edinburgh. 3 children in the same house. No abortive cases.

Prodromal Period - one week.

" Symptoms - Severe headache, vomiting, fever, slight sweating, slight constipation, indigestion for one week previously.

Alleged Cause - None.

Parts affected - Right arm; both legs: back, especially on right side, and abdominal muscles - especially on right side.

Date of onset of paralysis - Oct. 15, 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - No other case known.

Recovery- 5 months after onset - Right arm complete except at the shoulder, is still improving; legs almost complete except that the left calf muscles and toes of both feet are weak; abdominal muscles no paralysis, but they are still weak.

No domestic animals.

CASE XIV.

HELEN P. (F.) 2 $\frac{3}{4}$. Cowgate, Edinburgh.

Father - Mason.

No other children. No abortive cases. No school.

Prodromal Period - 2 days.

" Symptoms - Fever, irritability.

Alleged Cause - None.

Parts affected - weakness of left arm and left leg;
no complete paralysis.

Date of onset of paresis - Mar. 22nd 1911.

Concomitant Symptoms - Pain and tenderness. Malaise.

Evidence of contact - None.

Recovery - Left leg recovered completely in one week.
There is still (Mar. 30th) a little
weakness in left arm.

No domestic animals.

CASE XV.

JOHN L. (M) 3 & 4/12. Rossie Place. Edinburgh.

Father - Telephone Linesman.

Two other children. Healthy. No abortive cases. No school.

Prodromal Period. - 2 days.

" Symptoms - Vomiting, peevishness.

Alleged Cause - None.

Parts affected - Both legs and back.

Date of onset of paralysis - Aug. 18th 1910.

Concomitant Symptoms- Pain, Malaise.

Evidence of contact - Mother has heard of three other cases since her own boy took ill. No contact.

Recovery - Back, complete recovery in 5 weeks. Both legs incompletely recovered but still improving, 7 months after onset. Left leg has recovered more than right.

No domestic animals.

CASE XVI.

An adult.

Epistaxis as a concomitant symptom.

DONALD M^C K. (M.) 18 years. Armadale. Sutherland-shire.

Occupation - Pointsman.

One child in household. No abortive cases.

Prodromal Period. - 12 hours.

" Symptoms - Pain in the head and in the left arm. Vomiting. Fever. Some sweating.

Alleged Cause - None.

Parts affected - Left arm.

Date of onset of paralysis.- Dec. 1910.

Concomitant Symptoms - Pain, weakness all over, patient was in bed for a week, tenderness in the arm. Epistaxis - Nose bled every day for 3 weeks, commencing a month after onset of illness.

Recovery - Slight. 3 months after onset.

No illness in domestic animals.

CASE XVII.

DORRIS S.R. (F.) 1 & 4/12. Perth.

Father - Engine Driver (in India)

Two other children. Healthy. No abortive cases. William St. School, Perth.

Prodromal Period - 3 days.

" Symptoms - Fever. Vomiting. Slight constipation. Some Sweating. Twitching of the muscles of right side.

Alleged Cause.- None.

Parts affected - Right arm.

Date of onset of paralysis - Sept. 6th 1910.

Concomitant Symptoms - Malaise.

Evidence of contact - Mother knows of no other cases. The doctor attending this case does not know of any other more recent than 3 years ago.

Recovery - Partial, 6 months after onset.

No domestic animals known to be affected with paralysis.

The next four cases (CASES XVIII, XIX, XX, XXI,) all live in the same town of Kirkcaldy.

The following was the evidence obtained as to the possibility of contact between one case and another:-

1. CASE XVIII (Isa A.) and CASE XIX (Effie Mc K.) live within 300 yards of each other at one end of the town; CASE XX (Rosetta B.) and CASE XXI (Mary S.) live within 300 yards of each other at the opposite end of the town, and there is $1\frac{1}{2}$ miles between the two pairs.
2. The brother and sister of CASE XVIII attended the same school as the brothers of CASE XIX.
3. The parents of CASE XIX had heard of CASE XVIII but say there was no contact.
4. The parents of CASES XX and XXI only knew of their own child with this disease and had not heard of any other.
5. The same doctor attended CASES XVIII and XIX and also a third case, but could give no information as to contact.
6. The doctor attending CASE XXI knew of no other recent case.

Thus the only evidence obtained of any possibility of infection having been carried is the fact that other members of the family of CASES XVIII and XIX attended the same school. The patients, themselves are too young to be attending school.

CASE XVIII.

ISA. A. (f) 2&5/12 Kirkcaldy.

Father - Engineer.

Two other children healthy. No abortive cases
Go to Abbotshall Public School.

Prodromal Period - 2 days.

" Symptoms - Vomiting for one day. Fever for
two days. Pain in both legs.

Alleged Cause - None.

Parts affected - Right leg.

Date of onset of paralysis - Oct 1st. 1910.

Concomitant Symptoms - Sweating. Pain and tender-
ness. Thirst. Malaise.

Evidence of Contact - The Mother knows of Case XIX
but says there was no contact. The
doctor who attended this case also attend-
ed Case XIX and knows of a third case.
He says there is no evidence of contact
between any of them.

Recovery - Partial recovery of right leg, still im-
proving six months after onset. Patient
could walk at the end of six months.

No domestic animals.

CASE XIX.

Cerebral Symptoms in the Prodromal period.

Effie McK. (f) 288/12 Kircaldy.

Father - Mason.

Three other children, healthy. No abortive cases. Go to Abbotshall Public School.

Prodromal Period - one week.

" Symptoms - Vomiting. Fever, pain in the chest, head, hands, back and legs.
Restlessness, drowsiness.

Cerebral Symptoms - Head retraction,
irregular pulse, crying out occasionally.

Alleged Cause - None.

Parts affected - Both legs. Left arm.

Date of onset of paralysis - Aug 15th 1910.

Concomitant Symptoms - Tenderness. Nalaise.

Evidence of Contact - Mother had heard of Case XVIII and knows of no contact. The doctor who attended this case also attended Case XVIII. and a third case, but says there is no evidence of contact between one case and another

Recovery - Left arm has completely recovered five months after onset of paralysis. Right and left legs had only partially recovered seven months after onset.

No domestic animals.

CASE XX.

Progressive onset of the paralysis, twelve days being taken before the loss of power was established to the fullest extent.

Rosetta B. 4&8/12. Kirkcaldy.

Father - Engine driver.

