THE EPIDEMIOLOGY OF YOUNG ADULT PHTHISIS

A Review of all Deaths from Pulmonary Tuberculosis in Young Adults occurring in The Eastern Division of Glasgow for the Quinquennium 1928-1932.

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"HOW CLOSELY THE ROOTLETS OF TUBERCULOSIS ARE INTERTWINED WITH THE FABRIC OF OUR SOCIAL LIFE."

- Sir Robert Phillips, M.D.

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HISTORICAL INTRODUCTION.

Tuberculosis, in its many forms, has existed from the earliest times, and has interested mankind to an extent unequalled by any other medical problem. It is, and has for long been the cause of a very high mortality among the peoples of the world.

Very early writings throw no certain light upon the subject, and it was not until the time when Athens was at her zenith that the first real description was written by Hippocrates, (460 - 376 B.C.).

Hippocrates' description of the symptoms of phthisis was so convincing and clear that, for many centuries, it was accepted without amendment. He recognised that individuals of a certain type were prone to fall victims, that recovery was possible, and that a change of residence was a valuable method of treatment. Galen (130-200 A.D.) was of the opinion that phthisis was infectious.

Sylvius (1614 - 1672 A.D.) was the first to point out the connection between tubercular nodules and phthisis, and, later, William Stark (1740 - 1770) published a treatise accurately describing the progressive development of tubercles in the lungs, thus anticipating by nearly half a century the work of the great Frenchman, Laennec.

Laennec (1781 - 1826) was a master of objective analysis and was the first on the continent of Europe to visualise clearly the whole problem of pulmonary tuberculosis in both its clinical and pathological aspects. His publication, "The Unity of Phthisis", showed that phthisis was, in all its forms, one disease and one disease only. He also demonstrated the presence of tubercular nodules in every form of the disease. His scepti-

cism regarding the possibility of bronchial catarrh or lobar pneumonia being transformed into tuberculosis confirms his remarkable perspicacity.

In 1857 Buhl observed that acute miliary tuberculosis was frequently due to the breaking down of a caseous mass, which then became the primary seat of infection.

A distinguished scientific contribution was made by Villemin, a French Surgeon. On 5th December, 1865, he read a paper to the Paris Academy of Medicine, fully describing the experimental evidence which led him to the conclusion that tuberculosis was a specific infection, and that the inoculated disease was similar in its manifestations to the naturally acquired: also, that the source of infection, whether human or bovine, was of importance in determining the type and extent of the resulting lesions.

William Budd (1811 - 1880), a consulting physician of Bristol Royal Infirmary, studied the question for over ten years, and his memorandum on "The Nature and Mode of Propagation of Phthisis" is a work of outstanding merit, several of his conclusions having great significance. He stated that phthisis was a true zymotic disease, that it never originated spontaneously but was propagated solely by the law of continuous succession: that tuberculous matter itself constituted or included the specific morbific matter of the disease, and was the means of spread, and that sanitation and proper chemical destruction of this matter on issue from the body would result in eradication of the scourge. As proofs he quoted actual instances of contact infection and the spread of the disease among primitive tribes on

association with infected Europeans. He referred to Dr. Livingstone's observation that the Negro was free from tuberculosis until the coming of the white invaders, and to an article by Dr. Rush of Philadelphia, who made a similar observation anent the Red Indian tribes.

From the previous observations, it is apparent that an infecting agent was suspected from very early times, and we find confirmatory records of this, two of the most interesting being the Edicts of Nancy (1750) and Naples (1782), The first of these enforced the burning of all articles and bedding belonging to consumptives, while the latter ordered the isolation of consumptives and the disinfection of their belongings.

In 1839 George Sand was turned out of her hotel while travelling in Spain, because she was accompanied by the consumptive Chopin, and payment was demanded for the bed and bedding used by him.

But it was not until 1882, when Koch and Baumgarsten demonstrated the organism microscopically and succeeded in culturing it on an artificial medium, that this suspicion was confirmed.

Koch's proof that the Bacillus Tuberculosis was the essential cause of tubercle was singularly complete, and few discoveries in medicine have equalled it in importance.

For generations the pulmonary form of the disease, especially in young adults, has been and still is, a matter of grave concern to physician and layman alike.

The insidious mode of onset, particularly, fails in many cases, to arouse suspicion until the malady is well advanced, and the rapidity of its course and scant response to treatment bring about a fatal issue in almost all cases.

SPECIAL INTRODUCTION.

The aim of this thesis has been to ascertain the relative importance of the factors concerned in the causation and continued prevalence of young adult phthisis in the Eastern Division of Glasgow.

To carry out this investigation successfully, it was necessary to select an area suitable in size, and typical of the City as a whole. It was also essential that the investigator should have access to the cases concerned and authority to visit their homes. Only under such conditions could a proper survey be made of home conditions, prior history, and the contacts of the cases examined.

The Eastern Division was the area chosen for review, as it fulfilled, in all respects, the essentials quoted above, and had approximately, one quarter of the City's population within its seven wards.

The writer, as Medical Officer in charge of the Eastern Tuberculosis Dispensary, had every facility for investigating the cases.

From this area the Public Health Department annually receives a total of some 300 notifications of pulmonary tuberculosis, and records during the same time approximately 250 deaths from this disease.

As a high degree of accuracy was required before presenting statistical data, it was necessary to extend the investigation over a five year period, so that a series of five hundred young adult cases might be collected for detailed analysis. These cases could be collected in one of two ways - either from the notifications or from the deaths during the period under review. The former method had the obvious disadvantage that there

was no possibility of completing a duration table, unless the observer was willing to wait a number of years, whereas, if the latter method (analysis of deaths) were adopted, the cases could be traced back without much difficulty.

It was also apparent from a review of the statistics that, as the duration of the large majority was under four years, the cases would be well known to the investigator.

The five year period selected extends from 1st January, 1928, until 31st December, 1932.

The young adult group includes all the confirmed cases of pulmonary tuberculosis in the age period fifteen to thirty years inclusive, and is generally admitted to be a most refractory one, the mortality rate failing altogether to show the gradual decline noted during recent years in the other age groups.

An attempt has been made in the following analytical survey to elucidate this problem and proportion the onus upon the correct factors.

DESCRIPTION OF AREA.

The Eastern Division of Glasgow is essentially a busy, working-class area - the people, who are mainly of the labouring and artisan classes, being housed principally in buildings of the tenement type. During recent years, however, a considerable number have been re-housed in slum clearance schemes.

The businesses carried on are many and varied, and include carpet factories, mills, sweet factories, bakeries, locomotive and engineering works, and certain offensive trades.

The vital statistics of the area demonstrate that the density varies within wide limits, being lowest in Shettleston (38) and Dennistoun (91), where the spacing of buildings, general housing construction, and standards of cleanliness, speaking generally, are much higher than in any other ward. The density is highest in Whitevale (127) and Dalmarnock (124), where the housing is much less satisfactory. Many of the buildings in these wards are old, badly constructed, ill-spaced, damp, and overcrowded. The Calton Ward was at one time the most densely populated area in the East-End, but, owing to recent rehousing schemes, it now takes fourth place, with a density of 103 per acre, as compared with 224 per acre in 1924.

VITAL STATISTICS OF THE EASTERN DIVISION.

This section of the City covers an area of 3,212 acres, and had a population of 218,929 in the census returns for the year 1931. It is comprised of seven wards, showing the following population, density and acreage.

TABLE A.

CENSUS, 1931.

Ward.	Acreage.	Population.	Density to Nearest Whole Number.	
1. Shettleston & Tollcross	1,061	39,869	38	
2. Parkhead	883	39,418	44	
3. Dalmarnock	288	35,824	124	
4. Calton	333	34,389	103	
5. Mile-End	191	21,430	112	
6. Whitevale	176	22,439	127	
7. Dennistoun	280	25,560	91	
TOTAL	3,212	218,929	68	Average Density

The occupied houses in the area number 50,752 and are distributed as in the following table:-

TABLE B.

Occupied Houses in Municipal Wards 1-7, as returned by the City Assessor, Whitsunday 1932.

Ward	1 Apartment	2 Apartments	3 Apartments	4 Apartments	5 Apartments	Totals
1. Shettleston & Tollcross ..	1,299	4,173	2,987	740	303	9,502
2. Parkhead	1,773	5,072	1,753	179	75	8,872
3. Dalmarnock ...	3,169	4,708	556	55	14	8,502
4. Calton	1,624	3,359	1,213	217	188	6,601
5. Mile-End	1,832	2,775	442	31	4	5,084
6. Whitevale	979	2,935	1,191	155	49	5,309
7. Dennistoun ...	246	2,510	2,882	832	412	6,882
TOTALS	10,922	25,552	11,024	2,209	1,045	50,752

The knowledge of the density of an area without particulars as regards housing conditions and the presence or absence of open spaces is of limited value. The density figure for Ward 1 (Shettleston and Tollcross) is abnormally low, owing to the fact that the Ward contains a large park and much waste ground. Ward 7 (Dennistoun),

on the other hand, has few open spaces, but the houses are of a better type, as shown by the fewer single apartments.

At the other end of the scale, Whitevale, with a very high density, is better housed than the neighbouring Ward of Mile-End, where the presence of more open ground lowers the density figure.

In order to demonstrate the inter-relationship of over-crowding with the pulmonary phthisis death-rate in the East-End, a table has been drawn up for each ward comparing the percentage of population living more than three persons per room (1) with the young adult death-rate from pulmonary tuberculosis. The latter figure is obtained by accepting the last Census returns for all persons between the ages of 15 and 29 years in the respective wards. The death-rate per thousand is then calculated from the known deaths from pulmonary tuberculosis in the same age group.

TABLE C.

Pulmonary Tuberculosis - Wards 1 - 7

Both Sexes, 15 - 29 years inclusive

Age Group Death-Rate per 1,000.

Municipal Ward.	Percentage Population 3 persons per room.	Census Population 1931.	No. of Deaths 1928-32 Inclusive	Death Rate per 1,000	Comparative Mortality Combined Area = 100
1	22.5	11,056	75	1.357	87
2	25.4	10,675	82	1.536	98
3	39.8	9,656	93	1.926	123
4	28.3	8,741	77	1.762	113
5	37.8	5,752	56	1.947	125
6	24.9	6,200	49	1.581	101
7	5.7	6,578	26	.791	51
Combined Area.	26.6	58,658	458	1.562	100

Wards Arranged in Order of Degree of Overcrowding with Comparative Mortality Rates.

Ward.	Percentage More than Three persons Per Room.	Pulmonary Tuberculosis Death-Rate per 1,000 (15-29 years incl.)
7	5.7	.791
1	22.5	1.357
6	24.9	1.581
2	25.4	1.536
4	28.3	1.762
5	37.8	1.947
3	39.8	1.926

This table illustrates the close connection between the degree of overcrowding and the mortality figures. Dennistoun, with good housing and only 5.7 per cent. of persons living more than three per room shows the lowest mortality rate, while, on the other hand, Mile-End and Dalmarnock, with 37.8 per cent. and 39.8 per cent respectively, have by far the highest mortality.

When the seven wards are arranged in order of overcrowding the death-rates from pulmonary tuberculosis are observed to run a parallel course. This feature confirms the opinion that overcrowding in Glasgow is a potent factor in promoting the spread of pulmonary tuberculosis among young adults.

The Division returns appreciably higher death-rates than the City average, owing to its larger proportion of working-class population and its higher percentage of poorly constructed and overcrowded tenement houses. The

comparative figures over the five-year period, 1928-32, are given in Table C.

TABLE C.

YEAR	Death Rates per 1,000					
	All Causes.		Pulmonary Tuberculosis		Non-Pulmonary Tuberculosis	
	City	Eastern Division	City	Eastern Division	City	Eastern Division
1928	14.4	15.8	.876	.988	.317	.335
1929	16.3	16.8	.941	1.023	.303	.400
1930	14.2	15.0	.805	.861	.336	.369
1931	14.2	14.6	.865	1.033	.318	.377
1932	14.7	15.3	.889	1.001	.268	.302

When the same rates are worked out for the individual wards the lowest rates are again found to be returned by Dennistoun and Shettleston Wards and the highest by Mile-End and Dalmarnock, the comparative figures being as follows:-

Years 1928 to 1932 Combined.

WARD.	Death Rates per 1,000.		
	All Causes.	Pulmonary Tuberculosis.	Non-Pulmonary Tuberculosis.
Good Wards -			
1. Shettleston & Tollcross ...	12.8	.812	.293
7. Dennistoun ...	13.1	.600	.186
Bad Wards -			
3. Dalmarnock ...	16.2	1.049	.382
5. Mile-End	17.6	1.199	.510

These figures confirm the detrimental effect of overcrowding and poverty.

Before leaving the vital statistics of the area, a comparison of the present death-rate from pulmonary tuberculosis and those of previous years is of interest. As the earlier records fail to sub-divide the City into separate divisions, the figures for the entire City of Glasgow are quoted, and it can be accepted that the mortality for the East-End has fallen in a like manner.

GLASGOW: Death-Rate from Pulmonary Tuberculosis.[2] [3]

1860-1864	4.094 per 1,000	1922 ...	0.946 per 1,000
1865-1874 ...	3.940 per 1,000	1923 ...	1.029 per 1,000
1875-1884 ...	3.396 per 1,000	1925 ...	0.943 per 1,000
1881-1890 ...	2.680 per 1,000	1927 ...	0.869 per 1,000
1891-1900 ...	2.015 per 1,000	1928 ...	0.876 per 1,000
1901-1910 ...	1.533 per 1,000	1929 ...	0.941 per 1,000
1911-1915 ...	1.346 per 1,000	1930 ...	0.805 per 1,000
1916-1920 ...	1.191 per 1,000	1931 ...	0.865 per 1,000
1921	1.007 per 1,000	1932 ...	0.890 per 1,000

It appears that in Glasgow there is a distinct interruption in the downward trend of these death-rates and a review of the more detailed Age Group Tables shows that this is mainly due to an increased mortality among the age-group 15-25 offsetting the reduction in the older groups.

An average rate per 1,000 living in three age-groups has been calculated for the three years 1920-22, and for the three years 1930-32. The results show that there is an increase of 13.5 per cent. in the rate of incidence per 1,000 persons living, for females at ages 15 to 25 years and 2.3 per cent. for males in the same age group.

Variation in Age-Incidence of Cases Notified during the past 10 years.

Incidence per 100,000 at each Age-Group.

	-15		15-25		+25	
	M.	F.	M.	F.	M.	F.
Average Rates for three years around 1921	109	117	257	229	280	165
Average Rates for three years around 1931	70	78	263	260	210	120
Percentage Difference	-35.8	-33.3	+2.3	+13.5	-25	-27.3

SUMMARY:- The statistics illustrate the rise of the death-rates with the increase of overcrowding, and the fact that the young adult death-rate reacts to the same conditions as the pulmonary groups taken altogether. They also confirm Dr. J.A. Wilson's (4) conclusions, when he states, - "The serious and certain fact is that the disease is tending to become one mainly of young adult life."

METHOD OF COLLECTION OF DATA.

An attempt was made to obtain the following information from every case of the selected age group.

A. Personal

(1) Name, Sex, and Address.

(2) Age - (Throughout this investigation the age at sickening has been used, and not the age at death, otherwise, as the disease is of a distinctly variable duration, statistics based on the latter would underestimate its incidence in the younger groups while overestimating it in the older.)

(3) Occupation.

(4) Month of sickening.

(5) Month of notification.

(6) Interval of time between sickening and notification.

(7) Interval of time between notification and first examination by dispensary physician.

(8) Mode of onset with initial symptoms in order of occurrence.

(9) The presence or absence of haemoptysis or stained sputum as an early symptom.

(10) Habits of patient.

(11) Details of all prior illnesses with special reference to previous pulmonary complications.

(12) Duration of illness from date of sickening until death.

B. Familial

(1) Nationality of male parent.

(2) Previous tuberculosis in family - type, relationship to patient, closeness of contact especially as regards sleeping accommodation.

(3) Income of family at time when patient sickened.

C. Housing

(1) Size of house, locality, state of cleanliness and rent.

(2) Number of inmates.

(3) Sleeping accommodation with names and ages of all others occupying the same room or bed.

D. General and Pulmonary Condition of Patient at First Examination

(1) General appearance with degree of toxaemia as shown by temperature and more especially by the pulse rate.

(2) Site, extent and type of pulmonary lesion.

(3) Radiological findings with special note of the time interval between sickening and x-ray examination.

E. Particular Observations subsequent to Notification of Patient

(1) The type of disease - whether acute, subacute, or chronic.

(2) The duration and effect of hospital treatment with the interval elapsing from notification until admission.

(3) The occurrence of secondary tuberculosis in the family, attributable to infection from patient.

F. Contacts

(1) Health of contacts in infected households as ascertained by -

(a) Examination at the dispensary, or in the home.
(b) Tuberculin intracutaneous tests.
(c) Radiological examination.

METHOD OF CLASSIFICATION OF YOUNG ADULT GROUP.

The total number of deaths from pulmonary tuberculosis recorded in the Eastern Area during the five years 1928-1932 inclusive is 1,214, which includes a few institution cases. Under the Tuberculosis Scheme a record sheet of every case is kept, and in it the salient facts are recorded, one of the most important being the age of the patient at time of notification. The subsequent classification is based on the age at notification as this gives an accurate estimate of the incidence of the disease in the various age groups.

An examination of the 1,214 case-records elicited the information that 488 of the cases to which they referred had sickened and had been notified between the ages of 15 and 31 years. These ages (15-31) are regarded as the limits of the young adult group, and the 488 cases occurring within them taken as the series for investigation.

Throughout each of the five years this group accounts for a fairly constant 40 per cent. of all the deaths. This is best shown in tabular form.

Deaths from Pulmonary Tuberculosis
(Eastern Division)
1928 - 1932 inclusive.

Year	Total Number (Both Sexes)	Age Group 15-31.			
		Males	Females	Total (Both Sexes)	Percentage of Total Cases
1928	244	50	35	85	34.84
1929	265	45	59	104	40.75
1930	212	40	41	81	38.21
1931	256	48	68	116	45.31
1932	237	42	60	102	43.04
	1,214	225	263	488	40.2

A complete investigation has been made of each of the 488 cases and the type of the disease classified in one of the three categories outlined below.

(1) Acute Phthisis: Illness of a very rapid and toxic type with marked emaciation and progressive deterioration. Duration - less than six months from onset of illness.

(2) Subacute Phthisis: Early symptoms less pronounced. Some cases show a temporary improvement following treatment, but usually the lesions are progressive. Toxaemia is a persistent feature indicated oftener by a rapid pulse rate than by a hectic temperature.
Duration - more than six but less than eighteen months.

(3) Chronic Phthisis: All cases not falling into the above categories. Patients often show considerable periods of improvement. Cavitation and haemoptysis are common features.
Duration - over eighteen months.

The numbers falling into these three subdivisions are as follows:-

Type of Case	Number	Percentage of Group
(1) Acute	115	23.5
(2) Subacute ...	120	24.5
(3) Chronic	253	52.0
Total	488	100.0

The sexes are distributed in the various groups as shown in the following table:-

Type of Case	Males	Females	Total (Both Sexes)
(1) Acute	56	59	115
(2) Subacute ..	53	67	120
(3) Chronic ...	116	137	253
Total ...	225	263	488

GENERAL SURVEY OF THE GROUP AS A WHOLE.

It is a matter of common knowledge that certain diseases show a definite seasonal incidence, and it is the opinion of most workers in tuberculosis, that the spring is the busiest season, especially as regards the notification of new cases.

A table drawn up to compare the monthly notification rate of all cases of young adult pulmonary tuberculosis occurring in the whole city, the Eastern Division, and the group under survey shows that in all three series, May is the peak month.

Percentage of all Notifications of Young Adult Phthisis. (15 - 31 years).

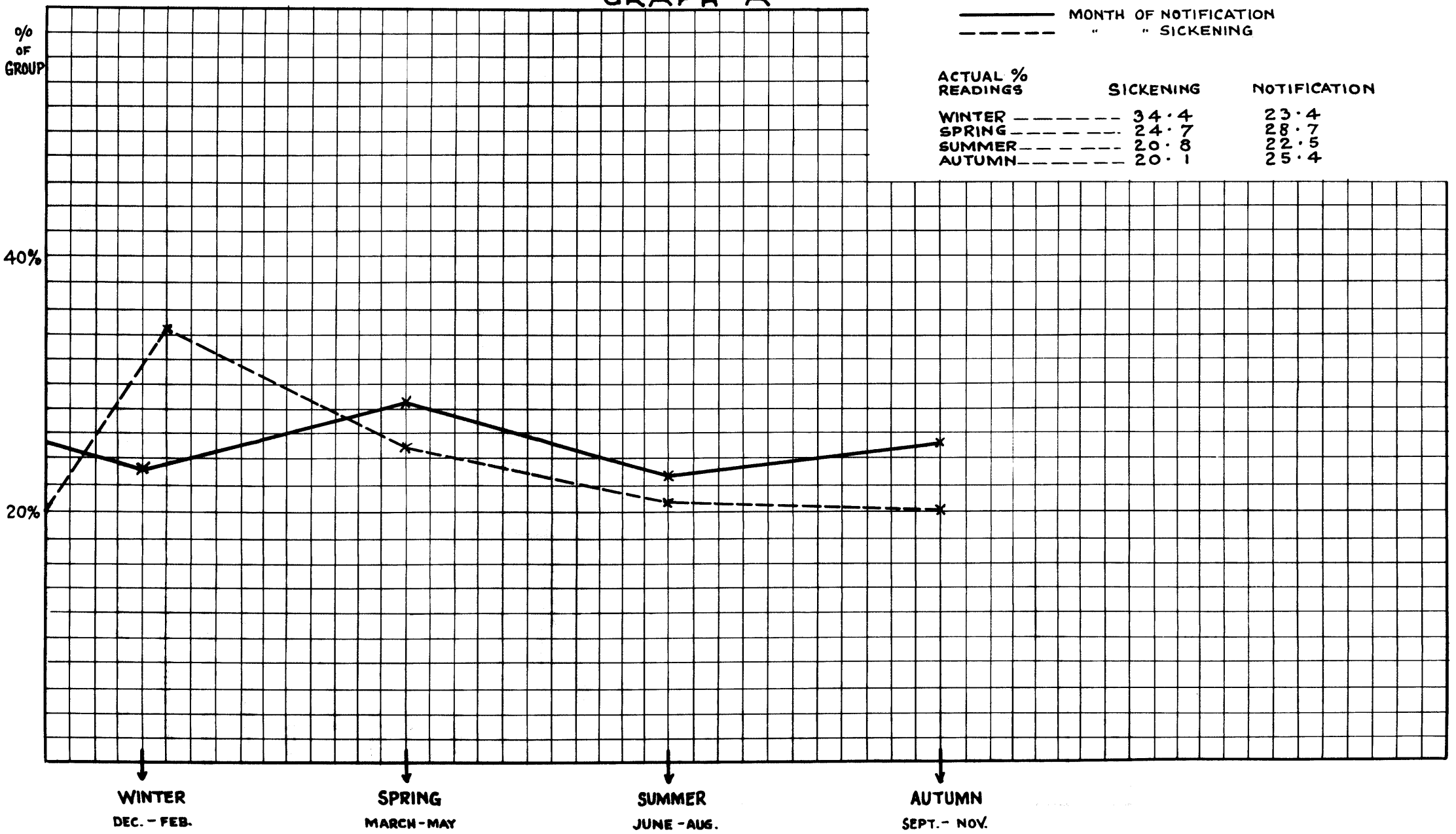
Month of Notification.	Glasgow 1928-32	Eastern Division 1928-32	Survey Group
January.....	7.3	8.1	8.6
February	8.4	9.6	9.0
March	9.8	9.1	9.2
April	9.9	10.5	8.4
May	10.0	11.0	11.4
June	9.4	8.0	8.2
July	7.3	7.0	6.4
August	7.7	7.6	7.6
September	7.4	6.7	9.4
October	7.6	7.4	7.3
November	6.9	6.6	8.8
December	8.3	8.4	5.7
	100.0	100.0	100.0
Total No. of Cases.	4,442	1,018	488

Although May is the commonest month of notification, on examination into the history of the cases it is found that January is the chief month of sickening (Graph A illustrates this). This is believed to be due to the cold, wet season giving rise to chills and influenza,

both of which are acknowledged precursors of phthisis.

(Graph A.)

GRAPH A


% OF GROUP
40%
20%
MONTH OF NOTIFICATION
" " SICKENING
ACTUAL % READINGS
SICKENING
NOTIFICATION
WINTER 34·4 23·4
SPRING 24·7 28·7
SUMMER 20·8 22·5
AUTUMN 20·1 25·4
WINTER
DEC. - FEB.
SPRING
MARCH - MAY
SUMMER
JUNE - AUG.
AUTUMN
SEPT. - NOV.

AGE DISTRIBUTION.

The age distribution of the cases is particularly interesting and is shown in detail in the following table:-

	AGE																TOTAL
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Acute																	
Male	1	5	5	8	10	3	4	4	3	0	2	1	4	4	1	1	56
Female	6	6	6	4	12	2	5	5	1	2	1	1	3	0	2	3	59
Subacute																	
Male	2	3	4	1	6	7	6	1	5	2	5	1	5	1	2	2	53
Female	4	6	5	7	5	3	8	4	4	5	2	6	1	4	1	2	67
Chronic																	
Male	3	6	6	9	9	12	5	4	10	8	11	3	8	6	7	9	116
Female	11	9	13	10	9	9	9	9	6	11	4	9	8	6	6	8	137
TOTAL =	27	35	39	39	51	36	37	27	29	28	25	21	29	21	19	25	488

It is noticeable from the table that the largest number of the cases in both sexes is present in the earlier years. When comparative tables of each five-year period are drawn up for each sex, it is seen that there is a preponderance of females in the 15-19 group. That this is not an accidental feature is proved by a comparison of the Eastern Division mortality rates with those of the whole city. Here again the female cases far outweigh the male cases in the 15 - 19 group - the actual proportion being 141:100 in the one case (Eastern Division), and 138:100 in the other (Glasgow). Again the tables show the much greater general prevalence of the disease in the Eastern Area and especially in the youngest group.

PULMONARY TUBERCULOSIS.

MALES

Age Group	Census Population 1931	Deaths 1928-32	Average Annual Death-Rate per 1,000.	Comparative Mortality Male Death Rate =100
Glasgow				
15-19	48,219	244	1,012	138
20-24	46,740	336	1.438	99
25-29	43,287	262	1.211	101
Wards 1-7				
15-19	10,373	78	1.505	141
20-24	9,479	74	1.561	105
25-29	8,930	61	1.366	86

FEMALES

Age Group	Census Population 1931	Deaths 1928-32	Average Annual Death-Rate per 1,000.
Glasgow			
15-19	51,787	361	1.394
20-24	51,927	368	1.417
25-29	48,183	294	1,220
Wards 1-7			
15-19	10,628	113	2.126
20-24	10,093	83	1.645
25-29	9,155	54	1.179

Comparative Rates - City Rates = 100

Eastern Division.

Age Group	Males	Females
15-19	149	153
20-24	116	116
25-29	113	97

The above figures show that the mortality in the age-group 15-19 is markedly higher than in either of the remaining two age-groups; particularly is this true with regard to the young females.

The relatively high death rate of young females over males occurs in all countries of the world where vital statistics are available for study.

Various views have been expressed regarding the cause of this, but the trend of present-day medical opinion tends to support a biological explanation. Lloyd Arnold (5) in a recent investigation into the metabolic changes in the female, shows that the basal metabolism is increased, and that there are changes in the permeability of capillaries and increased cellular exchange during menstruation. According to his view, any existing tubercular focus is apt to be aggravated at menstrual periods. There is no doubt that the strain of puberty, allied to insufficient clothing and the inadequate footwear favoured by young women of to day, tends to increase the heavy death-rate in Scotland. In many cases, too, the girls are called upon to perform domestic duties in the home, while their more fortunate brothers are amusing themselves out-of-doors.

Again, in the Eastern Division most girls of fourteen, on leaving the easy and hygienic conditions of School Life, are employed in the confined atmosphere of factories or mills whereas boys of a similar age are chiefly employed out-of-doors as errand-boys.

In both sexes in the age group 15-19 rapid growth and physiological changes are taking place which throw a great strain on the individual - A strain under which the resistance to disease is liable to break down, more especially if food is inadequate and the

hours of labour long. There is also a marked tendency for young people to take too little rest, overtaxing themselves with evening amusements - in other words, they burn the candle at both ends.

DURATION OF DISEASE.

The duration of the disease has been ascertained in each of the 488 cases, and is set forth in the subsequent tables, the first of which shows the number of cases succumbing within stated intervals of time. In all, 68 per cent of both sexes died within three years.

The second table gives the number per 1,000 of both sexes surviving at the end of each time interval.

