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MEDICAL  
COUNTY  
NO

**PREVENTION AND TREATMENT  
OF TUBERCULOSIS IN THE  
ADMINISTRATIVE COUNTY OF LANCASTER.**

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Report of the Central Tuberculosis Officer  
of the Lancashire County Council  
for the Year 1932.

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*C. Tinling & Co. Ltd., Liverpool, London and Prescott.*

1933.





# PREVENTION AND TREATMENT OF TUBERCULOSIS IN THE ADMINISTRATIVE COUNTY OF LANCASTER.

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# COUNTY TUBERCULOSIS COMMITTEE

(1933).

The Chairman of the County Council :

†Sir James T. Travis-Clegg, J.P., D.L.

The Vice-Chairman of the County Council :

\*†W. Hodgson, Esq., J.P.

*Chairman of Committee :*

\*†C. J. Trimble, Esq., C.B., C.M.G., L.R.C.P., D.P.H., J.P., D.L.

*Vice-Chairman :*

\*E. Boothman, Esq., J.P.

## COUNTY ALDERMEN—

J. C. Beckitt, Esq., M.R.C.S.,  
L.R.C.P., D.P.H.

A. S. Bury, Esq., J.P.

## COUNTY COUNCILLORS—

\*B. P. Allen, Esq., J.P.

L. Allen, Esq., J.P.

J. W. Baron, Esq., J.P.

W. R. Boydell, Esq., J.P.

H. Bright, Esq.

E. Clegg, Esq.

W. T. Jackson, Esq., J.P.

H. F. Jeffery, Esq., M.B., Ch.B.,  
J.P.

\*A. Kenyon, Esq.

\*Rev. A. Kershaw, M.A.

W. J. Lucas, Esq., J.P.,

F.I.O.B.

\*P. F. Mannix, Esq., M.D., M.Ch.,

B.A.O., J.P.

\*Rev. A. M. Mitchell, M.A.

N. Worsley, Esq., J.P.

\* Members of the Sanatorium and Hospital Sub-Committee.

† County Aldermen.

## MEDICAL AND NURSING STAFF OF THE TUBERCULOSIS DEPARTMENT, 1933.

G. Lissant Cox, M.A., M.D. (Camb.), M.R.C.S. (Eng.), L.R.C.P. (Lond.),  
Central Tuberculosis Officer.

### STAFF OF THE DISPENSARY AREAS AND COUNTY SANATORIA AND HOSPITALS.

#### *Area No. 1. (Population 266,831).*

(Lancaster, Morecambe and Heysham, Lytham St. Annes, Garstang Rural (part),  
Preston Rural, Walton-le-Dale, Chorley, and Horwich districts).

Consultant Tuberculosis Officer and Visiting Physician, Lancaster  
Pulmonary Hospital—Alan D. Brunwin, M.A., M.D., B.Ch.,  
(Camb.), D.P.H. (Aberdeen). [N.B.—The Lancaster Hospital is now in  
course of erection.]

Assistant Tuberculosis Officer—George H. Leigh, M.D., Ch.B.,  
D.P.H. (Manch.).

#### *Area No. 2. (Population 341,101).*

(Clitheroe, Colne, Nelson, Burnley Rural, Blackburn Rural, Accrington,  
Darwen, Haslingden, Rawtenstall, and Bacup districts).

Consultant Tuberculosis Officer and Visiting Medical Superintendent,  
Withnell Pulmonary Hospital—Burgess MacPhee, M.B., Ch.B.  
(Glas.), D.P.H. (Camb.).

Assistant Tuberculosis Officers—Scott C. Adam, M.B., Ch.B.  
(Glas.), D.P.H. (Lond.), and F. C. S. Bradbury, M.D., B.Ch.,  
B.A.O. (Belfast), B.Hy., D.P.H. (Durham).

#### *Area No. 3. (Population 374,490).*

(Ramsbottom, Littleborough, Radcliffe, Heywood, Crompton, Royton, Prestwich,  
Middleton, Chadderton, Failsworth, Ashton-under-Lyne, Mossley, and  
Denton districts).

Consultant Tuberculosis Officer and Visiting Medical Superintendent,  
Wolstenholme Pulmonary Hospital—George Fletcher, M.A., M.D.,  
(Glas.), M.R.C.P. (Lond.), D.P.H. (Camb.).

Assistant Tuberculosis Officers—Cecil Berry, L.R.C.P., L.R.C.S.  
(Edin.), L.R.F.P.S. (Glas.), D.P.H. (R.C.P.S.I.), and James L.  
Armour, M.B., Ch.B. (Liverpool), M.R.C.S. (Eng.), L.R.C.P.  
(Lond.).

#### *Area No. 4. (Population 354,134).*

(Westhoughton, Atherton, Farnworth, Leigh, Swinton and Pendlebury,  
Eccles, and Stretford districts).

Consultant Tuberculosis Officer and Visiting Medical Superintendent,  
Peel Hall Pulmonary Hospital—George Jessel, M.A., M.D.  
(Oxon.), D.P.H. (Manch.).

Assistant Tuberculosis Officers—Alexander B. Jamieson, M.B.,  
Ch.B. (Edin.), and Henry J. Villiers, L.R.C.P.I., L.R.C.S.I.

#### *Area No. 5. (Population 254,414).*

(West Lancashire Rural, Great Crosby, Waterloo-with-Seaforth, Newton-in-Maker-  
field, Whiston Rural, Warrington Rural, and Widnes districts).

Consultant Tuberculosis Officer and Visiting Medical Superintendent,  
Rufford Pulmonary Hospital—Charles W. Laird, B.A., M.D.  
(Dublin), D.P.H. (Liverpool).

Assistant Tuberculosis Officer—Charles H. Lilley, M.B., Ch.B.  
(St. Andrews), D.P.H. (Lond.).

*Furness Sub-Area.* (Population 38,487).

(Dalton-in-Furness, Grange-over-Sands, Ulverston, and Ulverston Rural districts).

Consultant Tuberculosis Officer and Medical Superintendent, High Carley Sanatorium—George Leggat, M.B., Ch.B., D.P.H. (Aberdeen).

*Fylde Sub-Area.* (Population 64,184).

(Fleetwood, Thornton Cleveleys, Fylde Rural, Garstang Rural (part), and Kirkham districts).

Consultant Tuberculosis Officer and Medical Superintendent, Elswick Sanatorium—G. Barker Charnock, L.R.C.P., L.R.C.S. (Edin.), L.R.F.P.S. (Glas.), D.P.H. (Liverpool).

*Wigan County Sub-Area.* (Population 109,059).

(Ashton-in-Makerfield, Hindley, Ince-in-Makerfield, and Wigan Rural districts).

Consultant Tuberculosis Officer and Medical Superintendent, Wrightington Hospital—E. H. Allon Pask, M.D. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.).

Assistant Tuberculosis Officer—J. Edgar Wallace, M.D., Ch.B. (Liverpool), M.R.C.S. (Eng.), L.R.C.P. (Lond.).

*High Carley Sanatorium and Oubas House Children's Sanatorium.*

Medical Superintendent and Consultant Tuberculosis Officer, Furness Dispensary Sub-Area—George Leggat, M.B., Ch.B., D.P.H. (Aberdeen).

Assistant Medical Superintendent—William Fettes, M.B., Ch.B., D.P.H. (Aberdeen).

*Elswick Sanatorium.*

Medical Superintendent and Consultant Tuberculosis Officer, Fylde Dispensary Sub-Area—G. Barker Charnock, L.R.C.P., L.R.C.S. (Edin.), L.R.F.P.S. (Glas.), D.P.H. (Liverpool).

*Wrightington Hospital.*

Medical Superintendent and Consultant Tuberculosis Officer, Wigan County Dispensary Sub-Area—E. H. Allon Pask, M.D. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.).

Assistant Medical Superintendent—E. H. W. Deane, M.B., B.S. (Melbourne).

Junior Assistant Medical Officer—D. I. A. Williams, M.B., Ch.B. (Liverpool). (Resigned 5. 10. 33).

*Chadderton Pulmonary Hospital.*

Visiting Medical Superintendent and Medical Officer of Health for the Chadderton Urban District—James Wood, M.D., Ch.B., D.P.H., R.C.P.S.I.

*Heath Charnock Pulmonary Hospital.*

Visiting Medical Superintendent and Medical Officer to the Chorley Joint Hospital Board—John W. Rigby, M.R.C.S. (Eng.), L.R.C.P. (Lond.).

*Withnell Pulmonary Hospital.**Wolstenholme Pulmonary Hospital.**Peel Hall Pulmonary Hospital.**Rufford Pulmonary Hospital.*

The Consultant Tuberculosis Officers of Dispensary Areas Nos. 2, 3, 4 and 5, respectively, are the Medical Superintendents of these Hospitals.

## CONSULTING SURGICAL STAFF.

T. P. McMurray, M.Ch., F.R.C.S. (Edin.), and  
Harry Platt, M.D. (Manch.), M.S. (Lond.), F.R.C.S. (Eng.).

Visiting Consulting Orthopædic Surgeons, Wrightington Hospital.

H. H. Bywater, M.D. (Manch.), D.Ch.O. (Liverpool), F.R.C.S. (Edin.),

Visiting Consulting Ophthalmic Surgeon, Wrightington Hospital.

H. Morrison Davies, M.D., M.Ch. (Camb.), F.R.C.S. (Eng.).

Visiting Consulting Chest Surgeon, Elswick and High Carley Sanatoria, and Peel Hall Pulmonary Hospital.

## VISITING DENTAL SURGEONS.

High Carley and Oubas House Sanatoria—Arthur Miller, L.D.S. (R.C.S., Eng.).

Elswick Sanatorium—Ronald Dunlop Allison, L.R.C.P., L.R.C.S. (Edin.), L.R.F.P.S. (Glas.), L.D.S. (R.C.S., Edin.).

Wrightington Hospital—John James Ward, L.D.S. (R.C.S., Eng.).

## TUBERCULOSIS HEALTH VISITORS.

Area No. 1.—L. Walker\*, J. Skelcher, F. D. Abbott\*, G. M. Hunter.

Area No. 2.—R. Lambert\*, A. Munro\*, M. Duggan\*, L. F. Norwood,  
E. Watterson, H. M. Alcock\*.

Area No. 3.—M. A. Potter, H. Dewsnap\*, I. F. Macdonald\*, C.  
Guilfoy\*, A. Flynn\*, W. Swift, M. Sherwen.

Area No. 4.—M. B. Jones, H. M. Shakespeare\*, F. G. Smith, A.  
Dickinson, I. M. Corfield, K. Blakemore, M. Gibson\*.

Area No. 5.—E. Walch, M. J. Wilson\*, A. Duncan, L. Farquhar\*,  
M. J. McKeown\*.

Furness Sub-Area.—E. A. Duston.

Fylde Sub-Area.—A. Tweedy\*.

Wigan County Sub-Area.—E. Walters\*, M. J. Evans.

\* Possesses a health visitor's or sanitary certificate.



## TUBERCULOSIS DEATH-RATES, 1901 TO 1932

The chart below shows the death-rates per thousand of the population from pulmonary and non-pulmonary tuberculosis in the County, and the favourable comparison with England and Wales:—



**REPORT**  
OF THE  
**CENTRAL TUBERCULOSIS OFFICER**  
FOR THE YEAR 1932.

---

*To the Chairman and Members of the  
Lancashire County Council.*

LADIES AND GENTLEMEN,

I have the honour to submit the nineteenth annual report on the work of the tuberculosis department, and in this introductory portion will give briefly some of the principal features of the work in 1932.

*Tuberculosis mortality and incidence.*

The death-rate from pulmonary tuberculosis (consumption) in 1932 is again the lowest on record; from 1923, with the exception of one year, there has been a continuous decline.

For non-pulmonary tuberculosis also, the deaths in 1932 are the lowest on record.

For all forms of tuberculosis, the total County deaths ten years ago were 1,751, and in 1932, 1,215.

The County death-rate from tuberculosis is still less than that for England and Wales, as it has always been. The experience in Lancashire may be compared with the death-rate from all forms of tuberculosis in other administrative counties with a population in the region of a million: Durham, 0.95; Essex, 0.68; Kent, 0.76; Middlesex, 0.67; Surrey, 0.60; West Riding of Yorkshire, 0.69. The Lancashire rate is 0.67, and England and Wales, 0.83.

The number of new cases is also declining slowly but steadily; there were 640 fewer in 1932 than in 1922.

*X-ray examinations and artificial pneumothorax treatment.*

X-ray examinations at the County dispensaries were 787 in 1922; in 1932, 8,499. Ten years ago artificial pneumothorax treatment was very sparingly given. Now, 15 to 20 per cent. of all cases entering the sanatoria and hospitals commence it during institutional treatment; many continue it at the dispensaries after they leave.

*Co-operation with medical practitioners, sanitary authorities,  
and health officials.*

The results of the tuberculosis scheme would be very different if the relations with the medical practitioners in the County, together with the sanitary authorities and their medical officers and sanitary inspectors, had not been of the most cordial and satisfactory character. I take this opportunity of acknowledging such co-operation from these sources. It was very satisfactory that 89 per cent. of new cases were sent *before notification* to the tuberculosis officers for an opinion as to diagnosis.

*Wrightington Hospital.*

The Wrightington Hospital, near Wigan, was formally opened by Sir George Newman, the Chief Medical Officer of the Ministry of Health, on the 16th June, 1933. Sir James Travis-Clegg, the Chairman of the County Council, presided at the opening ceremony, and Sir George delivered a brilliant address to a large number of guests. A report of the ceremony is printed on pages 116 to 120.

*Progress and future requirements in the tuberculosis scheme.*

*Eccles Dispensary.* The remainder of the rooms in 30, Gilda Brook Road, Eccles, have been taken on lease and their use in connection with the dispensary commenced in November, 1932. This has enabled the dispensary to be reorganised and provided more room and facilities for the examination and treatment of patients.

*Ulverston Dispensary.* New dispensary premises, 69, Albion Place, Lightburn Avenue, Ulverston, purchased by the County Council, were opened on the 13th March, 1933. Much better accommodation is now provided for the patients than in the old premises.

*Wolstenholme Pulmonary Hospital.* The arrangements for the provision of a pulmonary hospital in Dispensary Area No. 3 (south-east Lancashire) to be in charge of the consultant tuberculosis officer of that area have been completed since the last report. On the 1st July, 1933, the Wolstenholme Pulmonary Hospital was transferred by the Rochdale Corporation to the County Council. New buildings are now being constructed to provide 55 beds for male pulmonary cases. The contract for the work was signed on the 13th September, 1933. The existing accommodation for 45 male patients is still being used, partly for County and partly for Borough cases. On completion of the new work, 25 of the 55 beds will be leased to the Corporation.

*Springfield Pulmonary Hospital.* By an agreement with the Rochdale Corporation, 18 of 36 beds to be provided at Springfield House, Rochdale, by the Corporation will be available for County adult female patients suffering from pulmonary tuberculosis. The Corporation have accepted a tender for the necessary building work. The accommodation will be valuable for the treatment of County patients in south-east Lancashire.

*Aitken Sanatorium.* The Bury Joint Hospital Board have obtained the approval of the Ministry of Health to a loan for improving the facilities for treatment, accommodation, and maintenance of the patients at the Aitken Sanatorium, Holcombe Brook. The County Council have extended the lease with the Board until the 1st October, 1960, for the reservation of 50 beds at this sanatorium for County patients.

*Withnell Pulmonary Hospital.* The new treatment block adjoining the x-ray room was completed in March, 1933.

*Elswick Sanatorium.* The new treatment block adjoining the x-ray room was completed in June, 1933.

*Ashton-under-Lyne, Widnes and Oldham Dispensaries.* Better dispensary accommodation is still required at Ashton-under-Lyne, Widnes and Oldham. Efforts are being made to obtain more suitable premises.

#### *Death of Sir Robert Jones.*

It is with the greatest regret that I have to record the severe loss in regard to the tuberculosis scheme by the death on the 14th January, 1933, of Sir Robert Jones, Honorary Consulting Orthopædic Surgeon to the Wrightington Hospital.