One other child. No abortive cases. No school.

Prodromal Period - three days.

" Symptoms - Fever, listlessness, constipation. Pain. Skin eruption on face for a week previous to the onset of the fever.

Alleged cause - Chill caught after taking a bath.

Parts affected - Right leg was paralysed on the 3rd day after the onset of the signs of illness; Right arm on the 5th day; left leg on the 12th day.

Date of onset of paralysis - Oct 12th. 1910.

Concomitant Symptoms - Pain. Malaise.

Evidence of Contact. Mother knows of no other case.

Recovery - Right arm and left leg began to recover three weeks after the onset of paralysis and were completely recovered in five weeks. Right leg was only partially recovered five months after onset.

No illness among domestic animals

CASE XXI.

Scarlet Fever developed 4-5 days after patient began to be ill.

Cerebral symptoms in the prodromal period.

Mary S. (f) $3\frac{1}{4}$ Kirkcaldy.

Father - Miner.

One other child, healthy. No abortive cases
No school.

Prodromal Period - two weeks.

" Symptoms - The onset was gradual with few symptoms. Sweating. Patient gradually grew weaker for a fortnight. 4-5 days after the onset of the illness, she developed Scarlet Fever and then was feverish, sleepless, peevish, and tender to touch all over and had "Slight meningeal symptoms". She subsequently peeled.

Alleged Cause - None.

Parts affected - Both legs.

Date of onset of paralysis - Nov. 1910.

Concomitant Symptoms - Tenderness, Malaise.

Evidence of Contact - Mother knows of no other case. The doctor attending has had no other case recently, and says there is no likelihood of there having been contact either personally or through a third party with any of the three Kirkcaldy cases (Cases. XVIII. XIX. and XX).

No domestic animals.

The next three cases (CASES XXII. XXIII. XXIV) all live in Kelty, Fife. and were attended by the same doctor. On enquiring into the possibility of contagion from other cases of paralysis, the following points were noted:-

1. No family was known to either of the others before the onset of the illness.
2. No one visited as far as is known between any of the houses at the time of the illness.
3. The children of the three families go to the same school. CASE XXIV. developed the paralysis, however, during the vacation.
4. The Mothers of the patients and the doctor do not know of any possibility of communication of the disease between the cases.

Thus again, as in the Kirkcaldy cases, if infection has been carried from one case to another, the only means by which it could be conveyed appears to be through the other children of the family attending the same school. The patients themselves are all under school age.

CASE XXII.

MARTHA S. (f.) 2. Kelty, Fife.

Father _ Miner.

Six other children healthy. No abortive cases. Go to Kelty Board School.

Prodromal Period - one week.

" Symptoms - The first sign of illness was that patient had a sudden fit of crying, which was apparently due to pain. Followed by drowsiness, constipation, sweating and tenderness.

Alleged Cause - None.

Parts affected - Both legs and back.

Date of onset of paralysis - July 8th 1910.

Concomitant Symptoms - Pain and tenderness. Malaise.

Evidence of contact - The mother did not know of any other cases till told of them by the doctor. Both the mother and doctor know of no possibility of communication between this case and Cases XXIII & XXIV.

Recovery - Back recovered in 3 months, Legs only incompletely recovered, 6 months after onset of paralysis.

Domestic Animals. One canary which showed no sign of paralysis or illness.

CASE XXIII.

BARBARA F. (F.) I $\frac{1}{4}$. Kelty, Fife.

Father - Miner.

Four other children, healthy. No abortive cases. Go to Kelty Board School.

Prodromal Period - None.

" Symptoms - Paralysis came on without any previous symptoms.

Alleged cause - None.

Parts affected - Both arms and legs.

Date of onset of paralysis - July 27, 1910.

Concomitant Symptoms - Loss of appetite - Malaise.

Evidence of Contact - Mother and doctor way there is no possibility of contact with other cases.

Recovery - Neck and right arm were completely recovered 3 months after onset of paralysis. Left arm incompletely recovered, the deltoid being chiefly affected; said to be still improving on Jan. 27th, 1911, 6 months after onset of paralysis, but when examined two months later had not made any progress.

Domestic animals - Some canaries; none showed signs of paralysis or illness.

CASE XXIV.

MARY K. (f.) 1½, Kelty, Fife.

Father - Miner.

Five other children - healthy. No abortive cases. Go to Kelty Board School.

Prodromal Period - 2 weeks.

" Symptoms - Diarrhoea lasting for 2 weeks.
Pain for one week before onset of paralysis. Irritability.

Alleged Cause - None.

Parts affected - Right leg.

Date of onset of paralysis - Aug. 1910.

Concomitant symptoms - Pain, Malaise.

Evidence of Contact - The mother knows of 2 other cases in the neighbourhood. The mother and the Doctor attending the cases both say they do not know of any possibility of contact.

Recovery - only slight, 7 months after onset of paralysis.

No domestic animals.

CASE XXV.

PEGGIE R. (f.) 5 & 10/12, Cupar, Fife.

Father - Vanman.

Two other children, healthy. No abortive cases. Patient went to Kirkgate School other children to Castlehill School.

Prodromal Period - 4 days.

" Symptoms - Shivering, headache, vomiting fever, gradual onset of weakness, Pain in the legs.

Alleged Cause - None.

Parts affected - Both legs.

Date of onset of paralysis. Feb.3rd, 1910.

Concomitant Symptoms - Pain - Malaise.

Evidence of Contact - None - The 3 doctors in Cupar do not know of any other case.

Recovery. Left leg complete recovery in 6 months. Right leg only partially recovered. still improving slightly, 12 months after onset of paralysis.

No domestic animals.

CASE XXVI.

JOSEPH R. (m) 1 & 5/12, Buckhaven, Fife.

Father - Miner.

One other child, healthy. No abortive cases. No school.

Prodromal Period - 3 weeks.

" Symptoms - Fever, Malaise.

Alleged Cause - A fall which occurred one week before the onset of the illness and 4 weeks before the paralysis appeared.

Parts affected - Left leg.

Date of onset of paralysis - Octr.27th 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - None.

Recovery - None, 5 months after onset of paralysis.

No domestic animals.

CASE XXVII.

Progressive onset of paralysis, the full extent of the palsy being complete in 5 days.

MARY JANE D. (f). 7/12. Inverkeithing, Fife.

Father - Labourer.

Two other children, healthy. No abortive cases. No school.