TABLE ILLUSTRATING THE DURATION OF [illegible]

DISTRIBUTION OF DEATHS IN TOTAL OF 488 CASES, 1928-1932, INCLUSIVE.

No. of Cases in Survey	Acute	Sub-acute								Chronic					
	-6 Mos.	6-9 Mos.	9-12 Mos.	1 Year -15 Mos.	15 Mos. -18 Mos.	18 Mos. -2 Yrs.	2 Yrs. -3 Yrs.	3 Yrs. -4 Yrs.	4 Yrs. -5 Yrs.	5 Yrs. -6 Yrs.	6 Yrs. -7 Yrs.	7 Yrs. -8 Yrs.	8 Yrs. -9 Yrs.	9 Yrs. -10 Yrs.	over 10 Yrs
Male 225	56	15	11	18	9	16	28	15	20	5	4	1	3	3	21
		53								16					
Female 263	59	10	14	24	19	22	31	31	14	9	7	7	1	1	14
		67								25					
Total 488 Both Sexes	115	25	25	42	28	38	59	46	34	14	11	8	4	4	35
		120								41					

Number per 1,000 surviving at each Time Interval.

	6 Mos.	9 Mos.	1 Yr.	15 Mos.	18 Mos.	2 Yrs.	3 Yrs.	4 Yrs.	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	
1,000 Males	751	688	636	556	516	444	320	255	164	142	124	111	107	93	
1,000 Females	776	738	684	593	521	437	320	201	148	114	87	61	57	53	
1,000 Both Sexes	766	713	662	576	518	441	320	225	156	127	103	88	80	72	

THE HOUSING CONDITIONS OF THE YOUNG ADULT GROUP.

The size of house in which each family was resident at the time of notification of the case has been ascertained, together with the number of inmates in each, their sex and age. These data not only supply information regarding the percentage occupying the smaller size of house, but allow a comparative estimate of the density per apartment to be made. The first of the two following tables shows the features of the entire group, while the second illustrates the close similarity of the findings when male and female cases are separately analysed.

Housing Conditions of 488 Cases on Date of Notification.

Total No. of Cases.	Apartments						Institution Cases.
	1	2	3	4	5	6 or 7	
488	89	287	82	15	4	3	8
Percentage of group dwelling in each size of house	18.24	58.81	16.8	3.07	0.82	0.61	1.64
No. of inmates..	353	1572	494	98	31	22	-
Average number of persons per house	3.97	5.48	6.02	6.53	7.75	7.33	-
Average number of persons per room	3.97	2.74	2.01	1.63	1.55	-	-

Housing conditions of male and female cases calculated separately for comparative purposes -

Percentage occupying each Size of House at Time of Notification.

	Apartments.						Institution Cases.
	1	2	3	4	5	6 or 7	
Males..	17.33	58.22	18.67	3.56	0.44	1.33	0.44
Females	19.01	59.32	15.21	2.66	1.14	-	2.66

Less than five per cent of the total cases dwelt in a house larger than a three-apartment, while the majority lived in small two-apartment houses, generally termed "room and kitchen". Most of these were of the type in which there was a bed recess in the kitchen, shut off by a curtain during the daytime and usually occupied at nights by the parents, the younger adults and children sleeping in the adjacent room. Considering that the average number of inmates of this size of house was found to be as high as 5.48, it was obviously impossible to segregate an open case of phthisis satisfactorily. The conditions in the single apartment were even worse. With an average of four occupants, all had to sleep in the bed recess or a portion of them in a collapsible bed, let down at night, Sleeping, cooking, washing, and feeding had all to take place within these narrow limits. "Single ends", as they are known locally, are seldom through-and-through houses, and are often dark, ill-ventilated, miserable, and damp. As would be expected, they are principally found in the oldest and worst-constructed tenements, and are usually approached through an ill-lit and foul-smelling passage. Generally the single apartment is occupied by a young married couple with two or three children, obtaining

the necessities of life from the Public Assistance Department or the Unemployment Exchange. There is absolutely no possibility of successfully treating either the young husband or his wife under these circumstances. The young woman is disappointing as a hospital case - constantly fretting about her children left to the care of relatives - and usually dismisses herself after a comparatively short and ineffectual course of treatment. On her return she sleeps with her husband in the bed recess where there is no circulation of air. Is it any wonder that in a considerable percentage of cases he too contracts the disease?

Opie and McPhedran (6) have found that husbands and wives in marital contact with phthisis are infected nine times as often as persons who have no known contact with the disease.

The family occupying a three-apartment house differs in several ways. Firstly, their economic position is better; secondly, usually one member at least is employed; and thirdly, young children account for a smaller proportion of the inmates. The sleeping accommodation is much more satisfactory, as in most cases all three rooms are occupied at night. It is possible, therefore, to give up one room as a bedroom to an infected young adult and thus minimise to a large extent the liability of contact infection. Another feature of importance is the inside lavatory. This convenience abolishes the misuse of the kitchen sink as an outlet for the disposal of sputum, etc. As a rule also, these people are of a higher type and co-operate more readily with the Health Services in the use of sputum flasks, and are more amenable to hospital-

isation.

A Review of the Comparative Mortality from Tuberculosis in One, Two, and Three-Apartment Houses.

Before an analysis could be made, it was necessary to possess two pieces of knowledge - firstly, the number of inmates of the respective sizes of house, who were between the ages of 15 and 29 years; and secondly, the number of deaths from pulmonary tuberculosis among them. Hence, it was essential to ascertain the age and sex constitution of the population inhabiting each size of dwelling. The 1931 Census returns do not supply these data but give the total number of inmates of each sex for each size of house, without reference to age, thus a special estimate had to be made. This was done by making use of an analysis of the 1911 Census (specially prepared for the Medical Officer of Health, Glasgow), as this contained details regarding the age and sex constitution of the population in each size of house. From this analysis the percentage of the total occupants of each size of dwelling for the three age groups 15-19, 20-24, and 25-29 years were obtained (for each sex separately) and these percentages were applied to the total number of inmates of each size of house as returned at the 1931 Census. By this means the population for the aforementioned three age groups was separately calculated for the one, two and three-apartment houses, and as a proof of the accuracy of the estimate the resultant figures were compared with the age-group populations as made up by the Registrar-General.(7) The comparative figures are as follows:-

	Age Group	As Estimated.	Actual (as returned by Registrar-General)
Males	15-19 yrs.	10,859	10,373
	20-24 yrs.	9,411	9,479
	25-29 yrs.	8,930	8,930
Females	15-19 yrs.	10,993	10,628
	20-24 yrs.	10,490	10,093
	25-29 yrs.	9,155	9,155

The following tables give fuller details:-

Size of House	Males			
	15-19	20-24	25-29	Total 15-29
Estimated Populations in Each Size of House				
1 Apt.	824	1,368	1,981	4,173
2 Apts.	5,514	4,115	4,293	13,922
3 Apts.	3,348	2,792	1,732	7,872
Remaining Population.	1,173	1,136	924	-
TOTAL	10,859	9,411	8,930	25,967
Actual Number of Deaths from Pulmonary Tuberculosis in Each Age Group occurring in Each Size of House for the Five Years 1928-1932 inclusive.				
1 Apt.	10	10	16	36
2 Apts.	51	49	25	125
3 Apts.	14	12	13	39
4 Apts. and over.	4	4	4	12
TOTAL	79	75	58	212

(12 cases aged 30 years and 1 institution case excluded)

Size of House	Females			
	15-19	20-24	25-29	Total 15-29
Estimated populations in Each Size of House.				
1 Apt.	1,053	2,175	2,107	5,335
2 Apts.	5,493	4,077	4,341	13,911
3 Apts.	3,285	2,923	1,857	8,065
Remaining Population.	1,162	1,315	850	-
TOTAL	10,993	10,490	9,155	27,311
Actual Number of Deaths from Pulmonary Tuberculosis in Each Age Group occurring in Each Size of House for the Five Years 1928-1932 inclusive.				
1 Apt.	14	23	11	48
2 Apts.	75	40	35	150
3 Apts.	16	13	7	36
4 Apts. and over.	5	4	1	10
TOTAL	110	80	54	244

(12 cases aged 30 years and 7 institution cases excluded.)

From the above statistics an annual death rate per thousand for each size of house and for each age group and sex has been calculated. The results are shown in the following table:-

Size of House.	Males			Total
	15-19	20-24	25-29	15-29
1 Apt.	2.4	1.5	1.6	1.7
2 Apts.	1.8	2.4	1.2	1.8
3 Apts.	0.6	0.9	1.5	1.0

Size of House	Females			Total	Both Sexes
	15-19	20-24	25-29	15-29	15-29.
1 Apt.	2.7	2.1	1.0	1.8	1.8
2 Apts.	2.7	2.0	1.6	2.2	2.0
3 Apts.	1.0	0.9	0.8	0.9	0.9

These figures illustrate in a convincing way the superiority of the three-roomed house. They also show that the two-roomed house is little, if any, better than the single room. The percentage excess of the mortality rate in the one and two-roomed houses respectively, compared with the three-roomed house, is as follows -

	Males 15-29	Females 15-29	Combined Groups 15-29
1 : 3	70%	100%	100%
2 : 3	80%	144%	122%

When the age group 15-29 years is subdivided into three five-year periods the youngest (15-19 years) is found to show the most appreciable difference in the mortality rates. The following table shows the percentage excess of the mortality rate in the one and two-apartment houses as contrasted with the three-apartment house.

Apartments	Males			Females		
	15-19	20-24	25-29	15-19	20-24	25-29
1 : 3	300	67	7	170	133	25
2 : 3	200	167	-20	170	122	100
1 : 2	33	-37	33	-	5	-37

These figures show that four times as many young adult males between the ages of 15 and 19 years, residing in a single-apartment house succumb to pulmonary tuberculosis, as compared with an equal number of young males of the same age living in a three-apartment house. The equivalent female figures are somewhat less, being nearly three times as great in the single apartment. It is evident then that the three apartment house shows a definite statistical advantage over the one or two-roomed house. In the series of cases studied this advantage can be expressed in general terms by stating, that the three apartment house has only half the death rate from phthisis that obtains in the smaller house.

A.K. Chalmers (8) in a study of the death rates from phthisis in Glasgow for different sized houses, showed that during the years 1909-1912, the death rate in every age group was lower in houses of three and four apartments than in the smaller dwellings, and Peters, (9) speaking at Cardiff in July of this year, brought forward evidence to prove this also. He states that, "The inmates of the one-apartment house are 341 per cent worse off as regards the death rate from phthisis, than are the occupants of four apartments".

These findings are valuable as an indication that rehousing alone may contribute very materially to the reduction of the death rate from this disease. But it must not be forgotten that the incomes of families living in one apartment are very limited, and increase in the rent means less money for food. Thus a counterbalance may easily be struck as has been emphasised recently by G.C.M. McGonigle, (10) who found that the health of his re-housed families in Stockton-on-Tees failed to improve.

This he attributed entirely to the poorer diets enforced upon these families by pecuniary circumstances, the rents of the new houses being more than double their former rents, and to the fact that the large majority were unemployed. His enquiries led him to believe that the difference in rent was made up by curtailment of the diet, and an analysis of the diets of "Sample Families" showed every one to be below the standard requisite for health, - some containing little more than 50 per cent of the normal fat content, and a drastic reduction of "first class" protein.

Although these findings are fortunately not applicable to every town where rehousing has been carried out, they are of value in demonstrating the futility of any scheme evolved to curtail tubercular infection, if it improves the environment at the expense of an adequate diet.

It is of interest that the Phthisis Death-Rate of the East-End families, rehoused at Hamiltonhill Slum Clearance Scheme in 1927, now closely approximates to that of the Phthisis Death-Rate of the city. Previous to their removal they dwelt in the most congested areas of the East-End and returned a very high Phthisis Death-Rate.

Sleeping Accommodation of the 488 Cases Reviewed.

GROUP.	ROOM TO SELF.	BED TO SELF.	OTHERS IN SAME BED					TOTAL
			1	2	3	4	5	
MALES								
Acute	5	16	21	11	3	-	-	56
Subacute	3	19	28	3	-	-	-	53
Chronic	23	21	51	18	3	-	-	116
FEMALES								
Acute	4	15	25	10	5	-	-	59
Subacute	3	6	38	17	3	-	-	67
Chronic	13	31	58	24	9	1	1	137
Total Both Sexes	51	108	221	83	23	1	1	488
Percentage	10.45	22.13	45.28	17.0	4.71	-	-	100

The above table calls for little comment, but it is worthy of note that only one in every ten young adults had a bedroom of his, or her own, and that 67 per cent shared a bed with at least one person.

The figures regarding sleeping accommodation found in this enquiry show no improvement on those found by Dr. Currie (11) in his Glasgow Investigation of 1905. Of the 106 families investigated by him, less than one-third had a separate bedroom. In his report he emphasises the fact that neglect of precaution against sputum increases as the available house-room diminishes.

Spray infection projected into the atmosphere in the act of coughing is admittedly the most active form of infective agent and when present in ill-ventilated and congested sleeping apartments the liability of the occupants to infection is immeasurably increased.

FAMILY HISTORY WITH REFERENCE TO PREVIOUS CASES OF TUBERCULOSIS

A study of the family histories of the 488 cases brings to light that previous cases of tuberculosis occurred in 167 of them. This figure rather underestimates than over-estimates the incidence, as only those cases have been accepted which are capable of definite confirmation. No hearsay evidence has been taken into account. Altogether there are 243 prior cases, because 55 of the 167 families have more than one case. It is interesting to note that five families contained as many as four previous cases. The following table shows the distribution of prior cases.

		Total No. of Prior Cases	Percentage of 488 Cases.
No. of Families showing no Prior Case	321	-	65.8
" " " " 1 " "	112	112	23.0
" " " " 2 " "	39	78	8.0
" " " " 3 " "	11	33	2.2
" " " " 4 " "	5	20	1.0
	488	243	100.0

Two factors are of great importance - firstly, whether the associated tubercular case was pulmonary or non-pulmonary; and secondly, the time interval elapsing between the cases and the closeness of contact. Of those families mentioned above which had prior tuberculosis in them, (a) 129 contained at least one member with a positive sputum, and (b) the remaining 38 families had either non-pulmonary lesions or a pulmonary lesion of the pleuritic or fibrotic type never yielding a positive sputum.

Time Interval between, and the Contiguity of the Associated Cases.

This is best expressed by grouping the prior cases under three headings -

(1) Those in direct contact with the patient or associated with him during the previous year.

(2) Those in contact with the patient within from one to five years; and

(3) Those in contact with the patient more than five years previously.

The number of families of Group (a) falling into the above categories is shown below -

Group (a) - 129 Families.

Prior Case	Number	Percentage of 488
(1) Positive Phthisis within 1 year prior =	73	15.0
(2) " " " 1-3 years " =	33	6.8
(3) " " over 5 " =	23	4.7
	129	26.5
Group (b) - 38 Families		
Non-Pulmonary Tuberculosis	38	7.8
	167	34.3

The above figures emphasise the very considerable danger of contact infection, especially when that contact is with an open pulmonary tuberculosis. First of all, they show that of the entire young adult group 34.3 per cent, or fully one-third, had previous association with tuberculosis in their homes at some prior date, (12) (W.T. Munro, of Glenlomond Sanatorium found

previous familial tuberculosis in 60 per cent of 500 cases investigated by him.); secondly, that 15 per cent were contacts within the year with a parent, brother, or sister suffering from pulmonary tuberculosis with a positive sputum, and that 80 per cent. of these were found to have occupied the same bedroom as the patient; thirdly, that 26.5 per cent, or roughly a quarter of the group under review, had previous contact with an infective case of pulmonary phthisis; and fourthly, that contact with non-pulmonary tuberculosis only is much less frequent, being present in less than eight per cent of cases. Of course, if in reviewing a family history both pulmonary and non-pulmonary tuberculosis are present the former (pulmonary) is always given precedence as a possible source of infection.

The proportion of cases showing contact with a previous case, especially a recent case of phthisis, is so large that it obviously calls for a close investigation into the housing conditions and the sleeping arrangements. Brownlie (13) in his studies of the epidemiology of pulmonary phthisis in Great Britain has advanced the view that the different types of phthisis are associated with different types of tubercle bacilli. If this were the case, young adults becoming infected from contact with a chronic case presumably should contract chronic rather than acute phthisis, and the converse should be equally true. The group under review has been utilised to test out this view and has completely failed to confirm his assumption, for in fully half the acute cases associated with previous pulmonary tuberculosis in the house, the disease in the prior case was of the chronic type. Chronic cases may arise from contact with an acute case.

It is noteworthy that the ratio of acute, subacute, and chronic phthisis is the same in the 106 cases which were infected by a member of the household within the previous five years, as it is in the entire group. Further, that if the cases with contact infection more than five years previously are also included, the ratio is still unaltered. The comparative figures are shown below -

Total No. of Cases Reviewed = 488.		Percentage of Group	Cases Associated with Pulmonary Tuberculosis within 5 yrs. = 106.		Non-Associated Cases = 382	
Type of Case	No.		No.	Percentage of Group	No.	Percentage of Group
Acute	115	23.5	28	26.4	87	22.8
Sub-Acute	120	24.5	25	23.6	95	24.9
Chronic	253	52.0	53	50.0	200	52.3
	488	100.0	106	100.0	382	100.0

	Total Cases Associated with Pulmonary Phthisis prior to sickening = 129		Non-Associated Cases.	
	No.	Percentage	No.	Percentage
Acute	32	24.8	83	23.1
Subacute	32	24.8	88	24.5
Chronic	65	50.4	188	52.4
	129	100.0	359	100.0

It thus appears that, apart from the more frequent infection of families in which there is previous tuber-

culosis, the type of resulting disease is in no way changed from that arising from sources outwith the home.

FAMILY HISTORY WITH REFERENCE TO SUBSEQUENT CASES OF TUBERCULOSIS.

A survey of the subsequent history of the 480 families (eight were institutional cases which had no association with their families subsequent to sickening) showed that up to the end of October 1933, 99 of them had had subsequent cases of tuberculosis. Of the 99 families, 40 were found to have had previous infection as well, a fact which lends support to the contention that family predisposition is a factor of some importance. In all, 145 subsequent cases have occurred, 73 per cent of them being pulmonary phthisis, and 9 per cent tubercular meningitis. The forms assumed by the disease and the percentage of families affected in the acute, subacute, and chronic groups are shown in Table D.

TABLE D.

Type of Tuberculosis developed by 145 Subsequent Cases.

Cases arising from	Confirmed Pulmonary Phthisis.	Tubercular Pleurisy	Miliary Tuberculosis	Surgical Tuberculosis	Tubercular Meningitis	Percentage of families in each group showing subsequent cases
Acute Group.						
Males	5	-	-	-	-	16.5
Females	15	3	1	1	2	
Subacute Group						
Males	9	-	1	-	-	20.0
Females	19	-	-	2	2	
Chronic Group.						
Males	27	-	-	11	3	21.7
Females	31	1	2	4	6	
	106*	4	4	18	13	

*99 of these returned a positive sputum.

The most marked feature of the foregoing table is the predominance of subsequent pulmonary tuberculosis over all other types. Of the 115 families with an acute primary case, 19 (16.5 per cent) gave rise to at least one further case, the total number of subsequent cases being 27. Of the 120 families with a subacute primary case, 24 (20.0 per cent) gave rise to at least one subsequent case, the total number of subsequent cases being 33. Of the 253 families with a chronic primary case, 56 or (21.7 per cent) gave rise to at least one further case, the total number of later cases being 85.

From these figures it is seen that until October, 1933, approximately 20 per cent of families in each group have given rise to later cases. It is certain that as time passes this percentage will tend to increase to some extent, as a number of the reported cases have been dead only ten months. All, except one, of the 106 subsequent cases of pulmonary phthisis occurred in adults, the majority, 75 per cent, occurring in the brothers or sisters of the affected case (brothers 40 per cent, sisters 35 per cent). The remaining 25 per cent occurred in - sons, 6 per cent; daughters, 6 per cent; mothers, 5 per cent; fathers, 3 per cent; and husbands or wives, 5 per cent. The eight cases of tubercular pleurisy and miliary tuberculosis all occurred in adults. The surgical cases numbered 18, six occurring in adults and 12 in children, while 12 of the 13 cases of tubercular meningitis occurred in children. In other words, adults suffered in 120 of the 145 subsequent cases, and children in the remaining 25. Of the 25 cases which occurred in children, 12 were meningeal, 5 were abdominal, 6 were surgical, one was glandular, and one was pulmonary in

distribution. These findings demonstrate the rarity of pulmonary phthisis under the age of 14 years. This fact has lately been commented upon by F.J. Bentley (14) who reported the occurrence of only 34 deaths from pulmonary tuberculosis in children up to that age in London during the year 1930. It would appear that the risk for the child chiefly exists in the infection taking on a meningeal or surgical form and not in the development of a pulmonary lesion. The reverse is true of cases in the adolescent period of life.

As a matter of interest, the 13 cases of tubercular meningitis have been classified according to their source of infection, their age and sex, and time of sickening.

Analysis of 13 Cases developing Tubercular Meningitis subsequent to Sickening of Review Case.

Sex of Meningeal Cases	Age	Source of Infection	Time of Sickening (in relation to source of infection)	Had Infecting case a positive sputum?
Males	9	Sister	3 weeks after sister's death	Yes
	3	Mother	During residence of mother at home	"
6	2	Father	During residence of father at home	"
	5	Mother	During residence of mother at home	"
	1	Mother	During residence of mother at home	"
	17	Sister	9 months after sister's death	"
Females	10	Mother	3 weeks after mother's death	Yes
	8	Mother	During residence of mother at home	"
7	6	Father	2 weeks after father's death	"
	4	Mother	One week prior to mother's death at home	"
	3	Mother	Mother alive and at home.	
	1½	Female Lodger	Lodger alive and residing in house	"
	5	Mother	During residence of mother at home	"

The analysis shows an equal distribution of male and female cases, and demonstrates how the disease is most

often implanted by the female relatives - the mother being responsible in eight instances, the sister in two, and a female lodger in one. In only two instances was the father responsible. This is quite readily appreciated when one realises the closer connection existing between the females of the family and the young children. The sputum of the infecting case was positive in every instance and a number of the children sickened shortly after the mother had dismissed herself from hospital and returned to the home.

A recent investigation into the fate of young children in tubercular households has been carried out in Lancashire by G. Lissant Cox (15) who showed that under 5 years of age the deaths from non-pulmonary tuberculosis in children in contact with a "positive sputum case" were greatly in excess of those from the same cause in the Geographical County as a whole. The comparative figures recorded were -

9	times greater in the age group	0-1
14	do.	1-2
19	do.	2-5

Tubercular meningitis accounted for two-thirds of the deaths in the above groups. The deaths from pulmonary tuberculosis were too few upon which to base any conclusion. The result of investigation in the area under review fully confirms Lissant Cox's findings. The total number of deaths from tubercular meningitis recorded in the Eastern Division from January, 1928, until December, 1932, inclusive, was 207. Of these, 13 as previously stated, occurred in the contacts of the young adult age group, 9 more were found to be associated with phthisical relatives in older age groups, and 185 showed no connection

at all with prior tuberculosis in the family.

There are approximately 50,752 families resident in the Eastern Area, of which 600 are known to have at least one member affected by pulmonary phthisis with a positive sputum. Using these figures as a basis for calculation there are:- 50,752 minus 600 = 50,172 families in which there is no known case of positive phthisis and from these 185 cases of Tubercular Meningitis originated in the five years. This gives a yearly death rate of 0.73 per 1000 families.

The remaining 22 cases of Tubercular Meningitis originated from the aforementioned 600 families yielding a yearly death rate of 7.3 per 1000 families.

This shows a prevalence ten times greater among the contact than among the non-contact families.

When do the subsequent cases usually occur?

A correct answer to this query is of great importance to the successful administration of a tuberculosis scheme. It acts as a guide to physician and nurse alike, for it singles out the families which should be kept especially under observation. For example - if it is found that 95 per cent of subsequent tuberculosis manifests itself within the first three years following the death of the primary case, it makes subsequent nurses' visits a waste of valuable time.

Owing to the varying duration of the illnesses of cases under review, and to the fact that the series extends over a five-year period, it was essential that the subsequent cases should be divided into two groups - the first group including those cases which sickened during the life of the primary case; and the second group including those cases which sickened subsequent to the death of the primary

case. The interval of time from the dates of sickening of the primary and subsequent cases was ascertained for the first group, and the interval of time from the death of the patient until the sickening of the subsequent case for the second group. By this method it was possible to eradicate the confusing factors of variable duration and different years of notification.

SEE TABLES E AND F.

TABLE E.
(Primary Case Alive)

Time elapsing between Sickening and death of Patient	Year of Illness of Primary Case in which Subsequent Case sickened.													No. of subsequent cases	Total Cases
	-6/12	-1	-1 6/12	-2	-3	-4	-5	-6	-7	-8	-9	-10	+10		
-6/12 yr.	6	-	-	-	-	-	-	-	-	-	-	-	-	6	115
-1 "	2	-	-	-	-	-	-	-	-	-	-	-	-	2	50
-1 6/12 yrs.	6	1	1	-	-	-	-	-	-	-	-	-	-	8	70
-2 "	1	4	-	1	-	-	-	-	-	-	-	-	-	6	38
-3 "	-	2	2	2	3	-	-	-	-	-	-	-	-	9	59
-4 "	-	4	2	1	2	-	-	-	-	-	-	-	-	9	46
-5 "	1	2	-	3	4	1	-	-	-	-	-	-	-	11	34
-6 "	-	-	-	1	-	-	-	-	-	-	-	-	-	1	14
-7 "	-	1	-	-	-	1	-	1	-	-	-	-	-	3	11
-8 "	-	-	-	-	-	2	-	1	-	-	-	-	-	3	8
-9 "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
-10 "	1	-	-	-	-	-	-	-	1	-	1	-	-	3	4
+10 "	1	1	-	-	-	2	-	1	1	1	1	-	6	14	35
TOTAL	18 15 / 33		5 8 / 13		9	6	-	3	2	1	2	-	6	75	488
Total primary cases alive	488		323		215	156	110	76	62	51	43	39	35		
Percentage of subsequent Cases to Primary	6.8		4.0		4.2	3.8	0.0	4.0	3.2	2.0	4.7	0.0	-		

TABLE F.

Subsequent Cases occurring after Death of Primary Case

Year of Sickening of Subsequent Case from Date of Death of Primary Case.

Year of Death of Primary Case	No.of Primary Cases	Years				
		-1	-2	-3	-4	-5
1928	84	6	-	5	2	0
1929	104	8	-	1	1	-
1930	80	7	5	-	-	-
1931	112	7	9	-	-	-
1932	100	8	-	-	-	-
TOTAL	480*	36	14	6	3	0
Total Primary Cases Applicable to each Group		480	380	268	188	84
Percentage		7.5	3.7	2.2	1.6	0.0

* Other eight cases were institution cases.

Note: 10 cases notified in 1933 were not included in this table.

Commentary.

Reviewing Table E first of all, it is evident that, although the largest number of subsequent cases occurs within the first year of the illness of the primary case, an appreciable percentage of cases continues to crop up throughout later years. This is to be expected, when it is remembered that the patient is still alive and infectious. These families are under observation in any case owing to the existence of the primary case of phthisis.

Table F illustrates the progressive diminution in the

percentage of subsequent cases following the death of the primary case. The numbers are too small to state definitely when observation of the affected family should cease, but if this is continued for a two-year period the large majority of subsequent cases can be detected early.

FAMILIAL INFECTION.

The question of inherited predisposition to tuberculosis is difficult either to prove or refute. Of late years its importance as a factor has been minimised, and the importance of contact infection has been emphasised. Yet, it is apparent to any worker with tuberculosis that there is an extraordinary tendency on the part of some families to suffer. Similar facts are accepted without question in connection with a familial tendency to rheumatism and pneumonia. Monro (16) states that "The seed is essential, but the soil is scarcely less important." Whatever may be the outcome of the conflicting views on this subject, it is certain that further investigations are required before one can arrive at a definite conclusion.

In a survey of the family histories of the 488 cases under review, 227 were found to show evidence of either prior or subsequent infection. Of these 227 cases, 132 had only one case, other than the patient, 61 had two, 15 had three, 12 had four, 2 had five, 4 had six, and 1 had seven cases. The multiplicity of cases can be explained as well by contact infection as by family predisposition, but why some families should produce six cases, while others in similar circumstances with similar incomes and often more overcrowded have only one or none at all, weighs heavily in favour of an inherited predisposition. Four families in which six or more members developed the disease have been selected and reported in full.

Multiple Family History.