#### *National Association for the Prevention of Tuberculosis.*

##### *Tyneside Inquiry.*

During 1932, Dr. F. C. S. Bradbury, assistant tuberculosis officer, was carrying out an investigation into the incidence of tuberculosis on Tyneside on behalf of the National Association for the Prevention of Tuberculosis, for which purpose he was given leave of absence by the County Tuberculosis Committee. Dr. Bradbury has now completed his special work and his report, entitled "Causal Factors in Tuberculosis," gives reasons for the high incidence of tuberculosis in Jarrow. It has received wide publicity and is a valuable statistical and sociological work.

*Visits of medical officers from other countries.*

I beg to report that the following visitors came to study the work of the County tuberculosis scheme :—

Dr. Hideo Terada, Tuberculosis Officer for the Kanagwa Province, Japan. Visited in June, 1933, Central Office ; Leigh, Eccles, and Seaforth Dispensaries ; High Carley Sanatorium ; Peel Hall and Rufford Pulmonary Hospitals ; and Wrightington Hospital.

Dr. P. P. Bhavnage, and Dr. M. S. Kavarana, Medical Officers attached to sanatoria of the Indian Government. Visited in July, 1933, Central Office ; Leigh, Eccles, and Wigan Dispensaries ; Peel Hall Pulmonary Hospital ; and Wrightington Hospital.

*Extent and cost of County scheme.*

The tuberculosis scheme covers the whole of the Administrative County, population 1,802,700 and acreage 1,048,363. The average number of beds in use is 975. There are 24 tuberculosis dispensaries owned or rented, and a total of 7,888 definite cases on the dispensary registers. The gross expenditure on tuberculosis services for 1933-34 is estimated at £196,856 less £5,550, income from various sources. Towards the expenditure there is now an amount included in the General Exchequer Grant receivable under the Local Government Act, 1929 ; it is not specifically allocated to the tuberculosis service but is a general credit to the County Fund. Previous to the passing of the Act the Government made an annual grant based upon 50 per cent. of the net approved expenditure ; for 1928-29 their grant amounted to £74,105.

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I have again to thank my medical colleagues and the nursing and clerical staffs for continued help. I have had very valuable help from my principal clerk, Mr. H. F. Hughes, especially in preparing this report, and have, in addition, to thank the Public Health Department for furnishing certain statistics on notifications and deaths.

I am,

Your obedient Servant,

G. LISSANT COX,

Central Tuberculosis Officer.

*County Offices, Preston.*

13th October, 1933.

## I.—TUBERCULOSIS INCIDENCE AND MORTALITY IN 1932.

The principal features of tuberculosis incidence and mortality in 1932 in the Administrative County, which contains an estimated population of 1,802,700, are as follow:—

1. The death-rate (0·54 per 1,000 of the population) from pulmonary tuberculosis in the County is the lowest on record, and is again, as in previous years, below the pulmonary rate (0·68) for England and Wales. (See frontispiece.)

2. There was a small reduction in the number of new pulmonary cases in 1932 compared with 1931. Each year since 1924 has shown a reduction, varying from 6 to 137, in the number of new cases. Comparing 1924 and 1932, the total reduction in the new pulmonary cases is 522.

3. The death-rate (0·13 per 1,000 of the population) from non-pulmonary tuberculosis is also the lowest on record. It is now much less than one-half of the rates recorded in 1913 and 1914. The rate for England and Wales is 0·15.

4. The number of new cases of non-pulmonary tuberculosis—853—reported during the year was also the lowest on record.

5. The saving in human life by the reduction in the County death-rate from all forms of tuberculosis is considerable; for example, if the death-rate for 1932 had been the same as in 1914 there would have been 2,145 deaths instead of the actual number of 1,213—a difference of 932.

6. Pulmonary tuberculosis is again more prevalent among males than females in regard to both cases and deaths. Allowing for the difference in the population of the sexes, for every 100 deaths of females in 1932 there were 137 deaths of males. For England and Wales the ratio for 1932 was 100 female deaths to 139 male deaths. Similarly, based on new cases, in 1932 for every 100 female notifications in the County there were 135 male notifications.

7. For females, the age-group 15–25 years has the largest number of deaths from pulmonary tuberculosis (see Table 2, page 3). The Chief Medical Officer of the Ministry of Health in his report for 1932 states that the “mortality in young adult females increased considerably during and after the war; it appears now to have declined to the level recorded in the immediate pre-war years”. In the Administrative County, however, the deaths of females in age-group 15–25 are well below those of the immediate pre-war years 1911–13.

8. With regard to non-pulmonary tuberculosis, the most striking decline has occurred in the age-group 0–5 years; in 1914 the deaths in this group totalled 286, whereas in 1932 there were only 72.

## NEW CASES OF TUBERCULOSIS.

The following Table 1 shows since 1918 the total number of new cases of pulmonary and non-pulmonary tuberculosis reported in each year; the case-rate for pulmonary tuberculosis is also given:—

Year	Pulmonary tuberculosis				Non-pulmonary tuberculosis		
	Cases notified ( <i>i.e.</i> , during life)	Cases reported at time of death only	Total known cases	Case-rate per 1,000 of population	Cases notified ( <i>i.e.</i> , during life)	Cases reported at time of death only	Total known cases
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1918	2,534	303	2,837	1·64	885	137	1,022
1919	2,105	221	2,326	1·34	847	104	951
1920	2,084	177	2,261	1·30	968	122	1,090
1921	2,044	135	2,179	1·23	899	96	995
1922	1,863	105	1,968	1·11	956	83	1,039
1923	1,937	85	2,022	1·13	1,188	74	1,262
1924	1,972	64	2,036	1·14	1,120	65	1,185
1925	1,846	67	1,913	1·07	1,027	57	1,084
1926	1,828	58	1,886	1·05	953	32	985
1927	1,794	54	1,848	1·02	1,045	42	1,087
1928	1,660	56	1,716	0·94	956	51	1,007
1929	1,517	62	1,579	0·87	913	61	974
1930	1,527	46	1,573	0·87	982	61	1,043
1931	1,460	61	1,521	0·84	862	51	913
<b>1932</b>	<b>1,477</b>	<b>37</b>	<b>1,514</b>	<b>0·83</b>	<b>825</b>	<b>28</b>	<b>853</b>

The decline—continuous since 1924—in the new cases of pulmonary tuberculosis is seen in column (4) of the above table. The improvement has taken place mainly among the males in age-group 5–15 and females 25–45. Further, the reduction in the number of new cases has occurred among both the negative and positive sputum cases; more than four-fifths of all new patients come on the dispensary registers and we know from their classification that the number of new persons with a positive sputum was 742 in 1932 compared with an average of 765 for the previous five years.

With regard to non-pulmonary tuberculosis, notification was undoubtedly influenced by the developments in the County scheme between 1922 and 1927, such as the establishment of light centres at the dispensaries. Furthermore, in the earlier years it is known that notification of non-pulmonary cases was not uniformly carried out by the practitioners as in those years the treatment provided under the County scheme was not so extensive as at the present time.

The notifications referred to in columns (2) and (6) are dealt with further in Appendix II, where folding Tables B, C, and D are inserted.

## ANALYSIS OF DEATHS FROM PULMONARY TUBERCULOSIS.

The following Table 2 shows the deaths recorded from pulmonary tuberculosis in 1932 and the preceding 11 years analysed according to sex and age :—

Period	Estimated sex population	Pulmonary deaths in various age-groups									Death-rate per 1,000 of sex population
		0 to 5	5 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and over	Total	
<i>Males.</i>											
1921-25 (average)	841,030	9	15	120	131	151	153	83	26	688	0.81
1926-30 (average)	856,920	4	9	107	111	133	130	79	27	600	0.70
1931	858,023	6	11	99	126	120	142	80	29	613	0.71
1932	856,733	4	6	95	111	99	119	90	16	540	0.63
<i>Females.</i>											
1921-25 (average)	929,614	8	26	172	145	104	69	37	17	578	0.62
1926-30 (average)	946,771	4	18	155	133	81	49	37	18	495	0.52
1931	946,377	2	10	129	95	75	49	31	17	408	0.43
1932	945,967	1	18	121	113	98	34	35	15	435	0.45

It will be seen that a considerable decline took place in the male pulmonary deaths for 1932 compared with the previous year and with the averages since 1921. The total deaths of females in 1932, although a little more than the previous year, are still well below the averages since 1921.

## DEATHS FROM NON-PULMONARY TUBERCULOSIS.

The mortality from non-pulmonary tuberculosis is still greatest among young children (ages 0 to 5) and young adults (ages 15 to 25). Few deaths occur among persons over 35. The mortality rate is heavier among males (0.14) than females (0.11). The actual numbers of children dying each year from this form of the disease have greatly diminished. This decline is due to segregation and supervision of the adult pulmonary cases, social measures, the safeguarding of the milk supply, and the successful modern methods of treatment of children with non-pulmonary disease.

The classification of the deaths in 1932 from non-pulmonary tuberculosis, according to part affected, is as follows :—Vertebral column, 28 ; other bones and joints, 15 ; intestines and peritoneum, 57 ; central nervous system, 80 ; disseminated, 34 ; genito-urinary, 17 ; lymphatic system (abdominal and bronchial glands excepted), 4 ; skin and subcutaneous tissues, 2 ; other organs, 1 ; total, 238.

## DEATHS AND DEATH-RATES FROM TUBERCULOSIS.

Table 3 below shows the number of deaths registered and the death-rates recorded during the years 1913 to 1932 in the Administrative County:—

Year	Population.	Deaths.			Death-rate per 1,000 of population.		
		Pulmonary tuberculosis	Non-pulmonary tuberculosis	Total.	Pulmonary tuberculosis	Non-pulmonary tuberculosis	Tuberculosis (all forms)
1913	1,749,659	1,441	527	1,968	0.82	0.30	1.12
1914	1,748,289	1,523	572	2,095	0.87	0.32	1.19
1915	1,666,488	1,614	555	2,169	0.96	0.34	1.30
1916	1,620,062	1,685	471	2,156	1.04	0.29	1.33
1917	1,568,656	1,584	466	2,050	1.00	0.30	1.30
1918	1,537,951	1,652	435	2,087	1.07	0.28	1.35
1919	1,662,716	1,339	358	1,697	0.80	0.22	1.02
1920	1,728,967	1,323	396	1,719	0.76	0.23	0.99
1921	1,758,738	1,301	376	1,677	0.73	0.21	0.95
1922	1,766,027	1,362	389	1,751	0.77	0.22	0.99
1923	1,772,658	1,250	412	1,662	0.70	0.23	0.93
1924	1,782,800	1,215	339	1,554	0.68	0.19	0.87
1925	1,785,500	1,205	361	1,566	0.67	0.20	0.87
1926	1,788,500	1,158	286	1,444	0.64	0.16	0.80
1927	1,800,300	1,105	296	1,401	0.61	0.16	0.77
1928	1,811,000	1,066	287	1,353	0.58	0.15	0.74
1929	1,811,700	1,102	279	1,381	0.60	0.15	0.76
1930	1,806,960	1,046	253	1,299	0.57	0.14	0.71
1931	1,804,400	1,021	266	1,287	0.56	0.14	0.71
<b>1932</b>	<b>1,802,700</b>	<b>975</b>	<b>238</b>	<b>1,213</b>	<b>0.54</b>	<b>0.13</b>	<b>0.67</b>

In Appendix I are given the tuberculosis deaths and death-rates in the urban and rural sanitary districts in the Administrative County, and in the dispensary areas.

## II.—THE DISPENSARY ORGANISATION.

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A tuberculosis dispensary should be the centre of activity, for a town or district, in regard to measures for the prevention of the disease, the expert examination and diagnosis of cases, together with the supervision, special treatment, and care of all known tuberculous persons.

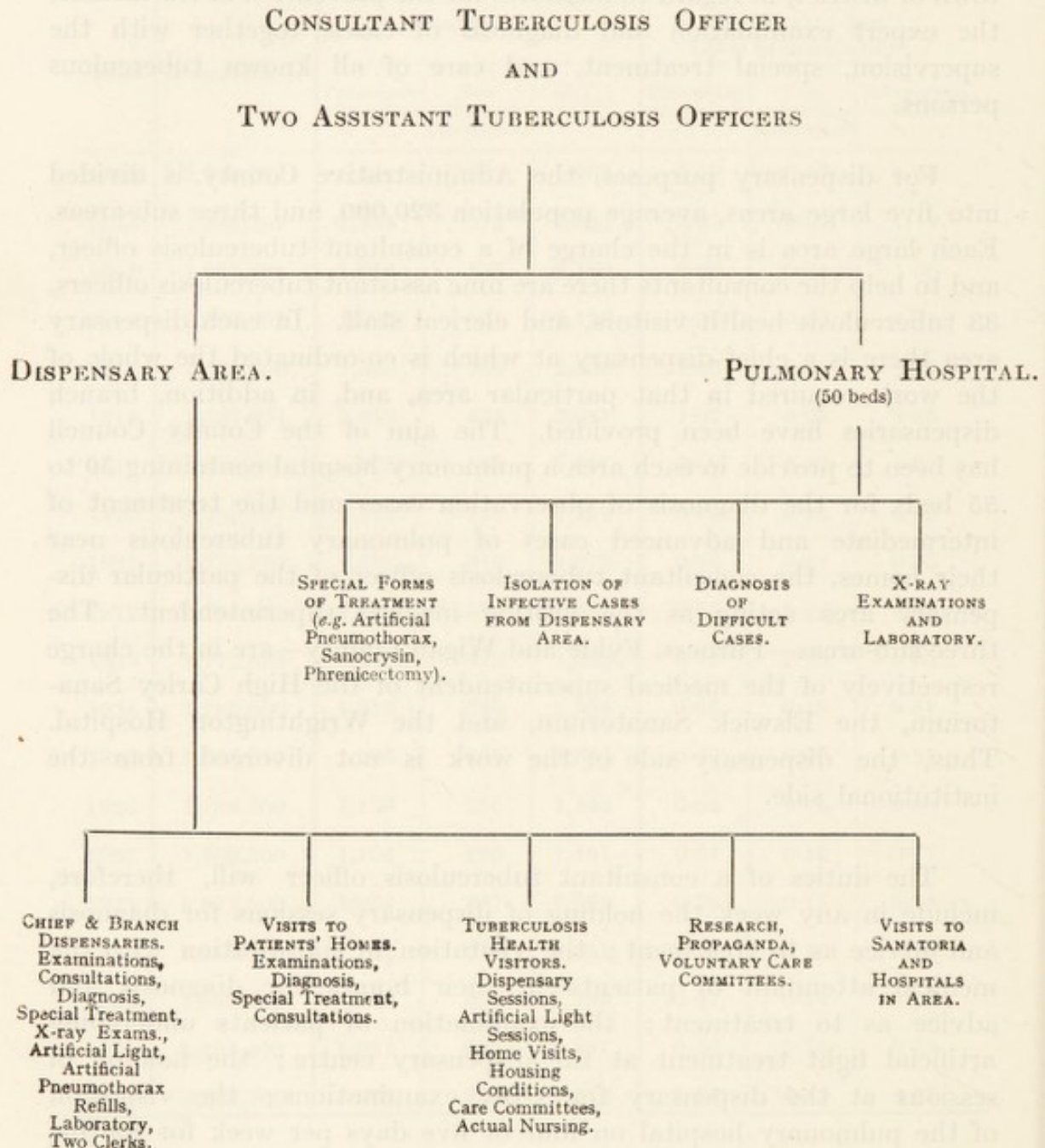
For dispensary purposes, the Administrative County is divided into five large areas, average population 320,000, and three sub-areas. Each large area is in the charge of a consultant tuberculosis officer, and to help the consultants there are nine assistant tuberculosis officers, 33 tuberculosis health visitors, and clerical staff. In each dispensary area there is a chief dispensary at which is co-ordinated the whole of the work required in that particular area, and, in addition, branch dispensaries have been provided. The aim of the County Council has been to provide in each area a pulmonary hospital containing 50 to 55 beds for the diagnosis of observation cases and the treatment of intermediate and advanced cases of pulmonary tuberculosis near their homes, the consultant tuberculosis officer of the particular dispensary area acting as the visiting medical superintendent. The three sub-areas—Furness, Fylde and Wigan County—are in the charge respectively of the medical superintendent of the High Carley Sanatorium, the Elswick Sanatorium, and the Wrightington Hospital. Thus, the dispensary side of the work is not divorced from the institutional side.