Prodromal Period - 3 days.

" Symptoms - Vomiting, fever, very drowsy, pain, unable to lift her head.

Alleged Cause - None.

Parts affected - Both legs paralysed 3 days after illness began. Right arm 2 days later Back.

Date of onset of paralysis. Septr. 1910.

Concomitant Symptoms - Pain in the back. Malaise.

Evidence of contact - The mother knows of no other case.

Recovery - Right arm recovered in 3 days. Back recovered in 8 weeks. Both legs incompletely recovered but still improving, 6 months after onset of paralysis.

No domestic animals.

The next two cases (CASES XXVIII & XXIX) both come from Bo'ness. There does not appear to have been any communication between the two families nor any chance of the contagion having been carried from one to the other. The one patient is an only child and not old enough for school, so that there is no possibility of him having contracted the disease from that source.

CASE XXVIII.

Complete recovery in 3 weeks.

WILLIAM S. (m.) 2 Bo'ness.

Father - Woodcutter.

No other children. No abortive cases. No school.

Prodromal Period - one week.

" Symptoms - Vomiting, fever, Malaise, Bowels loose.

Alleged Cause - None.

Parts affected - Right leg.

Date of onset of paralysis - May 1910.

Concomitant symptoms - Pain in right leg. Malaise.

Evidence of contact. None.

Recovery - Complete in 3 weeks.

No domestic animals.

CASE XXIX.

JOHN L. (M.) 2 & 7/12. Bo'ness.

Father - Colliery-fireman.

Four other children, healthy. No abortive cases. Go to Kinniel School.

Prodromal Period - one month.

" Symptoms - Malaise - occasionally feverish, occasionally sweating. Bowels loose.

Alleged Cause - Chill.

Parts affected - Right leg.

Date of onset of paralysis - Novr.7th 1910.

Concomitant Symptoms - Irritability, Malaise.

Evidence of contact. None.

Recovery - Patient could move toes and ankle, but there was still eversion and dragging of foot 2 months after onset. Still improving 2 months later.

Domestic animals - 4 canaries and one cat. Showed no sign of paralysis or illness at the time patient took ill.

The next two cases (CASES XXX. & XXXI.) both come from South Queensferry. CASE XXXII. comes from Dalmeny. All three were attended by the same doctor.

There does not appear to be any evidence of a possibility of infection between one case and another.

CASE XXX.

Gradual onset of the paralysis occupying two days.

Partial suppression of urine as a concomitant symptom.

ANDREW C. (m). 2 & 4/12. South Queensferry.

Father - Railway inspector.

Four other children, healthy. No abortive cases. South Queensferry Board School.

Prodromal Period. 12 hours.

" Symptoms - Vomiting, Fever, fretful.

Alleged Cause - None.

Parts affected - Left leg paralysed 12 hours after onset of illness. Right leg paralysed the next day.

Date of onset of paralysis - Aug. 30th 1910.

Concomitant Symptoms - Constipation; Partial suppression of urine; loss of appetite; loss of weight noticeable in 4 days; drowsiness; irritability; sweating of the head; thirst, pain in left arm, tenderness of limbs.

Evidence of Contact. The mother knows of no other case/

case. The doctor attending thinks there could be no possibility of infection from another case.

Recovery - Right leg incompletely recovered; left leg partially recovered, still improving 7 months after onset of paralysis.

No domestic animals.

CASE XXXI.

An unusual cause is blamed for bringing on the paralysis.

Loss of sensation as a concomitant symptom.

NELLIE R. (f). 2 & 8/12. South Queensferry.

Father - ploughman.

One other child healthy. No abortive cases
No school.

Prodromal Period - None

" Symptoms - None.

Alleged Cause - Patient was anaesthetised with nitrous oxide and 6 teeth extracted on the day before the paralysis developed.

Parts affected - Both legs - paralysis. Both arms - paresis.

Date of onset of paralysis - Aug. 31st 1910.

Concomitant Symptoms - Irritability, Constipation, Sweating, Drowsiness. Loss of weight. Loss of ordinary sensation in the lower limbs. Pain and tenderness.

Evidence of Contact - None.

Recovery - Arms completely recovered in one month. Right leg completely recovered, 4 months after onset of paralysis. Left leg only partially recovered, 7 months after onset. The power seemed to return all at once into both legs, but there was still a slight lameness in the left leg, 7 months after onset. Patient could, however run about well.

No domestic animals.

CASE XXXII.

WILHELMINA D. (f.). 1 $\frac{1}{4}$ Dalmeny.

Father - waiter.

No other children. No abortive cases. No school.

Prodromal Period - one week.

" Symptoms - Irritability.

Alleged Cause - None.

Parts affected - Both legs. Onset was gradual; weakness of legs one day, paralysis the next.

Date of onset of paralysis - Septr. 27th 1910.

Concomitant Symptoms - Pain, fever, geographical tongue and intestinal catarrh.

Evidence of contact - There have been other cases in the district but there is no evidence of contact. Patient has never at any time been amongst other children.

Recovery - Both legs only partial recovery, appeared to be still improving, 6 months after onset of paralysis.

No domestic animals.

(NOTE. The pain seemed to improve under Sodium Salicylate treatment.)

CASE XXXIII.

Death seven days after onset of paralysis.

Cerebral and pulmonary symptoms accompanying the paralysis.

MARY S. (f). 1 & 5/12. Blackford, Perthshire

No other children. No abortive cases.
No school.

Prodromal Period. 3 days.

" Symptoms - Restlessness, fever, drowsiness.

Alleged Cause - None.

Parts affected - Left arm.

Date of onset of paralysis -- Septr. 10 1910.

Concomitant Symptoms -

Cerebral Symptoms - Slight retraction of head
Slight Kernig of right leg.
Flushing all over the body
Irregular pulse.

Pulmonary Symptoms - Diminished breath sounds at
right base in front and behind. No accompaniments.
Dulness on percussion at
right base in front and behind.

Evidence of Contact - None.

Recovery - DEATH. Seven days after onset of paralysis.

No domestic animals.

Micro-Photographs of the Spinal Cord of this case at various levels are shown at the end of the volume.

CASE XXXIV.

JEMIMA M. (f). 2½ Bannockburn.

Father - Miner.

Five other children, healthy. No abortive cases. Bannockburn School.

Prodromal Period - one week

" Symptoms - Vomiting, rigor, fever, sweating.