In November, 1929, J.C., a boy of 16 years, was notified as a case of pulmonary tuberculosis with a history of sickening in the previous month. He was admitted

to hospital, but shortly returned home of his own accord. He attended the dispensary but could not be prevailed upon to return to hospital. Owing to the poor accommodation in his home - a room and kitchen which he shared with seven other persons - it was necessary for him to sleep in the same room as four brothers and a sister. He shortly subsided into a typical chronic, cavitating phthisis with a constantly positive sputum and died in January, 1933.

During his illness his sister developed acute phthisis at the age of 16 years. She sickened in February, 1931, but concealed her condition until May of the same year when she was first examined and found to be in a terminal state; she died three days later. The only sample of sputum obtained was very strongly positive.

In October, 1931, five months later, the brother James, aged 12 years, who had shared a bed with his sister, was notified. His sputum was positive and x-ray examination revealed fairly acute tuberculosis throughout both lungs. He was admitted to hospital but failed to improve, the disease subsiding into a subacute state. He died in December, 1932.

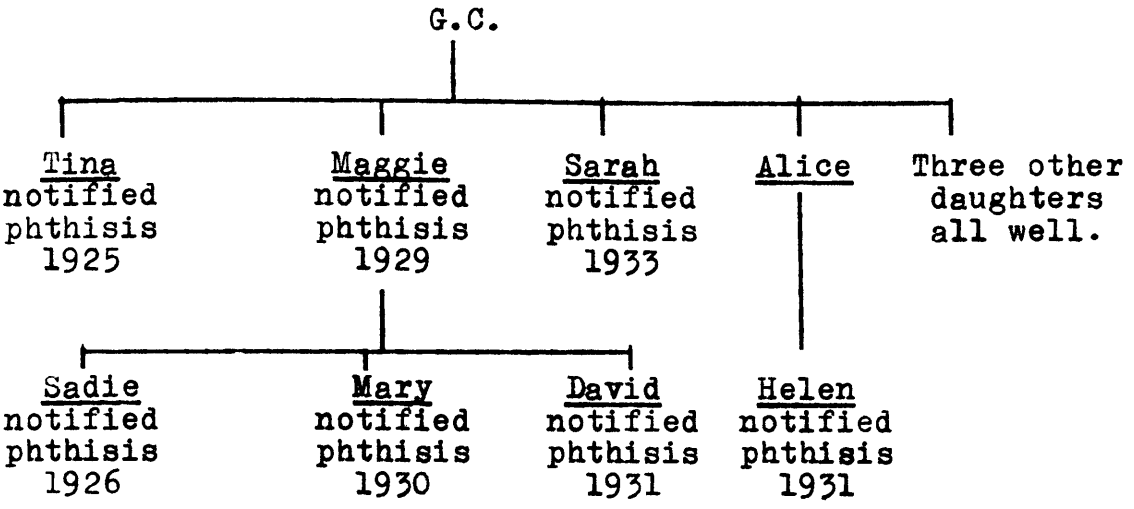
Following these deaths the nurse visited the house several times and all remaining members were reported well, but were asked to attend the dispensary as contact cases. The father and a brother of 16 years were examined in August, 1933, and found to be affected. In both cases the sputum was positive and x-ray examination showed in the case of the father - "Tuberculosis of practically the whole right lung and the upper third of the left": and in the case of the brother - "Tuberculosis of the lower two-thirds of the right lung and of the left root". In view

of these findings the remaining two members of the household, viz., the mother and a young brother of 11 years were examined and x-rayed. No definite disease was found, but there was a marked general fibrosis with pleural thickening present in the mother's case, and a much enlarged root shadow in the boy's.

It is difficult, in summing up, to affirm that J.C. was really the primary case, because the father's condition dated back at least three or four years, and had always been regarded by him as bronchitis due to his work as a coal miner. In any case, there have been five cases of definite confirmed pulmonary phthisis in this household during the last four years. To what extent this has been due to ignorance and congested sleeping accommodation, or to family predisposition, it is difficult to say. It seems possible that the others might have escaped infection had the first mentioned case remained in hospital for a longer period, and the family been rehoused to allow of his having a bedroom to himself on his return, but the economic state of the family made this impossible as they were already well below the "poverty level", the "Male Adult Equivalent" being 4/- per head - a factor which, without doubt, lowered their resistance to infection.

Multiple Family History.

G.C., the mother of seven daughters, lived to the age of 74 years and died of a cardiac condition. The tubercular history of her children and grand-children is shown by the following family tree:-



The daughter, Tina, was the first to sicken and appears to have contracted the disease while working as a weaver in a Bridgeton Mill. At that time she and Sarah lodged with the sister, Maggie, a widow with three children, Sadie, Mary, and David. Another sister, Alice, resided in the neighbouring house with her husband and child, Helen. Both dwellings were small, two-apartment houses. Tina slept with her niece, Sadie, who was the next to sicken, and following on this Maggie also contracted the disease and appears to have infected the remaining two children. The sister Sarah and the niece Helen also became victims of the disease. The sputum was positive in every one of the seven cases, and at the time of Sarah's notification in 1933 five were already dead.

These people were poor, the income being just above the "poverty level"; they were careless in their habits and were certainly overcrowded. The limited sleeping accommodation must have played an important part in the spreading of infection.

Multiple Family History.

M.A., a servant girl, aged 18 years, contracted pulmonary tuberculosis in 1913 and was admitted to hospital for a short period, after which she left, her disease having

subsided into a chronic state; her sputum was positive. She became a factory worker in 1914 and went to lodge with a family named Houston. Three months later the child Isabel Houston, aged 17 months, developed generalised tuberculosis and died within a few weeks. Owing to this M.A., had to leave, and she found a new lodging with the Connor family, consisting of the husband, wife, and two children. In 1915 the husband was notified as a pulmonary tuberculosis, and notification of the wife followed in 1916; later in the same year the two children died of tubercular meningitis. M.A. appears to have gone about 1916 to reside with a married sister, Mrs.A., whom she also infected, for three years later Mrs. A. was found to be an early case of pulmonary tuberculosis, and, despite treatment, she succumbed to the disease in 1923. M.A. continued to live on in the house, marrying the deceased sister's husband, and died in 1931, but fortunately left no issue. So far as is known, the husband escaped infection. M.A's mother is stated to have been phthisical, but no confirmation of this could be obtained.

The salient features of her case (No.16306) are reported in the Appendix 3 under "Chronic Females 1931."

Multiple Family History.

The disease in this family at first appeared to have originated in L.N., a girl of 18 years, employed as a weaver. She was notified in 1931 with a history of ill-health of two months' duration. Her sputum was positive and she was found to have active disease of both lungs. Within a fortnight she was admitted to hospital where she remained until her death a year later.

Two months after L.N's admission to hospital, her brother, aged 22 years, and a sister, aged 26 years, were

notified. The first was found to have an active one-sided lesion, and the disease in the second was broncho-pneumonic in distribution. Both were sent to hospital where the young woman died within three weeks of admission; the brother survived until November, 1933.

A second sister, aged 17 years, sickened in January, 1932, and was likewise removed to hospital where death ensued 14 months later, the disease following a subacute course.

Owing to the rapid succession of cases in this family, the remaining members were prevailed upon to come to the dispensary for examination. This was in February, 1932. The father, aged 55 years, was found to be a case of chronic fibroid phthisis in an advanced condition; hitherto this man had persistently refused to be examined by the tuberculosis officer. His illness dated from 1928, hence the malady may have originated with him. Two little grandsons, aged 5 and 9 years, occupants of the house were x-rayed and healed lesions were revealed in the apices and root glands of both children. Two members of the family were not seen at this period. John, a seaman in the Royal Navy, had not resided at home for some years, but spent his vacations there and shared a bed with his father. In June, 1933, he was transferred from Netley Hospital to Glasgow, suffering from pulmonary tuberculosis. The other member, Ina, had married and left home in 1929, going then to reside in Maryhill. She became a positive case of pulmonary phthisis, being notified to the Northern Dispensary in September, 1932. She was then 28 years of age.

Every member of this family has fallen a victim to the disease, seven of them being active cases with positive sputa. There is no admitted family predisposition except

in so far as the mother is said to have suffered for years from chest trouble; she died following a cholecystectomy in 1928. This family lived in a small, two apartment house containing three beds. The income was below the "poverty level", being less than 5/- per "Equivalent Male Adult."

L.N. (No.46289) and her sister Helen (No.47356) are both included in Appendix II under "Female Subacutes,1932."

RACIAL DIFFERENCES IN SUSCEPTIBILITY TO PULMONARY TUBERCULOSIS

It is obviously impossible, in view of the limited number of families investigated, to state definitely any appreciable racial difference in susceptibility to tuberculosis.

Classification has been based on the place of origin of the male parent; thus the family of a man born in Ireland, or whose father was born in Ireland, is classified as Irish.

Adopting this method the families have been grouped under the following six headings:-

Scots - Lowland, Highland and East-Country.

English, Irish and others.

The percentages respectively are:-

SCOTS		PERCENTAGES
	Lowland	70.7
	Highland	2.9
	E.Country	4.9
ENGLISH		3.3
IRISH		17.2
OTHERS		1

In dealing with the Scottish cases we find that the majority (70.7%) are admitted Lowland Scots - the greater number being Glasgow born. In many cases the parents or grandparents of these people have come of country stock, attracted to the city by the prospect of higher wages and better advancement. The immunisation of such people to tuberculosis is not sufficiently high to assure protection when exposed to the conditions existing in a congested city district, where overcrowding and inferior housing conditions prevail. The families of admitted Highland stock form a

small proportion, as do also the East Country people.

According to the interpretation of Irish Nationality, the proportion of Irish in the East-End of Glasgow is not officially known.

The Census returns for 1931 classify as Scots, all children born in this country of Irish parents. This obviously raises the number of Scots and lowers that of Irish, hence the above-mentioned percentages bear no comparison with Census returns.

It appears, however, that the majority of the Irish settled in Glasgow have come from Northern Ireland. The figure of 17% for Irish families in the East-End does not appear unduly high, as without doubt a very large proportion of Irish are settled in the poorest districts of the city, many of them being of the unskilled labouring classes.

Bradbury (17) in his Tyneside investigation states, that the Irish residing in that area are more prone to tuberculosis than are the English in the same district.

One must bear in mind that these people are mainly from Western Ireland, a great number being from Sligo and Galway, where fishing and agriculture are the chief industries, hence their immunisation to tuberculosis will be lower than that of those from the North of Ireland.

The English form a very small proportion of the city's working class population and return relatively few cases.

It is interesting to note that of the 488 cases recorded, only two were Jews. The Hebrews, through intercourse with civilisation, have been exposed to infection for generations, and it would appear that a very high degree of resistance to tuberculosis has been developed - a view which is confirmed by the low rate of tuberculosis mortality recorded among Jewish immigrants to the United

States of America.

OCCUPATIONS

The occupations of the young adult group are most varied and therefore somewhat difficult to classify. Those of the males are classified under two headings - firstly, a division into Outdoor and Indoor Workers is made, and then these in turn are sub-divided into those employed in heavy and those employed in light occupations.

No.in Series	Outdoor Workers		No.in Series	Indoor Workers		Never at any time employed
	Heavy	Light		Heavy	Light	
Acute						
22	15	7	31	9	22	3
Subacute						
19	7	12	33	9	24	1
Chronic						
44	24	20	66	21	45	6
85	46	39	130	39	91	10

The majority are seen to be indoor workers at light rather than heavy occupations. All of these were not in regular employment, in fact only 180 of the 225 cases had steady work at the time of notification. The occupations of the remaining 45 were ascertained, however, and included in the table, as many were but temporarily suspended.

The numbers and percentages in the six selected groups detailed below are of interest:-

GROUP I — Workers in the Spirit Trade
4 in Number = 1.8%

GROUP II — Workers in Dusty Trades:- Stonemasons, Miners, Sandblasters and Flour Workers.
16 in Number = 7.1%

GROUP III — Factory Workers
32 in number = 14.2%

GROUP IV — Workers in Offices, Shops, Warehouses: Scholars and Clerks
59 in number = 26.2%

GROUP V — Workers at Heavy Manual or Engineering Work, involving the expenditure of much energy and often exposed to extreme changes of temperature:- Moulders, Forgers, General Navvies.
68 in number = 30.2%

GROUP VI — Other Occupations
46 in number = 20.4%

The Occupations of the Females are Classified as:-

I. House duties including Housewives, Domestics, etc.

II. Factory Hands including Workers in Coffee, Tobacco, Sweet and Biscuit Works, Carpet Factories and Box Works: Tea Packers, Hosiery Workers, Shirt Finishers, Weavers and Machinists.

III. Shop and Warehouse Assistants, including Tailoresses, Saleswomen, Message Girls, Hoist Girls, Cinema Attendants.

IV. Clerkesses, Scholars, Typists, Office Girls.

V. Never at any time employed.

VI. Unclassified Occupations.

GROUP	I	II	III	IV	V	VI	TOTAL
Acute	18	20	10	5	3	3	59
Subacute	26	22	9	3	4	3	67
Chronic	50	50	15	11	6	5	137
TOTAL	94	92	34	19	13	11	263
PER-CENTAGE	35.74	34.98	12.92	7.22	4.94	4.18	

As in the male group, some of the female cases had not been employed for some time, while others had been temporarily suspended.

In all 209 of the 263 were in employment at the time of sickening; the occupations have been entered in the preceding table as if all were employed.

Occupation must have had a very varying effect on these young persons. In some cases it cannot possibly have exerted any deleterious influence, while in others the occupation was possibly an important factor. For example, the workers exposed to cold and wet, or to the changeable conditions of a blast furnace, must have suffered to a considerable extent.

Quite a number of the patients attributed their illness to exposure to cold and damp.

STUDY OF ACUTE AND SUBACUTE GROUPS.

The cases falling under this heading are 235 in number (115 acute and 120 subacute), and they have been selected for separate examination on account of the comparatively short duration of their illness and because they are the most refractory to treatment. The chronic cases frequently respond to artificial pneumothorax therapy by which means their lives can often be saved, or at least prolonged; but those falling under the heading of "duration less than eighteen months" are much less responsive to treatment of any kind. They are very numerous, comprising nearly one half of the whole young adult group, and about one fifth of all deaths from pulmonary tuberculosis.

Why are these cases so generally and rapidly fatal? Is it largely due to late notification or to a tendency to become easily discouraged and dismiss themselves from hospital? Does the condition, as a rule, arise in young people with previous history of chest trouble or as a sequel of acute illnesses, such as influenza or pneumonia, which lower the general resistance? Are they much more common among the ill-housed, the ill-clad, and under-nourished than among more fortunate persons? Do they usually follow previous phthisis in the family?

All these questions have been considered in making an examination into these cases, and their houses have been visited and the previous illnesses of the patient gone over with the parents. The financial state of the home at the time of sickening has been ascertained in 200 cases, and the degree of poverty calculated. The findings, with the conclusions arrived at, are best shown under the following sub-headings.

A. Type and Extent of Pulmonary Lesion when first seen by Tuberculosis Officer.

Pulmonary tuberculosis, like other infectious diseases manifests itself in varying degrees of intensity. At one end of the scale is the acute, fulminating variety, and, at the other, the chronic, fibrotic type. The pathological changes in the lungs differ very little, except for the formation of fibrous tissue in the chronic forms, and its absence in the very acute types. Fishberg (18) very aptly states that "Acute tuberculosis may be said to be active chronic phthisis without the remissions and ameliorations characteristic of the course of the latter affection". Cases of pulmonary tuberculosis living only a few months from the date of sickening, are of either the acute broncho-pneumonic or acute lobar types. Those living from six to eighteen months include a few broncho-pneumonic cases in which the disease has subsided into a subacute form, and a large majority of cases where the disease began insidiously in one lobe, pursued an even course for a while, but ultimately resulted in an acute spread with a rapidly fatal termination; or steadily progressed from the primary site of infection until it involved every lobe in both lungs. Brief descriptions are given below of the two usual forms of acute pulmonary phthisis.

Acute Pulmonary Tuberculosis.

Under this heading it is usual to include the two fundamental types namely -

(1) Acute pneumonic phthisis; and

(2) Acute broncho-pneumonic phthisis, or tuberculosis broncho-pneumonia.

(1) The first of these is much the less common, and the anatomical changes are those typical of pulmonary

tuberculosis, but the processes of caseation and softening predominate. Little or no connective tissue is formed to localise the lesion. Usually a whole lobe is affected and Kerley (19) states that the right lung is more often involved than the left. The parenchyma is transformed into a solid caseous or gelatinous mass, destruction of lung tissue rapidly proceeds, and, within a short time, extensive excavations are formed. These cavities are surrounded by caseated lung tissue and not by a connective tissue wall. Death may supervene either before or after the onset of softening.

The onset and symptoms are akin to those of lobar pneumonia for which it is often mistaken. Cough is a prominent symptom and may be incessant and exhausting. At first it is dry but slowly becomes productive with rusty and viscid sputum. Weakness, anorexia, fever, and emaciation are marked clinical features. The wasting is very rapid, and is well marked over the pectoral muscles. The sputum may not contain tubercle bacilli for a considerable time, which adds to the difficulties of differential diagnosis. The absence of a crisis in the second week of the illness, and the persistence of an elevated temperature arouse the suspicions of the physician. Soon the temperature becomes intermittent showing a daily swing of several degrees. Clinical examination shows the signs of typical lobar pneumonia. There is impaired resonance or dullness over the upper part of one side of the chest; often bronchial breathing is present coupled with medium-sized moist rales. The duration is usually under three months, yet may be as short as four weeks, the patient succumbing to asthenia.

(2) Acute broncho-pneumonia phthisis - The Clinical picture in this type is that of an acute infectious disease

with pronounced toxaemia. The onset is most frequently sudden, accompanied by fever, chill, muscular pains, and cough. The fever is usually high but the temperature curve is not characteristic, some cases showing a continuous high temperature with very slight remissions, while the fever in others is intermittent. Profuse and exhausting sweats are a noticeable feature; dyspnoea is marked and cyanosis is frequent. The cough is severe, painful, and may provoke vomiting. Expectoration is scanty at first, but in the later stages becomes abundant and nummular, and contains tubercle bacilli. The digestive functions are impaired and emaciation is rapid.

The physical signs vary according to the stage of the disease. At first, all that may be detected is some slight change in the breath sounds over the chest together with sibilant and sonorous rales. Later localised areas of consolidation, with bronchial breathing and moist, sub-crepitant rales manifest themselves. These areas are seldom situated in the apices, most frequently being detected in the sub-clavicular regions, As the disease progresses, these localised areas tend to coalesce, forming areas of consolidation and often involving two or more lobes. If the patient is examined at this stage definite flattening and impaired percussion are found over the affected areas, accompanied by bronchial breath sounds and moist rales. Death usually supervenes within three or four months from the onset of the illness, most commonly from asthenia but occasionally from a fatal haemorrhage.

Classification of Cases.

Acute Group. An examination of the clinical notes of the pulmonary condition of each patient in the acute group shows that 50 of the 56 male cases were of the acute

broncho-pneumonic type and the remaining six of the lobar pneumonic type. The distribution among the female cases was very similar, 50 out of the 59 being broncho-pneumonic and nine of the lobar variety. The large majority of these acute broncho-pneumonic cases were well advanced when first examined. The acute lobar pneumonic cases totalled 15 (six males and nine females) and were of extremely short duration, 14 dying within three months of notification. Four of these cases were erroneously notified and admitted to hospital as acute lobar pneumonia, but in the remaining eleven cases acute tuberculosis was suspected from the first by the family doctor and the diagnosis subsequently confirmed. Nine of the 15 lesions were right-sided ones, thus confirming the opinion of Kerley that in this disease the right lung is more frequently involved than the left. The above figures indicate that acute-broncho-pneumonic phthisis is seven times as frequent a cause of death among acute cases as is acute lobar pneumonic phthisis.

Subacute Group. Subacute phthisis is a group intermediate between acute and chronic phthisis, including all cases of acute broncho-pneumonic phthisis which have run an unusually long course, and also cases of chronic phthisis, which, from some cause, have terminated rapidly. The different types included in this group are best illustrated by describing three selected cases, the first of which, No.40887, is a case of broncho-pneumonic phthisis who lived eight months; the second, No.46943, commenced as an active, unilateral lesion which became quiescent, but had a fatal exacerbation at the end of ten months; while the third, No.40883, exemplifies a case who shows progressive deterioration throughout the course of her

illness.

Case 1 - No.40887. The illness of this 15 year old boy began in February 1928 in a manner resembling bronchitis which was unresponsive to treatment. Early in May of the same year he developed what appeared to be an acute broncho-pneumonia and was admitted to Belvidere. As his condition was unchanged at the end of three weeks, an x-ray examination was made and a condition of tubercular broncho-pneumonia was found. He was transferred to Ruchill Hospital where he remained until his death in October, 1928. The duration of this illness was eight months from sickening. During his residence in Ruchill he constantly returned a positive sputum and his general condition became progressively worse without any intermissions.

Case 2 - No.46943. This youth of 17 years was first examined at the dispensary in June 1931 when there was found an extensive tubercular involvement of the upper two-thirds of the right lung. He was toxic and emaciated; his temperature was 100°F and his pulse 118; cough was troublesome and the sputum although scanty, was strongly positive. He gave a history of cough and lassitude, poor appetite, with loss of weight, and night sweats of four months' duration. Prior to this he had enjoyed good health and had never had any form of chest trouble. Within a week he was admitted to Ruchill Hospital where his condition steadily improved. At the end of ten weeks he voluntarily left hospital but continued to attend the dispensary. His pulmonary condition remained quiescent and physically he was much improved, having gained 21 pounds in weight. This state of affairs continued until July of the following year when he contracted a chill

and the old lung lesion flared up, rapidly spread to the opposite side, and terminated fatally within six weeks. The total duration of his illness was 18 months.

Case 3 - No.40883. A school girl of 15 years, a contact case, was brought by her parents for examination on account of a short persistent cough, night sweats, loss of weight, and amenorrhoea of two months' duration. On examination her general condition was found to be poor, and her thorax somewhat wasted, especially over the subclavicular regions. Moist rales, with alternations in the respiratory murmur, were present in the upper thirds of both lungs. Her sputum was found to be positive. X-ray examination revealed definite active disease of the upper half of the right lung and of the left root. She was admitted to hospital later in the month, but was quite unresponsive to treatment, her condition becoming progressively worse. A further x-ray examination three months after admission showed that the disease had now extended throughout the right lung and was well advanced in the left. Little or no fibrosis was present. Her chart showed a remittent temperature throughout the course of her illness with a much increased pulse rate. She died ten months after the date of sickening.

A survey of the pulmonary conditions of the subacute cases at the first examination indicates that one-fifth were of the broncho-pneumonic type similar in course and duration to example case No.1, and that relatively few of these survived eight months from the date of sickening. The remaining 80 per cent, pursued a course similar to those of example cases Nos.2 and 3. The actual number of cases falling under the three headings were as follows:-

	Type I Broncho-pneumonic	Type II Progressive Deterioration	Type III With Intermissions
Males ...	9	36	8
Females ..	14	41	12
	23	77	20
Percentage.	19	64	17

B. Percentage of Patients returning a Positive Sputum.

(1) At any time during their illness; and

(2) At the time of notification.

Of the 235 cases, 209 returned a positive sputum at some time during the course of their illness, and 185 were positive when notified. The proportion of positive sputum cases, as would be expected, was higher among the subacute cases than among the acute. There was little difference in the relative percentages returned by the two sexes. The actual figures were as follows -

	Acute Cases.		Subacute Cases.	
	Males	Females	Males	Females
	%	%	%	%
Returning a positive sputum at any time during course of illness	75	88	96	96
Having a positive sputum at time of notification	68	76	87	87

Thus 89 per cent of the combined groups were found to return a positive sputum during their illness, and 79 per cent were positive when notified. As a positive sputum is only found when an open pulmonary lesion is present,

these findings indicate that few, if any, of the cases were seen in the early stages of their illness.

C. Radiological Findings.

Of the acute male cases 15 were x-rayed within one month of notification, and in 14 cases there was extensive disease of both lungs of the broncho-pneumonic type, while in the fifteenth case there was a lobar involvement of the upper half of the left lung.

In the acute female group 17 of the 59 patients were x-rayed within one month of notification. Of these, three were of the lobar variety, two right-sided, and one left-sided in distribution. The remaining cases were of the broncho-pneumonic type.

Surveying the subacute male section, it is found that 12 of the 53 cases were x-rayed within a month of notification and four others within three to six months. In all, two were broncho-pneumonic in distribution, one was a right-sided and one was a left-sided lesion, while in the remaining 12 the disease was widely distributed throughout both lungs.

In the subacute female group 20 were x-rayed within a month of notification, and four others within two to seven months. In all, only one was broncho-pneumonic in distribution, seven were left-sided lesions, and in the remaining 16 both lungs were extensively involved.

It is worthy of note that 64 of these cases were x-rayed within one month of notification, and that in every instance the disease had so far progressed that, as a form of treatment, artificial pneumothorax could not be considered.

D. Institutional Treatment.

(1) Proportion who accepted Institutional Treatment: Of the combined groups 86 per cent were received into hospital, while of the remaining 14 per cent 10 per cent refused hospital treatment, and the other four per cent were too ill for removal. The proportion of subacute cases admitted was the higher by 13 per cent. In both groups there was no appreciable difference in the percentage of male and female admissions.

(2) Average Duration in Hospital: The average period was 6.7 weeks for male acutes, 8.2 weeks for female acutes, 17.7 weeks for subacute males, and 22.2 weeks for subacute females. This shows a slightly higher duration in female groups than in the male ones.

Of these hospital admissions, 50 per cent of the acute male cases and 30 per cent of the acute female cases died within four weeks of admission, while at the end of eight weeks the percentages were 67 and 63 respectively. Reviewing the subacute cases, 20 per cent of both males and females succumbed within a month of admission, while at the end of the eight weeks' period there was a marked difference in the mortality rate, being 40 per cent for males as compared with 27 per cent for females.

None of the acute cases voluntarily left hospital, but 33 per cent of the subacute group returned home, half of them in a terminal stage.

(3) Interval between Notification and Admission to Hospital: Of those accepting hospital treatment, 64 per cent of the acute cases were admitted within a week, and by the end of the second week 91 per cent. had been admitted. The remaining nine per cent were accommodated

during the third week. Of the subacute cases the percentages admitted were -

During first week	45
During second week	23
During third or fourth week	19
After four weeks	13

The long delay in some of these admissions was due solely to the inability of the patients to make up their minds to receive sanatorium treatment. All things considered, the administration of hospital admissions of urgent cases was most efficient.

(4) Interval between Sickening and Notification: the table shown below demonstrates the lapse of time in months between sickening and notification of the cases under discussion.

Group	Time Interval in Months.							
	1	2	3	4	5	6	7-9	10-12
	%	%	%	%	%	%	%	%
Acute ...	10	26	37	14	8	5	-	-
Subacute.	5	26	14	15	9	13	10	8

From this table it is seen that the greatest proportion of acute cases are not notified until the second or third month after sickening, while in the subacute group notification, although greatest in the second month, still remains high until the sixth month. This is quite comprehensible as the onset is so often insidious and the symptoms obscure. It is difficult to account for the delay in notification of the acute cases, unless one takes into consideration that a certain percentage start insidiously, and that quite a number of others neglect

their condition, either due to carelessness or from fear of what they may be told if tuberculosis already exists in the family. Actually 32 of the 115 acute cases were not notified until a fortnight before death.

MODE OF ONSET OF ILLNESS

Phthisis may commence insidiously or acutely, but the subsequent course of the illness does not necessarily follow the mode of onset; that is to say, an acute beginning may subside into a subacute or chronic case, and an insidious commencement may usher in a galloping consumption.

An insidious onset may have no other history than that the patient has felt "off colour" for some time, or, again, close questioning may elicit the information that there has been a slight cough with or without expectoration, lassitude, night sweats, loss of weight and appetite, and, in some female cases, amenorrhoea for the previous two or three months.

When consumption commences acutely it frequently simulates influenza, pneumonia, pleurisy, or gastritis, or it may be ushered in by a brisk haemoptysis.

Of the 235 cases, 70 commenced acutely. Forty of these began and continued as acute cases and thirty commenced acutely but subsided into a subacute state. The majority of the 70 cases at first resembled influenza or pneumonia, and were only diagnosed correctly on account of the continuation of the symptoms and persistence of the pyrexia.

The appended table illustrates in what manner these cases commenced.

Mode of Acute Onset.

Group	Influ-enzal	Pneumo-nic	Pleuritic	Gastric	Haemop-tysis	Tot-al
Acute Males ...	7	11	-	1	1	20
Acute Females .	9	6	2	3	-	20
Subacute Males ...	6	6	1	-	1	14
Subacute Females .	5	1	8	-	2	16
	27 (39%)	24 (34%)	11 (16%)	4 (5.5%)	4 (5.5%)	70

The remaining 165 cases had an insidious onset. Cough, as the initial symptom, was five times more common than any other.