The duties of a consultant tuberculosis officer will, therefore, include in any week the holding of dispensary sessions for diagnosis and advice as to treatment; the visitation in consultation with the medical attendant of patients in their homes for diagnosis and advice as to treatment; the examination of patients undergoing artificial light treatment at the dispensary centre; the holding of sessions at the dispensary for x-ray examinations; the visitation of the pulmonary hospital on four or five days per week for routine and special treatment, and administration; the attendance at meetings of voluntary care committees; arrangement of work with the two assistant tuberculosis officers, the tuberculosis health visitors, and the clerical staff.

The dispensary organisation is better illustrated by the chart overleaf.

## THE DISPENSARY ORGANISATION.

The Administrative County is divided into five large dispensary areas (average population 320,000). The chart below illustrates the organisation and work of one of these dispensary areas :—



The work done through the dispensary organisation during the year 1932 is dealt with further in Chapter III.

### III.—SUMMARY OF WORK DONE THROUGH THE DISPENSARY ORGANISATION.

#### CASES UNDER SUPERVISION.

On the 31st December, 1932, there were on the dispensary registers the following number of cases :—

	Males.	Females.	Total.
Pulmonary tuberculosis :			
Under 15 years of age ... ..	139	142	281
15 years and over ... ..	2,256	1,820	4,076
Non-pulmonary tuberculosis :			
Under 15 years of age ... ..	747	710	1,457
15 years and over ... ..	933	1,141	2,074
<b>TOTAL PATIENTS ON DISPENSARY REGISTERS</b> ... ..	<b>4,075</b>	<b>3,813</b>	<b>7,888</b>
Doubtful cases (diagnosis not determined) ... ..	...	...	23

On the estimated population of the Administrative County, namely, 1,802,700, the 7,888 cases represent an incidence of 4·37 per 1,000.

The medical classification\* of the 7,888 patients was as under :—

	Disease active.	Disease quiescent.	Total.
Pulmonary tuberculosis :			
T.B. minus ... ..	646	1,144	1,790
T.B. plus 1 ... ..	356	310	666
T.B. plus 2 ... ..	1,282	382	1,664
T.B. plus 3 ... ..	207	30	237
<b>Total</b> ... ..	<b>2,491</b>	<b>1,866</b>	<b>4,357</b>
Non-pulmonary tuberculosis :			
Bones and joints ... ..	366	416	782
Spine ... ..	165	127	292
Abdomen ... ..	100	218	318
Other organs ... ..	58	82	140
Peripheral glands ... ..	446	1,136	1,582
Skin ... ..	294	123	417
<b>Total</b> ... ..	<b>1,429</b>	<b>2,102</b>	<b>3,531</b>
<b>TOTAL PULMONARY AND NON-PULMONARY</b> ... ..	<b>3,920</b>	<b>3,968</b>	<b>7,888</b>

\* Classification in accordance with Memorandum 37/T. (Revised) issued by the Ministry of Health in October, 1930. The pulmonary cases are divided into : (a) "Class T.B. minus"—cases in which tubercle bacilli have never been demonstrated in the sputum, pleural fluid, fæces, etc. ; (b) "Class T.B. plus"—cases in which tubercle bacilli have at any time been found ; this class is further divided into Groups 1, 2, and 3, representing the early, intermediate, and advanced stages of the disease.



TABLE 4.

	1926.	1927.	1928.	1929.	1930.	1931.	1932.
Dispensary patients :							
Skiagrams ... ..	3625	4506	5519	5364	5676	6045	6336
Screenings ... ..	815	733	672	519	854	1417	2163
Institutional patients :							
Skiagrams ... ..	194	333	774	1320	2162	2458	3763
Screenings ... ..	157	284	470	840	2012	2988	3418
Total ... ..	4791	5856	7435	8043	10704	12908	15680

The greater amount of artificial pneumothorax treatment for which radiological control is necessary accounts mainly for the increasing number of x-ray examinations.

The policy of placing an apparatus in each dispensary area for use by the tuberculosis officer himself is, from experience, found to be the best method, because the tuberculosis officer, with his knowledge of the patient's history and clinical signs, is most fitted to make a correct interpretation of the skiagrams.

#### HOUSING.

The following table shows the housing conditions of all patients under treatment or supervision at the end of 1932. Whilst every effort is made to secure that infectious cases occupy a separate room, or at least a separate bed, no useful purpose is served by making the same insistence in regard to patients with the disease quiescent or arrested. The non-pulmonary cases are given separately, and only a very small number indeed may be considered infectious.

TABLE 5.—Housing statistics of 7,888 County patients.

		Patients occupying a separate bedroom.	Patients occupying a separate bed, but not a separate bedroom.	Patients not occupying a separate bed.
Number of pulmonary cases considered <i>infectious</i> .	Under 15 years	7	11	2*
	15 and over ...	1,215	519	127*
Number of pulmonary cases considered <i>not infectious</i> .	Under 15 years	43	124	94
	15 and over ...	932	467	816
Number of non-pulmonary cases.	Under 15 years	205	589	663
	15 and over ...	541	447	1,086
TOTAL ...	Under 15 years	255	724	759
	15 and over ...	2,688	1,433	2,029

\* 28 of these 129 cases were isolated in sanatoria or pulmonary hospitals at the end of 1932.

It will be seen that 129 patients (including two children) suffering from pulmonary tuberculosis and considered to be infectious were not occupying a separate bed when at home at the time the census of the housing conditions was taken at the end of 1932. Of this number, 38 were away from home and isolated in pulmonary hospitals or sanatoria, leaving (from a total of 1,881 infectious cases) 91, or 4·8 per cent., infectious cases at home not occupying a separate bed. The percentage in 1931 was 4·9.

Appendix IV of this report shows the housing conditions of the patients in each dispensary area.

#### EXAMINATION OF HOUSE CONTACTS.

By the systematic examination of house contacts, particularly among those of patients with positive sputum, many early or unsuspected cases of tuberculosis are detected. Owing to indifference or unwillingness, considerable difficulty—which, however, is gradually being overcome—is experienced in persuading contacts to come to the dispensary for examination, or even to submit themselves for examination at all.

By direction of the Ministry of Health, Memo. 37/T (Revised), cases are regarded as contacts only if the cause of their being examined is the fact that they have recently been, or still are, living in contact with some dispensary patient or other notified case; many persons suffering, or suspected to be suffering, from tuberculosis who attend at the dispensary of their own accord, or who are referred by a private medical practitioner, may give a history of previous contact with a known case of tuberculosis, but this does not bring them within the definition of “contacts.”

The following Table 6 shows the number of new contacts which have been examined in the Administrative County during 1932 :—

	Diagnosed as tuberculous.		Doubtful.	Non-tuberculous.	Total.
	Pulmonary.	Non-pulmonary.			
Examined at home ...	4	—	—	98	102
Examined at dispensary	33	14	2	842	891
Total ...	37	14	2	940	993
	51				

Of the 993 new contacts examined during the year, 51 were ultimately diagnosed as definite cases of tuberculosis—pulmonary 37, and non-pulmonary 14. These cases are equal to 51·35 per 1,000 of contacts examined, as against the proportion of 4·37 tuberculous

persons, per 1,000 of the population, known to the dispensary staff in the County. Thus, the examination of selected contacts revealed many more tuberculous cases proportionately than would be found in the ordinary population.

It may be stated that of the 37 pulmonary cases, 40 per cent. were found with a positive sputum.

#### EXAMINATION OF SPUTUM.

As an aid to diagnosis, arrangements are in existence for the examination, free of cost, of specimens of sputum sent by medical attendants. At each chief dispensary a small laboratory is installed for this work, whilst, in addition, an arrangement exists with the Director of the Public Health Laboratory, Manchester, for the examination of specimens including inoculation tests.

The following statement shows the results of the examinations made in 1932, compared with the previous year :—

	At Dispensary Laboratories.		At Public Health Laboratory, Manchester.	
	1931.	1932.	1931.	1932.
Positive ( <i>i.e.</i> , tubercle bacilli present) ...	1,249	1,400	90	2
Negative ( <i>i.e.</i> , tubercle bacilli not found)	5,447	5,633	248	6
Total ... ..	<u>6,696</u>	<u>7,033</u>	<u>338</u>	<u>8</u>

#### TUBERCULOSIS OFFICERS' VISITS TO SANATORIA AND HOSPITALS.

Periodical visits (mostly monthly) have continued to be paid by one or other of the consultant tuberculosis officers to the majority of the pulmonary hospitals, non-County sanatoria, and special hospitals treating County patients. These visits are of mutual help, inasmuch as they keep in touch the medical superintendent and the tuberculosis officer, who are able to confer on the patients' future treatment, the home circumstances, the provisions of the County scheme, and so on.

The following is the rota of visits for 1933 :—

Dr. A. D. Brunwin	Wilkinson Sanatorium, Heath Charnock Pulmonary Hospital, and Warwickshire Orthopædic Hospital.
Dr. B. MacPhee	Eastby and Halifax Sanatoria, and Burnley Pulmonary Hospital.
Dr. G. Fletcher	Aitken Sanatorium, and Chadderton, Marland, and West-hulme Pulmonary Hospitals.
Dr. G. Jessel	East Lancashire Tuberculosis Colony, and King Edward VII Hospital for Crippled Children, Sheffield.
Dr. C. W. Laird	Liverpool Open-air Hospital for Children, Leasowe; Royal Liverpool Children's Hospital, Heswall and Thingwall Branches; Hefferston Grange and Ecclestone Hall Pulmonary Hospitals.
Dr. G. Leggat	Meathop Sanatorium.
Dr. E. H. A. Pask	Pemberton Pulmonary Hospital, and Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry.

### PROVISION OF SPECIAL NOURISHMENT.

Special nourishment is granted to tuberculous persons on the following conditions, which have been approved by the Ministry of Health :—

- (1) That special nourishment be in no case ordered for a period of more than three months, and if in any case a continuance of the treatment is considered from a medical point of view desirable, the Central Tuberculosis Officer to report the case specially to the County Tuberculosis Committee.
- (2) That special nourishment be granted to persons who are waiting for admission to sanatoria or hospitals, or have returned therefrom, when it is thought to be medically essential as part of the cure of the disease.
- (3) That special nourishment may be allowed to cases not included in the foregoing, provided that particulars of the cases are laid before the Tuberculosis Committee for consideration.
- (4) That each grant of special nourishment will only be allowed by the Tuberculosis Committee subject to the patient carrying out, in a satisfactory way, the medical treatment and such general hygienic measures as may be advised by the medical practitioner and tuberculosis officer.
- (5) That special nourishment be limited to orders for new milk and cream, unless on special report other nourishment be found desirable.
- (6) That the limit of expenditure be 7/- per week, unless an amount in excess of this sum is specially recommended on medical grounds by the Central Tuberculosis Officer and sanctioned by the Tuberculosis Committee.

During the year, 1,335 grants of special nourishment for varying periods were made to 708 individual patients as part of their medical treatment. The figures in 1931 were 1,424 grants to 673 patients.

### SPECIAL SURGICAL APPLIANCES.

During 1932 the following surgical appliances were supplied to patients on the recommendation of the tuberculosis officers :—

Abdominal belts, 4 ; abduction frame, 1 ; ankle splint, 1 ; artificial limbs, 7 ; back supports, 5 ; caliper splints, 14 ; celluloid hip spicas, 4 ; celluloid splints, 2 ; cervical collar, 1 ; crab splints, 4 ; crutches, 18 pairs ; finger splint, 1 ; foot splint, 1 ; hand splints, 2 ; hip splints, 7 ; leg splint, 1 ; pattens, 10 ; poroplastic splint, 1 ; spinal brace, 1 ; spinal collars, 2 ; spinal frames, 3 ; spinal jackets, 3 ; spinal supports, 34 ; surgical boots, 28 ; Thomas' knee splints, 6 ; Thomas' walking splints, 6.

### PROVISION OF BEDSTEADS, MATTRESSES, AND NURSING REQUISITES.

In each County dispensary area a small stock of bedsteads, mattresses (but not bedding), and nursing requisites belonging to the County Council is available for loan to necessitous patients undergoing home treatment.

The bedsteads and mattresses, which are held at the disposal of the consultant tuberculosis officers, have proved of valuable assistance in securing the better sleeping accommodation at home of persons with pulmonary tuberculosis considered to be infectious.

The table following shows the number of these articles owned by the County Council, and also the number of patients who have been granted the use of the articles :—

TABLE 7.

Articles.	Quantity owned by County Council, 31/12/32.	Number of patients to whom articles have been loaned during 1932.	Articles in possession of patients on 31/12/32.
Bedsteads ... ..	207	46	154
Mattresses ... ..	195	43	149
Mattress covers ... ..	144	23	102
Air beds ... ..	9	13	1
Air cushions ... ..	154	182	86
Air pillows ... ..	1	—	—
Air pumps ... ..	3	5	—
Bath chairs ... ..	8	4	—
Bed cradles ... ..	6	—	—
Bed pans ... ..	98	94	40
Bed rests ... ..	57	59	34
Bed slippers ... ..	73	24	11
Extension apparatus ... ..	15	—	—
Fracture boards ... ..	2	—	—
Ground sheets ... ..	31	5	12
Hot water bottles, rubber... ..	5	3	1
Ice bags ... ..	1	—	—
Rest chairs ... ..	4	1	1
Rubber sheeting ... ..	18½ yds.	2	1 yd.
Rubber sheets ... ..	7	2	1
Spinal boxes ... ..	21	1	1
Spinal carriages ... ..	16	3	4
Splints ... ..	19	—	1
Sponge beds ... ..	1	3	—
Urinals... ..	105	77	39
Water beds ... ..	15	8	2

#### TUBERCULOUS EX-SERVICEMEN.

Of the 7,888 patients under supervision of the dispensary staff at the end of 1932, 182 were discharged sailors, soldiers or airmen whose disease was held by the Ministry of Pensions to be attributable to or aggravated by service in the Great War, a pension being granted for the disability. The number of these tuberculous pensioners is declining, falling from 1,017 at the end of 1922 to the figure of 182 mentioned above.

#### SLEEPING SHELTERS.

There were, at the end of the year, 44 shelters in use by patients at their homes.

The loan of sleeping shelters is made to suitable cases on the recommendation of the tuberculosis officer, after careful consideration of the following points : (1) the condition of the patient and his ability to use the shelter properly ; (2) the position of the shelter ; (3) the home

conditions of the patient ; and (4) the means of communication with the nearest inhabited building in case of a sudden relapse.

The number of persons in 1932 who were allowed the use of the shelters was 57.

I have to thank medical officers of health and sanitary inspectors throughout the County for much valuable help in connection with the removal, disinfection, and re-erection of shelters used by County patients.

#### TUBERCULOSIS DISPENSARIES AND STAFF.

Table A, here inserted, shows the dispensary areas with the populations, present staffs, the addresses of the 24 dispensaries at present in use, and the days and times on which they are open.

#### EVENING SESSIONS AT DISPENSARIES.

As in previous years, the evening sessions have been regularly held at most of the dispensaries for the convenience of patients who are at work during the day.

#### ARTIFICIAL LIGHT TREATMENT.

A report on the work done at the artificial light centres established at thirteen of the dispensaries is given in Chapter XII.

#### STATISTICS REQUIRED BY MINISTRY OF HEALTH.

By Memorandum 37/T (Revised), issued in October, 1930, the Ministry require certain information concerning the work done at tuberculosis dispensaries. These statistics, in the compulsory Table A of the Memorandum, are given in Appendix V. of this report.

#### RECOVERED CASES.

Since 1926 the Ministry of Health have allowed cases of pulmonary tuberculosis to be written off the dispensary register as recovered provided the disease has been quiescent for two years and arrested for a further three years. During 1932, 280 pulmonary cases were written off the register as recovered ; of these 70 were classified as T.B. plus cases.