Alleged Cause - Teething.

Parts affected - Both legs.

Date of onset of paralysis - Aug. 1910.

Concomitant Symptoms - Pain, Malaise.

Evidence of Contact - No other case known to the mother. The doctor knows of one other case a short distance away from where patient lived, but is sure there was no contact either directly or through a third party.

Recovery - None, 5 months after onset of paralysis.

No domestic animals.

CASE XXXV.

Came in contact with another case of Infantile Paralysis who died with pulmonary symptoms.

JOHN G. (M). 3 $\frac{1}{2}$, Polmont Station.

Father Miner.

Five other children healthy. No abortive cases. Go to Wallacestone School, Rumford.

Prodromal Period - 3 days

" Symptoms - Fever 101°F, Malaise, Sweating, irritability, Constipation.

Alleged Cause - None.

Parts affected - Right arm, - right leg, and back.

Date of onset of paralysis - Aug. 21 1910.

Concomitant Symptoms - Pain, tenderness (general) fever, malaise.

Evidence of Contact. Two brothers living next door to each other each had a child attacked with paralysis. One died, the other is the patient (CASE XXXV). Patient's mother and brother came in contact with the child next door who died, but patient did not.

The child next door died of acute pneumonia 2 or 3 weeks after the onset of the paralysis.

Recovery. Right arm completely recovered in 3 weeks. Back recovered in 3 weeks. Right leg incompletely recovered 7 months after onset of paralysis.

No domestic animals.

CASE XXXVI.

WILLIAM P. (m). 1 & 7/12. Denny, Loanhead.

Father Engineman.

Three other children healthy. No abortive cases. Go to Denny Loanhead School.

Prodromal Period - 3 days.

" Symptoms - Vomiting, constipation.

Alleged Cause - None.

Parts affected - Both legs.

Date of onset of paralysis. Oct. 24 1910.

Concomitant Symptoms. Malaise.

Evidence of Contact - No other case occurred in Denny Loanhead nor in the adjoining village of Denny.

Recovery - Both legs partially recovered; said to be still improving 5 months after onset of paralysis.

Domestic Animals. None showed any signs of paralysis or illness.

CASE XXXVII.

A possibility of contact with another case.

The doctor mentions two other cases who came in contact with each other.

MARY M. (f). 1½. Fauldhouse.

Father - Miner.

No other child. No abortive cases. No school.

Prodromal Period - 2 weeks.

" Symptoms - Malaise.

Alleged Cause - Cutting eye teeth.

Parts affected - Both legs.

Date of onset of paralysis - Aug. 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - The doctor knows of 3 other cases:-

1. A child living at Fauldhouse. The mother of Mary M. passed her door every day on her way to work and may have come in contact.
2. A child living at Fauldhouse.
3. A cousin of (2) living at Shotts. These two children came in contact with each other.

Recovery - Right leg none; left leg partial recovery 6 months after onset of paralysis.

Domestic Animals. None.

CASE XXXVIII.

MARY McG. (f). 9/12. Tarbrax.

Father - Miner.

No other children. No abortive cases. No School.

Prodromal Period. 3 days.

" Symptoms - Vomiting and listlessness. Fever lasting for one week. Sweating for one week.

Alleged Cause - None.

Parts affected - Left face, left arm, left leg.

Date of onset of paralysis - Aug. 4th 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - The mother knows of one other case; there was no contact to her knowledge. The doctor knows of one other case, but says there was no communication between the two houses and no possibility of infection by a carrier.

Recovery - Left leg and left face recovered completely in one month. There was no recovery in left arm 7 months after onset of paralysis.

Domestic Animals - One cat which showed no sign of paralysis or illness.

CASE XXXIX.

Progressive onset of paralysis.

ARCHIBALD R. (m). 1 $\frac{1}{2}$, West Calder.

Father - policeman.

Four other children, healthy, no abortive cases. West Calder School.

Prodromal Period - 1 day.

" Symptoms - Vomiting, drowsiness.

Alleged Cause - None.

Parts affected - Both legs. Right leg paralysed first, recovered completely after 5 days. Then left leg became affected.

Date of onset of paralysis. July 17th 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - The mother knows of no other case.

Recovery - Right leg completely recovered in 5 days. Left leg only partially recovered 8 months after onset of paralysis.

No domestic animals.

CASE XL.

BARBARA W. (f). 1 & 10/12 Uphall.

Father - engineer (at oil works.)

One other child healthy. No abortive cases. No school.

Prodromal Period - one week.

" Symptoms - Vomiting, fever lasting a week. Malaise, irritability.

Alleged Cause - Teething.

Parts affected - Right foot.

Date of onset of paralysis - Aug. 23rd 1910.

Concomitant Symptoms - Irritability. Loss of appetite. Malaise.

Evidence of contact - The mother and doctor know of one other case who took ill, 10 months before Barbara W. was affected. The doctor says there does not seem to be any possibility of even carried infection.

Recovery - Foot much improved though recovery still incomplete 7 months after onset of paralysis.

No domestic animals.

The next four cases (CASES XLI, XLII, XLIII, & XLIV) all come from Broxburn, and three of them were attended by the same doctor. The question of the communication of the disease from one case to another was carefully gone into and the following points noted.

1. The parents of the patients did not know each other before their children took ill.

2. The doctor of three of the cases says that he made careful inquiry and could elicit no evidence of the least coming and going between the three houses, and that there is no evidence whatever of contact either directly or by a third person.

3. The other children of two of the families attended the same school, the patients themselves being under school age.

CASE XLI.

CATHERINE G. (f.). 3 $\frac{1}{4}$. Broxburn.

Father - insurance agent.

Three other children healthy. No abortive cases. Go to Broxburn Public School.

Prodromal Period - 2 days.

" Symptoms - Severe headaches, fever, constipation. Patient was sneezing and coughing for a fortnight previous to the onset of illness.

Alleged Cause - Fell & hurt her back a fortnight previously. Fright?

Parts affected - Left leg, back and neck.

Date/

Date of onset of paralysis - Aug.6th 1910.

Concomitant Symptoms - Pain in the leg and tenderness. pain in the back & neck. Loss of appetite. Thirst, Fever for 1st 3 days. Constipation. Irritability, especially at night.

Evidence of Contact - None.

Recovery - Neck recovered completely in 4 weeks; back in 6 weeks. Left leg was only incompletely recovered 7 months after onset of paralysis.