Of the 165 cases, 123 commenced with cough, 24 with lassitude or loss of weight, 8 complained of obscure gastric symptoms with lack of appetite, and 10 developed the disease in the puerperium.

Of these puerperal cases five developed acute phthisis and the remainder sub-acute disease. Their previous history was carefully investigated, and, prior to their confinements, there was no suggestion whatsoever of a tubercular condition.

Pregnancy appeared as a complication in one other case. The woman conceived some months after notification. Subsequently the initial lesion, which had subsided into a chronic condition, spread rapidly and she succumbed a few weeks later during an extremely active exacerbation.

Eight per cent of the female cases developed phthisis during the puerperium.

HISTORY OF ANY PREDISPOSING ILLNESS OR ANY FORMER CHEST TROUBLE.

In all only 18 of the 235 patients admitted any former pulmonary complication. Of these, three cases stated that they had suffered from Broncho-pneumonia in childhood; two had had primary lobar pneumonia three years previously; four complained of winter bronchitis and nine gave a history of having had pleurisy.

Three other cases had had rheumatic fever some years before and another case developed the disease during convalescence following appendicectomy. Only four of the patients showed evidence of healed tubercular cervical glands and none had had prior surgical tuberculosis of any other kind. Ten females sickened in the puerperium, as already stated.

From the above findings it would appear that previous chest complications seldom predispose to pulmonary phthisis and that the same can be said of former surgical tuberculosis.

THE FREQUENCY OF HAEMOPTYSIS

There is great diversity of opinion regarding the frequency of haemoptysis as an initial symptom, although most observers are agreed that it is of frequent occurrence among established cases of chronic fibrocaseous and fibroid phthisis. It is true that most consumptives complaining of haemorrhage from the lungs show evidence of cavitation, either on physical or on x-ray examination but it is equally correct to state that sometimes haemoptysis is the initial symptom complained of in a patient who has hitherto shown no evidence of disease.

These initial haemoptyses are said to be caused merely by localized, active inflammatory hyperaemia; that is to say, they have the same origin as the rusty sputum of pneumonia.

No premonitory symptoms may be present, in which case the first experience of the patient may be a tickling sensation in the throat, inducing cough, which is followed by the expectoration of blood, or he may have suffered from cough for some time and only become alarmed when blood appeared in the sputum.

Some cases never show any subsequent physical signs, but when the bleeding is the forerunner of young adult phthisis, other symptoms soon manifest themselves, the chief being cough, expectoration which is often still blood-stained, night sweats, and tachycardia. Physical examination of the chest reveals distinct signs in one upper lobe, and tubercle bacilli soon appear in the sputum.

Haemoptysis occurring later in the disease is more common, as, by this time, definite destruction of lung

tissue has taken place with the production of cavities, the surrounding wall of which differs according to the acuteness of the disease. In any case, there is a tendency for blood vessels to be eroded, and, the more rapid the disease, the more probable it is that a large vessel will be involved, from which a fatal haemorrhage may result.

In only four of the 235 acute and sub-acute cases was haemoptysis the initial symptom, while 41 other cases subsequently expectorated blood-stained sputum or had a haemopytsis. Of these 25 appeared early inthe disease and 16 late, two of the latter being the actual cause of death. In one case, a profuse haemoptysis, which would have been fatal, was controlled by artificial pneumothorax.

As one would anticipate, haemoptysis was more frequent among the sub-acute than the acute cases, the relative percentages being 25 and 13.

POVERTY IN RELATION TO TUBERCULOSIS

For many years investigators have tried to assess the part played by poverty in the production of tuberculosis. Under-nourishment, like over-crowding, is one of those conditions liable to be accepted, without proof, as being one of the main causes. The factor of nutrition is of much greater importance in chronic infections such as tuberculosis than in acute illnesses, and there is every reason to believe that anabolism is conducive to resistance and that katabolism has the opposite effect.

Good Feeding - Anabolism is one of the principal aids to the arrest of the tuberculous process, and may be equally effective in its prevention. That under-nourishment encourages the disease is evidenced by the rise in mortality following famines in India and China. During the World War, 1914-1918, malnutrition and influenza played an unfavourable part, and the mortality from tuberculosis rose rapidly in many countries. The shortage of fats was especially felt, and in this respect Germany and Austria suffered most, and a survey of the death-rate of Prussia, reported by the Ministry of Health,(20) shows a sixty per cent increase in tuberculosis mortality.

Prussia in the year 1913, with a population of 41,649,062, had a total death-rate from tuberculosis of 56,801. In 1919 the population had fallen to 39,340,447 yet the deaths from tuberculosis had risen to 85,996. This increase is attributed entirely to privation consequent upon the fortunes of war.

Ewart(21) found a high degree of relationship between the "real value of wages" and the tuberculosis death-rate

in England and Wales during the years 1851-1920, and Stallybrass (22) states that "The most sensitive indicator of mulnutrition is, without doubt, the death-rate from tuberculosis."

Recently, further support for this view has been published by Bradbury (17) in his Tyneside Investigation. This observer stated that poverty played an important part in both the poorer district of Jarrow and the better housed area of Blaydon, and that the percentage of families classified as under-nourished was 49 among the tuberculous as against 34 in the non-tuberculous control group. He summarised his findings as follows:-

(1) Poverty shows a marked statistical association with tuberculosis. The chief element of this association is that poverty causes tuberculosis rather than tuberculosis leads to poverty.

(2) The principal results of poverty, which are particularly concerned in leading to tuberculosis, are overcrowding and under-nourishment.

In the course of a lecture delivered in 1919 to the Royal Institute of Public Health, Dr. L.S.T. Burrell (23) said that if it were possible to kill poverty we should have gone a long way towards stamping out consumption.

There is no universal definition of poverty, and the meaning attached to the term varies from time to time and from place to place. In attempting to define it, and calculate its prevalence, a minimum standard of economic welfare is required, based on the provision of primary needs such as food, clothing, shelter and warmth. A method of calculation must be adopted which makes comparison with similar previous surveys possible, and in this series Professor A.L. Bowley's classification has

been employed.[24] The method he applied to certain London boroughs in 1929 differs in no essential detail from that previously adopted by Booth[25] and Rowntree.[26]

The London 1890 standard was brought up to date by a study of price changes, when it was found that the 21/- of the earlier survey was equivalent to 38/- to 40/- in 1929. The same figure (38/-) was reached when the five towns' investigation of Bowley and Hogg[27] was treated in like manner.

Briefly, then, the kind of livelihood obtained for 21/- in London in 1890, and described in "Life and Labour", is similar to that of the family (man, wife, and three young children) living on a wage of 38/- in 1929.

Bowley presents the following illustration of the application of his method:-

Man, Wife and Children aged 10 and 4

(Equivalent Male Adults 2.68).

Minimum Scale Per Week.

Food, 7/1d x 2.68	£ -:19: -
Clothing, Man	1: 2
" Woman	1: 1
" Children	1:11
Fuel, ...	3: 0
Household Sundries, ...	1: 2
Insurance, ...	1: 4
Travelling, ...	1: 0
Rent, say, ...	9: 4
	£1:19: -

He details a specimen diet for the week, costing 19/- and giving a caloric content of from 3,230 to 3,640 per equivalent male adult per diem, and containing a suitable proportion of protein.

The basic standard allows, for the male adult engaged in moderate work, 7/1d per week for food. This,

at the prices current in London in 1929, is the minimum sufficient to purchase a mixed diet considered sufficient for health and efficiency. A recent report of a Committee on Nutrition (28) closely confirms the standards adopted above.

The family is then reckoned as consisting of so many "equivalent" male adults so far as food expenses are concerned on one of the scales commonly used for this purpose. For clothing 58/6d per annum is reckoned as adequate for a man or woman and 48/- for each child.

Fuel is calculated at 3/- per week to include gas used for cooking. For lighting and cleansing materials and household sundries, 3½ per head per week is deemed sufficient. Insurance and travelling expenses are allowed for in all employed persons.

Rent is a very variable factor, and it also is subtracted from the computed income before judging whether the latter is sufficient for needs.

By this method, then, an accurate estimate can be ascertained of the money left over for food, and can be calculated on a comparative basis.

Investigation into the Financial State of Families of the Selected Groups.

Of these there is a total of 235 families, but accurate information has been obtainable from only 200, as firstly, a number were institution cases; secondly, certain families had more than one case in the house; and thirdly, in other instances the information was unreliable.

Details of each family income, and its distribution are shown in full in tabular form in Appendix IV. A summary

of the results obtained is shown below:-

	No. of Families in each Group
7/1d. Standard.	
(1) All persons 10% above to 10% below regarded as standard 6/5d. - 7/10d.	
Total families with standard income, ...	24
Below Standard (44%)	
(2) Between 10% and 25% below ..... 6/4d. - 5/4d.	32
(3) Between 25% and 50% below ..... 5/3d. - 3/7d.	39
(4) More than 50% below ..... below 3/7d per male adult	17
Total families below standard	88
Above Standard (44%)	
(5) Between 10% and 25% above ..... 7/10d. - 8/10d.	17
(6) Between 25% and 50% above ..... 8/11d. - 10/7d.	15
(7) More than 50% above ..... Above 10/7d. per male adult.	56
Total families above standard	88
Total,	200

Although 7/1d, is the accepted standard figure by which the level of poverty is judged, it has been thought advisable in drawing up a table to include all figures within ten per cent, whether above or below, as standard incomes. When this is done, 24 families, or 12 per cent, are found to correspond exactly with the standard. Eighty-eight families, or 44 per cent, are above the standard, and the same number and percentage below the standard. That is to say,

44 per cent of the East-End families investigated are definitely below the poverty level.

Out of the 200 families, 48 were unemployed, deriving their incomes either from the Labour Bureau or the Public Assistance Department. Of the unemployed families, 41 were below the poverty level, 5 received standard incomes, and 2 were just above the level.

Of the 152 employed families, 47 were below the poverty level, 19 received standard incomes, and 86 were above the level.

Expressed in another way, 69 per cent of the employed families were in receipt of a standard or above standard income as contrasted with 15 per cent of the unemployed families.

According to these findings, poverty in the East-End is a very important factor, and plays an even more vital part when one realises that these people do not outlay their money according to any recognised standards. The improvident spend a relatively large proportion of their incomes on luxuries, entertainment, alcohol, and gambling, thereby reducing the funds available for necessaries.

As already shown in a previous paragraph, 44 per cent of the East-End families were below the poverty level. To these must be added the improvident families, whose incomes, although adequate, were not laid out advantageously. According to the records made in the house visits, 22 families whose incomes were on and above the poverty level were noted as being spendthrift and indolent. Adding this 11 per cent to the previous figures of 44 per cent a total of 55 per cent of undernourished families may safely be accepted. To recapitulate,

over one-half of the tuberculous families in the young adult group are underfed.

EXAMINATION OF CONTACTS.

At the time when the investigation into this subject was commenced, viz., December 1, 1932, there were 133 notified cases of tuberculosis among the contacts of the "Enquiry Group". The total number of contacts was 2,582 so that 2,449 of these were not on the Tuberculosis Register.

It was not possible to examine them all, so 600 were selected, mainly those associated with the more acute types of phthisis.

A direct physical examination was made of every one of the 600 and a radiological examination offered in all cases where disease was suspected, suspicious symptoms were present, or multiple cases had occurred in the house. In all 85 chests were x-rayed and evidence of active disease found in 12 of them.

These twelve were proportioned thus:-

Firstly, three had pleurisy with effusion at the base of one lung but the sputum in each case was negative.

Secondly, 5 young adults were suffering from pulmonary phthisis. In two cases the disease was advanced, while in the remaining three it was early. The sputum was positive in all five cases.

Thirdly, two cases who had always regarded themselves as suffering from chronic bronchitis were found to have fibroid phthisis with a negative sputum.

Fourthly, the remaining two patients were found to be cases of chronic cavitating phthisis with positive sputa.

The other 73 cases who were examined radiologically have been described in the section dealing with radiolog-

ical findings.

Of the 600, 358 agreed to submit themselves to an intra-cutaneous tuberculin test and the results were compared with those from a control group of 266 non-contact cases. The findings have been fully reported in the section dealing with Mantoux Tuberculin Test.

Summaries are given at the end of each section.

RADIOLOGICAL EXAMINATION OF CONTACTS.

As a diagnostic aid in pulmonary tuberculosis the skiagraph has proved itself to be of inestimable value and most clinicians now regard x-ray examination as an essential link in the chain of evidence, particularly in regard to early and childhood cases.

The diagnosis of pulmonary phthisis in the child is particularly difficult owing to several factors: firstly, the lack of sputum for examination; secondly, the normal puerile breathing; and thirdly, a more serious condition may be masked by bronchitis, bronchiectesis or post-pneumonic changes following measles, whooping cough or broncho-pneumonia. In these cases a skiagraph is particularly helpful.

Of the 85 cases who were radiologically examined, 75 showed no clinical evidence of active disease yet the x-ray plates revealed evidence of healed lesions in the lung, pleura or root glands of 62 per cent of them.

A table is appended giving the x-ray findings, the age at time of examination, the relationship to the patient, the sleeping accommodation, their reaction to the Mantoux Test and the time interval between exposure to infection and x-ray examination.

In selecting the contact cases only those were chosen who were related to primary cases having a positive sputum.

TABLE X.

CONTACTS OF ACUTE CASES.

Serial Number of Primary Case	Relationship of Contact Case to Primary	Age: March, 1933	Sleeping Arrangements			Mantoux Result	Time Interval between Last Exposure and X-Ray	Radiological Findings
			Same Bed	Same Room	Separate Room			
46,946	Brother	11	Yes	-	-	+	1 year	There are calcified areas in both roots and a small healed focus in the right lower zone.
46,948	Brother	22	-	Yes	-	+	11 months	Small calcified focus at level of second inter-space right lung and a calcified gland in the Right Root.
46,948	Brother	23	Yes	-	-	+	11 months	No abnormality in either lung.
48,358	Brother	10	-	Yes	-	+	6 months	Calcified glands in both roots. No evidence of intrapulmonary disease.
48,358	Brother	13	-	Yes	-	+	6 months	No abnormality in either lung.
48,358	Sister	8	-	-	Yes	+	6 months	Slight enlargement of both roots. No calcification is seen.
48,393	Brother	4	-	-	Yes	-	8 months	No abnormality.
48,393	Sister	11	-	-	Yes	+	8 months	No abnormality.
48,393	Sister	9	-	-	Yes	+	8 months	Calcified glands in both roots.
47,438	Brother	16	Yes	-	-	+	5 months	Evidence of bronchial changes in the right lower zone, but no evidence of tuberculosis
46,928	Daughter	8	-	Yes	-	+	$1\frac{6}{12}$ years	Healed focus in right lung. Calcification in both roots.
46,928	Son	6	-	Yes	-	+	$1\frac{6}{12}$ years	No abnormality.
46,928	Son	9	-	Yes	-	+	$1\frac{6}{12}$ years	No abnormality.
47,854	Brother	9	-	-	Yes	+	8 months	No abnormality.
46,873	Sister	8	-	Yes	-	+	1 year	Mediastinal shadow a little enlarged. Re-X-rayed later, but no intrapulmonary disease seen.

Serial Number of Primary Case	Relationship of Contact Case to Primary	Age: March, 1933	Sleeping Arrangements			Mantoux Result	Time Interval between Last Exposure and X-Ray	Radiological Findings
			Same Bed	Same Room	Separate Room			
46,264	Sister	18	Yes	-	-	+	$1\frac{8}{12}$ years	No abnormality.
44,837	Brother	20	Yes	-	-	+	$2\frac{3}{12}$ years	Healed pleurisy at left base. No intrapulmonary disease.
44,504	Son	4	Yes	-	-	+	$2\frac{5}{12}$ years	Calcified glands in both roots.
44,504	Daughter	6	Yes	-	-	+	$2\frac{5}{12}$ years	Healed focus in lower zone of right lung, with calcified glands in right root.
44,833	Brother	17	Yes	-	-	+	$2\frac{2}{12}$ years	Healed focus, right upper zone. Calcification in right root.
44,833	Brother	9	Yes	-	-	+	$2\frac{2}{12}$ years	No abnormality.
45,974	Son	3	Yes	-	-	-	$2\frac{2}{12}$ years	No abnormality.
45,974	Son	4	Yes	-	-	+	$2\frac{2}{12}$ years	Healed focus in right lung. Calcification in both roots.
45,978	Sister	21	-	-	Yes	+	$2\frac{2}{12}$ years	Calcified gland in right hilum. No intrapulmonary disease.
45,995	Brother	11	-	Yes	-	+	$2\frac{3}{12}$ years	Calcified glands in both roots. No intrapulmonary disease.
43,535	Sister	20	Yes	-	-	+	$2\frac{10}{12}$ years	Shows evidence of chronic bronchial changes in right lower lobe.
43,535	Sister	11	Yes	-	-	+	$2\frac{10}{12}$ years	There are small healed foci in the upper and middle zones of the right lung, and a calcified gland in the left root.
43,535	Sister	8	-	Yes	-	+	$2\frac{10}{12}$ years	There is a calcified gland in the left root. No intrapulmonary disease is seen.
43,516	Wife	29	Yes	-	-	+	$2\frac{6}{12}$ years	No abnormality.

Serial Number of Primary Case	Relationship of Contact Case to Primary	Age: March, 1933	Sleeping Arrangements			Mantoux Result	Time Interval between Last Exposure and X-Ray	Radiological Findings
			Same Bed	Same Room	Separate Room			
44,331	Brother	16	Yes	-	-	+	$2^{3}/12$ years	Calcified glands in both roots, and a few calcified foci in both lungs.
41,735	Daughter	5	Yes	-	-	+	4 years	Healed focus in left upper zone, and calcified glands in left root.
46,260	Sister	8	-	Yes	-	+	3 months	Calcified gland in left root. No intrapulmonary disease.
46,260	Sister	7	-	Yes	-	+	3 months	No abnormality.
41,714	Brother	17	Yes	-	-	+	4 years	Small healed focus in right upper zone, with calcified glands in the right root.
41,725	Sister	14	-	Yes	-	+	$4^{4}/12$ years	Calcification in both roots. No other abnormality.
41,725	Sister	10	-	Yes	-	+	$4^{4}/12$ years	Calcification in left root. No other abnormality.
41,726	Brother	15	-	Yes	-	+	$4^{4}/12$ years	Healed foci in both apices and a calcified gland in the left root.
41,726	Brother	10	-	Yes	-	+	$4^{4}/12$ years	No abnormality.
41,726	Brother	13	-	Yes	-	+	$4^{4}/12$ years	Healed foci in both upper zones. No calcification seen in root glands.
41,683	Brother	13	Yes	-	-	+	$4^{3}/12$ years	No abnormality.
42,203	Sister	17	Yes	-	-	+	4 years	Small left basal adhesions. No other abnormality.
42,203	Sister	13	Yes	-	-	+	4 years	No abnormality.
42,198	Daughter	9	Yes	-	-	+	4 years	Healed focus in right lower zone. Calcified glands in both roots.
42,487	Son	8	Yes	-	-	+	$3^{8}/12$ years	No abnormality.

Serial Number of Primary Case	Relationship of Contact Case to Primary	Age: March, 1933	Sleeping Arrangements			Mantoux Result	Time Interval between Last Exposure and X-Ray	Radiological Findings
			Same Bed	Same Room	Separate Room			
40,433	Brother	8	-	Yes	-	+	5 years	Calcified gland in left root.
40,433	Father	44	-	Yes	-	+	5 years	No abnormality.
40,918	Brother	11	-	Yes	-	+	5 years	Healed foci in both lungs, and calcification in both roots.
40,918	Brother	13	-	Yes	-	+	5 years	Calcification in left root.
41,736	Sister	9	-	Yes	-	+	4 2/12 years	No abnormality.
41,736	Brother	11	-	Yes	-	+	4 /12 years	Evidence of healed pleurisy at both bases.
44,795	Brother	13	Yes	-	-	+	2 years	No abnormality.
44,795	Sister	10	Yes	-	-	+	2 years	Calcified glands in the left root.
44,795	Sister	4	Yes	-	-	+	2 years	Small calcified gland in right root. Enlarged left auricle.
44,263	Sister	11	Yes	-	-	+	2 9/12 years	No abnormality in either lung.
44,263	Brother	6	Yes	-	-	+	2 /12 years	Some calcified glands in both roots which are enlarged. Some fibrosis at right base. No active intrapulmonary disease

Total Contacts of Acute Cases X-rayed = 55.

CONTACTS OF SUB-ACUTE CASES.

Serial Number of Primary Case	Relationship of Contact Case to Primary	Age: March, 1933	Sleeping Arrangements			Mantoux Result	Time Interval between Last Exposure and X-Ray	Radiological Findings
			Same Bed	Same Room	Separate Room			
41,663	Brother	7	-	Yes	-	+	4 years	No abnormality.
41,663	Sister	6	-	Yes	-	+	4 years	No abnormality.
40,414	Sister	10	Yes	-	-	+	5¼ years	Calcified glands in both roots; healed focus in left subclavicular region.
43,886	Brother	13	-	Yes	-	+	2½ years	Calcified tuberculous glands in the right root; no intrapulmonary disease.
43,886	Father	40	-	Yes	-	+	2½ years	No abnormality.
43,886	Sister	11	Yes	-	-	+	2½ years	Enlarged glands in both roots; no other abnormality.
43,886	Sister	15	Yes	-	-	+	2½ years	Evidence of old pleurisy at both bases.
45,461	Daughter	6	1	-	-	+	2 years	No abnormality.
45,519	Brother	17	-	1	-	+	6 months	Calcified glands in left root; no intrapulmonary disease.
45,474	Brother	11	-	1	-	+	6 months	Calcified glands in both roots, and evidence of healed pleurisy at left base.
45,474	Brother	10	-	1	-	+	1½ years	Diffuse fibrosis of right middle lobe; root glands show no calcification.
45,474	Sister	15	1	-	-	+	1½ years	Definite tubercular glands in the right root, but no intrapulmonary disease.
45,474	Sister	5	1	-	-	+	1½ years	Several tubercular glands in the right root.
47,356	Brother	5	-	1	-	+	7 months	Active tubercular glands in both roots, but no intrapulmonary disease.
47,356	Brother	9	-	1	-	+	7 months	Tubercular glands in both roots, and a healed focus in the left apical region.

Serial Number of Primary Case	Relationship of Contact Case to Primary	Age: March, 1933	Sleeping Arrangements			Mantoux Result	Time Interval between Last Exposure and X-Ray	Radiological Findings
			Same Bed	Same Room	Separate Room			
44,785	Brother	14	-	1	-	+	$1^{5}/12$ years	Calcified area in left apical region, with some enlargement of left root glands.
44,785	Father	49	-	-	1	+	$1^{5}/12$ years	There is one healed tubercular area in both apices, and calcified glands in both roots.
44,785	Mother	41	-	-	1	+	$1^{5}/12$ years	No intrapulmonary disease.

Total Contacts of Sub-Acute Cases X-rayed = 18.

SUMMARY OF X-RAY FINDINGS.

The radiological findings of the above 73 cases have been summarised under four headings:-

i. Those showing no abnormality: these numbered 28 or 38.3 per cent.

ii. Those showing calcification in the root glands but no apparent lesion in the lung parenchyma: these numbered 22 or 30.1 per cent.

iii. Those showing evidence of a healed lesion in the lung together with enlarged or calcified root glands: these numbered 18 or 24.7 per cent.

iv. Those showing evidence of healed pleurisy: these numbered 5 or 6.9 per cent.

Of these 61.7 per cent showed evidence of healed lesions and it is noteworthy that no case was found with a healed pulmonary lesion which did not also show a corresponding infection in the root glands.

The five cases of healed pleurisy were all regarded as primarily tubercular as none of them gave a history of previous pneumonia or rheumatic fever.

These findings illustrate the very high proportion of tubercular contacts who showed evidence of healed tubercular lesions; and they reveal no case in which the disease involved the lung parenchyma without also involving the mediastinal glands; nor any in which it could be said to be extending from the root glands into the lung substance.

None of the cases showed a condition of "epituberculosis" as described by Goldberg (29).

The findings confirm those of Ghon (30) and Canti (31). These observers performed a large series of autopsies on children and published the constant discovery of a lung focus when affected mediastinal glands are present and the close anatomical relationship of those glands to

the lung focus. In their opinion the glands are always infected secondarily as the direction of the lymphatic stream is from the lung towards the hilum, the flow being directed by valves which open towards the hilum.

Calcification of the mediastinal glands is a definite proof of healed tubercular disease.

Sometimes the focus in the lung is so small or evanescent that it is not demonstrable in an x-ray plate yet in these cases the glands may enlarge very considerably on account of their function and structure.

THE MANTOUX INTRACUTANEOUS TUBERCULIN TEST.

Technique.

This test resembles the "Von Pirquet" with this difference, that by using dilute solutions exact quantities can be injected intradermally leading to definite, dependable reactions when tuberculous individuals are tested.

To ensure active tuberculin, fresh dilutions must be made at fortnightly intervals. Human Old Tuberculin is recommended, and the manufacturer must concentrate the bacillary broth culture ten times by heat. The tuberculin must comply with the International Standard, and the product supplied by Burroughs Wellcome & Company conforms to these requirements. The dilutions are made with 0.5 per cent phenol-Saline, and for routine purposes the 1:1000 dilution is used - the test dose , 0.1 c.c., therefore contains 0.0001 gram of Koch's Old Tuberculin.

The skin of the forearm is cleansed with methylated ether, and the injection is made into the skin and the site is examined after forty-eight hours.

Reaction.

A positive reaction is evidenced by a reddish zone surrounding the site of the injection, and in most cases is well developed in twenty-four hours. It commences as a slightly raised, red spot, spreading outwards and rapidly increasing in extent. The inflammation reaches its maximum in about forty-eight hours, after which it gradually fades with scaling of the epidermis. All cases giving a negative reaction are re-tested, and wherever there is the least doubt of the reaction, further tests with 1:100 dilution are made.

Value of the Test.

The Mantoux intracutaneous test performed as described with the routine 1:1000 dilution has been proved to be as accurate as the "Von Pirquet" test, even when the maximum concentration of undiluted tuberculin is used in the latter method.(32) It is a valuable negative test with an error of less than 4 per cent, and can be applied in this respect to adults as well as children. While (except in early childhood) a positive skin reaction is only of limited value in the diagnosis of clinical tuberculosis, a negative intracutaneous reaction at any age excludes this disease with a high degree of accuracy.

The Test as applied to Communities

Much useful work has been done in various parts of the world to ascertain the general practicability of the test, as it was for long considered that its application was only of service in early life. This is, in the main, correct with regard to a positive diagnosis of clinical tuberculosis. On the other hand, a negative reaction excludes the disease with an equal accuracy at all ages (2 - 4% error).

It is therefore profitable to perform the Mantoux for the purpose of a negative diagnosis in any case where the patient has a reasonable chance of giving a negative reaction should his condition be non-tubercular. This chance is entirely determined by the incidence of negative reactors among the clinically non-tuberculous population and a knowledge of this incidence is in consequence essential. When the incidence is low the chance of obtaining a negative reaction in a patient who is in reality non-tuberculous is extremely poor and the test

becomes of little practical value, yet if the incidence of non-reactors among the clinically non-tuberculous population is high, the utility of the test in negative diagnosis is correspondingly great.

A resumé of the reports from different centres shows a remarkable variation in incidence. Broker of Battle Lake Sanatorium in Minnesota reports a township in which of 160 school boys and girls there was only one positive reactor - the cattle of this town were also all negative to the tuberculin test.(33)

McCain calls attention to an area in North Carolina where only 4 per cent of all persons reacted positively. Rathbun finds 25 per cent of children in smaller towns and 41 per cent in the largest cities in Chautauqua County New York, react positively, while only 30 per cent of the students of Wisconsin were positive in 1931. Hetherington found 90.2 per cent reactors among young adults in the densest wards of Philadelphia.

A Comparison of the Incidence of Positive Reactors in Tubercular and Non-Tubercular Households.

The first comparison of the tuberculin reactions of children from tubercular and non-tubercular households was made in New York in 1915 by Fishberg, who found an insignificant difference in the two groups. A definite difference between the tuberculin reactions of children of tubercular and non-tubercular households, has, however, been recorded by the majority of other urban enquiries.(34)

Manning and Knott (1915) tested a group of 228 children in Seattle where the housing conditions were much better than the poorer quarters of New York and recorded 51 per cent of reactors in the first group as

against 23 per cent in the seoond. These findings were confirmed by Delthloff (1916) of Bergen.

Opie and McPhedran (35) (1926) in Philadelphia carried out a similar investigation, and found that by five years, three quarters of their home contacts gave positive reactions as compared with one quarter of the non-contacts.