In regard to non-pulmonary tuberculosis, cases may be written off the register as recovered if arrest of the disease has been maintained for at least three years. During 1932, 396 non-pulmonary cases were so written off.

On the other hand, in 1932, 42 cases were restored to the register after having been written off as recovered in previous years ; 16 of these were pulmonary cases when originally on the register (4 being classified as T.B. plus cases) and 26 were non-pulmonary.

TABLE A.

DISPENSARY ORGANISATION.

AREAS, MEDICAL STAFF, NURSING STAFF,  
DISPENSARIES, AND TIMES OF DISPENSARY  
SESSIONS.



SUMMARY OF DISPENSARY WORK DONE BY TUBERCULOSIS  
OFFICERS IN 1932, SHOWING COMPARISON WITH 1931.

VISITS BY TUBERCULOSIS OFFICERS TO PATIENTS' HOMES—	1931	1932
(a) Number of new persons (including new contacts) examined for diagnosis or expert opinion ... ..	1,352	1,250
b) Number of re-examinations of "old" cases and "old" contacts—		
1. Respecting continued general supervision or dispensary treatment ... ..	3,793	3,947
2. Contacts respecting diagnosis ... ..	—	8
3. Other cases respecting diagnosis ... ..	142	156
4. For special forms of treatment or examinations resulting therefrom—		
Aspirations... ..	5	15
Adjustment of splints and surgical appliances ... ..	158	185
Lupus cases ... ..	45	20
Pneumothorax (refills) ... ..	—	1
Mantoux test ... ..	—	8
Other forms ... ..	10	—
	5,505	5,590

DISPENSARY ATTENDANCES BY PATIENTS—

(a) Number of new persons (including new contacts) examined for diagnosis or expert opinion ... ..	3,984	4,183
(b) Number of re-examinations of "old" cases and "old" contacts—		
1. Respecting continued general supervision or dispensary treatment ... ..	14,340	13,119
2. Contacts respecting diagnosis ... ..	305	364
3. Other cases respecting diagnosis ... ..	2,047	2,171
4. For special forms of treatment or examinations resulting therefrom—		
Artificial light (Lancaster, Chorley, Preston, Acrinton, Nelson, Stacksteads, Ashton-under-Lyne, Radcliffe, Eccles, St. Helens, Wigan, Ulverston and Fleetwood Dispensaries) ... ..	33,879	33,060
Aspirations ... ..	125	172
Adjustment of splints and surgical appliances ... ..	928	890
Lupus cases ... ..	577	405
Pneumothorax (refills) ... ..	862	1,594
Tuberculin ... ..	264	238
Mantoux test ... ..	—	52
Other forms ... ..	259	67
	57,570	56,315

X-RAY EXAMINATIONS MADE AT COUNTY DISPENSARIES AND INSTITUTIONS—

(a) Dispensary patients ... ..	7,462	8,499
(b) Institutional patients... ..	5,446	7,181
	12,908	15,680

	1931	1932
EXAMINATIONS OF SPUTUM AT COUNTY DISPENSARIES ... ..	6,696	7,033
NUMBER OF RECOMMENDATIONS BY TUBERCULOSIS OFFICERS—		
1. Sanatorium or hospital treatment ... ..	1,749	1,806
2. Dispensary treatment or general supervision ... ..	9,173	9,617
3. Provision of special nourishment ... ..	1,424	1,335
4. Provision of surgical appliances ... ..	185	147
5. Loan of shelters ... ..	16	16
6. Diagnosis not confirmed—		
(a) Notified cases ... ..	132	150
(b) Non-notified cases ... ..	3	8
7. Cases written off the register as refusing treatment ... ..	32	33
8. Pulmonary cases written off the register as recovered ... ..	320	280
9. Non-pulmonary cases written off the register as recovered ... ..	578	396
CARE COMMITTEE MEETINGS ATTENDED BY—		
(a) Tuberculosis officers ... ..	94	94
(b) Tuberculosis health visitors ... ..	160	150
LECTURES OR ADDRESSES GIVEN ON TUBERCULOSIS ... ..	10	10
CONSULTATIONS WITH MEDICAL PRACTITIONERS—		
Personal ... ..	767	773
Other ... ..	4,769	5,241
VISITS BY TUBERCULOSIS OFFICERS TO SANATORIA, AND PULMONARY, SPECIAL, AND PUBLIC ASSISTANCE HOSPITALS	312	358
SPECIAL VISITS BY TUBERCULOSIS OFFICERS ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.) ... ..	91	92
EXAMINATIONS OF ENTRANTS TO INDUSTRY UNDER SANDSTONE INDUSTRY (SILICOSIS) SCHEME, 1929 ... ..	119	37
VISITS BY DISPENSARY NURSES TO PATIENTS' HOMES—		
Routine visits ... ..	37,610	37,051
Actual nursing ... ..	1,175	795
Application of surgical dressings... ..	1,299	1,187
Adjustment of splints and surgical appliances ... ..	1,690	1,674
	<u>41,774</u>	<u>40,707</u>
PATIENTS' DISPENSARY ATTENDANCES FOR ATTENTION BY NURSES—		
Application of surgical dressings... ..	2,799	2,873
Adjustment of splints and surgical appliances... ..	614	522
	<u>3,413</u>	<u>3,395</u>

#### IV.—INTRAVENOUS UROGRAPHY IN THE DIAGNOSIS OF TUBERCULOSIS OF THE KIDNEY.\*

By E. H. ALLON PASK, M.D.,

*Medical Superintendent, Wrightington Hospital, and Consultant Tuberculosis  
Officer, Wigan County Sub-Area.*

There are two methods of visualising the urinary tract by means of injecting contrast substances. The first and older method of instrumental pyelography is a purely anatomical one, whereas the second—intravenous urography—is both anatomical and physiological. In addition to detecting anatomical details it gives a picture of the dynamics of the urinary tract. Excretion urography is useful in that it can be employed in cases where, owing to anatomical hindrances, such as stricture of the urethra, enlarged prostate, etc., instrumental pyelography cannot be performed.

The first attempt to delineate the urinary tract by means of intravenous injection was made in 1905 by Von Lichtenberg. He used the colloidal heavy metals, but they were abandoned on account of their toxicity. It was not till 1923 that Rountree and his associates published the first positive results; they used a solution of sodium iodide and proved that intravenous urography was possible provided that a satisfactory contrast substance was found. Roseno was the first to attain clinical success. He used a urea-iodine combination. Zeigler and Koehler improved on this method by compression of the ureters as an adjuvant. This urea-iodine preparation was not generally adopted owing to the fact that it was not tolerated in all cases. The best substance for intravenous urography is one which is non-toxic and which will be in sufficient concentration to visualise the urinary tract with regularity and certainty.<sup>1</sup> The discovery of this substance was made after laborious research by a team of German workers. The chemistry was worked out by Binz and Raeth, and the physiological, clinical, and x-ray work was done by Von Lichtenberg and his assistants. The name given to this substance was uroselectan B.

It is a complex organic chemical compound, a derivative of pyridin and containing 51·5 per cent. iodine, the iodine being in close organic combination. Before uroselectan B was finally decided upon exhaustive trials were made with six other similar (organic) compounds including abrodil and uroselectan, and reading an account of this work, one is impressed by the thoroughness of their investigations, and the numerous exhaustive tests employed before uroselectan B was finally adopted.<sup>2</sup>

\* Presidential address to the North-Western Tuberculosis Society, Manchester, 27th October, 1932, and published in the *British Journal of Tuberculosis*, July, 1933, Vol. xxvii, No. 3.

Uroselectan B is put on the market by Schering in ampoules, each containing 15 grammes of uroselectan B dissolved in 20 c.c. of a 10 per cent. solution of invert sugar (a mixture of equal quantities of dextrose and laevulose). It is claimed that this invert sugar solution is hypertonic, and thus fluid passes from the tissues to the blood. In this way the absorption of uroselectan B by the tissues is hindered, with the result that excretion is increased and tolerance improved. In addition the drug contains the two iodine atoms in close organic combination, and it passes through the body without the liberation of iodine. The sterilized solution remains stable in the ampoules without undergoing any chemical change.

Uroselectan B is very readily soluble and the injection of a large quantity of fluid is no longer necessary, 20 c.c. being sufficient for an adult as against 50 to 100 c.c. of uroselectan, which is injected by the rather cumbersome method of funnel and rubber tubing. The ampoules are already sterilized ready for use, whereas with uroselectan the preparation for injection involves filtration of the solution twice and subsequent sterilization. Uroselectan B can also be used as the contrast substance in cystoscopic pyelography.

The preparation of the patient consists of giving a dose of castor oil the evening before; the injection is done at 11 a.m. the following morning after a light breakfast, and one hour before injection 10 ounces of Bovril are given. Immediately before the injection the bladder is emptied. Uroselectan B is apt to cause troublesome formation of gas in the large intestine, which tends to obscure the kidney outline in the skiagram. To avoid this, I tried giving a washout of the lower bowel one hour before the injection, but this did not improve matters and I think there was more gas formation in the bowel than in the cases which had the castor oil.

The injection is carried out in a similar manner to any intravenous injection. An ordinary 20 c.c. syringe is used and the contents are injected slowly. Some recommend that the ampoule be warmed to the body temperature, but this is not necessary. It has been my practice to take a series of skiagrams at intervals of 5, 10, 20, and 40 minutes after injection.

Uroselectan B is very well tolerated. Patients usually experience a feeling of warmth, especially about the head, during the time the injection is made; this ceases immediately the injection is over. Occasionally nervous patients may take an excessive and apprehensive interest in the actual injection, but beyond this I have not observed any immediate or remote ill-effects. I have done it on out-patients and allowed them to go home after skiagrams have been taken. Severe reactions have been noted with the earlier contrast substances. After uroselectan, symptoms of iodine poisoning have occurred—urticaria,

œdema of face, thirst, cough, giddiness—probably due to the fact that the iodine in uroselectan is not in such firm combination as in uroselectan B and is liberated in the blood.<sup>3</sup> One or two fatal cases after uroselectan have been reported in patients who were previously seriously ill. Local thrombosis of the veins has been recorded, probably due to damage of the intima at the time of injection.

Intravenous urography is particularly useful in cases of tuberculosis of the kidney. There is frequently associated cystitis in which the bladder is very irritable and contracted, and the use of the cystoscope causes considerable pain; there may be swelling and constriction of the ureteric orifice which renders the passage of the ureteric catheter difficult or impossible. It is especially useful in children where a general anæsthetic is necessary for instrumental pyelography. This is avoided by the injection of the contrast substance into the veins. In quite a number of my cases the serious general condition has been such that it would have been unfair to ask the patient to submit to an instrumental examination, owing to the other organs being infected. One case had involvement of the lungs, intestines, wrist, and ankle in addition to the kidneys. Again, there is no risk by the intravenous method of carrying the infection to the healthy kidney, but the greatest advantage of intravenous urography compared with instrumental pyelography is its simplicity—the employment of cystoscope and ureteric catheters, which require special technical skill for their use, is entirely obviated.

The skiagrams obtained by intravenous urography do not give such clear-cut pictures as those obtained by injecting sodium iodide from below.<sup>4</sup> On the other hand, they give a perfectly natural photograph. There is no overdistension of the renal pelvis. This may occur in instrumental pyelography unless the complete co-operation of the patient is obtained to give an indication when overdistension is about to occur. If a general anæsthetic is used this indication cannot be given at all.

When intravenous urography was first practised it was usual to apply some form of abdominal compression of the ureters by means of a tight binder in order to obtain better visualisation of the contrast substance, but this has been generally abandoned as it tends to cause artificial distension of the pelvis and does not give a true picture of the condition of affairs. By compression, pictures are obtained which resemble those seen in cases where there is peripheral obstruction. Compression disturbs the physiological picture and inhibits the dynamics of the urinary tract, and the great advantage of intravenous urography over instrumental is the fact that a natural picture is obtained. Abdominal compression has occasionally proved useful in cases where there is marked hypertonicity of the urinary system.

The skiagram obtained in an excretion urogram is that of a running stream—*viz.*, the urine flow—and in disease the kidney may not be functioning and thus there is no stream owing to the springs having dried up.

A series of photographs is necessary to obtain the fullest information, because in a single skiagram some part of the ureter or pelvis, or both, will be in systole and that part will not contain any of the contrast substance. The only parts delineated in a given skiagram are those that are in diastole at the time of taking the urogram. The dynamics are constantly changing owing to peristalsis.

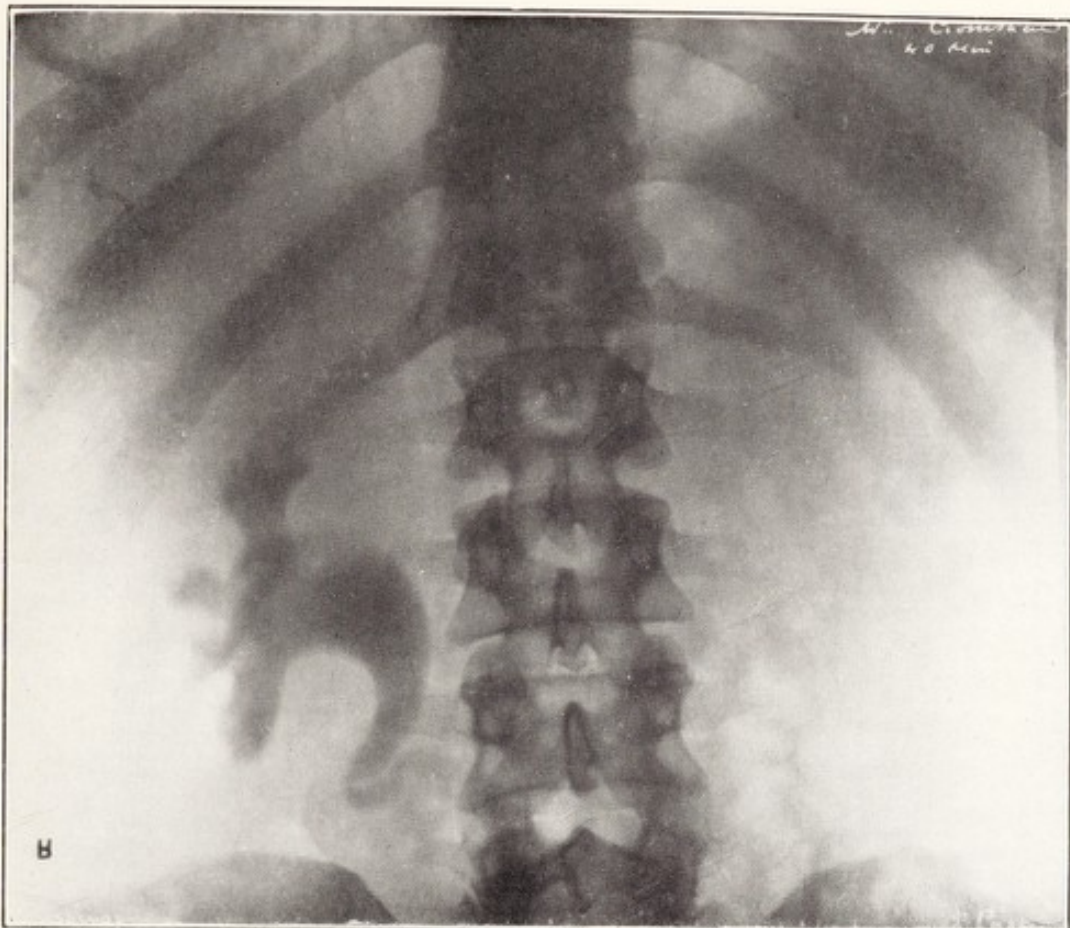
The ideal method of observing the excretion of uroselectan B would be by continuous screening of the patient, but unfortunately the density of the contrast substance does not permit this. Jarre has recorded a number of cases by means of the Cinex camera, using four exposures per second, and observes that a normal pelvic or ureteric outline may assume widely varying dimensions in a given study; therefore, the interpretation of the condition of affairs from a single film is erroneous.<sup>5</sup>

Cumming, in studies made on normal kidneys and ureters, has noted the following regular activities: Separate contractions of the calyces, infundibulum, and pelvis occur which follow no regular sequence; the ureteric contractions are segmental, the upper, middle, and lower segments filling and emptying in sequence. Milking of the pyramids by calyces has been observed, and there is a tendency to form a bulb at the uretero-pelvic junction.<sup>6</sup> It will be seen from these changes that are constantly going on how necessary it is to take a series of skiagrams to avoid pitfalls. Bugbee and Murphy, whilst admitting the usefulness of intravenous urography state that it is a method of corroboration to be employed as a supplement to our present known methods of urological diagnosis, except in a limited number of cases in which cystoscopic examination is impossible.