Domestic Animals - 4 canaries, which showed no sign of paralysis or illness.

CASE XLII.

Progressive onset of paralysis, taking 5 days to fully develop.

Almost complete recovery, there being some residual paralysis in right hand and left upper arm.

ARCHIBALD M. (m). 1 & 10/12 Broxburn.

Father - fireman.

Three other children healthy, No abortive cases. No school.

Prodromal Period - 2 days.

" Symptoms - Fever, restlessness, irritability sweating, twitching of arms and legs during 2 nights.

Alleged Cause - None.

Parts affected - Right arm on 2nd day. Left arm on 3rd day. Both legs and back on 5th day.

Date of onset of paralysis - Aug.1910.

Comcomitant Symptoms - Malaise.

Evidence/

Evidence of Contact - None.

Recovery - Back recovered completely in one month;
legs in 3 months; Right arm except the
hand, and left arm except muscles of
upper arm, in 5 months after onset of
paralysis.

No domestic animals.

CASE XLIII.

An abortive case in the family of patient?

ROBERT A. (m). 5/12, Broxburn.

Father - Miner.

One other child healthy. No school

Prodromal Period - one week

" Symptoms - Fever, irritability.

Alleged Cause - Vague history of a wetting.

Parts affected - Both legs, both arms, back and neck.

Date of onset of paralysis _ Aug. 1910.

Concomitant Symptoms - Pain and tenderness - Malaise.

Evidence of Contact - No contact with another case
of paralysis.

Recovery - Neck recovered completely in 3 weeks;
arms in 2 months; the back was still
weak and the legs incompletely re-
covered 7 months after onset.

No domestic animals.

On enquiry for a history of any abortive case -
the mother says she had diarrhoea for a
period of 3 months before her child took
ill. For 2 weeks previous to his illness
she was feverish and vomiting; she also
had attacks of dizziness and her legs and
arms very easily "fell asleep" and became
benumbed.

CASE XLIV.

Progressive onset of paralysis, reaching
its fullest extent on the 8th day.

Complete recovery in 4 months.

DAVID R. (m.) 2½, Broxburn.

Father - Still headman.

Four other children, healthy. No abortive
cases. Go to Broxburn Public School.

Prodromal Period - 5 days.

" Symptoms - Malaise. Catarrh from nasal
 passages and wheezing. Fever, profuse
 sweating. Pain in right hand. Consti-
 pation.

Alleged Cause - None, unless due to a fright.

Parts affected - Left face on the 5th day. Left arm,
 left leg and back on the 6th day.
 Right leg on the 8th day.

Date of onset of paralysis - Septr. 24 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - None.

Recovery - complete recovery of the back in 2 weeks,
 of both legs, left arm and left face
 in 4 months after onset of paralysis.

No domestic animals.

CASE XLV.

Some difficulty with micturition and defaecation in the prodromal period.

ANNIE O. 9½. Winchburgh.

Father - farmer.

Seven other children healthy, No abortive cases. Go to White Quarries School.

Prodromal Period - 3 days.

" Symptoms - Pain, headache. Retention of urine and some difficulty with defaecation.

Alleged Cause - None.

Parts affected - Both legs and back

Date of onset of paralysis - Novr. 11th 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact. None.

Recovery - Back completely recovered; right leg movements weak but still improving; left leg incomplete recovery 4 months after onset of paralysis.

No domestic animals.

CASE XLVI.

MICHAEL McE. (m.). 2 $\frac{1}{4}$ Winchburgh.

Father - oilworker.

One other child, healthy, - No abortive cases.
No school.

Prodromal Period - 1 week.

" Symptoms - Shivering, sweating, fever

Alleged Cause - Fall on right shoulder on the fourth
day of illness, i.e., 3 days before onset
of paralysis.

Parts affected - Right arm and right leg.

Date of onset of paralysis. Oct.27, 1910.

Evidence of Contact. None.

Recovery - Right leg complete; right arm incomplete
5 months after onset of paralysis.

No domestic animals.

CASE XLVII.

An adult. The oldest case of this series.

Progressive onset of paralysis.

Retention of urine as a concomitant symptom.

JOHN F. (m). 29, Kirkliston.

Occupation - Miner.

Two children in the family. No abortive cases. Go to Kirkliston School.

Prodromal Period, - one week.

" Symptoms: Heavy cold for one week before onset of illness. Severe frontal headache, vomiting, fever, heavy sweating, loss of appetite.

Alleged Cause - Chill after severe wetting a week previously.

Parts affected - Paralysis began in right arm. Arm was completely paralysed in $1\frac{1}{2}$ days. Left arm next attacked: then paralysis spread to the back and lastly both legs were affected.

Date of onset of paralysis - Aug. 23rd 1910.

Concomitant symptoms - Pain and tenderness. Retention of urine. Constipation.

Evidence of Contact. None.

Recovery - Slight recovery in right shoulder, left arm and hand, muscles of thighs and toes; patient cannot sit up but is still improving 7 months after onset of paralysis.

Domestic Animals - One dog which showed no signs of paralysis or illness.

CASE XLVIII.

The youngest case of this series.

CATHERINE J. (f.). 3/12 _ Slatford.

Father - Vanman.

One other child, healthy. No abortive cases. No school.

Prodromal Period - 1 day.

" Symptoms - Drowsiness, fever.

Alleged Cause - Chill after a bath 4 days previous to onset of paralysis.

Parts affected - Neck. Both arms.

Date of onset of paralysis - Octr. 23rd 1910.

Concomitant symptoms - Constipation, drowsiness. Increased amount of moisture from the mouth.

Evidence of Contact - None.

Recovery - Neck completely recovered in 4 months. Right arm almost completely except the infraspinatus: left arm incompletely recovered $4\frac{1}{2}$ months after onset of paralysis.

No domestic animals.

Patient also has congenital syphilis.

The next two cases (CASES XLIX & L.) both come from Corstorphine.

The three doctors in Corstorphine know of only these two recent cases in the village.

The other children of both families attended the same school. There is a period of six months between the date of the onset of the paralysis in the first case and the date of onset of the second.

The parents of the patients were not known to each other and there was no one who went from one house to the other.

The possibility of any infection or contagion appears to be remote.

CASE XLIX.

JESSIE W. (f.). 3 Corstorphine.

Father - Farm-servant.

Three other children, healthy. No abortive cases. Corstorphine Public School

Prodromal Period - 2 days.