In Europe, one of the most recent investigations is the London Survey of 1929, involving 1,030 cases of clinical tuberculosis with 751 control cases.

When the reactions of the pulmonary contacts in the different age groups are compared with those of the non-contact controls of the same age, it is observed that the percentage of positive reactors increases from infancy to adolescence in both groups, but that the curve of the home-contacts runs above that of the non-contacts up to the age of 16. By six years of age one-half, and by ten years three-quarters of the home contacts have been infected, whereas only one-fifth and one-third of the non-contact controls are positive reactors at these respective ages.

As an adjunct to this investigation 118 children of the hospital class in London, who came from tubercular households and whose ages ranged from 0 - 15 years, were compared with a control group of 513 clinically non-tuberculous children of the same class and district, but whose homes were free of tuberculosis. (36)

A similar comparison between contact cases and non-contact cases has been made for the Eastern Division of Glasgow. The contact cases were all brothers or sisters of the young adult group which is being investigated. The non-contact controls consisted of clinically non-tubercular

and healthy children from non-infected households. The number of contact cases tested was 358 as compared with 266 in the control group.

Of the following tables the first, Table E, has been drawn up to show the percentage of positive reactors for different age groups in the contact and control series. Tables G and H compare the Glasgow and London Findings, while Graph B shows the close similarity between the Philadelphia and Glasgow figures.

TABLE E

Age last Birthday.	Home Contacts of Pulmonary Tuberculosis			Non-contact Controls		
	Number Tested	Number Positive	Percentage Positive	Number Tested	Number Positive	Percentage Positive
0-2	34	23	67.6	8	0	0
3-5	56	45	80.4	44	4	9.1
6-10	132	114	86.4	148	56	37.8
11-15	112	102	91.0	32	18	56.3
16-20	12	11	91.7	15	11	73.3
21	12	12	100	19	18	95.3
0-10	222	182	81.9	200	60	30.0
0-15	334	284	85.0	232	78	33.6

The earlier tuberculinisation of the home contact group is very evident and the fact that 80 per cent of the contact group react positively by five years of age as against 9 per cent of the control group goes a long way towards explaining the far greater incidence of tubercular meningitis in households where one member has returned a positive sputum.

TABLE G.

Comparison of Tuberculin Reactions in Home Contacts of Pulmonary Tuberculosis and Non-Contact Controls - London Investigation, 1929, and Glasgow Eastern Division, 1933.

Age last Birthday	Home Contacts of Pulmonary Tuberculosis			Non-Contact Controls		
	Number Tested	Number Positive	Percentage Positive.	Number Tested	Number Positive	Percentage Positive.
0-5						
London	32	12	37.5	221	22	10
Glasgow	90	68	75.5	52	4	7.7
6-10						
London	36	28	78	217	58	27
Glasgow	132	114	86.4	148	56	37.8
11-15						
London	19	14	74	75	44	59
Glasgow	112	102	91.1	32	18	56.3

TABLE H.

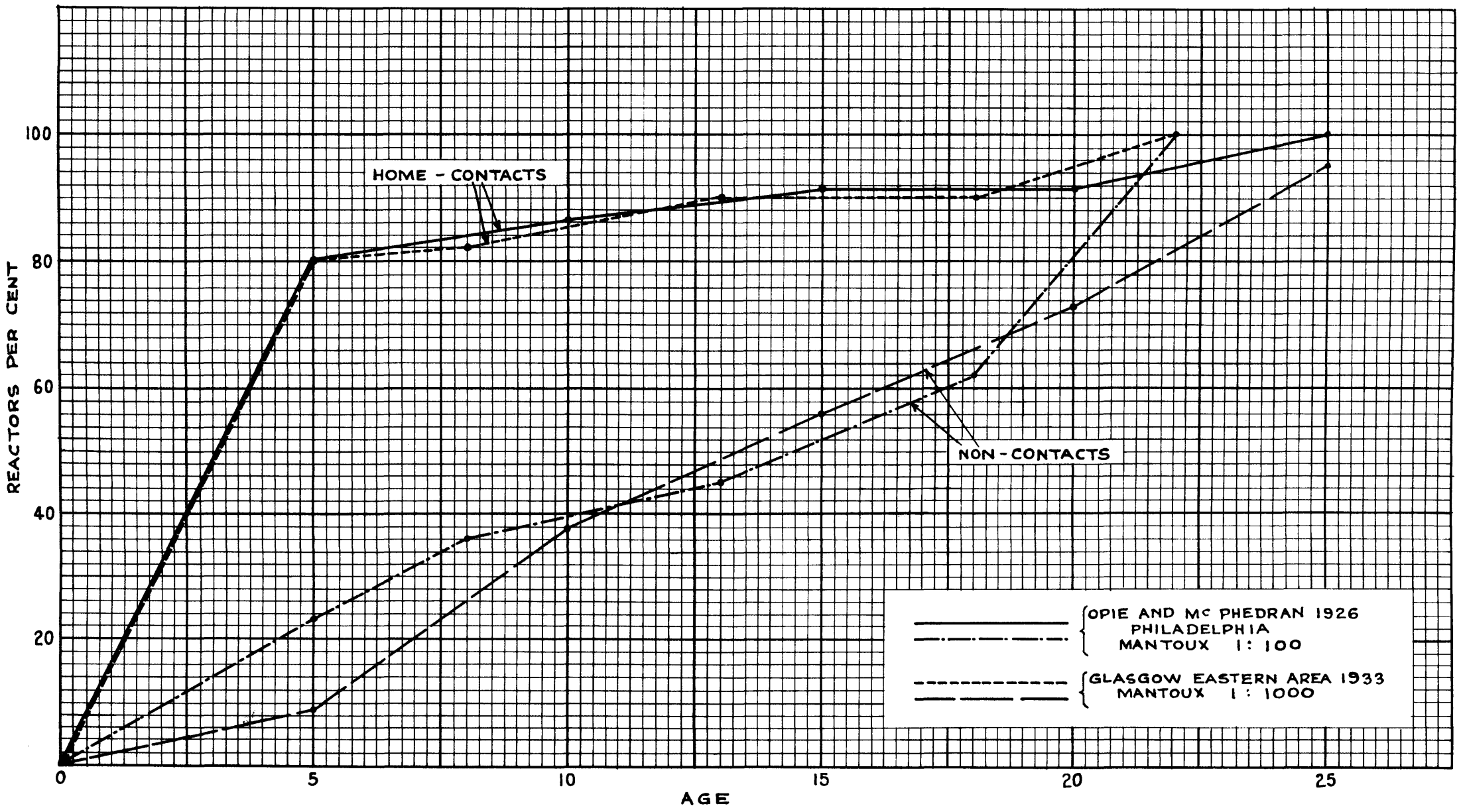
Comparison between the Figures of the London Investigation of Contagion, 1929, and The Glasgow Eastern Dispensary Figures for 1933

Group	Number Tested Aged 0-10	Number Positive	Percentage Positive
Home contacts of open pulmonary tuberculosis .. (bacilli in sputum)			
London	42	29	69
Glasgow	222	182	81.9
Non-contact controls			
London	438	80	18
Glasgow	200	60	30

(GRAPH B.)

GRAPH B

TUBERCULIN REACTIONS OF NON-CONTACTS AND OF HOME-CONTACTS OF PULMONARY TUBERCULOSIS.



It will be seen that tuberculinisation occurs earlier in children among the home contacts than the non-contacts, and that it has its maximum rate in infancy and early childhood, whereas the tuberculinisation of non-contacts occurs at roughly the same rate from birth to adult life. This dissimilarity is in keeping with the difference in the mode of exposure to contagion. Children in tubercular households are subject to constant infection from birth, but those whose homes are free from open tuberculosis make their contacts with the disease mainly outside the house and with increasing frequency as they grow older.

CONCLUSIONS.

The history of tuberculosis has shown that the disease existed in very early times, and that for a long period its different forms were not understood. Gradually, as the centuries passed, one observer after another wrote concerning the disease, each showing evidence of the trend of thought of his own particular time.

Thus, until the 17th century the only knowledge of value was connected with the symptomatology, the mode of onset, and the fact that young persons were liable to contract the infection in a fulminating form.

To Sylvius must be given the credit of first pointing out the connection between tubercular nodules and phthisis, and setting in motion the great researches of following centuries - researches which were crowned with success by Koch's isolation of the infecting organism.

To-day we are in possession of definite knowledge regarding the many forms which tuberculosis may assume in its attack upon the human organism, of the age groups prone to attack by the varying forms of the disease, and of the importance of sterilizing the sputum or discharges in order to avoid dissemination of the malady.

It is realised that the meningeal form most frequently affects young children, while the pulmonary chiefly attacks adults. The adults affected can be divided into three groups - (a) adolescent and young adult, (b) the middle age, and (c) the old age. The course of the illness varies considerably in each case.

Of the three types just mentioned, the young adult group presents the greatest problem, for, apart from

being a large group, the disease often takes on a very acute form and is quite intractable to treatment. A study of this group over a five year period in an industrial working class area has been made and the findings and conclusions thereof summarised. The selected district, The Eastern Division of Glasgow, covers an area of 3,212 acres, and had a population of 218,929 in the Census Returns for the year 1931.

The five year period chosen extended from January 1, 1928, until December 31, 1932, and during this time 1,214 deaths from pulmonary tuberculosis were recorded in the above area. When the 1,214 cases were classified it was found that in 488 of them the disease had commenced during the young adult period of life (limited for the purpose of this enquiry to the age group 15-30 inclusive).

The group of 488 cases is regarded as the "Enquiry Group" and is made up of 225 male and 263 female cases, thus showing a 17 per cent excess of females over males.

The "Enquiry Group" is next divided into three sub-groups, according to the duration of the illness dated from its onset. The first of these sub-groups includes the very acute cases with a duration of less than six months, the second, sub-acute cases with a duration of less than eighteen months, and the third, chronic cases with a duration of longer than eighteen months. Approximately one quarter of the "Enquiry Group" can be classified under the first heading, another quarter under the second heading, and the remaining 52 per cent. in the third or chronic category. The sexes show no material difference in this respect.

Area.

The mortality rate for the Eastern Division exceeds

the City average, not only for pulmonary tuberculosis, but for the non-pulmonary type and all causes as well. The death rate from pulmonary tuberculosis has been found heaviest in the overcrowded wards. Overcrowding is adjudged for each ward by the percentage of persons living more than three per apartment, and, applying this standard, a close correlation between the degree of over-crowding and the phthisis death rate is found.

The explanation for the interruption in the downward trend of the Phthisis Death Rate is accounted for by the increased number of cases sickening in the age group, 15-25 years, offsetting the decrease in the other groups.

Seasonal Incidence.

May is found to be the peak month of notification, although inquiry elicits the fact that January is the main month of sickening.

Age Distribution.

The disease is shown to be much more prevalent in the 15-19 age group than in the 20-24 or the 25-29 age groups. Especially is this true of the young females who, in the first group, show an excess mortality of 41 per cent over the males. A comparative table shows that this is not an isolated finding, as a 38 per cent excess of females over males for the same age group is recorded for the City. A further comparison of the age group death rates indicates that the Eastern Area has a 49 per cent excess mortality for males and a 53 per cent excess for females for the age group 15-19 years, a 16 per cent excess for both sexes in the age group 20-24, and a 13 per cent excess for males, but no excess for females for the age group 25-29.

It is thus apparent that the percentage of adolescent phthisical cases for the Eastern Area is very appreciably higher than the City's average. The excess of young female over male cases has been attributed to physiological changes inseparable from puberty, and that this is the probable explanation is confirmed by the fact that, in every country of the world where vital statistics are kept, similar findings are recorded.

Duration of Disease.

Of the 488 cases of the "Enquiry Group". 115 (23.5 per cent) succumbed within six months, 165 (33.8 per cent) within 12 months, 235 (48 per cent) within 18 months, 273 (56 per cent) within two years, and a further 59 within three years, making a total of 332 (68 per cent). In short, over two-thirds of the cases investigated were dead within three years of sickening.

After the fifth year the mortality rate materially declined, owing to the fact that only chronic cases were still surviving. The comparative mortality figures for the male and female cases showed no difference worthy of note.

Family History - (a) Prior.

Approximately one third (33.4 per cent) of the "Enquiry Group" belonged to families in which at least one case of tuberculosis had previously occurred.

In 73 cases (15 per cent) pulmonary phthisis had occurred in the household within the preceding 12 months. In these cases at least, familial contact infection is certain as the majority had shared a bed

or room with the affected person.

Other 56 cases (11.5 per cent) gave a family history of previous pulmonary tuberculosis, more than half (6.8 per cent) within the preceding five years. Contact infection is probable in many of these cases also.

It would probably be no exaggeration to state that 20 per cent, or one in five of the "Enquiry Group" were infected by a prior case in the household.

The relative proportion of acute, subacute and chronic cases in the "Enquiry Group" remains constant, whether these cases have been infected in their own homes or from an unknown source outside. Therefore frequent exposure to massive doses of infection in the home does not necessarily give rise to acute phthisis.

Acute phthisis may follow subacute or chronic disease and the converse is equally true.

These findings lend no support to Brownlie's view that there may be three types of infecting bacilli.

(b) Subsequent.

Until the end of October, 1933, subsequent cases of tuberculosis occurred in 99 families (20.3 per cent) of the "Group", comprising in all 145 cases. These were chiefly pulmonary in distribution and occurred mainly in brothers and sisters. Only one child was included in the 106 phthisical cases emphasising the rarity of pulmonary phthisis in children under 14 years of age. On the other hand, 12 of the 13 cases of tubercular meningitis occurred in children under the age of ten. On analysis of all cases of tubercular meningitis occurring in the Eastern Division for the five year period 1928-1932 inclusive, it was found that the incidence was ten

times more frequent in families containing a pulmonary case with a positive sputum than in the remainder of the population.

While the patient remained alive, subsequent cases, although most numerous in the first year, still continued to occur in appreciable numbers in subsequent years. After the death of the patient, subsequent cases diminished rapidly in numbers after the first year, indubitable evidence that the patient was the source of infection.

Family Predisposition.

That family predisposition plays some part in the subsequent occurrence of Tuberculosis is difficult to refute. Some examples of tubercular family histories have been quoted at length and certain of these appear to support the theory of familial susceptibility. How otherwise can one explain the occurrence of no subsequent cases in one family while as many as six or seven cropped up in another in similar environmental conditions?

Housing and Sleeping Accommodation.

The first feature of interest with regard to this question is that less than 5 per cent of the total cases dwelt in a house larger than three apartments, and 77 per cent occupied a one-room or two-roomed dwelling.

Calculation shows that when the Phthisis Mortality Rates of the smaller dwellings are compared with those of the three-apartment house there is an increase of 300 per cent in the males and 170 per cent in the females in the age group 15-19, and over 100 per cent in the whole of the age group 15-29.

Although the three-apartment house was shown to be markedly superior to the one and two-apartment dwelling,

there was no appreciable advantage demonstrable for the two-apartment over the one-apartment.

It is thus apparent, that a room and kitchen house is still too small to accommodate satisfactorily an average-sized family of which one member is phthisical. These conclusions corroborate the earlier findings that the densest wards, with overcrowded tenements, give rise to the highest death rates from this disease. The poor sleeping accommodation supplies further proof of the congested conditions. Fewer than 10 per cent of the entire "Enquiry Group" had a separate bedroom and 67 per cent occupied a bed with one or more other persons.

Poverty.

Closely associated with housing is the question of poverty. It cannot be denied that, as far as physical health is concerned, food is the most important environmental factor. The effects of inadequate nourishment are by no means easy to detect by physical examination. They produce an insidious sapping of the virility with a consequent lowering of the natural resistance to infection.

A detailed investigation into the economic circumstances of the families of 200 of the more acute cases of the "Group" showed that 44 per cent were in receipt of incomes below the "Poverty Level", and that a further 11 per cent were so improvident that their incomes, although otherwise adequate, were spent unwisely. Briefly, then, more than half the cases investigated were living on diets which were insufficient to build up and maintain the bodily strength. Malnutrition seldom occurs alone, being usually found in conjunction with poor

housing and its concomitant, congested sleeping accommodation. Summarising, it appears that poverty tends to include insufficient and poor food, lack of fresh air and sunshine, overcrowding, serious risk of exposure to undiluted infection, unhappiness and mental depression and undoubtedly all these factors prevent the individual from resisting Tuberculosis.

Racial Susceptibility.

No feature of particular note was revealed with regard to Racial Susceptibility except that the families of Irish Origin did not appear more prone to contract the disease than did the Lowland Scots, living under similar conditions, while the Jewish people showed remarkable immunity.

Occupation.

Conclusions regarding the effect of occupation based upon 500 cases are of very limited value, but it did appear that exposure to damp and extremes of temperature were factors of some importance.

Study of Acute and Subacute Groups

(a) Acute Cases. The large majority were cases of Acute Broncho-pneumonic Phthisis, the minority Acute Lobar Pneumonic Phthisis.

The former was found to be eight times as prevalent as the latter.

Right-sided lobar lesions were found to be more frequent than left-sided.

(b) Subacute Cases. The pulmonary condition of this group was either Broncho-pneumonic, or resembled Chronic Phthisis in which deterioration took place with particular rapidity.

Nineteen per cent of these cases were of the

Broncho-Pneumonic type.

Sputum and Radiological Findings.

It is noteworthy that a positive sputum was present in 79 per cent of the combined groups at the time of notification, an indication that the large majority had passed the initial stage of the illness. This was confirmed when the radiological findings were examined. In 64 cases x-rayed within a month of notification, the disease had so far progressed, that it rendered treatment by artificial pneumothorax of no value.

Institutional Treatment,

Of the combined groups 86 per cent were received into Hospital at some period during their illness. None of the Acute Cases voluntarily left, but 33 per cent of the Subacute Group returned home, half of them in a terminal stage.

The administration of hospital admissions was found to be thoroughly efficient.

Interval between Sickening and Notification.

In the majority of Acute Cases this was two to three months while in the Subacute Group the interval varied from two to six months, but exceeded this in a few cases.

Mode of Onset.

Of the 235 cases, 70 began acutely, the others insidiously. The most frequent modes of acute onset were those resembling Influenza or Pneumonia: only 4 commenced with a Haemoptysis. Cough, as the initial symptom of an insidious onset, occurred five times more frequently than any other symptom and 8 per cent of the female cases

developed phthisis during the Puerperium, but investigation into the previous history of these cases revealed no evidence of previous tubercular affection.

Haemoptysis.

As might be anticipated, haemoptysis was more frequent among the Subacute than the Acute Cases, the relative percentages being 25 and 13.

History of Previous Chest Trouble.

Previous Pulmonary Affections were shown to occur in a relatively small number of cases.

Contacts.

Only 2 per cent of active cases were discovered among the 600 contacts examined.

The Mantoux Test, which was carried out on 358 Contact Cases and on 266 Non-Contact Cases, showed the rapid tuberculinisation of the former group as contrasted with the gradual tuberculinisation of the latter. By the fifth year 80 per cent of the contact cases gave a positive reaction as compared with 9 per cent of the control group.

These figures agree very closely with those published by Opie and McPhedran in Philadelphia.

The general trend of the tables for Contacts and Non-Contacts in the Glasgow Eastern Division and the 1929 London Investigations is similar.

The much higher readings of the Contact Group must be due to the close proximity of the positive sputum case. Contacts are exposed not only to infection but to continuous infection which certainly accounts for the greater mortality from tuberculosis among them.

Leroy Gardiner (37) has shown that the negative phase lasts at least fifteen days after the first infection

and five days after subsequent infections. Therefore, the effect of a non-lethal dose may be magnified by being received during this negative phase.

Radiological examination of the chests of 73 contacts, who themselves showed no clinical evidence of tuberculosis, revealed that in 62 per cent healed pulmonary lesions were present.

No evidence to support the theory of Epituberculosis was found in the series of films examined; and also no lesion in the lung parenchyma existed without one in the corresponding root glands.

The Mantoux Reaction and Radiological findings among the Contact Group illustrate to what a large extent early tubercular infection has occurred, and emphasises the serious risks run by those in close association with positive cases.

Examination of the prior history of the Young Adult Group showed that one-fifth of all cases arose through contact infection and that the disease in these cases was equally as far advanced as in the remaining four-fifths. If all contacts could be kept under observation by the Health Visitor and any showing even the mildest of reasonable symptoms brought to the Clinic for physical and radiological examination the majority would be detected in an early and curable stage.

Any of the following complaints occurring in contacts call for full investigation.

1. Dry cough of several weeks' duration.
2. Pleurisy, with or without effusion.
3. Unexplained loss of weight with night sweats.
4. Unexplained persistent tachycardia.

5. Dyspepsia.
6. Haemoptysis.
7. Influenzal symptoms with delayed convalescence.
8. Amenorrhoea.

When over-crowding is rife in tubercular families frequent or continuous exposure to infection is inevitable and it has been shown that this condition obtains amongst the majority of the "Enquiry Group". Thus it appears that, if these families were suitably rehoused, over-crowding would cease to prevail among them and a very real step would be taken towards the prevention of subsequent cases.

In reality it has been found that, owing to poverty, many families have been compelled to refuse the offer of a better house as the extra rent, and often the extra travelling expenses, leave too narrow a margin of income for food. It might be suggested as a practical step towards over-coming this barrier, and towards the prevention of future cases, that financial assistance might be granted to such necessitous families through the Tuberculosis Scheme. Of supreme importance is the work of the Health Visitor in educating the affected families in tubercular hygiene.

Briefly, cleanliness, good food, fresh air, pleasant and adequate accommodation are inimical to disease. In other words, all factors tending to social amelioration, will, ipso facto, tend to reduce the death rate from Pulmonary Tuberculosis.

PREFACE TO APPENDICES 1, 2 AND 3.

These appendices give the essential particulars with regard to each of the 488 cases included in the survey and are self explanatory.

Appendix 1 deals with the Acute Cases.

Appendix 2 deals with the Subacute Cases.

Appendix 3 deals with the Chronic Cases.

GLOSSARY

Br. Pn indicates Broncho pneumonic distribution.

L_1 indicates one lobe of left lung affected.

R_1 indicates one lobe of right lung affected

L_2 indicates both lobes of left lung affected.

R_2 indicates two lobes of right lung affected.

R_3 indicates whole of right lung affected.

APPENDIX NO. 1

APPENDIX I

MALES

ACUTE PHTHISIS DEATHS - 15-30 (INCLUSIVE).

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Type of Onset, Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Notified Contacts in House: Prior	Notified Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1928.																	
39,627	18	1	6	Riveter	+	Insidious	2	7	1	-	-	3	Nil	Nil	L.2.	Nil	4 months
40,433	19	2	3	Spinner	+	Insidious	2	5	3	-	1	-	Nil	Nil	Br. Pn.	Nil	1 week
40,353	19	2	5	Engineer	+	Insidious	2	5	-	-	1	-	Nil	1	Br. Pn.	3, L1, R2	3 months
40,877	20	4	6	Unemployed	+	Insidious	2	8	-	-	-	2	Nil	1	Br. Pn.	Nil	2 weeks
40,918	18	3	4	Labourer	+	Insidious	2	6	2	-	1	-	Nil	Nil	Br. Pn.	Nil	1 week
41,165	21	1	2	Salesman	+	Acute	1	3	-	-	-	1	Nil	1	Br. Pn.	Nil	1 month
41,172	22	1	3	Labourer	+	Acute	2	2	-	-	-	1	1	Nil	Br. Pn.	Nil	2 weeks
41,198	21	4	6	Coalman	Nil	Insidious	2	5	-	-	1	-	1	Nil	Br. Pn.	Nil	Refused
40,939	21	3	3	Clerk	?	Acute	3	5	-	-	1	-	Nil	Nil	Br. Pn.	Nil	Refused

Reg. No.	Age	Duration in Months from Date of Sickening		Occupation	Sputum	Type of Onset, Insidious or Acute	No. of Rooms	Inmates		Room to Self	Bed to Self	Others in Bed	Notified Contacts in House		Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
		To Notification	To Death					+10	-10				Prior	Subsequent			
1929.																	
42,162	18	2	5	Woodworker	+	Acute	3	5	-	-	-	1	1	Nil	Br. Pn.	Nil	Refused
41,735	27	4	4	News Vendor	Nil	Insidious	1	2	1	-	-	2	1	Nil	Br. Pn.	Nil	2 weeks
42,171	19	3	5	Moulder	+	Insidious	1	3	-	-	-	1	Nil	Nil	Br. Pn.	Nil	1 week
41,744	19	1	2	App. Turner	Nil	Insidious	2	7	2	-	-	1	1	1	Br. Pn.	Nil	1 day
41,714	17	2	5	Labourer	Nil	Insidious	2	6	1	-	-	2	1	Nil	Br. Pn.	Nil	1 month
42,168	23	2	4	Trunkmaker	+	Acute	2	7	-	-	-	2	Nil	Nil	Br. Pn.	Nil	1 month
41,719	26	4	4	Labourer	Nil	Insidious	1	2	1	-	-	2	Nil	Nil	Br. Pn.	Nil	Nil
41,725	16	3	6	Can Washer	+	Insidious	2	4	3	-	1	-	1	Nil	Br. Pn.	Nil	1 month
41,653	19	4	6	Baker	+	Insidious	2	4	2	-	1	-	Nil	Nil	Br. Pn.	Nil	2 months
41,736	20	2	6	Unemployed	+	Insidious	1	3	2	-	1	-	1	Nil	Br. Pn.	Nil	3 months
41,747	15	2	6	Scholar	+	Acute	4	6	-	1	-	-	1	Nil	Br. Pn.	Nil	Refused
41,713	19	Nil	2	Labourer	Nil	Acute	1	3	-	-	1	-	Nil	Nil	R.2.	Nil	2 months
41,726	22	3	4	Tube Worker	+	Insidious	2	5	4	-	-	1	3	1	Br. Pn.	Nil	1 month

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Type of Onset, Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Notified Contacts in House: Prior	Notified Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1930.																	
43,516	29	6	6	Miner	+	Insidious	1	2	-	-	-	1	2	Nil	Br. Pn.	Nil	Refused
43,526	16	1	2	Pupil	+	Acute	Institution Case			-	1	-	Nil	Nil	Br. Pn.	Nil	1 month
43,539	20	2	6	Barrowman	+	Insidious	2	5	-	-	-	2	Nil	Nil	Br. Pn.	Nil	4 months
44,350	19	2	2	Engineer	Nil	Insidious	2	6	2	-	-	1	Nil	Nil	L.1.	Nil	2 weeks
44,331	23	1	5	Postal Clerk	+	Acute	3	3	3	-	-	1	Nil	Nil	Br. Pn.	Nil	4 months

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Type of Onset, Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Notified Contacts in House: Prior	Notified Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1931.																	
44,837	30	2	3	Labourer	+	Acute	1	6	-	-	-	2	Nil	Nil	Br. Pn.	Nil	3 months
44,795	22	3	5	Labourer	+	Insidious	2	5	2	-	-	1	1	Nil	Br. Pn.	Nil	2 months
44,814	16	1	2	Scholar	Nil	Acute	2	5	1	-	-	1	Nil	Nil	Br. Pn.	1 month, Br. Pn.	2 months
45,504	28	3	4	Clerk	+	Insidious	1	2	3	-	-	3	Nil	Nil	Br. Pn.	Nil	1 week
15,691	25	1	2	Clerk	+	Acute	4	4	1	1	-	-	1	Nil	Br. Pn.	1 month L.2, R.1	2 months
45,525	27	1	1	Farm Labourer	+	Acute	1	3	-	-	1	-	Nil	Nil	Br. Pn.	Nil	1 week
45,506	17	1	2	Plumber	Nil	Acute	3	5	-	1	-	-	Nil	Nil	Br. Pn.	1 month Br. Pn.	Refused
44,833	18	3	6	Fitter	+	Insidious	3	6	1	-	-	1	Nil	Nil	Br. Pn.	3 months L.2, R.2	3 months
45,974	28	2	2	Labourer	+	Acute	1	2	2	-	-	3	4	Nil	Br. Pn.	Nil	2 months
45,528	28	6	6	Watchmaker	+	Insidious	2	2	1	-	-	2	Nil	Nil	Br. Pn.	6 months L.2, R.1	Refused
45,508	18	1	4	Driller	Nil	Acute	2	4	2	-	-	1	Nil	Nil	Br. Pn.	Nil	4 months
46,260	27	3	5	Tram Conductor	+	Insidious	3	3	2	-	1	-	3	Nil	Br. Pn.	Nil	2 months
46,303	17	2	2	Saw mill worker	Nil	Insidious	1	2	-	-	1	-	Nil	Nil	Br. Pn.	Nil	1 week
45,999	23	2	6	Labourer	+	Insidious	2	6	-	-	-	1	Nil	Nil	Br. Pn.	Nil	3 months
46,255	19	2	5	Iron Driller	+	Insidious	1	4	1	-	-	1	Nil	Nil	Br. Pn.	Nil	3 months
46,042	18	1	6	Motor Mechanic	+	Insidious	3	5	-	-	1	-	Nil	Nil	Br. Pn.	1 month L.2,R.1.	5 months
46,851	22	2	2	Crane Worker	Nil	Acute	3	3	-	1	-	-	Nil	Nil	Br. Pn.	2 months Br. Pn.	1 month

Reg No.	Age	Duration in Months from time of Sickening: To Notification.	Duration in Months from time of Sickening: To Death	Occupation	Sputum.	Type of Onset Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Notified Contacts in House: Prior	Notified Contacts in House: Subsequent	Pulmonary Condition at First Examination.	X-ray with Months after Sickening	Duration in Hospital
1932																	
46,860	21	5	6	Nil	+	Insidious	3	5	-	-	-	1	Nil	Nil	L.2.	5 months L.2.	1 month
46,883	28	6	6	Metal Worker	+	Insidious	2	3	-	-	-	1	1	Nil	Br.Pn.	6 months L.2, R.3.	2 weeks
46,925	18	5	6	News Vendor	+	Insidious	2	5	-	-	-	2	Nil	Nil	Br.Pn.	Nil	Refused
46,946	18	3	3	Labourer	+	Acute	2	7	2	-	-	2	Nil	Nil	Br.Pn.	Nil	Nil
46,896	16	3	5	Butcher's Assistant	+	Insidious	2	6	-	-	-	1	Nil	Nil	Br.Pn	4 months L.2, R.1	2 months
46,948	27	2	3	Baker	+	Insidious	6	4	-	-	-	1	Nil	Nil	Br.Pn	3 months L.1, R.2.	2 weeks
47,360	17	2	3	Bricklayer	+	Insidious	2	4	-	-	-	2	Nil	Nil	Br.Pn.	Nil	2 weeks
48,358	16	5	6	Message Boy	+	Insidious	2	5	2	-	1	-	Nil	Nil	R.2.	Nil	6 weeks
16,042	25	1	3	Leather Worker	+	Acute	2	4	-	-	1	-	2	Nil	Br.Pn.	1 month Br.Pn.	2 months
48,393	19	4	6	Plater	+	Insidious	2	4	3	1	-	-	Nil	Nil	Br.Pn.	5 months Br.Pn.	2 months
47,438	17	3	6	Dock Labourer	+	Insidious	2	4	2	-	-	1	Nil	Nil	L.2.	3 months L.2, R.2.	5 months
46,942	19	1	1	Clerk	Nil	Acute	2	5	-	-	-	1	Nil	Nil	Br.In.	Post Mortem Br.Pn.	1 month

FEMALES.