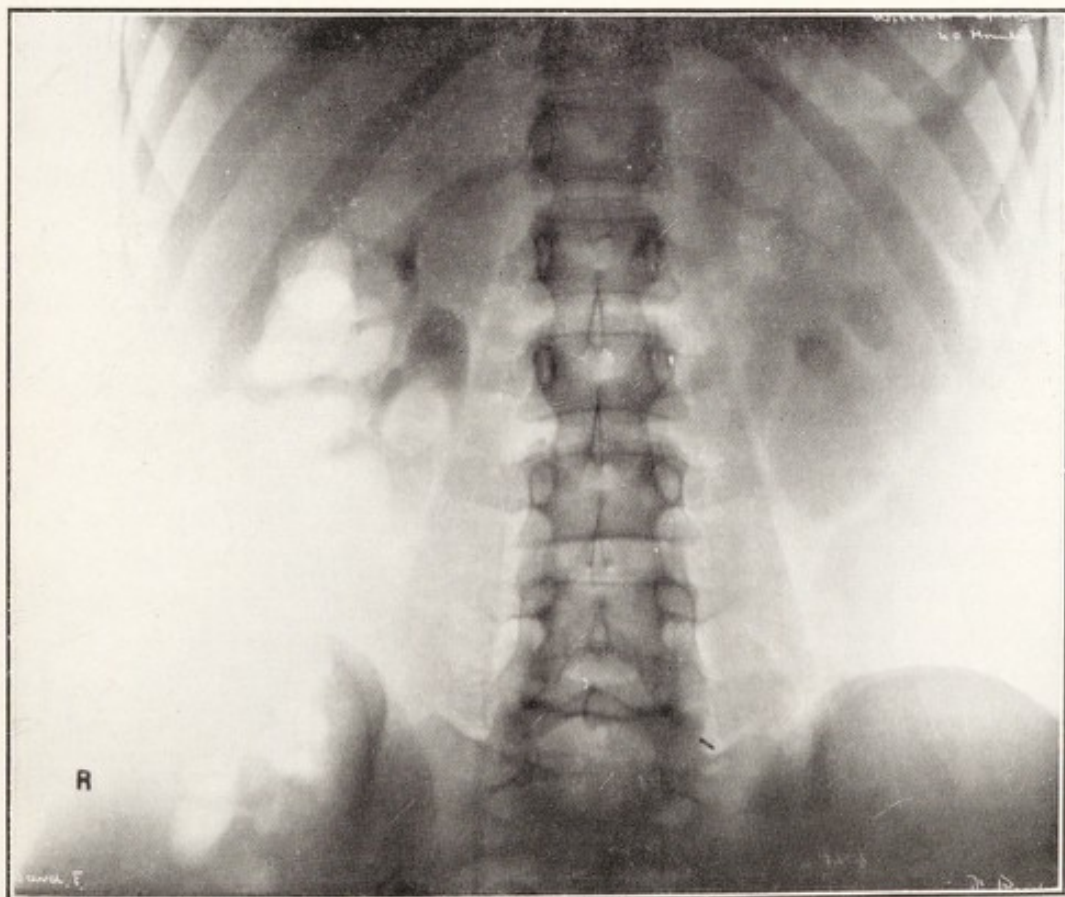
Here they consider it gives valuable information otherwise unavailable, but when such data are unsupported by cystoscopic examination, interpretation must be made with extreme care and conservatism.<sup>7</sup>

Some workers have stated that they have observed the failure of normal kidneys to excrete the contrast substance. What does happen, as I will show later, is that there is failure to obtain in a single skiagram a complete picture of the whole pelvis and ureter. This is due to the fact that the contrast substance is seen only in those parts of the urinary tract that are in diastole. Those parts that are in systole at the time of the taking of the picture will not be visualised. It is generally admitted that the contrast substance in radiograms of

## INTRAVENOUS UROGRAPHY.



SKIAGRAM I.—None of the contrast substance is seen on the left side, thus demonstrating a functionless kidney on that side. On the right side there is dilatation of the pelvis and calyces and upper part of the ureter with kinking. The urine contained T.B.



SKIAGRAM II.—The outline of the pelvis and calyces is normal on the right side. On the left side there is little to be seen of the pelvis as such, and the lower calyces are irregular in outline and considerably dilated. There is also dilatation of the upper part of the ureter. Tuberculosis of the left kidney was confirmed at operation.

[Skiagrams taken at Wrightington Hospital.]



normal kidneys does not show up so well as in those which are diseased. This is due to the fact that the contrast substance is excreted more rapidly in healthy kidneys.

By intravenous urography visualisation of both sides of the urinary tract and the relations between the various parts can be studied in a series of skiagrams. It is thus possible to demonstrate the presence of both kidneys and contrast their relative functional activity. It has been proved by animal experiment that uroselectan B is excreted by the glomeruli of the kidneys and not the tubules,<sup>8</sup> and before it passes into the renal pelvis the general outline of the kidney is often well seen owing to the contrast substance being present in the glomeruli of the kidney. As the uroselectan B passes to the calyces and pelvis and along the ureters any abnormality can be noted. In cases of tuberculosis of the kidney there is frequently seen irregularity of the outline of the pelvis and calyces and dilatation of the ureter. If the kidney substance is completely destroyed on one side no urogram will be obtained on that side. Five per cent. of uroselectan B in the urine is said to be sufficient to give a picture.

In addition to abnormalities in the size and shape of the urinary tract, information can be obtained of the kidney function by noting the time and appearance of the contrast substance in the various parts of the upper urinary tract.

In normal kidneys a good picture is sometimes obtained as early as five minutes after injection, but in tubercle of the kidney the rate of excretion is retarded and occasionally six hours are necessary before a sufficiently dense pyelogram is obtained. In cases of tuberculosis of the kidneys there is no typical picture to be seen which is characteristic. A considerable number of conditions may be met with. If a kidney is completely destroyed by disease there will be no urogram, due to the fact that there is no excretion of the contrast substance on that side. If the affected kidney is enlarged but functioning the outline of the enlarged kidney will frequently be delineated much better than without any contrast substance, the uroselectan B as it is being excreted by the glomeruli causing a general opacity of the kidney parenchyma. Cortical tubercular abscesses can be diagnosed, due to the fact that the kidney containing the contrast substance stands out prominently around the abscess.

In cases of tuberculous pyonephrosis in which the pelvis is affected there is seen irregularity and dilatation of the pelvis and calyces. The pictures seen are no different from pyonephrosis from other causes than tubercle, and therefore do not help in diagnosis; other corroborative evidence must be sought, *e.g.*, T.B. in urine.

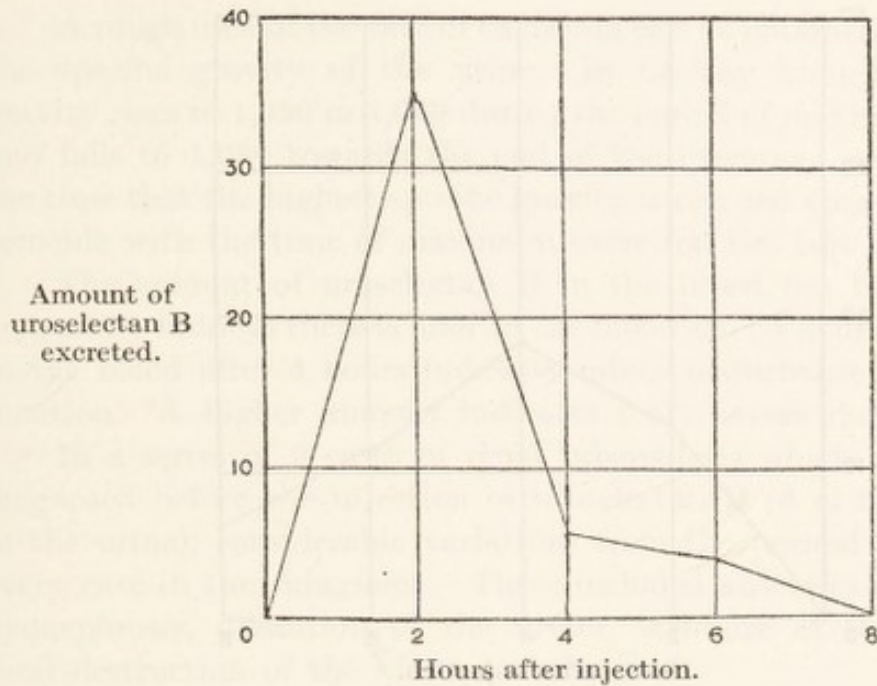
It is also most important to take a series of skiagrams at intervals, as when there is disturbance of kidney function there may be con-

siderable delay in the appearance of the contrast substance on the affected side as compared with the healthy kidney. Dilatation of the ureter, especially of the upper part, is commonly seen in tubercle. Constriction of the ureter due to tubercular ulceration has been observed. This must be diagnosed with caution, because a single skiagram of a normal case may show the contrast substance in the ureter suddenly stop at a given spot without any constriction, due to the ureter being in a state of systole at this spot, whereas the part above containing the contrast substance is in diastole. It is only when the uroselectan B stops at the *same* spot in a series of skiagrams that pathological constriction of the ureter can be diagnosed with any degree of certainty.

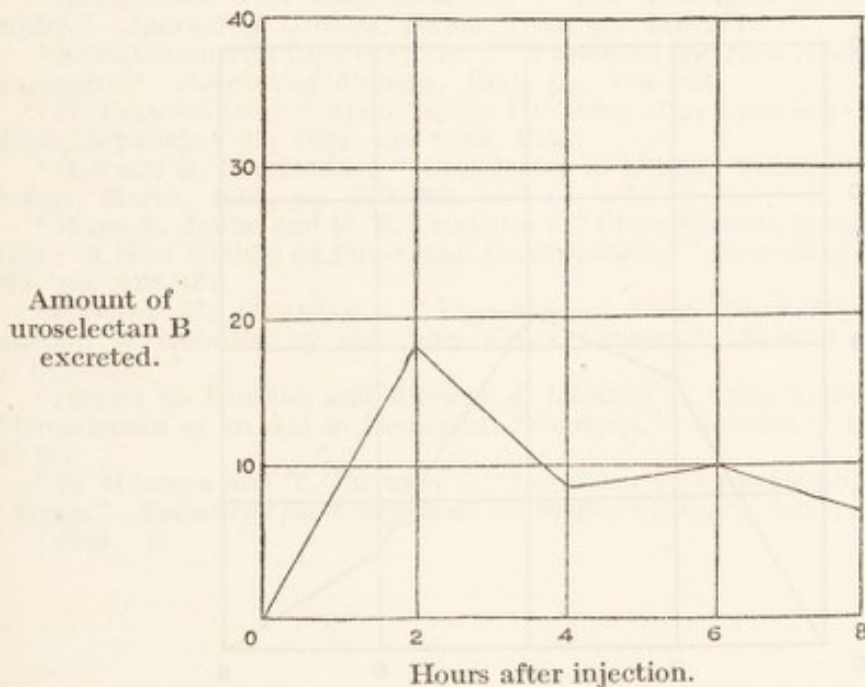
Lichtenberg, whose experience of excretion urography extends to over 2,000 cases, is able to diagnose early tuberculosis of the calyces by this method, and owing to his wide experience recommends removal of diseased kidney after intravenous urography alone without any cystoscopic examination. He maintains that excretion urography, blood retention tests, and the finding of T.B. in the urine are all the necessary data required.<sup>9</sup>

However, in my opinion, without a considerable experience of a large number of cases it is extremely difficult to diagnose *early departures from the normal*, as although anatomically the calyces are divided into upper, middle, and lower groups, one frequently meets with considerable variants of this without any disease, and the shape of the normal pelvis is not by any means constant. Anatomical peculiarities of the ureter are also common; it may be twisted on itself or duplicated, but when the disease is well established valuable information can be obtained concerning the actual condition of the kidneys and ureter.

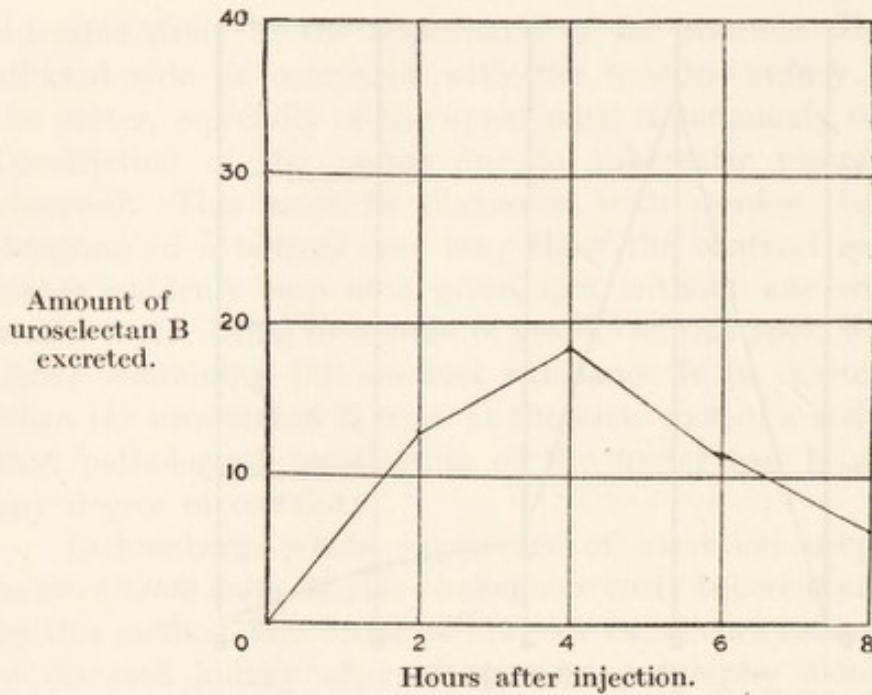
Further information of the kidney function can be obtained by estimating the amount of uroselectan B in the urine. It is excreted in the urine unchanged as a sodium salt and can be precipitated by the addition of 1 part of concentrated hydrochloric acid to 4 parts of urine. The precipitate is a white substance—free dicarboxylic acid. This is dried and weighed. Healthy kidneys excrete uroselectan B fairly rapidly and the maximum rate of excretion may be reached 2 to 3 hours after injection. It then falls rapidly, and at the end of 10 hours none is to be found in the urine; whereas in disease the rate of excretion may be delayed considerably, and uroselectan B may be found in the urine as long as 17 hours after injection. Dr. Deane, my assistant, has done a series of estimations of uroselectan B in the urine. Specimens of urine voided at intervals of 2, 4, 6, and 8 hours after injection were examined, and overleaf are some of the graphs he has prepared.