" Symptoms - Malaise, fever.

Alleged Cause - None.

Parts affected - Back and both legs.

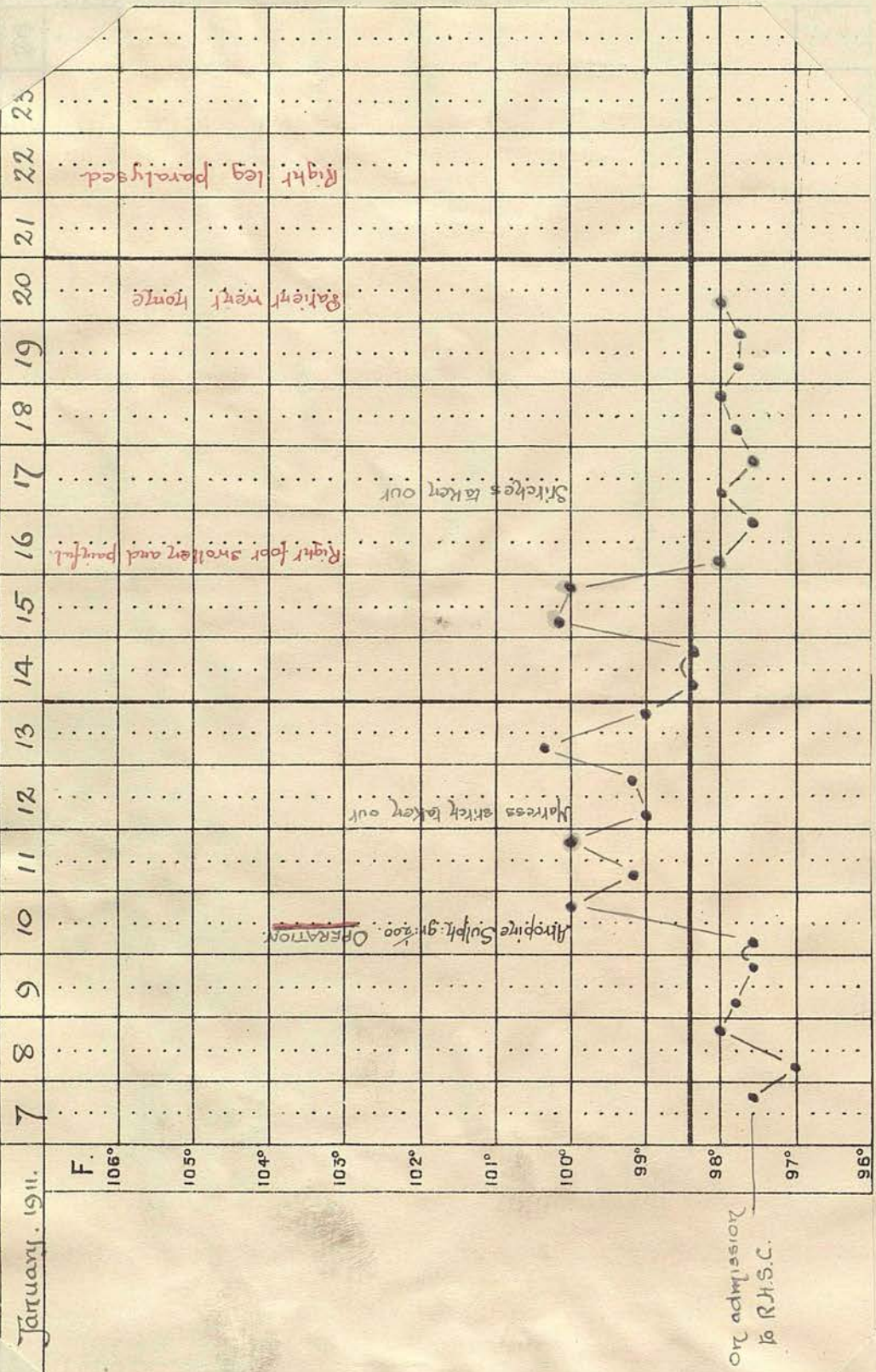
Date of onset of paralysis - Aug. 1910.

Concomitant Symptoms - Pain in the back and neck on movement.

Evidence/

Coast: P. J. Thompson's Cove

CASE, I. Temperature Chart.



Evidence of Contact - None.

Recovery - Back, complete in 1 week. Right leg began to improve in 3 weeks and has completely recovered; left leg only partially recovered 7 months after onset of paralysis.

No domestic animals.

CASE L.

This case is of special interest because he was in the surgical ward of the Royal Hospital for Sick Children at the time he appears to have become infected by Infantile Paralysis. The family history also is of interest.

DOUGLAS K. (m.). 11/12 Corstorphine.

Father - Baker.

Four other children. Corstorphine Public School.

In October 1910 - two brothers of patient, aet. 5 & 4 respectively, suffered from sore throats with slight enlargement of tonsils and general redness of fauces and pharynx: cleared up entirely in a few days with ordinary treatment. A week later - the boy aet. 4, developed paralysis of the palate & later some paresis of right face, occasional squinting and, for two or three weeks, unexplained vomiting/

vomiting - especially on rising in the morning. He made a complete recovery under tonic treatment. The patient Douglas K. never had any throat or other feverish symptoms and remained in perfectly good health.

On Jan.7th 1911. A sufficient time having elapsed to avoid any possibility of infection from the tonsillitis, Douglas K. was admitted to the Royal Hospital for Sick Children to be operated on for right inguinal hernia.

On Jan.10th 1911. Patient had his operation.

" Jan.16th - The right foot was noticed to be swollen and painful. There were no other symptoms of illness.

" Jan.20th - Patient went home. Appeared to be quite well.

" Jan.22nd - Paralysis of right leg first noticed. Patient also had sweating and pain.

It will be seen by looking at the temperature chart:-

1. That for five days after the operation there was some rise of temperature.
2. The right foot was first noticed to be swollen and painful the day the temperature came down to normal.

Prodromal/

Prodromal Period (counting from the day the right foot was noticed to be swollen and painful) six days.

Alleged Cause - None.

Parts affected - Right leg.

Date of onset of paralysis - Jan. 22nd. 1911.

Concomitant Symptoms - Pain, sweating.

Evidence of Contact - None, unless the paralysis which occurred in patient's brother three months previously, be regarded as due to poliomyelitis.

Recovery - None two months after onset of paralysis.