ACUTE PHTHISIS DEATHS - 15-30 (INCLUSIVE).

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset (Insidious or Acute)	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1928.																	
39,732	25	1	1	Charwoman	+	Acute	3	4	1	-	1	-	1	Nil	R.1.	Nil	1 month
39,688	24	2	3	Housewife	+	Insidious	1	2	2	-	-	3	Nil	Nil	Br. Pn.	Nil	6 weeks
39,730	19	4	6	Machinist	+	Acute	2	6	1	-	-	2	1	Nil	Br. Pn.	5 mths. L2, R2.	3 weeks
39,629	21	2	6	Finisher	+	Insidious	2	6	-	-	-	1	2	Nil	Br. Pn.	Nil	Refused
39,731	21	1	5	Seamstress	+	Insidious	Institution case				1	-	Nil	Nil	Br. Pn.	Nil	Refused
40,449	19	5	6	Shopgirl	+	Insidious	2	8	1	-	-	1	Nil	1	Br. Pn.	Nil	Nil
40,886	17	3	3	Factory Worker	Nil	Acute	1	4	-	-	-	1	3	1	Br. Pn.	Nil	Nil
40,862	19	3	6	Shop Asst.	+	Insidious	1	4	-	-	-	1	2	2	L.1.	Nil	3 months
40,923	22	3	6	Housewife	+	Insidious	1	2	-	-	-	1	1	Nil	Br. Pn.	4 mths. Br. Pn.	5 months
40,417	17	6	6	Maid	+	Insidious	1	4	-	-	1	-	Nil	Nil	Br. Pn.	Nil	6 months

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset (Insidious or Acute)	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1929.																	
41,700	21	3	5	Millgirl	+	Insidious	2	8	1	-	-	3	Nil	Nil	Br. Pn.	Nil	2 weeks
41,683	17	1	3	French Polisher	Nil	Insidious	2	5	2	-	-	2	Nil	Nil	Br. Pn.	Nil	Refused
41,739	24	1	2	Domestic	+	Acute	2	4	-	-	1	-	2	Nil	Br. Pn.	Nil	1 week
42,203	19	3	4	Domestic	+	Insidious	2	4	1	-	-	2	Nil	1	Br. Pn.	Nil	1 week
42,174	19	3	4	Hoistgirl	+	Insidious	2	5	-	-	-	1	1	Nil	Br. Pn.	Nil	1 month
42,214	19	2	4	Machinist	+	Insidious	2	6	1	-	-	1	Nil	Nil	Br. Pn.	3 mths. Br. Pn.	3 months
42,468	29	5	6	Housewife	Nil	Insidious	3	2	2	-	-	1	Nil	Nil	Br. Pn.	Nil	6 weeks
42,198	30	2	6	Housewife	+	Insidious	3	2	3	-	-	1	1	Nil	Br. Pn.	Nil	2 months
42,494	15	3	5	Nil	+	Acute	3	6	3	-	-	1	1	Nil	Br. Pn.	3 mths. Ll, Rl.	5 weeks
43,057	15	6	6	Nil	+	Acute	2	4	3	-	-	2	-	2	Br. Pn.	Nil	1 week
42,487	30	5	6	Cleaner	+	Insidious	3	3	1	-	-	1	1	Nil	Br. Pn.	Nil	10 weeks
42,462	15	2	6	Cashgirl	+	Insidious	2	5	2	-	-	1	Nil	1	Br. Pn.	Nil	5 months

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset (Insidious or Acute)	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1930.																	
43,515	22	3	5	Shopgirl	+	Insidious	2	4	1	-	-	1	Nil	Nil	Br. Pn.	Nil	Refused
43,524	29	3	6	Dairymaid	+	Insidious	2	3	2	-	-	1	Nil	Nil	Br. Pn.	Nil	2 months
43,543	18	4	6	Cinema Usher	+	Insidious	2	3	2	-	-	1	4	2	Br. Pn.	Nil	Refused
43,535	15	1	5	Factory Girl	+	Acute	2	5	7	-	-	3	Nil	Nil	Br. Pn.	Nil	10 weeks
44,263	18	4	6	Bottle Examiner	+	Acute	1	2	4	-	1	-	Nil	Nil	Br. Pn.	Br. Pn. 5 mths.	2 months
44,322	19	3	4	Weaver	+	Acute	3	4	1	-	1	-	Nil	Nil	Br. Pn.	Nil	6 weeks
43,942	27	3	6	Printer	+	Insidious	2	3	1	-	-	1	2	Nil	R3.	Nil	3 months
44,333	18	3	6	Maid	+	Insidious	2	3	-	1	-	-	Nil	Nil	Br. Pn.	Nil	4 months

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset (Insidious or Acute)	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1931.																	
45,458	16	4	4	Maid	Nil	Acute	Institution Case			-	1	-	1	-	Br. Pn.	Nil	Nil
44,803	20	3	6	Lace-worker	+	Insidious	2	5	2	-	-	3	Nil	1	Br. Pn.	Nil	3 months
45,469	15	3	4	Domestic	+	Acute	1	2	3	-	-	1	1	Nil	Br. Pn.	Nil	3 weeks
45,503	20	Nil	1½	Housewife	+	Acute	1	2	1	-	-	1	Nil	Nil	Br. Pn.	1 mth. Br. Pn.	6 weeks
45,992	27	1	1½	Housewife	+	Acute	2	6	2	-	-	2	Nil	2	Br. Pn.	Nil	1 month
45,978	23	2	2	Typist	Nil	Acute	4	5	-	1	-	-	Nil	Nil	Br. Pn.	1 mth. Br. Pn.	Nil
45,995	16	3	3	Chocolate Worker	+	Insidious	2	7	1	-	-	1	2	4	Br. Pn.	Nil	Nil
24,331	17	3	6	Laundry Worker	+	Insidious	Institution Case			-	1	-	1	Nil	Rl.	Nil	3 months
45,460	19	1	6	Salesgirl	+	Insidious	2	4	2	-	1	-	Nil	2	Br. Pn.	1 mth. Br. Pn.	6 months
46,251	16	3	5	Housework	+	Acute	3	7	-	-	-	1	Nil	Nil	Br. Pn.	Nil	6 weeks
46,330	19	4	4	Student	+	Acute	4	7	-	-	1	-	1	1	Br. Pn.	Nil	Refused
46,331	16	3	4	Factory Girl	+	Insidious	2	6	-	-	-	2	-	1	Br. Pn.	Nil	5 weeks
46,264	18	1	5	Shopgirl	Nil	Acute	3	8	3	-	-	1	1	Nil	Br. Pn.	Nil	Refused

Reg. No.	Age	Duration in months from Date of Sickening: To Notification	To Death	Occupation	Sputum	Mode of Onset Insidious or Acute.	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination.	X-ray with Months after Sickening	Duration in Hospital
1932																	
46,886	16	3	3	Box-Maker	+	Insidious	2	6	1	-	1	-	-	-	Br. Pn.	Nil	2 days
46,928	26	3	4	Housewife	+	Insidious	2	2	3	-	-	2	1	Nil	Br. Pn.	Nil	1 week
46,300	19	4	6	Tin-worker	+	Insidious	2	4	1	-	-	2	1	-	Rl.	5 mths.R3	2 months
47,442	19	2	2	Shopgirl	+	Acute	2	3	-	-	-	1	1	-	Br.Pn.	1 mth. L2, Pl.	3 weeks
46,880	17	3	6	Clerkess	+	Insidious	3	5	-	-	-	1	Nil	Nil	R2.	Nil	5 months
47,406	15	3	6	Rug-Maker	+	Acute	4	7	4	-	-	1	-	-	Br. Pn.	4 mths. L2, R3.	6 weeks
47,854	17	5	6	Housework	+	Insidious	2	3	1	1	-	-	1	Nil	Br. Pn.	6 mths. L2, R2.	2 months
47,373	21	2	6	Domestic	+	Insidious	2	9	-	-	-	3	Nil	Nil	Br. Pn.	2 mths. L2, Rl.	4 months
47,444	22	2	5	Laundry-Worker	+	Insidious	Institution case				1	-	Nil	Nil	L2.	3 mths.L2	6 weeks
47,425	22	2	6	Bottle-Packer	+	Insidious	2	6	-	-	-	2	2	Nil	Br.Pn.	2 mths. Ll, R3.	4 months
46,936	19	3	3	Chemist's Asst.	Nil	Acute	2	5	1	-	1	-	Nil	Nil	Br.Pn.	Nil - P.M. confirmation	1 week
47,361	22	2	2	Housewife	+	Insidious	1	2	1	-	-	2	Nil	Nil	Br.Pn.	2 mths.Br.Pn	6 weeks
46,873	16	3	6	Clerkess	+	Insidious	3	4	1	-	-	1	Nil	1	R2.	Nil	5 weeks
47,378	27	3	4	Typist	+	Insidious	3	3	-	1	-	-	Nil	Nil	Br.Pn.	Nil	Refused
48,427	21	4	5	Unemployed	+	Insidious	2	5	-	-	1	-	Nil	Nil	Br. Pn.	Nil	1 month
48,381	30	3	4	Hospital Sister	+	Insidious	Institution case				1	-	Nil	Nil	R2.	3 mths.R2	3 months

A P P E N D I X N O. 2

APPENDIX 2.

MALES.

SUBACUTE PHTHISIS DEATHS - 15-30 (INCLUSIVE).

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1928.																	
40,887	15	4	8	Asst. Turner	+	Insidious	2	6	-	-	-	2	Nil	Nil	Br. Pn.	Nil	6 months
40,381	25	3	7	Chemical Worker	+	Insidious	1	3	-	-	1	-	Nil	Nil	Br. Pn.	3 mths. L1, R1.	6 weeks
41,245	25	6	6	Cold-Storage Worker	Nil	Insidious	3	6	-	-	1	-	Nil	Nil	Br. Pn.	Nil	2 days
40,434	20	12	14	Tube Worker	+	Insidious	2	5	-	-	1	-	1	Nil	L2, R2.	Nil	2 months
39,667	23	6	7	Labourer	+	Insidious	2	4	-	-	-	1	Nil	Nil	L2, R1.	Nil	6 weeks
39,607	19	6	15	Van Boy	+	Insidious	2	5	4	-	-	2	1	1	L1, R2.	6 mths. L1, R2.	6 weeks
39,706	29	17	18	Turner	+	Acute	1	2	2	-	-	1	Nil	Nil	L2, R3.	15/12 yrs. L2, R2.	2 weeks
40,944	19	2	6	Engineer	+	Acute	2	4	2	-	1	-	Nil	Nil	R2.	Nil	4 months
40,919	26	2	14	Fireman	+	Insidious	2	3	-	-	1	-	2	0	L1, R1.	Nil	1 week
39,356	23	3	16	Footballer	+	Insidious	3	5	-	-	1	-	Nil	Nil	R1.	3 mths. R1.	5 months
39,739	19	3	6	Baker	+	Acute	2	6	2	-	-	1	1	1	Br. Pn.	Nil	Refused
38,616	18	2	14	Bar-tender	+	Insidious	2	4	-	-	-	1	Nil	Nil	L2, R1.	Nil	11 months
39,695	29	9	10	Ship's Steward	+	Insidious	3	3	3	-	-	1	Nil	Nil	L1, R2.	Nil	2 weeks

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1929.																	
41,693	19	5	9	Grocer	+	Insidious	2	5	-	-	-	1	Nil	Nil	L1, R2.	Nil	2 months
40,905	27	2	12	Miner	+	Insidious	2	5	-	-	1	-	2	Nil	L1, R1.	Nil	9 months
42,161	16	4	10	Office Boy	+	Insidious	2	5	-	-	1	-	1	Nil	L1, R2.	Nil	Refused
41,234	23	10	12	Labourer	+	Insidious	2	5	-	-	1	-	1	1	L2, R2.	Nil	10 weeks
42,239	20	2	8	Salesman	+	Acute	2	5	-	-	-	1	Nil	Nil	L1, R1.	Nil	6 months
42,497	16	5	10	Butcher	+	Insidious	3	4	2	-	-	1	Nil	1	L1, R2.	Nil	10 weeks
40,930	20	6	12	Metal Driller	+	Acute	2	6	1	-	-	1	Nil	Nil	R1.	10 mths. L1, R2.	3 months
43,090	21	2	6	Cigarette Packer	+	Acute	2	4	-	-	-	1	Nil	Nil	Br. Pn.	Nil	1 month

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1930.																	
43,466	19	2	8	Motor Driver	+	Insidious	2	4	-	-	-	1	Nil	Nil	L2, R2.	8 mths. L2, R2.	3 months
43,122	17	3	12	Labourer	+	Insidious	2	6	-	-	1	-	Nil	1	L1, R1.	Nil	7 months
43,088	21	8	13	Motor Driver	+	Acute	2	6	-	-	-	1	Nil	Nil	L1.	8 mths. L1, R2.	1 month
44,797	30	2	6	Gas Worker	+	Insidious	3	2	1	-	-	1	Nil	Nil	R1.	Nil	1 month
44,302	27	6	10	Chiropodist	+	Acute	2	2	-	-	-	1	Nil	Nil	L2, R1.	Nil	4 months
43,884	21	2	8	Labourer	+	Acute	2	3	-	-	-	1	Nil	1	Br. Pn.	Nil	8 months
43,474	20	5	17	Clerk	+	Insidious	6	10	-	-	1	-	Nil	3	L1, R2.	8 mths. L2, R2.	1 year
43,494	20	4	10	Labourer	+	Insidious	2	4	-	-	1	-	1	Nil	L1, R1.	Nil	5 months
41,686	28	2	18	Crane Driver	+	Insidious	2	3	-	-	1	-	Nil	Nil	L2, R2.	Nil	15 months
42,499	25	5	12	Baker	+	Insidious	2	2	1	-	-	1	Nil	Nil	L1, R1.	Nil	7 months
42,461	21	2	12	Machine-man	-	Acute	2	7	-	-	1	-	2	Nil	L1, R1.	Nil	2 months
44,255	25	3	9	Lance-Corporal	+	Acute	2	6	1	-	1	-	1	Nil	R1.	Nil	2 months
43,130	24	9	12	Plumber	+	Insidious	3	3	4	1	-	-	Nil	Nil	L2, R1.	Nil	2 months
43,498	23	10	13	Shipping Clerk	+	Acute	5	4	-	1	-	-	Nil	Nil	L1, R1.	Nil	1 month

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1931.																	
43,903	25	2	12	Steel Worker	+	Insidious	2	3	2	-	-	2	Nil	Nil	L1, R1.	Nil	10 months
43,947	15	5	14	Message Boy	+	Insidious	3	5	3	-	-	1	Nil	Nil	L1, R2.	Nil	10 months
44,269	21	2	12	Motor Driver	+	Insidious	2	4	-	-	-	1	1	Nil	L2, R1.	Nil	10 months
44,283	19	1	11	Student	+	Acute	2	3	-	-	-	1	Nil	Nil	L1, R1.	Nil	9 months
44,812	27	5	8	Tube Worker	+	Insidious	2	4	-	-	1	-	Nil	Nil	L1, R2.	5 mths. L1, R2.	6 weeks
44,786	24	3	11	Traveller	+	Insidious	3	7	-	-	1	-	Nil	Nil	L1, R1.	3 mths. L2, R2.	10 weeks
45,963	16	4	6	Joiner	+	Insidious	2	5	-	-	1	-	Nil	Nil	Br. Pn.	Nil	2 months

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification.	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening.	Duration in Hospital
1932																	
46,920	21	6	15	Unemployed	+	Insidious	2	7	1	-	-	1	Nil	1	L.2,R.1	Nil	3 months
46,904	20	6	6	Labourer	+	Insidious	2	4	-	-	-	1	Nil	Nil	Br. Pn.	Nil	Refused
46,929	30	4	12	Bookmaker	+	Acute	2	3	-	-	-	1	Nil	Nil	L.1.	8 mths. L.2	1 month
47,914	27	2	6	Fitter	+	Insidious	3	6	-	-	-	1	1	Nil	L.1.	2 mths. L.1, R.1.	2 months
47,875	27	4	9	Spirit-Salesman.	+	Insidious	1	2	-	-	-	1	1	Nil	L.2,R.1	5 mths. L.2, R.1.	1 month
45,511	23	2	13	Leather Worker	+	Insidious	3	3	-	1	-	-	Nil	Nil	L.2.	Nil	2 months
46,012	17	4	18	Briquette Worker	+	Insidious	2	7	-	-	-	1	Nil	Nil	R.2.	Nil	10 weeks
46,943	17	12	18	Messenger	+	Insidious	1	5	3	-	-	1	Nil	Nil	L.1, R.2.	1 year L.2, R.2.	5 months
45,480	17	4	16	Appr.Engineer	+	Insidious	2	6	1	-	1	-	2	Nil	L.1, R.2.	Nil	11 months
46,345	22	5	13	Pawnbroker's Assistant	+	Insidious	2	4	-	-	-	1	Nil	Nil	L.1, R.2.	5 mths. L.2, R.2.	8 months
48,365	20	4	9	Hide Stretcher	+	Insidious	2	4	-	-	-	1	Nil	Nil	L.1, R.3	4 mths. L.2, R.3.	2 months

FEMALES
SUB-ACUTE PHTHISIS DEATHS - 15-30 (INCLUSIVE).

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1928.																	
40,355	17	4	12	Weaver	+	Insidious	5	6	2	1	-	-	Nil	Nil	Br. Pn.	Nil	8 months
39,645	23	7	15	Housework	+	Insidious	2	7	1	-	-	1	1	Nil	L2, R1.	Nil	3 months
40,390	26	4	13	Housewife	+	Insidious	2	6	2	-	-	1	Nil	Nil	L1, R1.	Nil	9 months
38,966	15	2	18	Cotton Spinner	+	Insidious	2	6	-	-	-	2	1	Nil	L1, R2.	9 months L2, R2.	14 months
40,358	26	2	10	Housewife	+	Insidious	3	2	3	-	-	3	Nil	Nil	L1.	4 months L1.	1 month
39,402	16	2	12	Printing Work	+	Insidious	2	4	-	-	-	1	Nil	Nil	L1, R1.	Nil	Refused
39,632	20	3	7	Housewife	+	Insidious	2	3	2	-	-	2	Nil	Nil	L1.	Nil	4 months
39,660	17	9	13	Machinist	+	Acute	2	6	1	-	-	2	1	1	L1, R2.	9 months L1, R1.	4 months
39,412	16	4	18	Basket Maker	+	Insidious	2	4	1	-	-	2	Nil	Nil	L1, R1.	Nil	8 months
40,414	18	3	10	Mill Worker	+	Acute	1	5	2	-	-	2	Nil	1	Br. Pn.	Nil	6 months
40,942	28	6	14	Housewife	+	Insidious	2	8	-	-	-	1	Nil	2	L2, R3.	Nil	6 months
40,419	18	11	12	Domestic	+	Insidious	2	7	-	-	-	1	Nil	Nil	L1.	11 months L1.	Refused

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1929.																	
42,534	23	3	7	Housewife	+	Insidious	2	2	1	-	-	1	Nil	Nil	L1, R2.	Nil	2 months
41,663	20	1	13	Unemployed	+	Insidious	2	7	-	-	-	1	Nil	Nil	R1.	Nil	Refused
41,668	21	5	7	Weaver	+	Insidious	1	2	1	-	-	1	Nil	Nil	Br. Pn.	Nil	2 days
42,199	21	2	9	Housework	+	Insidious	3	8	1	-	-	1	Nil	1	Br. Pn.	Nil	1 week
41,229	21	2	14	Shop Assistant	+	Insidious	1	4	-	-	-	1	3	1	L1, R1.	2 months L1, R1.	4 months
42,225	30	3	10	Housewife	+	Acute	3	5	2	-	-	1	1	Nil	L2, R1.	Nil	5 months
39,662	22	1	15	Housewife	+	Acute	2	5	-	-	1	-	Nil	Nil	R1.	1 month L1, R1.	6 months
41,729	24	10	10	Housewife	+	Acute	1	2	2	-	-	2	Nil	Nil	L2.	Nil	1 day
41,161	15	2	9	Scholar	+	Insidious	2	5	-	-	-	1	Nil	Nil	Br. Pn.	Nil	Refused
38,955	22	2	18	Laundry Maid	+	Insidious	2	6	-	-	-	1	Nil	1	L2.	Nil	10 months
40,857	25	-	10	Machinist	+	Insidious	3	9	-	-	-	2	Nil	Nil	L2, R2.	Nil	3 days
39,434	18	3	18	Machinist	+	Insidious	2	7	1	-	-	1	Nil	1	L1, R1.	Nil	Refused
39,593	16	6	18	Pianist	+	Acute	2	5	2	-	-	2	1	Nil	L2, R1.	Nil	3 months
42,509	24	6	12	Weaver	+	Insidious	2	3	-	1	-	-	2	-	L2, R1.	Nil	Refused
41,205	16	2	11	Tailoress	+	Insidious	2	5	2	-	-	2	Nil	Nil	Br. Pn.	Nil	8 months
40,883	15	2	10	Scholar	+	Insidious	2	7	1	-	-	2	3	Nil	L1, R1.	2 months L1, R2.	7 months

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1930.																	
42,479	23	8	18	Weaver	+	Insidious	3	5	-	-	-	1	2	Nil	Br. Pn.	Nil	10 months
43,094	24	3	11	Housewife	+	Insidious	1	2	1	-	-	2	Nil	Nil	L1.	Nil	6 months
42,493	19	1	8	Shop Assistant	+	Insidious	2	3	-	-	1	-	Nil	Nil	Br. Pn.	Nil	2 months
42,508	19	2	12	Housework	+	Insidious	2	4	-	-	-	1	1	Nil	L2, R1.	Nil	5 months
43,897	18	5	12	Domestic	+	Insidious	2	6	-	-	-	2	Nil	Nil	L2, R1.	Nil	7 months
43,132	24	12	15	Storeworker	+	Acute	2	4	-	-	1	-	Nil	Nil	L2, R2.	Nil	2 weeks
43,106	19	6	14	Factory Hand	+	Insidious	2	6	2	-	-	1	Nil	Nil	L1.	6 months L2, R1.	7 months
42,545	19	6	17	Unemployed	+	Acute	3	5	2	-	1	-	Nil	Nil	L2, R2.	Nil	11 months

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1931.																	
43,920	20	4	16	Housework	+	Acute	3	6	-	1	-	-	Nil	Nil	L2.	Nil	9 months
43,937	21	11	18	Dressmaker	+	Insidious	3	5	-	-	-	1	3	Nil	L2, R1.	11 months L2, R1.	10 months
45,461	26	6	7	Housewife	+	Insidious	1	2	2	-	-	1	2	2	L1, R2.	Nil	1 week
43,878	22	4	17	Clerkess	+	Insidious	3	4	-	-	-	1	Nil	Nil	L1, R1.	Nil	11 months
46,014	21	5	8	Machinist	+	Insidious	1	3	1	-	-	2	1	2	Br. Pn.	5 months L1, R2.	2 months
44,756	24	2	12	Carpet Weaver	Nil	Insidious	3	5	-	-	-	1	1	1	R1.	Nil	Refused
43,886	15	3	13	Shopgirl	+	Insidious	2	3	2	-	-	1	Nil	Nil	L1.	3 months L2.	11 months
44,337	19	7	12	Packer	+	Insidious	2	6	1	-	-	1	Nil	1	L1, R1.	Nil	4 months
44,779	26	6	9	Housewife	+	Insidious	1	2	1	-	-	1	Nil	Nil	L1, R3.	Nil	1 month
46,000	22	6	6	Unemployed	Nil	Insidious	2	3	3	-	-	1	Nil	Nil	Br. Pn.	Nil	Refused
45,510	21	3	11	Photographer	+	Acute	2	3	2	-	-	1	1	Nil	L2, R1.	Nil	9 months
46,278	28	2	12	Housewife	+	Acute	1	2	4	-	-	3	Nil	Nil	L1.	2 months L1 with effusion	4 months
45,453	25	7	8	Housewife	+	Insidious	1	2	-	-	-	1	Nil	Nil	L2, R2.	Nil	1 month

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination	X-ray with Months after Sickening	Duration in Hospital
1932.																	
46,313	28	6	14	Housewife	+	Insidious	2	2	1	-	-	2	2	Nil	L2.	6 months L2.	7 months
45,957	23	3	14	Printer's Feeder	+	Insidious	2	4	2	-	1	-	1	1	R1.	3 months L1, R1.	6 months
44,785	18	1	18	Bottler	+	Acute	2	5	-	-	-	1	Nil	1	L2.	1 month L2	5 months
46,011	21	4	18	Warehouse Assistant	+	Insidious	3	7	-	-	-	1	Nil	Nil	L1, R1.	Nil	14 months
45,474	17	2	14	Unemployed	+	Insidious	3	6	3	-	-	2	2	Nil	R1.	2 months L1, R2.	8 months
47,922	18	7	10	Basket Worker	+	Acute	2	6	-	-	-	1	1	Nil	L1, R1.	7 months L2, R2.	4 months
46,939	28	9	18	Housewife	+	Acute	2	3	1	-	-	1	3	1	R3.	9 months L1, R3.	10 months
46,293	16	2	17	Baker's Girl	+	Acute	2	3	-	-	-	1	Nil	Nil	L2.	5 months L2, R1.	15 months
45,983	29	3	15	Housewife	+	Insidious	2	2	4	-	-	1	4	Nil	L1.	2 months L1.	5 months
45,539	16	2	18	Message Girl	+	Insidious	2	4	5	-	-	3	1	Nil	L1.	4 months L1, R1.	16 months
47,896	27	12	12	Housewife	Nil	Insidious	2	3	1	-	-	1	Nil	Nil	L1, R2.	Nil	2 months
47,356	26	3	6	Carpetweaver	+	Insidious	2	5	2	-	-	1	3	2	Br. Pn.	Nil	1 month
46,289	18	2	14	Weaver	+	Insidious	2	5	2	-	-	2	1	4	L1, R1.	2 months L1, R1.	1 year
45,519	17	4	14	Box Maker	+	Acute	3	4	-	-	-	1	Nil	Nil	R2.	Nil	8 months
46,344	30	4	8	Housewife	+	Insidious	1	2	1	-	-	1	Nil	Nil	Br. Pn.	Nil	2 weeks

Reg. No.	Age	Duration in Months from Date of Sickening: To Notification	Duration in Months from Date of Sickening: To Death	Occupation	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Inmates: +10	Inmates: -10	Room to Self	Bed to Self	Others in Bed	Positive Contacts in House: Prior	Positive Contacts in House: Subsequent	Pulmonary Condition at First Examination.	X-ray with Months after Sickening	Duration in Hospital
1932																	
46,859	26	5	12	Housewife	+	Insidious	2	2	2	-	-	1	Nil	Nil	L2.	6 mths L2, R2.	6 weeks
47,951	17	9	12	Unemployed	+	Insidious	2	5	-	-	-	1	Nil	Nil	Br.Pn	Nil	1 week
47,872	21	4	10	Housewife	+	Insidious	2	4	2	-	-	2	1	Nil	Br.Pn	4 mths. Br.Pn	6 months

A P P E N D I X N O. 3

APPENDIX 3.