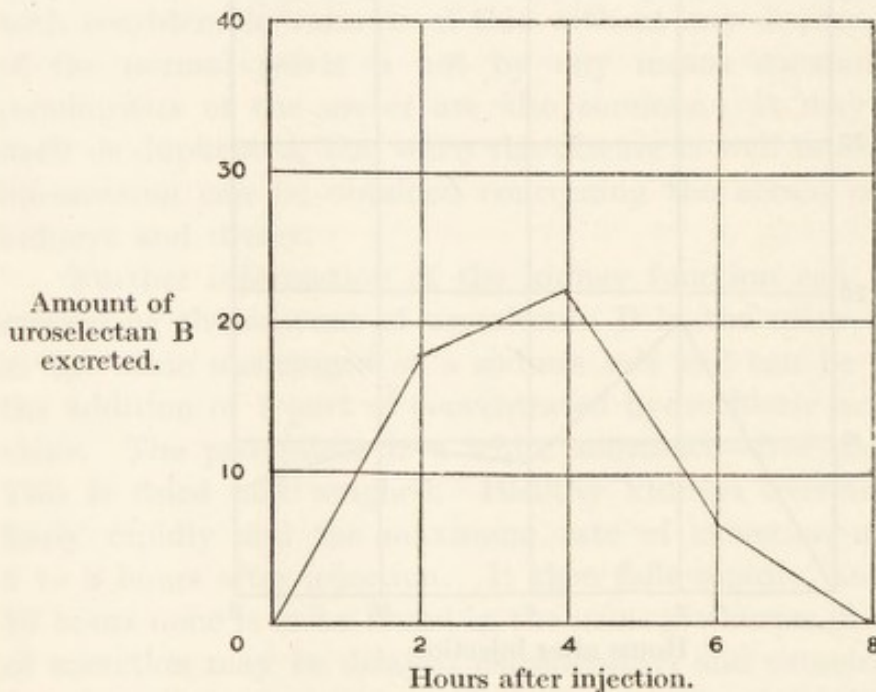
GRAPH I.—A typical one of healthy kidneys, the chief characteristic being that the maximum peak of excretion is reached 2 hours after injection. This is followed by a rapid drop, and at the end of 8 hours after injection all excretion has ceased.



GRAPH II.—A case of tubercle of the left kidney. This kidney was not functioning at all, as there was none of the contrast substance showing in any of the skiagrams on the left side. It will be seen that although the maximum rate of excretion in this case is reached 2 hours after injection, it is only 19 on the scale as against 34 for the normal case (roughly half), and there is not the sudden drop as in Graph I, but the curve gradually comes down, and at the end of 8 hours uroselectan B is still being excreted.



GRAPH III.—A case of tubercular pyonephrosis of the left kidney. It is very similar to Graph II, except that in this case the maximum peak of excretion is reached 4 hours after injection instead of 2. The curve is a gradual one as compared with the normal one (Graph I), and at an interval of 8 hours uroselectan B is still being excreted.



GRAPH IV.—A case of early tubercular disease of the left kidney presenting similar characteristics to Graphs II and III, except that the curve is somewhat higher and more uroselectan B is being excreted, and excretion has ceased at 8 hours showing that the function, although impaired compared with the normal, is better than the second and third cases. Other things being equal, the case would be a more favourable one for operation than Nos. II and III.

A rough idea of the rate of excretion can be obtained by estimating the specific gravity of the urine. In healthy kidneys the specific gravity rises to 1,050 or 1,060 during the period of maximum excretion, and falls to 1,030 towards the end of the excretory period, although the time that the highest specific gravity is reached does not absolutely coincide with the time of maximum excretion but lags a little behind.

The amount of uroselectan B in the blood has been measured. In healthy kidneys there is none in the blood after 4 hours; 0.5 gramme in the blood after 4 hours indicates minor disturbance of the kidney function. A higher amount indicates more severe damage.

In a series of 9 cases of renal tuberculosis which were definitely diagnosed before the injection of uroselectan B (8 of them had T.B. in the urine), considerable variations from the normal were noted in every case in the skiagrams. These included abscesses of the kidney, pyonephrosis, dilatation of the ureter, stricture of the ureter, and total destruction of the kidney substance.

It will thus be seen that intravenous urography is a most useful aid to diagnosis in tubercle of the kidney, and gives valuable information both as regards the anatomical condition of affairs and also the functioning of the kidney.

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<sup>3</sup> D. TSAMPLAKOS: "Acute Iodine Poisoning after Uroselectan." *Medizinische Klinik*, September 11, 1931, pp. 1353, 1354.

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<sup>5</sup> HANS A. JARRE and R. E. CUMMING: "Cinex Camera Studies on the Urinary Tract: A New Method of Functional Investigation." *Journal of Urology*, October, 1931, pp. 423-431.

<sup>6</sup> ROBERT E. CUMMING: "Physiological Data upon Renal and Ureteric Function as recorded by the Jarre Cinex Camera." *Journal of Urology*, 1931, pp. 613-623.

<sup>7</sup> HENRY G. BUGBEE and ARTHUR J. MURPHY: "The Value and Limitations of Uroselectan as an Aid in Urological Diagnosis." *Journal of Urology*, Vol. xxv, No. 3.

<sup>8</sup> B. HUGHES and T. PETERFI: "Detection of Uroselectan in the Glomeruli of Frogs." *Zeitschrift für Urologische Chirurgie*, February, 1931, pp. 146-152.

<sup>9</sup> *Ibid.* 2.

## V.—AN ANALYSIS OF FORTY CASES OF PHRENICECTOMY.\*

By G. JESSEL, M.D., D.P.H.,

*Medical Superintendent, Peel Hall Pulmonary Hospital, and Consultant Tuberculosis Officer, Dispensary Area No. 4.*

The following notes refer to forty male patients on whom phrenicectomy was performed at the Peel Hall Pulmonary Hospital (56 beds), by Mr. Morrision Davies, visiting consulting chest surgeon, between April, 1931, and the end of 1932. This small series is of interest, because the patients formed part of the regular hospital population during this period and were not drafted in from other institutions for the purpose.

Of the 40 cases, 29 had tubercle bacilli in the sputum prior to the phrenicectomy, while the sputum was negative in the remaining 11. As regards side, 18 were right-sided cases and 22 left-sided. All the patients were x-rayed both before and after the operation. Their condition, radiologically, before the operation was as follows:—

1. Unilateral :		
(a) General... ..	21	
(b) Apical, without cavity ... ..	1	
(c) Apical, with cavity ... ..	3	
(d) Mainly basal ... ..	1—26	
2. Bilateral ... ..	9	
3. Basal pleurisy ... ..	5	

The reasons which led me to refer the cases to Mr. Morrision Davies for phrenicectomy were as follow:—

Failure to induce pneumothorax owing to extensive adhesions, or the production of a small pneumothorax insufficient to achieve the result aimed at ... ..	32
Pneumothorax not attempted because of obvious extensive pleural thickening ... ..	3
Cardio-phrenic or diaphragmatic adhesions at base after effusion	5

### RESULTS.

The immediate results were satisfactory in every case. No untoward symptoms occurred, and small, clean scars were left, which gradually became inconspicuous. The patients professed to feel benefit. In one case with an apical cavity, this was no longer visible a few weeks after the phrenicectomy. As regards sputum, this was

\* The word "phrenicectomy" is used to include cases where phrenic evulsion was done. The latter operation, which aims at a gradual evulsion of the whole of the nerve, has been latterly modified by Mr. H. Morrision Davies. He now removes a segment of the nerve and divides such accessory phrenic nerves as can be found (phrenicectomy). This operation avoids the risk of hæmorrhage, which may occasionally occur when evulsion is performed.

reduced in amount and at the end of 1932, of the 29 positive sputum cases, 19 had lost their bacilli. Regarding the physical condition, and taking as a criterion whether or no the man was actually working or fit for remunerative employment, the position at the end of the year was as follows:—

TABLE 8.

Classification.	Number of patients.	Working or fit for work at end of 1932
Originally T.B. plus ... ..	29	14
Originally T.B. minus ... ..	11	7
Total ... ..	40	21

The following Table 9 shows the distribution of the patients as regards bacillary loss and fitness for remunerative employment based on the foregoing radiological classification:—

Type of case.	Total	Sputum positive before phrenicectomy.	Sputum became negative.	Working or fit for work.
1. Unilateral :				
(a) General ... ..	21	16	11	11
(b) Apical, without cavity ...	1	—	—	1
(c) Apical, with cavity ...	3	3	1	1
(d) Mainly basal ... ..	1	1	1	1
2. Bilateral ... ..	9	7	4	4
3. Basal pleurisy ... ..	5	2	2	3
Total ... ..	40	29	19	21

It is, of course, impossible to establish positive conclusions from a small series of cases of so recent a date, but the impression left on my mind, based on several years' dispensary and institutional experience, is that the results are superior to those which would have been obtained in the same length of time under ordinary so-called sanatorium treatment alone. It would appear that phrenicectomy is a useful substitute for artificial pneumothorax when, owing to adhesions, this is not practicable or when only a small degree of collapse is secured.

VI.—ARTIFICIAL PNEUMOTHORAX TREATMENT :  
SOME RESULTS AND CONCLUSIONS.

By G. JESSEL, M.D., D.P.H.,

*Medical Superintendent, Peel Hall Pulmonary Hospital, and  
Consultant Tuberculosis Officer, Dispensary Area No. 4.*

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The provision of an x-ray apparatus at the Peel Hall Hospital in 1928, enabled artificial pneumothorax to be more extensively applied than had previously been thought desirable, and since that year the possibility that this form of treatment might be beneficial has been considered in relation to each patient admitted.

The patients, all men, treated at the hospital are drawn almost exclusively from the dispensary area under my charge and conversely nearly all the male adult pulmonary cases from the area find their way on diagnosis to this hospital.

Artificial pneumothorax—the greatest advance in treatment since the inception of the sanatorium—is, in fact, a particular application of the fundamental principle of sanatorium treatment, *viz.*, rest. By compression of the lung, and particularly of the diseased portions of the lung, through the introduction of air into the pleural cavity, local rest of the affected part is obtainable. In practice the possibilities of applying the treatment are limited. Severe bilateral cases have usually to be excluded, and in patients with less extensive disease the introduction of air is frequently impossible owing to the diseased lung being adherent to the chest wall. The success of the treatment in certain acute forms of unilateral disease is often marked, but many types of case are unsuitable, and the majority of experienced workers agree that artificial pneumothorax should not be lightly undertaken. Apart from the duration of treatment (refills necessary at intervals for about three years), each individual patient requires special consideration, not only as regards suitability but subsequently before each refill.

SELECTION OF CASES.

Recent unilateral cases with comparatively slight involvement of the opposite lung are particularly suitable, especially in young subjects.

Some of the most dramatic results are seen in such patients : high fever disappears, sputum is lessened and the condition steadily improves. Good results are also frequently obtainable in patients with more extensive lesions, dependent upon the amount of fibrosis and the closure of cavities, if present. On the other hand, patients with much fibrosis, and particularly those of middle age, should not be given artificial pneumothorax as they are likely to be made worse by it. The point as to how long it is desirable to wait before induction is debatable. If a patient is doing well with bed-rest, there is no advantage in initiating a form of treatment which, owing to its duration and possible complications, may prove troublesome. The patients in this hospital are invariably requested as soon as tuberculosis is diagnosed to remain in bed at home until their turn for admission to the hospital arrives, so that it is usually possible to reach a decision as to their suitability for artificial pneumothorax treatment soon after they are admitted, as a comparison can be made between the clinical and radiological evidence obtained on diagnosis and on admission after a period of bed-rest. As regards the presence of tubercle bacilli, in the majority of cases bacilli were found during the course of the illness. Since the utilisation of good skiagrams has, in combination with clinical evidence, placed diagnosis on a more satisfactory basis than obtained in pre-radiology days, it is not my practice to wait until bacilli are demonstrated in the sputum as thereby valuable time may be lost. In fact, as will be shown later, the percentage of negative sputum cases alive after a given time was found to be twice as high in those who received artificial pneumothorax, as in those where this was unsuccessful or abandoned.

It is convenient to subdivide possible cases of pneumothorax into classes representing degrees of suitability for this form of treatment. In this connection it is generally agreed that the extent of the disease should be considered with definite reference to the presence or absence of cavitation in the lung chosen for collapse, and the presence or absence of disease in the better lung, both founded on a combination of x-ray and physical findings. In connection with a proposed investigation of the results of the particular T.B. plus cases, a sub-committee of the Joint Tuberculosis Council, which has this matter under special consideration, has suggested the following classification of "choices" :—

*Choice A.* Cases of unilateral disease without definite evidence of cavitation, the other lung being clear.

*Choice B.* Cases with evident cavitation in one lung only and with or without limited lesions in the opposite lung, such limited lesions not involving more than one-third of the lung.

*Choice C.* All other cases, including cases with severe complications, such as advanced laryngeal disease.

The present paper deals with 143 men in whom inductions were attempted from January 1929 onwards. Four of these being untraced at the end of 1932 are excluded from the tables.

#### AGE.

The following table shows the age-groups of the 139 patients. The youngest patient\* was a boy of fifteen years, with tubercle bacilli in the sputum; the oldest patient was 55. Unless the disease is acute and progressive it is well to hesitate before making inductions in the elderly.

TABLE 10.

Age Periods—Years.	T.B. plus.	T.B. minus.	Total.
Under 20 ... ..	11	6	17
20 to 30 ... ..	30	18	48
30 to 40 ... ..	31	7	38
40 to 50 ... ..	21	8	29
50 and over ... ..	6	1	7
Total ... ..	99	40	139

\*This year I have been giving artificial pneumothorax to a boy aged eight, whose sputum contained tubercle bacilli, so far with excellent result.

#### SIDE.

The following Table 11 shows the side mainly involved:—

Side.	T.B. plus.	T.B. minus.	Total.
Right side ... ..	45	23	68
Left side ... ..	52	17	69
Bilateral ... ..	2	—	2
Total ... ..	99	40	139

## TECHNIQUE.

This has been described in an earlier report and there has been no need to change methods found satisfactory. Treatment is given in bed at first, and subsequently in a special treatment room, x-ray screening beforehand being the rule, with skiagrams at intervals. Frequent refills (1 to 3 weeks) with reasonably small quantities of air (300 to 600 c.c.) are desirable. In this way one is more likely to obtain collapse of the diseased portions only (selective collapse) while, in addition, effusions tend to occur much less frequently than have been reported when big refills at long intervals (6 to 8 weeks) were in vogue. In my series effusions requiring gas replacement on one or more occasions occurred in twenty cases.

Artificial pneumothorax is often advantageously combined with other forms of treatment and it is, of course, superadded to the sanatorium régime of the hospital. In addition, sanocrysin has been of benefit in some cases where the disease has spread to the opposite lung, and phrenicectomy has also been found useful where the degree of collapse was slight or inadequate.

## RESULTS.

It is no easy matter to evaluate the results of any given form of treatment by methods likely to satisfy a statistician, especially where, as in the present instance, the numbers are relatively small and the time interval is rather short. Moreover, in comparing the results of different workers, a number of complicated factors have to be taken into account. Selection of cases, technique, association with other forms of treatment, etc., all complicate the issue. On this account many of the foregoing remarks have been made to render the subsequent figures and observations more intelligible.

The figures presented relate to the condition at the end of 1932 of 139 men in whom inductions were attempted from January 1929 onwards. It will be noticed that tables for T.B. plus cases and T.B. minus cases have been given separately. Various forms of treatment are seen to have been combined with artificial pneumothorax. The particular criteria taken are (1) whether or not the patient was alive at the end of 1932, (2) whether the patient was working or fit for work, (3) whether, in T.B. plus cases, bacilli had disappeared from the sputum at that date.

As a basis of comparison, cases where sufficient air was regularly induced for a period of at least three months to obtain a satisfactory collapse are contrasted with corresponding cases where the induction was unsatisfactory or was soon abandoned owing to adhesions. This, however, is not really a satisfactory criterion, though it is difficult to devise a better, as the number of patients in the hospital in whom inductions were attempted was only 28 per cent. of the admissions of definitely tuberculous cases. Unsuccessful induction is nearly always due to fibrosis, and as the formation of fibrous tissue is evidence of a healing process or tendency it is reasonable to expect that in such cases the fibrosis, unsuspected perhaps at the time, will lead to healing of the lesion. We are thus comparing our successfully induced cases with cases where, from the nature of the condition, a satisfactory result is not unlikely. It follows that the results of artificial pneumothorax will appear in a relatively less favourable light than if one could compare the results of treatment in two exactly similar groups of cases, one receiving the treatment, the other not.

In the accompanying tables the cases are sub-divided under choices, as described above in dealing with selection of cases, but the numbers under these separate headings are too few to enable definite conclusions to be drawn therefrom. A register is being kept whereby the condition of all patients in whom artificial pneumothorax has been attempted, will be noted at the end of each year, and it is hoped that, as the numbers and time factor increase, useful information will thereby be obtained.