Domestic animals.- None.

The next three cases (CASES LI., LII. & LIII.) all live at Granton, but unless the disease was spread from (CASE LII to CASE LIII) by the sisters of the patients being in the same class at school, there is no evidence of any possibility of infection or contagion between the three cases.

CASE LI.

Cerebral Symptoms present after the onset of paralysis.

NORAH P. (f) 4. Granton.

Father - Labourer.

One other child, healthy, No abortive cases.
No school.

Prodromal Period - one day.

" Symptoms - Twitching of right side of face. Right eye closed. Constipation. Thirst. Loss of appetite. Restlessness

Alleged Cause - None.

Parts affected - Left face, left leg, right leg.

Date of onset of paralysis - Aug 20th. 1910.

Concomitant Symptoms - Dazed appearance. Listlessness. Constipation. Irritability.

Cerebral Symptoms - Slight Kernig, flushing of face irregular pulse.

Recovery - Right leg completely recovered; left face still slightly paralysed and left leg incompletely recovered, seven months after onset of paralysis.

No domestic animals.

CASE LII.

MAY D. 3.7/12. Granton.

Father - Warehouseman.

Two other children healthy. No abortive cases. Go to Granton school.

Prodromal Period - one day.

" Symptoms - Fever, loss of appetite. Constipation.

Alleged Cause - None.

Parts affected - Left leg.

Date of onset of paralysis - Sept 1910.

Concomitant Symptoms - Pain and tenderness for one day in the affected leg.

Evidence of Contact - Sister of patient is in the same class at school as the sister of CASE LIII. Annie McG. No other possibility of communication. of the disease.

Recovery - Only partially recovered but still improving five months after onset of paralysis.

No domestic animals.

CASE LIII.

ANNIE McG. (f) 4. Granton.

Father - Seaman.

Three other children, healthy. No abortive cases. Go to Granton school.

Prodromal period - one day.

" Symptoms - Tired feeling.

Alleged Cause - None.

Parts affected - Right leg below the knee.

Date of onset of paralysis. Oct 5th. 1910.

Concomitant Symptoms - Occasional shooting pains in both legs for a week. Pain in small of back. Feverish for four days, Vomiting one day.

Evidence of Contact - The mother knows of three other cases, (CASES XV and LII and one other) The sister of patient is in same class at school as the sister of CASE LII. (May S.) There is no other evidence of contact with another case.

No domestic animals.

CASE LIV.

PETER McF. (m) 1.5/12 Musselburgh.

Father - Colliery Engineer.

Two other children, healthy. No abortive cases. School - Our Lady of Loretto R.C. school.

Prodromal Period - one day.

" Symptoms - Vomiting, Malaise.

Alleged Cause - Cold.

Parts affected - Right leg.

Date of onset of paralysis _ Aug 8th.1910.

Concomitant Symptoms - Emaciation. Irritability.
Sweating a good deal.

Evidence of Contact - None. The doctor knows of no other cases.

Recovery - Right leg partially recovered seven months after the onset of paralysis.

No domestic animals.

CASE LV.

ELIZABETH W. (f) 1. 11/12 Millerhill.

Father - Farm labourer.

Eight other children healthy. No abortive cases. Go to Newton school Millerhill.

Prodromal Period - one day.

" Symptoms - Listlessness, Sweating. Drowsiness.

Alleged Cause - None.

Parts affected - Both legs and both hands.

Date of onset of paralysis. Oct 8th.1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - No other cases known.

Recovery - Both hands complete in three weeks .
Right leg complete in four months. Left leg incompletely recovered five months after onset of paralysis.

No domestic animals.

CASE LVI.

ISOBEL M. (f) 3. Newtongrange.

Father - Miner.

Two other children healthy, No abortive cases.
No school.

Prodromal Period - three weeks.

" Symptoms - Pains in the legs, slight tiredness, "feeling as if stones were in her shoes" for three weeks. Cough and Nasal Catarrh for two weeks - Fever. loss of appetite, headache, drowsiness, heavy sweating for one week before onset of paralysis.

Alleged Cause - Chill.

Parts affected - Both legs.

Date of onset of paralysis. Aug 11th. 1910.

Concomitant Symptoms - Pain, constipation, numbness.

Evidence of Contact - The father knows of two other cases in Newtongrange, but there was no contact.

Recovery - Right leg very slight recovery. Left leg partial recovery; began to recover three months after onset and is still improving seven months after onset.

Domestic Animals - Chickens and one dog. No signs of paralysis or illness.

CASE LVII.

Progressive onset of paralysis.

Tonsillitis and a rash as concomitant symptoms

ELIZABETH A. (f) 1. 7/12 New Craighall.

Father - Miner.

Four other children, healthy. No abortive cases. Go to New Craighall School. Niddrie.

Prodromal Period - one week.

" Symptoms - Listlessness.

Alleged Cause - Blow on the nose owing to a fall.

Parts affected - Right arm and left leg. A week later - Left arm and left leg and neck.

Date of onset of paralysis - Aug 18th. 1910.

Concomitant Symptoms - Pain and tenderness in arms. Sore throat lasting for one week, coming on two days after first onset of paralysis. Rash lasting for three weeks.

Evidence of Contact - The mother knows of one other case. No contact. The doctor has not had a similar case for some time.

Recovery - Neck completely recovered in two weeks.
 Left hand " " " four "
 Both legs " " " six "
 Both arms only incompletely recovered seven months after onset of paralysis; the deltoids being chiefly affected.

No domestic animals

The next two cases (CASE LVIII and LIX.) come from Prestonpans, but there seems to be no connection between the two cases.

CASE LVIII.

MARGARET H. (f) 1.5/12. Prestonpans.

Father - Miner.

No other children. No abortive case. No school.

Prodromal Period. two months.

" Symptoms - Diarrhoea.

Alleged Cause - None.

Parts affected - Right leg. Left leg partially affected.

Date of onset of paralysis. Oct 1910.

Concomitant Symptoms - Malaise.

Evidence of Contact - One other case known. No contact.

Recovery - Left leg completely recovered in nine weeks. Right leg only partially recovered but still improving greatly five months after onset of paralysis.

No domestic animals.

CASE LIX.

JOHN C. (m) 3. Prestonpens.

Father. Miner.

No other children. No abortive cases. No school.

Prodromal Period - two days.

" Symptoms - Diarrhoea. Vomiting. Fever, less of appetite. Pain in right leg.