MALES.
CHRONIC PHTHISIS DEATHS - 15-30 (INCLUSIVE).

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1928 -									
40,374	30	3 years	+	Unknown	1	3	2	Nil	Scotland (Lowland)
38,760	28	10 years	-	Followed Gassing	2	8	Nil	Nil	Colonial
40,444	24	3 8/12 years	+	Insidious	4	4	Nil	Nil	Scotland (Lowland)
39,710	20	4 years	+	Acute	2	5	1	1	Ireland
38,055	19	1 9/12 years	+	Acute	3	6	Nil	1	Scotland (Lowland)
37,957	20	2 years	+	Acute	3	6	Nil	Nil	Scotland (Lowland)
38,581	25	2 1/12 years	+	Insidious	4	8	Nil	Nil	Scotland (Lowland)
41,156	29	8 years	+	Unknown	3	3	Nil	Nil	England
36,413	30	9 1 years	+	Acute	3	2	Nil	Nil	Scotland (East Coast)
34,442	28	4 1/2 years	+	Insidious	1	3	1	1	Scotland (Lowland)
38,020	20	2 1/2 years	+	Acute	2	4	2	Nil	Scotland (Lowland)
37,033	17	2 8/12 years	+	Acute	2	7	Nil	Nil	Ireland
39,637	28	1 6/12 years	-	Acute	1	3	Nil	1	Ireland
35,475	17	4 9/12 years	+	Insidious	2	7	Nil	Nil	Scotland (Lowland)
37,249	18	3 4/12 years	+	Acute	2	4	3	Nil	Scotland (Lowland)
39,417	24	2 1/12 years	+	Insidious	3	8	Nil	1	Scotland (Lowland)
25,184	27	13 years	+	Insidious	4	5	Nil	Nil	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1928 (Contd.)									
36,358	16	7 years	+	Insidious	2	6	1	Nil	Scotland (Highland)
20,045	25	12 years	+	Insidious	3	7	Nil	Nil	Scotland (Lowland)
40,947	23	4 years	+	Insidious	2	4	Nil	Nil	Scotland (Lowland)
32,709	27	10 years	-	Followed Gassing	3	6	2	Nil	Scotland (Lowland)
36,698	22	$2^{7}/12$ years	+	Acute	2	7	Nil	1	Scotland (Lowland)
35,360	18	$3^{6}/12$ years	+	Insidious	1	4	1	1	Scotland (Lowland)
27,965	22	8 years	+	Insidious	2	4	Nil	Nil	Scotland (Lowland)
36,688	23	$2^{9}/12$ years	-	Acute	2	5	1	Nil	Scotland (Lowland)
34,362	26	$4^{10}/12$ years	+	Insidious	2	5	1	2	Ireland
37,154	21	3 years	+	Insidious	2	4	2	Nil	England
36,446	20	$2^{9}/12$ years	+	Insidious	2	7	Nil	Nil	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1929 -									
40,863	20	2 8/12 years	+	Insidious	2	4	1	Nil	Scotland (Lowland)
39,410	15	1 8/12 years	+	Acute	3	10	Nil	Nil	Scotland (Lowland)
41,228	18	1 6/12 years	+	Insidious	2	7	Nil	Nil	Scotland (Lowland)
39,722	23	2 years	+	Insidious	2	4	2	Nil	Scotland (East Coast)
43,464	24	2 years	+	Unknown	2	4	Nil	Nil	Scotland (Lowland)
39,628	19	2 8/12 years	+	Insidious	1	7	1	Nil	Scotland (Lowland)
39,381	23	1 8/12 years	+	Insidious	2	4	4	Nil	Scotland (Lowland)
40,362	26	2 6/12 years	+	Insidious	2	2	2	Nil	England
41,670	16	1 6/12 years	+	Insidious	3	6	1	Nil	Scotland (Lowland)
41,661	20	2 6/12 years	+	Insidious	1	5	Nil	Nil	Scotland (Lowland)
41,717	23	1 6/12 years	+	Insidious	2	5	Nil	Nil	Scotland (Lowland)
21,446	21	11 4/12 years	+	Insidious	2	8	1	Nil	Scotland (Lowland)
24,798	23	11 years	+	Followed Gassing	1	4	Nil	Nil	Scotland (Lowland)
26,642	27	9 6/12 years	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
3,351	18	19 5/12 years	-	Insidious	2	4	Nil	Nil	Scotland (Lowland)
29,447	30	11 years	+	Followed Gassing	2	3	Nil	Nil	Ireland

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1929 (Contd.)									
37,585	23	4 8 years	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
39,420	28	3 8/12 years	+	Insidious	1	6	Nil	Nil	Scotland (Lowland)
34,379	24	6 years	+	Insidious	3	7	Nil	Nil	Scotland (Lowland)
34,401	23	4 10/12 years	-	Acute	2	6	1	Nil	Ireland
35,752	30	4 2/12 years	-	Acute	3	7	Nil	Nil	Scotland (Lowland)
38,646	27	3 years	+	Acute	2	2	Nil	Nil	Scotland (Lowland)
43,460	30	3 years	-	Insidious	1	4	Nil	Nil	Scotland (Lowland)
28,595	16	8 years	+	Insidious	2	6	Nil	Nil	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1930 -									
42,511	26	2 4/12 years	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
43,125	29	1 9/12 years	+	Insidious	2	3	1	Nil	Scotland (Lowland)
41,159	21	1 8/12 years	+	Acute	2	8	Nil	1	Scotland (Lowland)
37,159	27	4½ years	+	Insidious	3	6	1	1	Ireland
39,744	29	2 9/12 years	+	Insidious	4	5	Nil	Nil	Scotland (Lowland)
28,631	25	10 years	+	Insidious	2	10	Nil	2	Ireland
41,208	24	4 3/12 years	+	Insidious	2	7	1	Nil	Scotland (Lowland)
17,887	20	15 years	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
38,145	18	4 10/12 years	+	Insidious	3	7	Nil	Nil	Scotland (Lowland)
39,362	29	3 7/12 years	+	Insidious	2	7	1	Nil	Scotland (Lowland)
24,760	25	13 years	+	Insidious	3	10	Nil	Nil	Ireland
43,456	17	2 years	Not Known	Insidious	3	7	Nil	Nil	Scotland (Lowland)
37,180	28	4 3/12 years	+	Insidious	1	2	Nil	Nil	Scotland (Lowland)
28,017	30	10 years	-	Acute	2	6	1	Nil	Scotland (Lowland)
37,615	16	5 years	+	Insidious	2	9	Nil	Nil	Scotland (Lowland)
20,290	24	14 years	+	Insidious	1	2	Nil	Nil	Scotland (Lowland)
38,649	25	4 9/12 years	+	Insidious	2	3	Nil	Nil	Scotland (Lowland)
27,207	15	10 3/12 years	+	Insidious	3	7	Nil	Nil	Scotland (Lowland)
11,165	25	17 5/12 years	-	Insidious	2	3	Nil	Nil	Scotland (Lowland)
37,971	28	5 6/12 years	+	Insidious	3	6	Nil	Nil	England
43,896	27	3 years	+	Insidious	2	3	Nil	1	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1931 -									
46,343	19	5 years	-	Unknown	2	4	Nil	Nil	Scotland (Lowland)
43,924	20	1 6/12 years	+	Insidious	2	5	2	Nil	Scotland (Lowland)
43,859	18	1 6/12 years	+	Insidious	1	8	2	Nil	Scotland (Lowland)
43,949	25	1 10/12 years	+	Insidious	3	7	Nil	Nil	Scotland (Lowland)
22,302	20	2 7/12 years	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
42,451	17	2 1/12 years	+	Acute	3	9	Nil	1	Scotland (Lowland)
43,533	30	2 2/12 years	+	Insidious	2	4	Nil	1	Scotland (Lowland)
17,163	19	3 years	+	Insidious	2	5	1	2	Scotland (Lowland)
39,414	24	4 5/12 years	+	Insidious	2	6	2	1	Scotland (East Coast)
30,727	18	9 9/12 years	+	Insidious	2	2	2	Nil	Scotland (Lowland)
42,237	29	2 8/12 years	+	Insidious	3	3	1	1	Ireland
39,358	20	4 years	+	Insidious	2	5	Nil	Nil	Scotland (Lowland)
20,098	25	14 6/12 years	+	Insidious	3	6	Nil	1	Scotland (Lowland)
44,262	19	2 1/12 years	+	Insidious	2	4	1	Nil	Scotland (East Coast)
44,783	18	2 3/12 years	-	Insidious	4	8	1	Nil	England
27,040	27	11 2/12 years	+	Insidious	2	8	Nil	Nil	Scotland (Lowland)
21,212	19	2 8 years	+	Insidious	2	3	Nil	Nil	Scotland (Lowland)
41,420	24	4 8/12 years	+	Insidious	3	5	Nil	Nil	Scotland (Lowland)
41,151	27	3 11/12 years	+	Insidious	1	4	Nil	Nil	Scotland (Lowland)
37,967	16	5 4/12 years	+	Acute	2	5	Nil	1	Scotland (Lowland)
43,082	30	2 5/12 years	+	Insidious	2	4	1	1	Scotland (Highland)
43,083	21	4 years	+	Insidious	2	4	Nil	Nil	Scotland (Lowland)
45,986	22	2 1/12 years	+	Insidious	2	5	2	1	Scotland (Lowland)
39,858	15	4 6/12 years	+	Insidious	7	8	1	1	Scotland (East Coast)

Ref.No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset Insidious or Acute	No.of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1932									
46,030	25	1 7/12 yrs.	+	Acute	2	4	Nil	Nil	Scotland (Lowland)
43,932	19	2 3/12 yrs.	+	Insidious	2	4	Nil	2	Scotland (Lowland)
45,530	30	1 6/12 yrs	+	Insidious	2	6	Nil	Nil	Scotland (East Coast)
48,416	20	1 8/12 yrs.	Nil	Insidious	2	5	Nil	Nil	Scotland (Lowland)
43,121	23	3 5/12 yrs	+	Acute	2	8	Nil	Nil	Scotland (Lowland)
37,934	25	6 yrs.	+	Insidious	4	5	Nil	Nil	Scotland (East Coast)
38,054	22	6 2/12 yrs	+	Insidious	1	4	1	Nil	Scotland (Lowland)
17,589	21	16 yrs.	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
22,771	19	13 8/12 yrs	+	Insidious	2	12	Nil	Nil	Scotland (Lowland)
27,213	29	15 years	-	Insidious	2	6	Nil	2	Ireland
6,324	20	20 yrs.	-	Unknown	2	5	Nil	Nil	Ireland
41,177	25	5 yrs.	+	Insidious	2	2	Nil	Nil	England

Ref.No.	Age	Duration of Illness from Date of Sickening.	Sputum	Mode of Onset Insidious or Acute	No.of Rooms.	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent.	
1932									
12,521	23	4 5/12 yrs.	+	Insidious	2	3	Nil	Nil	Scotland (East Coast)
42,152	17	3 4/12 yrs.	+	Acute	2	2	Nil	Nil	Scotland (Lowland)
43,052	17	3 6/12 yrs.	+	Insidious	1	7	Nil	3	Scotland (Lowland)
37,234	29	6 8/12 yrs.	+	Acute	1	4	1	3	Ireland
39,750	18	4 9/12 yrs.	+	Acute	2	9	1	5	Scotland (Lowland)
47,410	19	1 8/12 yrs.	+	Insidious	2	5	Nil	Nil	Scotland (Lowland)
46,941	16	3 6/12 yrs.	+	Insidious	3	5	Nil	1	Ireland

FEMALES

CHRONIC PHTHISIS DEATHS - 15-30 (INCLUSIVE)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1928 -									
37,986	19	1 9/12 years	+	Insidious	2	8	Nil	Nil	Scotland (Lowland)
36,738	26	4 3 years	+	Insidious	2	8	1	Nil	Scotland (East Coast)
36,702	18	2 3/12 years	+	Acute	2	9	Nil	Nil	Scotland (Lowland)
38,027	26	3 7 years	+	Acute	2	3	1	Nil	Ireland
34,679	24	4 7/12 years	+	Acute	4	11	Nil	Nil	Ireland
1,541	26	18 6 years	-	Insidious	2	4	Nil	Nil	England
37,988	28	2 6/12 years	+	Insidious	1	4	1	Nil	Scotland (Lowland)
17,891	22	12 7 years	+	Insidious	1	5	1	Nil	Scotland (Lowland)
37,998	19	2 7/12 years	+	Acute	2	6	Nil	Nil	Scotland (Lowland)
33,959	21	4 10/12 years	+	Acute	2	5	4	Nil	Scotland (Lowland)
36,382	15	2 8/12 years	+	Insidious	2	4	Nil	Nil	Scotland (East Coast)
29,448	16	6 7/12 years	+	Insidious	2	7	1	1	Ireland
34,004	26	4 6/12 years	+	Unknown	2	3	2	Nil	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1929 -									
5,695	25	18 years	-	Insidious	2	7	Nil	1	England
36,356	22	5 years	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
39,582	27	12 years	-	Insidious	2	8	Nil	1	Scotland (Lowland)
39,407	24	3 years	+	Insidious	2	4	Nil	Nil	Scotland (Lowland)
26,567	17	10 years	+	Insidious	1	2	1	1	Scotland (Highland)
40,389	20	3 2/12 years	+	Insidious	2	6	Nil	Nil	Ireland
24,441	28	11 years	-	Insidious	1	3	Nil	Nil	Scotland (Lowland)
38,982	17	1 10/12 years	+	Acute	2	11	Nil	1	Scotland (Lowland)
34,362	27	5 2/12 years	-	Acute	2	7	Nil	Nil	Scotland (Lowland)
39,648	21	5 years	-	Acute	1	2	Nil	Nil	Scotland (Lowland)
29,395	15	7½ years	+	Acute	2	3	Nil	2	Scotland (Lowland)
35,847	28	3½ years	+	Unknown	5	8	Nil	1	Scotland (East Coast)
43,101	18	1 6/12 years	-	Insidious	4	3	Nil	Nil	Ireland
40,407	22	2 8 years	-	Insidious	4	10	Nil	Nil	Scotland (Lowland)
39,034	29	2 8/12 years	+	Acute	2	6	Nil	Nil	Scotland (Lowland)
31,791	22	8 years	-	Acute	1	7	Nil	Nil	Ireland
14,344	26	14 years	-	Insidious	2	7	Nil	6	Scotland (Lowland)
29,383	17	7 7/12 years	+	Acute	2	6	Nil	1	Scotland (Lowland)
18,475	16	12 9/12 years	+	Insidious	2	9	2	Nil	Scotland (Lowland)
32,338	19	7 years	+	Acute	2	4	1	Nil	Scotland (Lowland)
41,692	21	2 10/12 years	+	Insidious	1	4	Nil	1	Ireland

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1929 (Contd.)									
39,640	29	1 7/12 years	+	Acute	2	3	2	Nil	Scotland (Lowland)
39,390	26	1 11/12 years	-	Acute	1	4	1	Nil	Scotland (Lowland)
39,712	16	2 years	+	Insidious	1	4	Nil	Nil	Scotland (Lowland)
41,213	28	3 6/12 years	-	Unknown	3	6	Nil	Nil	Scotland (Lowland)
40,872	22	1 /12 years	+	Insidious	2	3	1	Nil	Scotland (Lowland)
43,150	20	3 years	-	Insidious	2	4	Nil	Nil	Scotland (Lowland)
41,201	23	2½ years	+	Insidious	2	2	Nil	Nil	Ireland
39,476	17	3 years	+	Acute	1	5	1	Nil	Scotland (Lowland)
8,455	19	15 years	+	Acute	2	3	Nil	Nil	Scotland (Lowland)
37,587	17	2 8/12 years	+	Insidious	2	5	Nil	Nil	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1930 -									
44,759	18	2 9/12 years	-	Insidious	2	4	1	Nil	Scotland (Lowland)
42,481	25	1 9/12 years	+	Acute	2	4	Nil	Nil	Scotland (Lowland)
42,001	24	1½ years	-	Insidious	3	5	1	Nil	Scotland (Lowland)
44,315	21	5 8/12 years	+	Insidious	3	10	Nil	Nil	Scotland (Lowland)
43,064	24	1 8/12 years	+	Acute	1	5	Nil	1	Ireland
44,339	17	10 7/12 years	-	Insidious	2	6	Nil	Nil	Scotland (Lowland)
42,240	21	1 7/12 years	+	Insidious	1	2	Nil	Nil	Scotland (Lowland)
41,662	15	2 years	+	Insidious	2	6	1	Nil	Scotland (Lowland)
43,899	29	6 3/12 years	+	Insidious	1	4	Nil	1	Scotland (Lowland)
32,768	25	7 3/12 years	+	Insidious	3	5	Nil	Nil	England
37,695	26	3 9/12 years	+	Acute	2	7	1	Nil	Scotland (Lowland)
41,155	23	2 3/12 years	+	Insidious	2	7	Nil	Nil	Scotland (Lowland)
40,907	26	3 3/12 years	+	Acute	2	2	Nil	Nil	Scotland (Lowland)
40,421	17	2 3/12 years	+	Acute	3	8	Nil	1	Scotland (Lowland)
38,580	29	4 years	+	Acute	1	7	Nil	Nil	Scotland (Lowland)
37,564	21	4 3/12 years	-	Insidious	2	4	Nil	Nil	Scotland (East Coast)
39,664	15	3½ years	+	Insidious	2	8	Nil	1	Scotland (Lowland)
39,002	16	3 4/12 years	+	Insidious	2	10	Nil	Nil	Scotland (Lowland)
43,522	30	3 years	+	Unknown	3	3	Nil	1	Ireland
39,415	17	3½ years	+	Acute	2	3	2	Nil	Scotland (Lowland)
18,205	18	3 years	+	Insidious	3	6	Nil	Nil	Scotland (East Coast)
39,368	18	4 years	+	Insidious	3	10	Nil	2	Scotland (Lowland)
44,323	28	2 years	+	Insidious	2	5	Nil	Nil	Scotland (Lowland)
42,470	30	1 1/2 years	-	Insidious	2	6	Nil	1	Scotland (Lowland)
39,036	16	3 7/12 years	+	Insidious	1	7	Nil	2	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1931 -									
20,037	16	1 8/12 years	+	Acute	2	8	Nil	Nil	Scotland (Lowland)
43,528	19	3 4/12 years	+	Insidious	2	4	Nil	Nil	Ireland
44,777	16	1 1/2 years	+	Insidious	(Institution Case)		Nil	Nil	Ireland
44,685	15	2 3/12 years	-	Insidious	1	2	Nil	Nil	Scotland (Lowland)
43,054	18	1 9/12 years	+	Acute	2	7	3	Nil	Scotland (Lowland)
44,299	21	1 1/2 years	+	Acute	4	5	1	Nil	Scotland (East Coast)
46,021	27	1 1/2 years	+	Insidious	1	4	1	Nil	Scotland (Lowland)
43,936	18	1 7/12 years	+	Acute	3	6	Nil	Nil	Scotland (Lowland)
43,542	23	2 5/12 years	+	Acute	2	3	Nil	1	Scotland (Lowland)
35,082	15	7 4/12 years	+	Insidious	2	4	1	1	Scotland (Lowland)
37,572	19	6 4/12 years	+	Insidious	2	3	1	Nil	Ireland
16,306	29	18 years	+	Insidious	2	6	1	6	Scotland (Lowland)
37,660	15	5 8/12 years	+	Insidious	2	6	Nil	Nil	Russian Jew
41,216	21	3 8/12 years	+	Insidious	2	5	Nil	Nil	Scotland (Lowland)
39,413	24	3 8/12 years	+	Acute	2	4	1	Nil	England
37,994	30	4 7/12 years	-	Insidious	2	5	Nil	Nil	Scotland (East Coast)
38,978	23	4 3/12 years	+	Insidious	1	2	Nil	2	Scotland (Lowland)
40,413	24	3 1/12 years	+	Acute	2	3	Nil	Nil	Scotland (Lowland)
41,191	17	3 years	+	Insidious	2	6	2	Nil	Scotland (Lowland)
36,419	17	6 years	+	Acute	2	8	Nil	Nil	Scotland (Lowland)
43,065	27	2 1/2 years	-	Insidious	2	7	Nil	Nil	Scotland (Lowland)

Ref. No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute	No. of Rooms	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1931 (Contd.)									
40,438	27	3 9/12 years	+	Insidious	2	3	2	Nil	Ireland
34,889	30	7 5 years	+	Insidious	2	6	Nil	Nil	Scotland (Lowland)
42,216	15	2 5/12 years	+	Acute	2	9	2	2	Ireland
37,631	22	5 10/12 years	+	Insidious	(Institution Case)		Nil	Nil	Ireland
39,408	15	3 1/2 years	-	Acute	1	8	Nil	Nil	Scotland (Lowland)
36,362	30	6 4/12 years	+	Insidious	1	4	Nil	1	Scotland (Lowland)
39,603	30	3 4/12 years	+	Insidious	2	7	1	Nil	Scotland (Lowland)
45,523	21	2 years	+	Insidious	1	3	1	Nil	Scotland (Lowland)
43,100	19	2 8 years	+	Insidious	2	4	Nil	Nil	Scotland (East Coast)
43,911	20	2 8/12 years	+	Acute	3	5	Nil	Nil	Scotland (Lowland)
40,446	20	3 2/12 years	+	Acute	2	10	1	1	Scotland (Lowland)
30,172	24	9 7/12 years	+	Acute	3	8	Nil	Nil	Scotland (Lowland)
20,264	23	14 years	+	Insidious	3	5	3	Nil	Scotland (Lowland)
19,356	23	15 years	-	Insidious	2	4	1	Nil	Scotland (Lowland)
44,349	25	3 years	+	Insidious	1	2	1	Nil	England
43,929	23	2 1 years	-	Insidious	2	5	Nil	Nil	Scotland (Lowland)
45,969	16	1 1/2 years	-	Insidious	2	8	Nil	Nil	Scotland (Lowland)
44,801	27	1 1/2 years	+	Insidious	2	4	1	Nil	Ireland
46,284	30	3 1/2 years	+	Insidious	2	3	Nil	Nil	Scotland (Lowland)
43,925	24	2 2 years	+	Acute	1	4	Nil	Nil	Scotland (Lowland)
44,335	29	3 2/12 years	+	Acute	2	5	Nil	Nil	Scotland (Lowland)

Ref.No.	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute.	No.of Rooms.	Total Inmates	Positive Contacts in House		Birthplace of Father
							Prior	Subsequent	
1932									
44,348	20	2 years	+	Insidious	1	6	1	Nil	Scotland (Lowland)
45,531	27	2 years	+	Insidious	2	4	1	1	Scotland (Lowland)
43,869	17	2 9/12 yrs.	+	Acute	2	8	1	Nil	Scotland (Lowland)
46,319	24	1 1/12 yrs.	+	Insidious	1	3	Nil	Nil	Scotland (Lowland)
39,641	19	5 years	+	Insidious	5	11	Nil	1	Italy
44,760	20	2 4/12 yrs.	+	Insidious	2	6	2	1	Scotland (Lowland)
43,926	15	2 1/12 yrs.	+	Acute	1	5	1	Nil	Scotland (Lowland)
42,151	22	3 1/12 yrs.	+	Insidious	2	3	3	Nil	Scotland (Lowland)
42,484	17	3 3/12 yrs.	+	Acute	2	4	Nil	Nil	Ireland
22,473	15	14 years	+	Insidious	1	5	Nil	Nil	Scotland (Lowland)
39,624	20	4 4/12 yrs.	+	Insidious	2	5	1	Nil	Ireland
37,953	20	6 3/12 yrs.	+	Insidious	2	4	1	Nil	Scotland (Lowland)
39,589	18	5 years	+	Insidious	3	7	Nil	Nil	Scotland (Lowland)

Ref.No	Age	Duration of Illness from Date of Sickening	Sputum	Mode of Onset - Insidious or Acute.	No.of Rooms.	Total Inmates	Positive Contact in House		Birthplace of Father.
							Prior	Subsequent.	
1932.									
40,864	19	4 9/12 yrs.	+	Insidious	3	7	1	Nil	Scotland (Lowland)
38,969	26	6 1/12 yrs.	+	Insidious	2	4	Nil	Nil	Scotland (Lowland)
23,232	20	2 years	-	Insidious	3	4	Nil	Nil	Scotland (Lowland)
35,833	24	7 5/12 yrs.	+	Acute	1	5	Nil	Nil	Ireland
41,709	18	4 years	+	Insidious	3	6	2	Nil	Scotland (Lowland)
47,447	22	1 10/12 yrs	+	Unknown	1	2	Nil	Nil	Ireland
43,468	27	3 1/12 yrs	+	Insidious	2	6	Nil	Nil	Scotland (Lowland)
40,909	28	4 3/12 yrs.	+	Acute	2	4	Nil	Nil	Scotland (Lowland)
10,714	18	1 1/12 yrs.	+	Insidious	2	10	2	Nil	Scotland (East Coast)
42,458	30	3 1/12 yrs	+	Insidious	2	2	Nil	Nil	Scotland (Lowland)
6,296	17	4 1/12 yrs	+	Insidious	2	5	1	Nil	Scotland (Lowland)
44, 276	16	2 9/12 yrs.	+	Acute	2	6	Nil	1	Scotland (Lowland)
43,139	24	5 1/12 yrs.	+	Acute	2	6	Nil	Nil	England.

APPENDIX NO. 1

PREFACE TO APPENDIX 4.

The following table has been compiled using the method employed by Professor A.L. Bowley, and the scale by which the number of "equivalent male adults" is calculated is that drawn up by Cathcart,[38] which gives the undernoted relative values.

Adult Male Caloric Requirements taken as 100.

Males aged 20 or over	= 100	Females aged 18 or over	= 83
" 14-18	= 100	" 14-18	= 83
" 12	= 90	" 12	= 90
" 10	= 80	" 10	= 80
" 6	= 60	" 6	= 60
" 5	= 40	" 5	= 40
" 3	= 30	" 3	= 30
Under 3	= 20	Under 3	= 20

For convenience the following symbols have been used.

Rent,..... R.

Clothing,..... C.

Fuel,..... F.

Household Sundries,H.

Insurance, ... I.

Travelling,..... T.

Equivalent Male Adults,..... E.

The Residual Income is the amount left over for food after all other expenses have been deducted.