Table 12 shows (i) that of the T.B. plus cases satisfactorily induced 42 per cent. were working or fit, and 22 per cent. were dead; 11 out of 46 living cases had gas replacements, as compared with 5 out of 13 deceased; (ii) that there was a similar number of 40 per cent. working or fit out of 31 T.B. plus cases where induction was unsuccessful, but it must be particularly noticed that in 19 of these phrenicectomy was done, and of the 19, 11 or 58 per cent. were working or fit. This form of treatment, added to a tendency towards fibrosis or healing, thus appears to give results comparable with those obtained by artificial pneumothorax in more acute cases. In addition, 22 per cent. were dead and none of these had phrenicectomy.

Table 13 deals with 26 T.B. minus cases where a satisfactory collapse was obtained; 69 per cent. were working or fit, and 8 per cent. deceased. It also shows where induction was unsuccessful. Of 14 T.B. minus cases, of whom 8 had phrenicectomy, 36 per cent. were working or fit while 21 per cent. were dead.

Table 14 shows that up to the end of 1932, 78 per cent. of 46 "satisfactory" cases lost their bacilli, as compared with 64 per cent. of 31 cases unsuccessfully induced. Note, however, that in 19 of the latter 31 phrenicectomy was done, and of these 13 or 68 per cent. had lost their bacilli.

#### DISCUSSION.

Artificial pneumothorax was attempted in 139 out of 487 admissions of definite cases of pulmonary tuberculosis, *i.e.*, 28 per cent. A satisfactory collapse was obtained in 59 out of 99 T.B. plus cases, and in 26 out of 40 T.B. minus cases, *i.e.*, in 17 per cent. of the total cases admitted. The tables show that, of patients so treated, a considerable number of men were working or fit and had lost their bacilli at the end of 1932. This disappearance of bacilli has a distinct bearing on public health, because thereby important sources of infection are removed. There is reason to believe that in my dispensary area more T.B. plus cases are alive relatively to the total number of tuberculous patients, than before the introduction of collapse-therapy, and the impression that such patients live longer is thus strengthened. Their regular attendance at the dispensary for refills is noteworthy, and by their obvious improvement in health they help to raise the morale of their fellow-patients, both in hospital and as out-patients. This in itself is significant. The results in the T.B. plus cases of artificial pneumothorax satisfactorily applied, and in cases with fibrosis where this was impossible (but where in 19 out of 31 phrenicectomy was done) show a striking similarity. It thus appears that we must regard artificial pneumothorax as but one aspect of collapse-therapy, which includes phrenicectomy, and, occasionally, thoracoplasty.

#### GENERAL CONCLUSIONS.

1. Artificial pneumothorax is a valuable adjunct to treatment in an appreciable, but limited, number of patients. It assists restoration to working capacity and leads to the disappearance of bacilli from sputum in a large proportion of the cases so treated.
2. The benefits of this treatment are thus not limited to the patient but have an important bearing on prevention.
3. Artificial pneumothorax is a form of collapse-therapy and must be considered in relation to other forms. In cases unsuitable for this treatment, good results are often obtainable from phrenicectomy.
4. The favourable impression that patients undergoing collapse-therapy create on the minds of their fellow-patients, both in hospital

and at dispensaries, is an indirect testimony to the value of the treatment and incidentally is important as affecting the morale of the other patients.

5. The results of collapse-therapy suitably applied are often appreciably better in a given time than used to be the case without it, although the close supervision that is needed in connection with artificial pneumothorax must be given due weight in assessing the value of this special ancillary method of treatment.

Table 12. Position at the end of 1932 of 99 artificial pneumothorax patients with positive sputum treated at Peel Hall Pulmonary Hospital from January, 1929, onwards.

	Choice			Total.	
	A	B	C	No.	%
<b>(i) SATISFACTORY INDUCTIONS.</b>					
Working or fit for work ... ..	4	14	7	25	42
Unfit for work ... ..	2	11	8	21	36
Additional measures :					
Gas replacement ... ..	1	2	3	6	
†Phrenicectomy ... ..	—	1	2	3	
Gas replacement and phrenicectomy ... ..	—	—	2	2	
Phrenicectomy and scalenectomy ... ..	—	1	1	2	
Gas replacement, phrenicectomy and oleothorax	—	1	—	1	
Gas replacement, phrenicectomy and scalenec-	1	—	—	1	
tomy ... ..	—	1	—	1	
Gas replacement and oleothorax ... ..					
Dead ... ..	2	6	5	13	22
Additional measures :					
Gas replacement ... ..	2	2	1	5	
Sanocrysin ... ..	—	—	1	1	
<b>Total ... ..</b>	<b>8</b>	<b>31</b>	<b>20</b>	<b>59</b>	
<b>(ii) UNSUCCESSFUL INDUCTIONS.</b>					
Working or fit for work ... ..	8	5	3	16	40
Unfit for work ... ..	—	8	7	15	38
Additional measures :					
†Phrenicectomy ... ..	4	8	7	19	
Dead ... ..	1	3	5	9*	22
Additional measures :					
Gas replacement ... ..	—	1	—	1	
<b>Total ... ..</b>	<b>9</b>	<b>16</b>	<b>15</b>	<b>40</b>	

† See footnote on page 26.

\* None of these had phrenicectomy.

The percentage working or fit for work is almost the same for patients who had artificial pneumothorax satisfactorily induced as for patients who had an unsuccessful induction, although in the latter group 19 of the 31 had phrenicectomy. Eleven of the nineteen were working or fit. Phrenicectomy, added to a tendency towards fibrosis or healing, appears to give results comparable with those obtained by artificial pneumothorax in more acute cases.

Table 13. Position at the end of 1932 of 40 artificial pneumothorax patients with negative sputum treated at Peel Hall Pulmonary Hospital from January, 1929, onwards.

	Choice			Total	
	A	B	C	No.	%
<b>(i) SATISFACTORY INDUCTIONS.</b>					
Working or fit for work ... ..	11	3	4	18	69
Unfit for work ... ..	1	3	2	6	23
Additional measures :					
Gas replacement ... ..	—	—	2	2	
Phrenicectomy ... ..	—	2	—	2	
Gas replacement and phrenicectomy ... ..	—	1	—	1	
Dead ... ..	—	1	1	2	8
<b>Total ... ..</b>	<b>12</b>	<b>7</b>	<b>7</b>	<b>26</b>	
<b>(ii) UNSUCCESSFUL INDUCTIONS.</b>					
Working or fit for work ... ..	2	2	1	5	36
Unfit for work ... ..	2	1	3	6	43
Additional measures :					
Phrenicectomy ... ..	3	3	2	8	
Dead ... ..	2	—	1	3	21
<b>Total ... ..</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>14</b>	

Note a remarkable difference between the cases with a satisfactory induction and those with an unsuccessful induction in regard to the percentage working or fit for work—69 per cent. against 36.

Table 14. Bacillary loss as at the end of 1932 of T.B. plus cases treated by artificial pneumothorax.

	Choice			Total
	A	B	C	
<b>(i) SATISFACTORY INDUCTIONS.</b>				
Sputum still positive ... ..	—	3	7	10
Sputum become negative ... ..	2	15	4	21
Sputum now absent ... ..	4	7	4	15
Total ... ..	6	25	15	46
<b>(ii) UNSUCCESSFUL INDUCTIONS.</b>				
Sputum still positive ... ..	1	4	6	11
Sputum become negative ... ..	1	4	2	7
Sputum now absent ... ..	6	5	2	13
Total ... ..	8	13	10	31*

\* Note : In 19 of the 31 phrenicectomy was done. In 13 of the 19 or 68 per cent. the sputum became negative or absent.

## VII.—INTRADERMIC TUBERCULIN TESTS.

By G. BARKER CHARNOCK, L.R.C.P., L.R.C.S., D.P.H.,

*Medical Superintendent, Elswick Sanatorium, and Consultant Tuberculosis Officer, Fylde Sub-Area.*

During the year, 163 Mantoux intratuberculin tests were carried out on patients soon after admission to the sanatorium. One hundred consecutive admissions were taken, comprising advanced, intermediate, early, and observation cases. As the reactions to the tests were extremely variable, an endeavour was made to ascertain any relation to some particular feature of the case: whether they could be correlated to family history, sputum result, sedimentation rate, length of illness, stage of disease, type of skin, type of heart, or presence or absence of fever; whether the tests had any prognostic significance; and whether any harm resulted from the tests.

TECHNIQUE.—The finest, short, bayonet-pointed needles on long-barrelled record tuberculin syringes, graduated in hundredths of a cubic centimetre, were used. Old tuberculin (1-1,000) was used made up under strict aseptic conditions in 0.5 per cent. carbolic saline and kept constantly on ice. Doses of 0.01 c.c. of tuberculin (1-1,000) were injected intradermically into the ulnar side of the flexor surface of the forearm. Control injections were similarly made into the skin on the radial side of the same surface. Reactions were noted at the end of 24 hours and 48 hours respectively. The small dose was selected to obviate large and painful reactions. The sizes of the "wheal" and the "flare" were measured at each reading in inches and fractions of an inch. The "flare" was taken as the standard of comparison and the cases were divided into four classes. The first class comprised those reactions up to half-an-inch in diameter; the second class those from half-an-inch to one inch; and the third class those from one inch upwards. The fourth class contained the negative reactions. All negative reactions were done a second time to verify the first reading. On examination the classes appeared as shown in the following Table 15:—

Reaction class.	Males.	Females.	Total cases.
Class 1. $\frac{1}{8}$ " to $\frac{1}{2}$ " ... ..	33	18	51
Class 2. $\frac{1}{2}$ " to 1" ... ..	18	9	27
Class 3. 1" and over ... ..	4	5	9
Class 4. Non-reactors ... ..	8	5	13

The ages in Class 1 varied from 17 years to 56 years ; in Class 2 from 11 years to 55 years ; in Class 3 from 22 years to 44 years ; and in Class 4, 16 years to 47 years.

Care was taken to get as correct details as possible relative to the criteria under consideration. Age, as given by the patient or relatives, was accepted. Family history was obtained from patients, relatives, and health visitors. Sputum tests both prior to and after admission were considered. Where a case was admitted with a negative result and was found positive on subsequent examination the case was classified as positive. Where a result was positive before admission but never subsequently found positive in hospital, the case was also classed as positive. Sedimentation rates obtained directly after admission were tabulated. Length of illness was determined by enquiries from patients and relatives. Stages of disease were classified according to the Ministry of Health groups. Types of skin were taken as shown in the pale blue elastic kind or the pink and white satin-like skin, or the pale granular type with well-marked pores and fine lanugo arranged in whorles. Finally, the normal heart was compared with the asthenic type in which the heart was long and narrow with the cardio-vascular angle approximating 180 degrees, where the obliquity of the cardiac axis was about 48 degrees, and where the apex was pointed and directed almost entirely downwards. The latter criteria were obtained radiologically.

There appear to be several factors influencing the skin reactions. Firstly, the true anaphylactic skin reaction which is specific for tuberculin, secondly, the traumatic which is non-specific and depends upon the patient's vaso-motor control. This varies considerably in tuberculous persons, but seems well-marked in those having pink and white satin-like skin. Where the nervous system is unstable there seems a larger response to cutaneous stimulation. Results are very variable ; so variable in fact as to make it almost impossible to draw any tangible conclusion. In advanced disease there seems to be a loss of sensibility to tuberculin injection. In other cases it may be that sufficient anti-bodies are produced to neutralize antigen and give negative results. Cases may be so toxic that no antigen can stimulate the regulating mechanism. Certain observers have shown in animals that a state of hyper-sensitiveness meant a certain degree of resistance. From the tests there is no evidence that the hyper-sensitive (Class 3) had any more points in favour of a good resistance than the other classes. Whether clinical tuberculosis is present or not a positive reaction is common in adults. In these tests 13 only gave negative reactions.

TABLE 16.—*Analysis of 100 consecutive cases undergoing intradermic tuberculin tests at the Elswick Sanatorium.*

Factors investigated.	Classification according to reaction.										
	Class 1 $\frac{1}{8}$ " to $\frac{1}{2}$ ".		Class 2 $\frac{1}{2}$ " to 1".		Class 3 1" and over.		Class 4 Non- reactors.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Family history :											
Positive ... ..	13	10	6	5	2	3	4	2	25	20	
Negative ... ..	20	8	12	4	2	2	4	3	38	17	
Sedimentation rate :											
10 and over ... ..	29	15	15	7	2	3	4	2	50	27	
Under 10 ... ..	4	3	3	2	2	2	4	3	13	10	
Length of illness in years ...	3.3	1.7	3.1	2.2	0.9	3.1	9.1	1.0	—	—	
Classification of patients :											
T.B. minus ... ..	8	6	5	4	3	2	3	1	19	13	
T.B. plus 1 ... ..	2	—	—	—	—	—	—	2	2	2	
T.B. plus 2 ... ..	18	8	10	5	—	1	5	1	33	15	
T.B. plus 3 ... ..	5	4	3	—	1	2	—	1	9	7	
Skin :											
Normal ... ..	12	5	5	4	1	2	3	2	21	13	
Phthinoïd ... ..	21	13	13	5	3	3	5	3	42	24	
Heart :											
Normal ... ..	22	11	8	5	3	3	4	4	37	23	
Asthenic ... ..	11	7	10	4	1	2	4	1	26	14	
Fever :											
Plus ... ..	24	11	13	6	3	4	4	4	44	25	
Minus ... ..	9	7	5	3	1	1	4	1	19	12	

The tests have been of little help in determining the presence or absence of active tuberculosis in adults. The search seems to indicate that there is no constant relationship between the degree of reaction and the clinical condition, and that no assistance as to the nature of the prognosis is possible from the tests. It is, perhaps, worth noting that no untoward symptoms have occurred and that the test appears safe to use as a routine, if desired, on all types of cases admitted into a sanatorium.

## VIII.—LIPIODOL RADIOGRAPHY IN DISPENSARY PRACTICE WITH SPECIAL REFERENCE TO BRONCHIECTASIS.

By J. EDGAR WALLACE, M.D.,

*Assistant Tuberculosis Officer, Wigan County Sub-Area.*

Lipiodol is a combination of iodine and poppy-seed oil in which 40 per cent. by weight of the iodine is incorporated with the oil. When injected into the respiratory tract it affords an effective method of rendering the bronchial tree opaque to x-rays and since its introduction in 1922 by Sicard and Forestier<sup>1</sup> has proved of increasing value in the differential diagnosis of thoracic disease, particularly in relation to bronchiectasis.

During the last fifteen months a series of 32 patients attending the Wigan County Dispensary have undergone lipiodol radiography. The injection in each case has been performed at Wrightington Hospital, where the x-ray apparatus for this dispensary area is situated. Patients are allowed to return home immediately after the injection and skiagrams are completed, the total time spent at the hospital by each patient being approximately one hour. In no case has it been necessary to exceed this period nor have there been any untoward after-effects.

In the ordinary way many of these 32 cases would have been sent to a sanatorium for observation purposes, and the number of beds available for definite cases of pulmonary tuberculosis would have been correspondingly diminished.

The use of lipiodol has in every case enabled the diagnosis to be completed at the dispensary and has resulted in considerably less inconvenience to the patients, at the same time effecting a marked economy to the County.

### METHODS OF INJECTION.

Three different routes have been employed:—

(a) *Crico-Thyroid Route.*—This gives the greatest certainty of success, but being in the nature of a minor operation is to be avoided for out-patients if at all possible. The method was used in the earlier cases of the series, but has now been abandoned.

(b) *Oral Route.*—The oral method is the simplest of the three, but demands more co-operation from the patient, whilst nervous subjects and those with sensitive throats or enlarged tonsils are quite unsuitable. A few days before the injection the patient is provided

with small squares of lint and instructed to practise quiet, regular breathing exercises with the tongue held forward by a piece of lint. An explanation is also made of what exactly is to be done. This preliminary training makes the operator's task much easier during the injection and ensures a greater degree of success.