Parts affected - Right leg.

Date of onset of paralysis - Aug 10th. 1910.

Concomitant Symptoms - Malaise.

Evidence of contact - None.

Recovery - No recovery one week after onset of paralysis.

No domestic animals.

The next two cases (CASES LX and LXI) both come from Tranent, but no evidence as to their having come in contact with each other was obtained.

CASE LX.

Unusual mode of onset.

DAVID T. (m) 1. 4/12. Tranent.

Father - Miner.

Three other children, healthy. No abortive cases. Tranent Public school.

Prodromal Period - None.

" Symptoms - The mother gives the history that patient became suddenly rigid while he was running about, but did not fall. It was then found he was paralysed.

Alleged Cause - None.

Parts affected - Both arms, both legs, back and neck.

Date of onset of paralysis - July 6th. 1910.

Concomitant Symptoms - Thirst, Constipation.

Evidence of Contact - None obtainable.

Recovery - Began after four days and was complete in one month except for the right leg.

No domestic animals.

CASE LXI.

HUGH SCOTT.(m) 1 $\frac{3}{4}$ Tranent.

Father - Miner.

Six other children, healthy. No abortive cases. Tranent Public school.

Prodromal Period - one week.

" Symptoms - Fever. Nasal Catarrh.

Alleged Cause - None.

Parts affected - Weakness all over the body. Left leg paralysed.

Date of onset of paralysis. Aug 31st 1910.

Concomitant Symptoms - Pain.

Evidence of Contact - None obtainable.

Recovery - General weakness was gone in one week.
Left leg incompletely recovered seven months after onset of paralysis.

No domestic animals.

CASE DXII

ELLEN F. (f) 2. Castlemill. Dumfriesshire.

Father - Gamekeeper.

Two other children, healthy. No abortive cases. No school.

Prodromal Period - nine days.

" Symptoms - Fever. Irritability. Sweating
Tenderness. Stopped walking.

Alleged Cause - None.

Parts affected - Right arm.

Date of onset of paralysis - Sept 1910.

Concomitant Symptoms - Tenderness. Malaise.

Recovery - None six months after onset of paralysis.

No domestic animals.

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MICRO PHOTOGRAPHS OF THE SPINAL CORD
AT VARIOUS LEVELS OF CASE XXXIII.

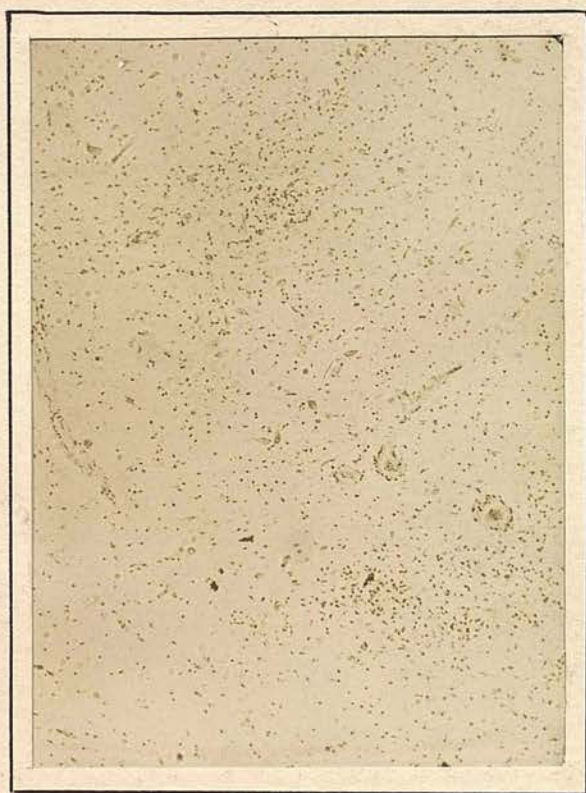
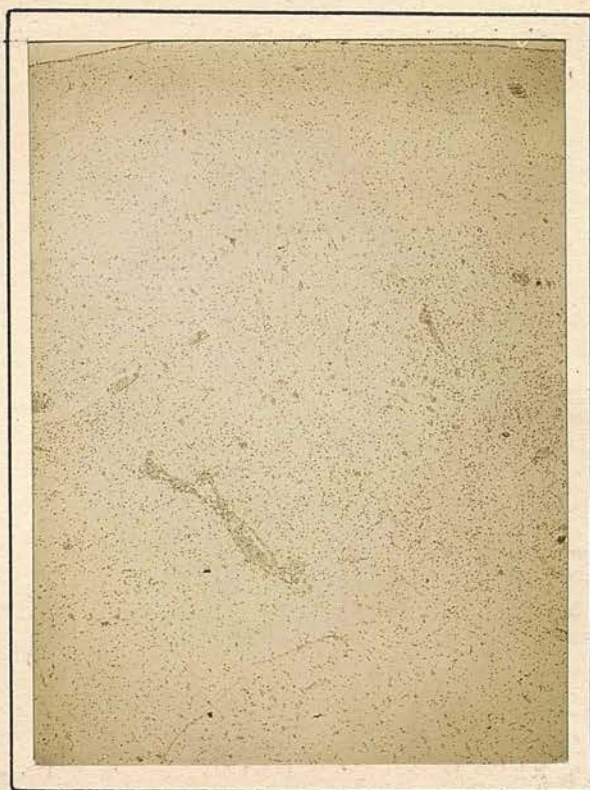
I am indebted to Mr RICHARD MUIR of the
University of Edinburgh, for these interesting
Micro-photographs, and to Dr.DAWSON, for the
descriptions of them.

NO.I. SECTION of PORES . x 30.

Dorsal Nucleus of the VIIIth Nerve: showing almost complete disappearance of ganglion cells and marked cellular infiltration.

NO.II. SECTION of MEDULLA. x 75

Nucleus of the Vagus Nerve: showing a similar condition to No.I.



NO.III. SECTION THROUGH 8th C.SEGMENT. x 26

Complete disappearance of ganglion cells.
Marked cellular infiltration of both
anterior and posterior Horns of grey matter.

NO. IV. MID-DORSAL SEGMENT. x 26.

Marked cellular infiltration - especially
round cells. Many ganglion cells still
left.

NO.V. 1st LUMBAR SEGMENT. x 26.

Very marked cellular infiltration especially
of anterior Horn : and almost complete
disappearance of ganglion cells in anterior
Horn.