ACUTE MALES.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1928												
39627	45	8/4	8/7	3/-	2/4	1/7	1/-	8	6.8	20/2	3/1	Male adult employed.
40433	45	8/-	8/7	3/-	2/4	-	-	8	6.1	23/1	3/10	Public Assistance.
40353	67	8/3	5/10	3/-	1/6	2/4	2/-	5	4.5	44/1	9/10	One male and one female employed.
40877	63/10	6/8	8/10	3/-	2/4	2/10	2/-	8	6.0	38/2	6/4	One male and one female working.
40918	45	7/1	8/10	3/-	2/4	1/3	1/-	8	6.8	21/6	3/2	Young girl employed. Remainder on unemployment roll.
41165	63	4/5	3/6	3/-	11	2/10	2/-	3	2.8	46/4	16/5	Two male adults employed.
41172	45	5/3	2/4	3/-	7	1/7	1/-	2	1.8	31/3	17/4	One male adult employed.
41198	30	6/9	5/10	3/-	1/6	-	-	5	4.2	12/11	3/1	Public Assistance.
40939	140	17/6	5/10	3/-	1/6	2/10	2/-	5	4.6	107/4	23/4	One male and one female employed.
1929												
42162	120/6	10/6	5/10	3/-	1/6	3/2	2/-	5	4.8	94/6	19/7	Two male adults employed.
41735	30	4/6	3/1	3/-	11	-	-	3	2	18/6	9/3	Unemployment money.
42171	26	3/8	3/1	3/-	11	-	-	3	2.1	15/4	7/4	Public Assistance.
41744	180	8/6	10/-	3/-	2/8	7/1	5/-	9	7.8	143/9	18/6	Four or five adults employed.
41714	100	9/-	7/8	3/-	2/1	4/7	3/-	7	6.2	79/8	12/10	Two male adults and one female employed
42168	38	8/-	7/-	3/-	2/1	-	-	7	5.8	17/11	3/1	Public Assistance.
41719	25	7/3	3/-	3/-	11	-	-	3	2.0	10/10	5/5	Unemployment money.
41725	60	8/3	6/5	3/-	2/1	1/7	1/-	7	5.5	37/8	6/10	One male employed.
41653	42	7/1	6/8	3/-	1/9	2/8	2/-	6	5.2	18/10	3/7	One male and one female adult employed.
41736	35	4/6	4/5	3/-	1/2	-	-	4	3.7	21/11	5/11	Unemployment money.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
41747	110	12/-	7/-	3/-	1/9	2/10	2/-	6	5.2	81/5	15/8	One male and one female adult employed.
41713	25	4/6	3/3	3/-	11	-	-	3	2.5	13/4	5/4	Public Assistance.
41726	60	7/11	9/6	3/-	2/8	4/1	3/-	9	7.8	29/10	3/10	One male and two female adults employed.
1930												
43516	45	8/3	2/4	3/-	7	1/7	1/-	2	1.8	28/3	15/8	One male adult employed.
43539	27/3	5/10	5/4	3/-	1/6	-	-	5	4.2	11/7	2/9	Unemployment money.
44350	80	8/6	8/10	3/-	2/4	4/1	3/-	8	6.3	50/3	8/-	One male and two female adults employed.
44331	96	10/-	6/-	3/-	1/9	1/7	1/-	5	4.9	72/8	14/8	One male adult employed.
1931												
44837	40	4/3	7/-	3/-	1/9	1/3	1/-	6	5.6	21/9	3/11	Only young girl employed. Residue from Labour Exchange.
44795	50	4/3	7/5	3/-	2/1	1/7	1/-	7	5.4	30/8	5/8	One male adult employed.
44814	40	6/6	6/6	3/-	1/9	2/10	2/-	6	5.4	17/3	3/2	One male and one female employed.
45504	34	8/3	5/1	3/-	1/6	-	-	5	2.6	16/2	6/3	Unemployment money.
15691	100	17/-	5/7	3/-	1/6	1/7	1/-	5	4.2	70/4	16/9	One male adult employed.
45525	23/3	5/-	3/6	3/-	11	-	-	3	2.6	10/10	4/2	Public Assistance.
44833	70	4/-	7/11	3/-	2/1	2/8	2/-	7	6.6	48/4	7/4	One male and one female employed.
45974	30	6/-	4/2	3/-	1/2	-	-	4	2.2	15/8	7/1	Unemployment Exchange.
45528	60	9/-	3/3	3/-	11	1/7	1/-	3	2.0	41/3	20/8	One male adult employed.
45508	50	7/-	6/6	3/-	1/9	2/10	2/-	6	5.6	26/11	4/10	One male and one female adult employed.
46260	75	11/3	5/10	3/-	1/6	4/1	3/-	5	4.6	46/4	10/-	One male and two female adults employed
46303	36/10	4/10	2/4	3/-	7	1/7	1/-	2	1.8	23/6	13/1	One male adult employed.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
45999	50	8/-	7/-	3/-	1/9	-	-	6	5.4	30/3	5/7	Unemployment Exchange.
46255	50/3	5/10	5/7	3/-	1/6	2/6	2/-	5	4.3	29/10	6/11	Two female adults employed.
46042	130	16/8	5/10	3/-	1/6	3/2	2/-	5	4.4	97/10	22/3	Two male adults employed.
46851	110	15/-	3/6	3/-	11	3/2	2/-	3	2.8	82/5	29/6	Two male adults employed.
1932												
46883	38	4/6	3/6	3/-	11	1/7	1/-	3	2.6	23/6	9/1	One male adult employed.
46925	80	7/-	5/10	3/-	1/6	3/2	2/-	5	4.8	57/6	12/-	Two male adults employed.
46946	60	7/6	10/-	3/-	2/8	1/7	1/-	9	7.2	34/3	4/9	One male adult employed.
46896	69	8/6	7/-	3/-	1/9	2/10	2/-	6	5.4	43/11	8/2	One male and one female adult employed.
46948	160	25/-	4/8	3/-	11	-	2/-	4	3.8	124/5	32/7	Own business. Comfortable circumstances.
47360	60	7/-	4/8	3/-	1/2	3/2	2/-	4	3.8	39/-	10/4	Two male adults employed.
48358	48/3	7/10	7/5	3/-	2/1	1/7	1/-	7	6.4	25/4	3/11	One male adult employed.
16042	50/-	6/3	4/8	3/-	1/2	1/7	1/-	4	3.8	32/4	8/6	One male adult employed.
48393	50/-	7/6	7/5	3/-	2/1	2/10	2/-	7	5.2	25/2	4/10	One male and one female adult employed.
47438	28/-	6/-	6/6	3/-	1/9	-	-	6	4.8	16/9	3/6	Public Assistance.
46942	45	8/9	5/10	3/-	1/6	-	-	5	4.8	25/11	5/5	Unemployment Exchange.

ACUTE FEMALES.

Regd. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1928												
39730	65	8/-	7/11	3/-	2/1	1/7	1/-	7	5.8	41/5	7/2	One male adult employed.
39629	50	8/-	7/-	3/-	1/9	1/7	1/-	6	5.0	27/8	5/6	One male adult employed.
40449	46	7/8	9/9	3/-	2/8	1/3	1/-	9	7.0	20/8	2/11	One young female working - remainder on Unemployment Exchange.
40886	100	6/3	4/8	3/-	1/2	4/7	3/-	4	3.6	77/4	21/6	Two males and one female employed.
40923	26	4/8	2/4	3/-	7	-	-	2	1.8	15/5	8/7	Unemployment Exchange.
40417	27	5/3	4/5	3/-	1/2	-	-	4	3.4	13/2	3/10	Public Assistance.
1929												
41700	120	8/3	10/-	3/-	2/8	4/7	3/-	9	7.8	88/6	11/4	Two male and one female adults employed.
41683	35	4/8	4/8	3/-	2/1	-	-	7	5.2	20/7	4/-	Public Assistance - clothes from Education Authority.
41739	30	6/1	4/8	3/-	1/2	-	-	4	3.8	15/1	4/-	Public Assistance.
42203	35	5/-	5/4	3/-	1/6	-	-	5	4.4	20/2	4/7	Unemployed.
42174	80	6/6	5/10	3/-	1/6	3/2	2/-	5	4.4	58/-	13/3	Two male adults employed.
42214	60	9/3	7/11	3/-	2/1	1/7	1/-	7	6.2	35/2	5/8	One male adult employed.
42468	70	10/-	4/2	3/-	1/2	1/7	1/-	4	2.3	49/1	21/4	One male adult employed.
42198	120	10/-	5/1	3/-	1/6	1/7	1/-	5	3.0	97/10	32/7	One male adult employed.
42494	60	9/-	9/9	3/-	2/8	2/10	2/-	9	6.7	30/9	4/7	One male and one female employed.
43057	60	6/8	7/11	3/-	2/1	2/10	2/-	7	5.8	35/6	6/2	One male and one female employed.
42487	33	7/-	4/5	3/-	1/2	1/7	1/-	4	3.0	14/10	4/11	One male adult employed.
42462	90	5/6	7/8	3/-	2/1	3/2	2/-	7	5.3	66/7	12/10	Two male adults employed.

Regd. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1930												
43515	55	8/6	5/7	3/-	1/6	2/10	2/-	5	3.7	31/7	8/6	One male and one female adult employed.
43543	50	7/-	5/7	3/-	1/6	1/7	1/-	5	4.0	30/4	7/7	One male adult employed.
43535	60	7/-	12/-	3/-	3/6	2/10	2/-	12	7.6	29/8	3/11	One male and one female adult employed.
44263	32/6	5/10	2/4	3/-	1/9	-	-	6	3.6	19/7	5/5	Public Assistance - clothes from Education Authority.
44322	75	9/-	5/7	3/-	1/6	3/2	2/-	5	4.0	50/9	12/8	Two male adults employed.
43942	60	7/6	4/5	3/-	1/2	1/7	1/-	4	2.8	41/4	14/9	One male adult employed.
44333	64/4	7/6	3/3	3/-	11	1/7	1/-	3	2.3	47/1	20/6	One male adult employed.
1931												
44803	50	4/3	7/5	3/-	2/1	1/3	1/-	7	5.3	31/-	5/10	One adult female employed.
45469	39/3	6/-	5/4	3/-	1/6	1/3	1/-	5	3.9	21/2	5/5	One young female employed. Remainder unemployed.
45503	25	5/-	3/3	3/-	11	-	-	3	2.0	12/10	6/5	Unemployment Exchange.
45992	47	6/6	8/7	3/-	2/4	1/7	1/-	8	6.4	24/-	3/9	One male adult employed.
45978	160	15/-	5/10	3/-	1/6	1/3	1/-	5	4.3	132/5	30/9	Father has own business - one female employed.
45995	46/7	6/10	8/10	3/-	2/4	1/7	1/-	8	7.0	23/-	3/3	One male adult employed.
45460	70	6/6	7/-	3/-	1/9	3/2	2/-	6	5.2	46/3	8/11	Two male adults employed.
46251	55	12/-	7/11	3/-	2/1	1/7	1/-	7	6.2	27/5	4/5	One male adult employed.
46330	90	16/-	8/2	3/-	2/1	4/1	3/-	7	6.2	53/8	8/8	One male adult and two females employed.
46331	65	8/9	7/-	3/-	1/9	2/10	2/-	6	5.4	39/8	7/4	One male and one female adult employed.
46264	63	8/9	8/-	3/-	2/-	-	-	11	8.0	41/3	5/2	Unemployed - Education Authority assists with clothes.

Regd. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1932												
46886	80	6/2	7/11	3/-	2/1	3/2	2/-	7	6.0	55/8	9/3	Two male adults employed.
46928	50	9/-	5/1	3/-	1/6	1/7	1/-	5	3.0	28/10	9/7	One male adult employed.
46300	51	6/8	5/4	3/-	1/6	1/3	1/-	5	3.8	32/3	8/6	One female adult employed.
47422	75	6/-	3/6	3/-	11	2/10	2/-	3	2.6	56/9	21/10	One male and one female adult employed.
46880	58	13/-	5/10	3/-	1/6	2/10	2/-	5	4.4	29/10	6/9	One male and one female adult employed.
47406	103	9/6	11/7	3/-	3/3	3/2	2/-	11	8.3	70/6	8/6	Two male adults employed.
47854	30	7/-	4/5	3/-	1/2	-	-	4	3.2	14/5	4/6	Public Assistance.
47373	86	7/-	10/6	3/-	2/7	4/1	3/-	9	8.2	55/10	6/10	One male and two female adults employed.
47425	46/6	7/-	7/-	3/-	1/9	2/6	2/-	6	5.0	23/3	4/8	Two female adults employed.
46936	52	7/6	6/6	3/-	1/9	1/7	1/-	6	5.0	30/8	6/2	One male adult employed.
47361	17/3	4/-	2/4	3/-	11	-	-	3	2.0	7/-	3/6	Public Assistance - extreme poverty - clothes for child from Welfare Clinic
46873	49	12/-	5/7	3/-	1/6	1/7	1/-	5	4.2	24/4	5/9	One male adult employed.
47378	40/7	10/-	3/6	3/-	11	1/7	1/-	3	2.6	20/7	7/11	One male adult employed.
48427	60	8/-	4/8	3/-	1/9	2/10	2/-	5	4.6	37/9	8/2	Two female adults employed - keep a lodger.

SUBACUTE MALES.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1928												
40887	50	5/3	7/-	3/-	1/9	2/10	2/-	6	5.2	28/2	5/5	One male and one female adult employed.
40381	48	4/10	3/6	3/-	11	1/7	1/-	3	2.8	33/2	11/10	One male adult employed.
40434	65	6/6	5/10	3/-	1/6	2/10	2/-	5	4.6	43/4	9/5	One male and one female adult employed.
39667	40	4/8	4/8	3/-	1/2	1/7	1/-	4	3.6	23/11	6/7	One male adult employed.
40944	75	8/5	6/6	3/-	1/9	4/5	3/-	6	5.2	47/11	9/3	One female and two male adults employed
40919	80	6/6	3/6	3/-	11	3/2	2/-	3	2.8	60/11	21/8	Two male adults employed.
39356	100	17/-	5/10	3/-	1/6	3/2	2/-	5	4.4	67/6	15/4	Two male adults employed.
38616	32	4/10	4/8	3/-	1/2	-	-	4	3.6	18/4	5/1	Public Assistance.
1929												
41693	62	8/3	5/10	3/-	1/6	4/1	3/-	5	4.4	36/4	8/3	One male and two female adults employed
40905	41	3/9	5/10	3/-	1/6	1/7	1/-	5	4.8	24/4	5/5	One male adult employed
42161	60	9/4	5/10	3/-	1/6	1/7	1/-	5	4.2	37/9	9/-	One male adult employed.
41234	62	7/6	5/10	3/-	1/6	3/2	2/-	5	4.4	38/10	8/10	Two male adults employed.
42239	60	6/6	5/10	3/-	1/6	2/10	2/-	5	4.4	38/4	8/9	One male and one female adult employed.
42497	50	8/-	6/6	3/-	1/9	1/7	1/-	6	4.4	28/2	6/5	One male adult employed.
40930	70	8/-	7/11	3/-	2/1	3/2	2/-	7	6.1	43/8	7/2	Two male adults employed.
43090	106	9/6	4/8	3/-	1/2	4/9	3/-	4	4	80/-	20/-	Three male adults employed.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1930												
43466	110	10/-	4/8	3/-	1/2	4/9	3/-	4	3.8	83/5	22/-	Three male adults employed.
43122	38	8/-	6/9	3/-	1/9	-	-	6	5.4	18/6	3/5	Unemployment Exchange.
43088	92	11/3	7/-	3/-	1/9	4/7	3/-	6	5.4	61/5	11/4	Two male and one female adult employed.
44797	60	9/10	3/3	3/-	11	1/7	1/-	3	2.0	40/5	20/3	One male adult employed.
44302	65	10/-	2/4	3/-	7	1/7	1/-	2	1.8	46/6	25/10	One male adult employed.
43884	60	5/3	3/6	3/-	11	4/5	3/-	3	2.8	39/11	14/3	Two male and one female adult employed.
43474	170	11/8	10/6	3/-	3/6	-	-	10	9.0	141/4	15/8	Own business.
43494	38	4/11	4/8	3/-	1/2	1/7	1/-	4	3.8	21/8	5/8	One male adult employed.
41686	25	8/6	3/6	3/-	11	-	-	3	2.6	9/1	3/6	Unemployment Exchange.
42499	60	5/6	3/3	3/-	11	1/7	1/-	3	2.0	44/9	22/5	One male adult employed.
42461	54	11/6	8/2	3/-	2/1	3/2	2/-	7	6.6	24/1	3/7	Two male adults employed.
44255	50	8/4	7/11	3/-	2/1	1/7	1/-	7	5.6	26/1	4/8	One male adult employed.
43130	60	10/-	7/2	3/-	2/1	3/2	2/-	7	4.6	32/5	7/1	Two male adults employed.
43498	120	15/-	4/8	3/-	1/2	2/10	2/-	4	3.6	91/4	25/4	One male and one female adult employed.
1931												
43903	30	6/6	5/4	3/-	1/6	-	-	5	3.0	13/8	4/7	Unemployment Exchange.
43947	59	8/9	8/10	3/-	2/4	2/6	2/-	8	6.8	31/7	4/8	Two female adults employed.
44269	65	10/-	4/8	3/-	1/2	3/2	2/-	4	3.8	41/-	10/9	Two male adults employed.
44812	65	8/10	4/8	3/-	1/2	3/2	2/-	4	3.6	42/2	11/8	Two male adults employed.
44786	105	15/-	8/2	3/-	2/1	1/3	1/-	7	5.8	73/6	12/6	Tailor's business - no poverty.
45963	43	8/-	5/10	3/-	1/6	2/10	2/-	5	4.6	19/10	4/4	One male and one female adult employed.
44283	60	8/3	3/6	3/-	11	1/7	1/-	3	3.0	41/9	13/11	One male adult employed.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1932												
46920	62	7/10	9/1	3/-	2/4	2/10	2/-	8	6.8	34/11	5/2	One male and one female adult employed.
46904	40	7/4	4/8	3/-	1/2	1/7	1/-	4	3.6	21/3	5/11	One male adult employed.
46929	35	6/1	3/6	3/-	11	1/7	1/-	3	2.6	18/11	7/3	One male adult employed.
47914	100	15/-	7/-	3/-	1/9	3/2	2/-	6	5.4	67/9	12/7	Two male adults employed.
47875	23	7/6	2/4	3/-	7	-	-	2	1.8	9/7	5/4	Public Assistance.
45511	100	8/6	3/6	3/-	11	3/2	2/-	3	2.6	78/11	30/4	Two male adults employed.
46012	60	9/1	7/-	3/-	2/1	2/10	2/-	7	6.2	34/-	5/6	One male and one female adult employed.
46943	62	4/6	8/7	3/-	2/4	2/10	2/-	8	6.0	38/9	6/6	One male and one female adult employed
45480	60	8/3	7/11	3/-	2/1	2/10	2/-	7	5.6	34/-	6/5	One male and one female adult employed
46345	51	8/5	4/8	3/-	1/2	3/2	2/-	4	3.6	28/7	7/11	Two male adults employed.
48365	40	7/10	4/8	3/-	1/2	1/7	1/-	4	3.6	20/9	5/6	One male adult employed.

SUBACUTE FEMALES.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1928												
40358	29	6/-	2/4	3/-	1/6	-	-	5	3.0	16/2	5/5	Public Assistance.
39402	41	6/10	4/8	3/-	1/2	1/7	1/-	4	3.6	18/3	5/1	One male employed.
39632	28	7/3	3/6	3/-	1/6	-	-	5	3.2	12/9	4/-	Public Assistance. Clothes for children from welfare clinic.
39660	65	8/-	7/11	3/-	2/1	2/10	2/-	7	6.0	39/2	6/6	One male and one female employed.
39412	85	6/1	5/7	3/-	1/6	2/10	2/-	5	3.8	64/-	16/10	One male and one female employed.
40414	33	7/3	2/10	3/-	2/1	-	-	7	5.2	17/10	3/5	Public Assistance. Also assisted with clothes.
40942	62	7/6	9/4	3/-	2/4	2/10	2/-	8	7.0	35/-	5/-	One male and one female employed.
40419	47	7/6	7/8	3/-	2/1	2/10	2/-	7	6.0	21/11	3/2	One male and one female employed.
1929												
42199	72	9/-	9/3	3/-	2/8	2/10	2/-	9	7.2	43/3	6/-	One male and one female adult employed.
41729	26	4/6	2/4	3/-	1/2	-	-	4	2.2	15/-	6/10	Public Assistance. Clothes for children from welfare clinic.
41161	35	4/10	5/10	3/-	1/6	-	-	5	4.6	19/10	4/4	Unemployment Exchange.
38955	45	8/-	6/2	3/-	1/9	1/7	1/-	6	4.5	23/6	5/3	One male adult employed.
40857	122	10/10	10/6	3/-	2/8	4/7	3/-	9	8.0	87/5	10/11	Two male and one female adults employed.
39434	120	8/5	9/1	3/-	2/4	4/1	3/-	8	6.6	90/1	13/8	Two female and one male adults employed.
39593	56	8/5	7/5	3/-	2/1	2/10	2/-	7	5.0	30/3	6/1	One male and one female employed.
42509	53	8/9	3/6	3/-	11	1/7	1/-	3	2.6	34/3	13/2	One male employed.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1930												
42479	65	9/6	5/10	3/-	1/6	2/10	2/-	5	4.4	40/4	9/2	One male and one female adult employed.
43094	56	3/9	3/3	3/-	11	1/7	1/-	3	2.2	42/6	19/2	One male adult employed.
42493	45	8/-	3/6	3/-	11	1/7	1/-	3	2.6	27/-	10/5	One male adult employed.
42508	76	9/6	4/8	3/-	1/2	2/10	2/-	4	3.6	52/10	14/7	One male and one female adult employed.
43132	50	8/-	4/8	3/-	1/2	1/7	1/-	4	3.6	30/7	8/6	One male adult employed.
43106	60	8/-	8/10	3/-	2/4	1/7	1/-	8	6.0	35/3	5/11	One male adult employed.
1931												
43920	60	9/6	7/-	3/-	1/9	3/2	2/-	6	5.4	33/7	6/2	Two male adults employed.
43937	80	13/2	5/10	3/-	1/6	3/2	2/-	5	4.4	51/4	11/7	Two male adults employed.
45461	24/6	4/6	2/4	3/-	1/2	-	-	4	3.0	13/6	4/6	Public Assistance. Assistance with clothes also given.
43878	100	15/-	4/8	3/-	1/2	2/10	2/-	4	3.6	71/4	19/10	One male and one female adult employed.
46014	40	6/6	4/5	3/-	1/2	1/7	1/-	4	2.8	22/4	8/-	One male adult employed.
43886	40	7/3	5/4	3/-	1/6	1/7	1/-	5	3.6	20/4	5/8	One male adult employed.
44337	80	7/3	7/11	3/-	2/1	3/2	2/-	7	6.0	54/7	9/1	Two male adults employed.
46000	35	7/-	3/6	3/-	1/9	-	-	6	3.8	19/9	5/2	Public Assistance. Children's clothes from Education Authority.
45510	35	7/3	4/5	3/-	1/6	-	-	5	3.4	18/10	5/6	Unemployed. Clothes for child supplied by Education Authority.
45453	31/1	4/6	2/4	3/-	7	1/7	1/-	2	1.8	18/1	10/-	One male adult employed.
1932												
46313	25/3	6/3	2/4	3/-	7	-	-	3	2.0	13/1	6/7	Public Assistance.
45957	60/-	6/6	6/9	3/-	1/9	3/2	2/-	6	5.0	36/10	7/4	Two male adults working.
44785	40/-	6/3	5/10	3/-	1/6	1/7	1/-	5	4.4	20/10	4/9	Father employed.
46011	100	7/6	7/8	3/-	2/1	3/2	2/-	7	5.5	74/7	13/6	Two male adults working.
45474	70	5/-	9/3	3/-	2/8	1/7	1/-	9	6.0	47/6	7/11	Father employed.

Reg. No.	Total Income in Shillings	R.	C.	F.	H.	I.	T.	Total No. of Inmates	E.	Residual Income	Average per Male Adult	Source of Income with Details
1932 (Contd.)												
47922	50	7/-	6/6	3/-	1/9	1/7	1/-	6	4.6	29/2	6/4	Father employed.
46939	40	7/6	4/5	3/-	1/2	1/7	1/-	4	3.0	21/4	7/1	Male adult employed.
46293	35	6/6	3/6	3/-	11	1/7	1/-	3	2.6	18/6	7/1	Male adult employed.
45983	65	7/-	6/3	3/-	1/9	1/7	1/-	6	4.0	44/5	11/1	Male adult employed.
45539	40	5/10	4/10	3/-	2/6	-	-	9	5.5	23/10	4/4	Parish Relief. Children clothed by Education Authority.
47896	26	7/-	4/5	3/-	1/2	-	-	4	3.0	10/5	3/6	Public Assistance.
47356	50	8/-	7/8	3/-	2/1	1/7	1/-	7	5.5	26/8	4/10	Male adult employed.
45519	40	9/-	4/8	3/-	1/2	1/7	1/-	4	3.6	19/7	5/5	Male adult employed.
46344	40	4/-	3/3	3/-	11	1/7	1/-	3	2.0	26/3	13/2	Male adult employed.
46859	27/3	7/-	4/2	3/-	1/2	-	-	4	2.4	11/11	5/-	Public Assistance.
47951	28/-	5/9	5/10	3/-	1/6	-	-	5	4.4	11/11	2/9	Public Assistance.
47872	30/-	5/3	6/8	3/-	1/9	-	-	6	3.8	13/4	3/6	Public Assistance. No help from any outside source.

B I B L I O G R A P H Y.

1. Census of Scotland, 1931. Vol.I, Part 2, City of Glasgow. Table 29.

2. "The Health of Glasgow, 1818-1925". An outline by A.K. Chalmers. Chapter III.

3. Report of the Medical Officer of Health, City of Glasgow, 1932.

4. "The Age-Factor in the Incidence of Tuberculosis" - J.A. Wilson. Report of the Medical Officer of Health, City of Glasgow, 1926.

5. "Tuberculosis in Girls and Young Women" - Lloyd Arnold. The American Review of Tuberculosis. Vol. XXVIII. August 1933.

6. Opie, E.L., and McPhedran, F.M: "Exogenous Tuberculous Infection of Adults: "Marital Tuberculosis", Arch.Int.Med., 50:945 (Dec) 1932.

7. A special report made by the Registrar-General at the request of the Medical Officer of Health, Glasgow. (Not included in official volumes.)

8. "The House as a Contributory Factor in the Death Rate". A.K. Chalmers. Proc. Roy. Soc.Med. Lond., April 1913.

9. "Environment and Tuberculosis: Housing". R.J. Peters. Transactions of the Nineteenth Annual Conference. National Association for the Prevention of Tuberculosis. July,1933.

10. Proceedings of the Royal Society of Medicine. Section of Epidemiology and the State Medicine, Vol 26. No.2. April 1933.

11. Report of the Medical Officer of Health of the City of Glasgow, 1905. "Results of an Enquiry into the Social and Sanitary Conditions of Certain Cases of Phthisis".

12. "The Influence of Environment in Relation to the Pathogenesis of Tuberculosis." W.T. Munro. Transactions of the Nineteenth Annual Conference, National Association for the Prevention of Tuberculosis. July, 1933

13. "An Investigation into the Epidemiology of Phthisis in Great Britain and Ireland". Medical Research Committee - Special Report Series, No.146, Page.7.

14. "Pulmonary Tuberculosis in Childhood", F.J. Bentley, Lancet. March 26, 1932. CCXXII. 689.

15. "The Fate of Young Children in Tuberculous Households". G. Lissant Cox. Tubercle. August, 1929. Vol.X. No.11

16. A Manual of Medicine, T.K. Monro, Page 109.

17. "Causal Factors in Tuberculosis". F.C.S. Bradbury, Chapters VIII and XI.

18. "Pulmonary Tuberculosis" - Maurice Fishberg, Chapter 21.

19. "Recent Advances in Radiology" - Peter Kerley, Page 165.

20. The Annual Report of the Chief Medical Officer of the Ministry of Health, 1923, Page 132 - "The Effects of the Blockade in Prussia.

21. "Economics and Tuberculosis" - R.J. Ewart, 1923. Proc.Roy.Soc.Med., XVI.2. (Epidemiological Section). 1-18. 228-9.

22. "The Principles of Epidemiology", - C.O. Stallybrass, 1931. Page 228.

23. The Lancet. Nov.1, 1919. Page 813. L.S.T. Burrell.

24. "New Survey of London Life and Labour", Vol.III Chap.V., Social Survey, 1-Eastern Area, 1932.

25. "Life and Labour" - Charles Booth.

26. "Poverty. A Study of Town Life". B.S. Rowntree, 1902, Chapters 3 and 4.

27. "Has Poverty Diminished?" A sequel to "Livelihood and Poverty". A.L. Bowley and Margaret H. Hogg.

28. Report of the Committee on Nutrition. Supplement to the British Medical Journal, Nov.25, 1933.

29. Goldberg: American Journal Med.Science, 1930 CLXXX 824.

30. "The Primary Lung Focus of Tuberculosis in Children. A. Ghon. Translated by D. Barty King, Lond., 1916, 8 Vo.

31. Primary Pulmonary Tuberculosis in Children". R.G. Canti. The Quarterly Journal of Medicine, Vol.13. No.49. 1919-1920.

32. "The Value of Tuberculin Tests in Man" (with special reference to the Intracutaneous Test). P.D'Arcy Hart - Medical Research Council, Special Report Series, No.164.

33. "Recent Developments in our Knowledge of Tuberculosis", - J. Arthur Myers. The American Review of Tuberculosis, February, 1933 Vol. XXVII. Page 125.

34. Manning, J.B., and Knott, H.J.1915. Amer.Journal Diseases Child., 10,354.

35. Opie, E.L. and McPhedran, F.M., 1926, Amer. Review Tuberc., 14,347.

36. An Account of this Investigation is given in a paper by Schlesinger and Hart (1930) Arch. Dis.Child., Lond., 5,191.

37. Leroy Gardiner, American Review of Tuberculosis, October, 1930.

38. Medical Research Council Special Report No.151, 1931.