(c) *Nasal Route*.—Briefly this consists of the passage of a gum-elastic catheter via the naso-pharynx and the larynx into the trachea. The buccal pharynx is previously anæsthetized with a cocaine spray to inhibit deglutition and so prevent the catheter passing into the œsophagus. This method introduced by Franklin and Orley<sup>2</sup> has only been used in some of the later cases, but is proving very satisfactory as it combines both the certainty of the crico-thyroid route and the simplicity of the oral method.

The following list indicates the number of cases in which each method was used :—Crico-thyroid, 9 ; oral, 14 ; nasal catheter, 9.

The choice of technique in any particular case depends largely on the age, sex and temperament of the patient, together with the presence or otherwise of local abnormalities in the pharynx or larynx. Of the three, the oral route may be accorded a slight preference as it entails least interference with the patient.

It may be noted here that lipiodol in amounts up to 40 c.c. has been injected with the complete absence of any reactions.

The only certain method of obtaining lipiodol skiagrams of the lungs in a child is by the crico-thyroid route. Children as a class are unsuitable subjects for this operation in an out-patient department and should be investigated in an institution, where, if necessary, a general anæsthetic can be given.

#### RESULTS.

The 32 cases under review (with one exception) presented clinical features of such a type that a diagnosis of bronchiectasis had to be considered. By means of lipiodol radiography this diagnosis of bronchiectasis was confirmed in 19 cases and excluded in 12. The remaining case was a doubtful one of bronchial carcinoma in a man aged 45 years with hæmoptysis. X-ray examination showed thickening of the left root shadow, but the bronchial tree filled normally with lipiodol, giving strong evidence against a neoplasm. Six months later the man's general condition had not deteriorated and the x-ray appearances showed no change, proving that the interpretation of the lipiodol skiagram was a correct one.

An analysis of the 19 bronchiectasis cases is contained in the following Table 17 :—

TABLE 17.—*Analysis of 19 cases of bronchiectasis.*

No.	Patient, age, and sex.	Type.*	Site.†	Sputum.	Previous relevant history and remarks.
1	E.J., 18, F.	S.	R. U.	Slight	Bronchitis since childhood; pneumonia at age 10.
2	R.W., 35, F.	S.	R. L.	None	Chest trouble 16 years.
3	H.H., 17, M.	S. & F.	R. L.	Moderate	Bronchitis since infancy.
4	W.D., 45, M.	F.	L. L.	Slight	Cough 9 years following pleurisy left side.
5	R.G., 57, M.	F.	L. L.	Profuse	Pleurisy 30 years ago.
6	M.P., 11, F.	F.	L. L.	Moderate	Pneumonia at age 4.
7	D.B., 33, M.	F.	R. L.	Slight	Sputum T.B. plus 7 years. <i>See skiagrams L.2(a) and L.2(b).</i>
8	M.G., 23, F.	S.	R. L.	Slight	Pneumonia in childhood; recurrent hæmoptyses 2 years. <i>See skiagram L.4.</i>
9	E.H., 26, F.	F.	L. L.	Slight	Cough 10 years at least.
10	J.W., 33, M.	S.	L. L.	Occasionally profuse	Cough all his life.
11	C.P., 27, M.	S.	R. L.	Slight	Bronchitis since childhood. <i>See skiagrams L.1(a) &amp; L.1(b).</i>
12	A.B., 19, F.	S.	R. L.	Slight	Bronchitis since birth.
13	J.L., 46, M.	S.	R. U.	Moderate	Cough 20 years.
14	M.R., 38, F.	F. & S.	L. L.	Slight	Cough many years. <i>See skiagram L.5.</i>
15	S.C., 39, F.	S.	R. L.	Slight	Cough 20 years; right basal pleurisy in 1928. <i>See skiagrams L.3(a) and L.3(b).</i>
16	J.W., 36, M.	S.	R. L.	Profuse	Pneumonia in 1925.
17	M.A., 39, F.	F.	L. L.	Slight	Pneumonia in childhood; winter cough ever since.
18	B.T., 19, F.	S.	L.L. & U.	Moderate	Pneumonia at age 6.
19	T.W., 42, M.	S.	L. L.	Moderate	Pneumonia 16 years ago.

\* F. = Fusiform (or cylindrical).

S. = Saccular.

† R.U. = right upper lobe; R.L. = right lower lobe; L.L. = left lower lobe; L.L. &amp; U. = left lower and left upper lobes.

A series of skiagrams illustrating some of the cases is here inserted.

## COMMENT.

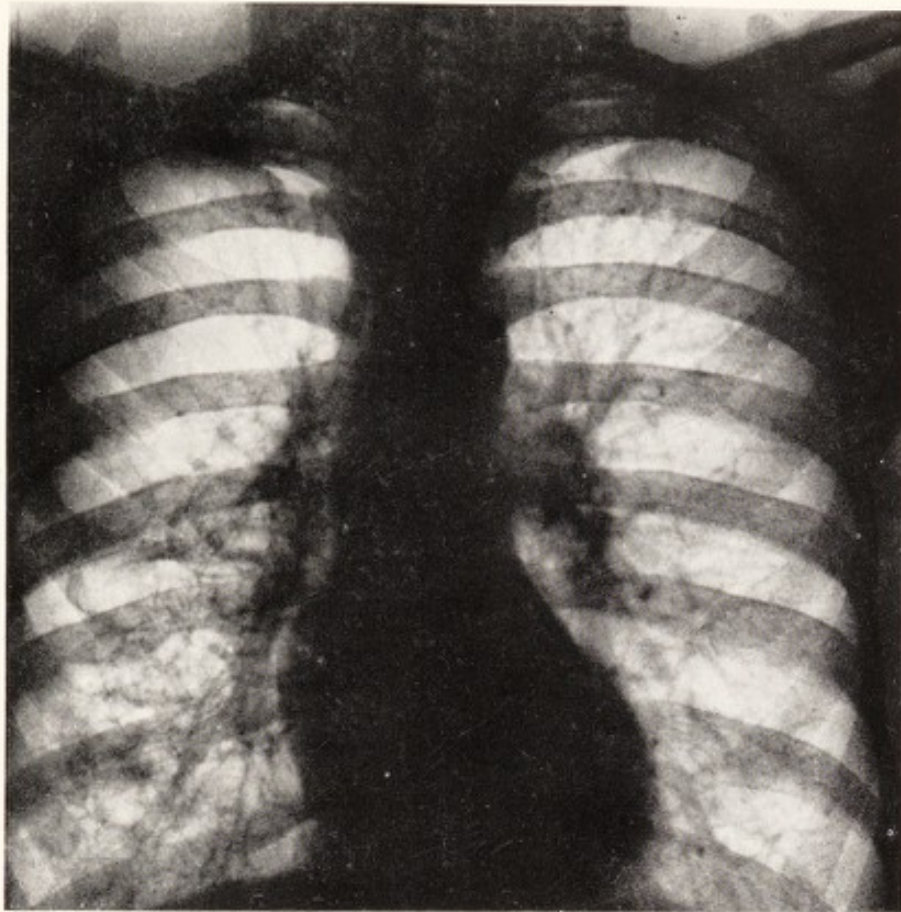
The group consists of 9 males and 10 females, the average age being 31·7 years. Contrasting the two sexes, however, it is found that the males average 37·3 years and the females 26·7 years, a somewhat striking difference.

The saccular type of bronchiectasis predominates over the fusiform in the proportion of 11 to 6. In the two remaining cases both varieties are combined.

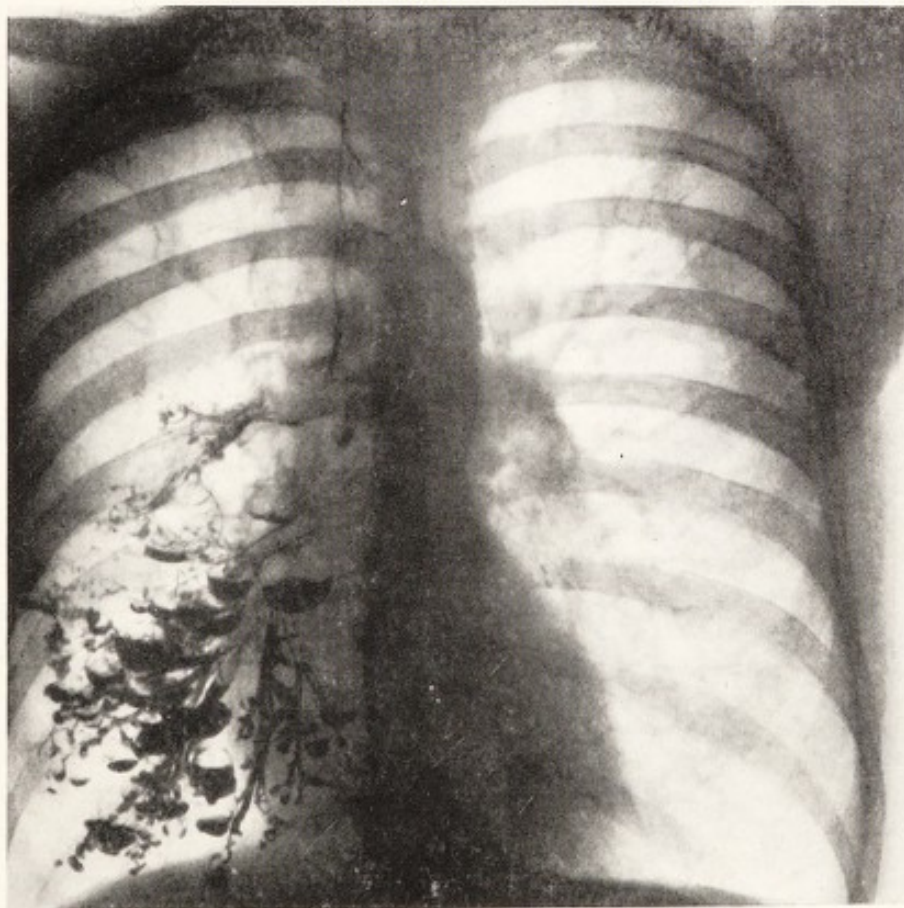
The distribution in the lungs is as follows:—

Right lower lobe	...	...	...	...	8
Left lower lobe	...	...	...	...	8
Right upper lobe	...	...	...	...	2
Left upper and lower lobes	...	...	...	...	1

SKIAGRAMS ILLUSTRATING THE USE OF LIPIODOL.



L.1(a).—Case No. 11. C.P., male, aged 27. Cough since 5 years of age. Present symptoms: cough and slight morning sputum. Physical signs: crepitations and rhonchi lower half right lung. Skiagram taken 30-1-33 shows fibrosis with ring shadows lower half right lung.

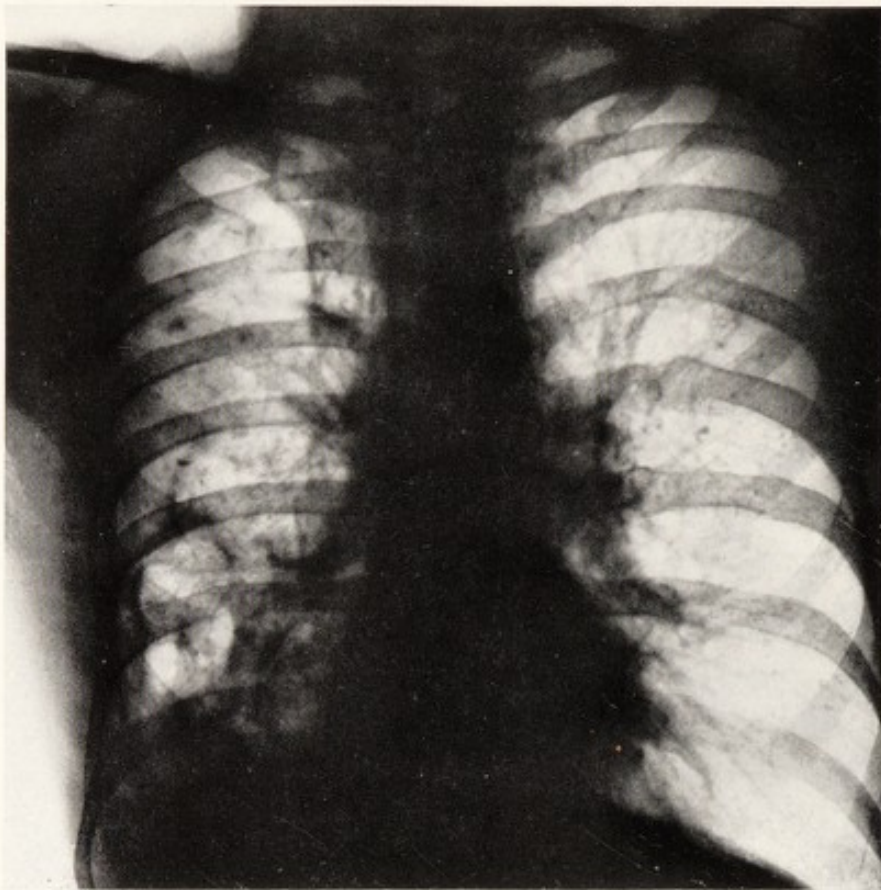


L.1(b).—Same patient. Skiagram taken 30-1-33 after lipiodol injection shows typical saccular bronchiectasis right lower lobe.

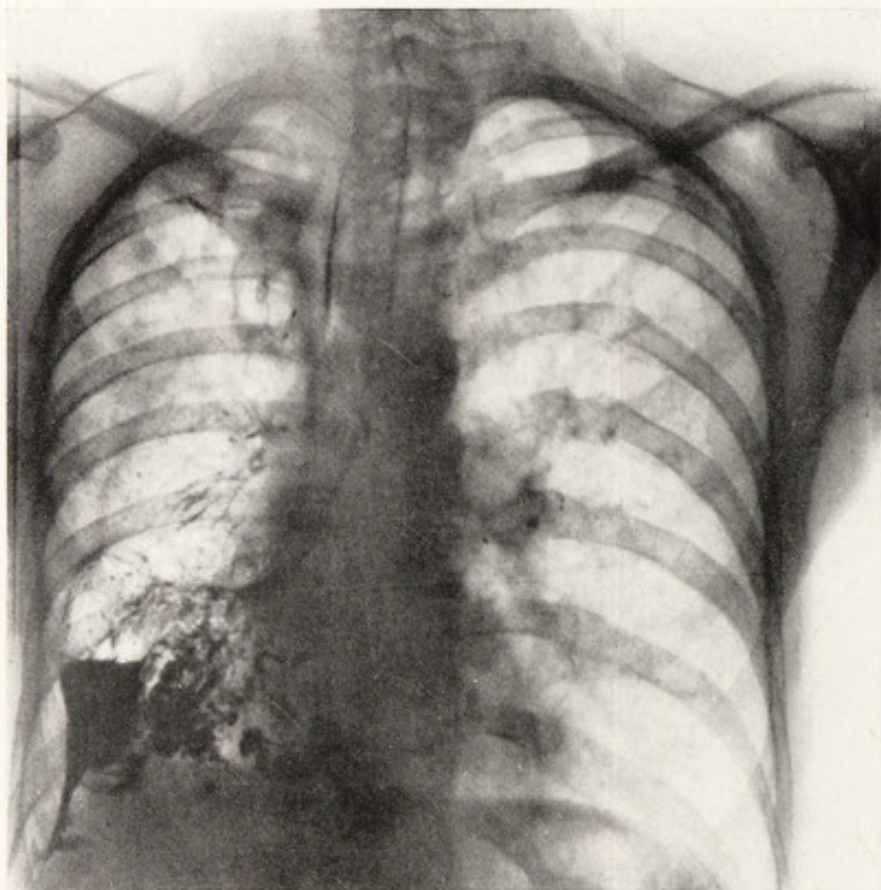
[Skiagrams taken at Wrightington Hospital.]

Right side.

Left side



L.2(a).—Case No. 7, D.B., male, aged 33 years. Bronchitis many years. Sputum T.B. plus since 1926. Present symptoms: slight cough and sputum. Physical signs: crepitations over whole of right side and at left base. Skiagram taken 12-5-32 shows ill-defined mottling right upper and middle lobes. Fibrosis at right base with ? cavity.



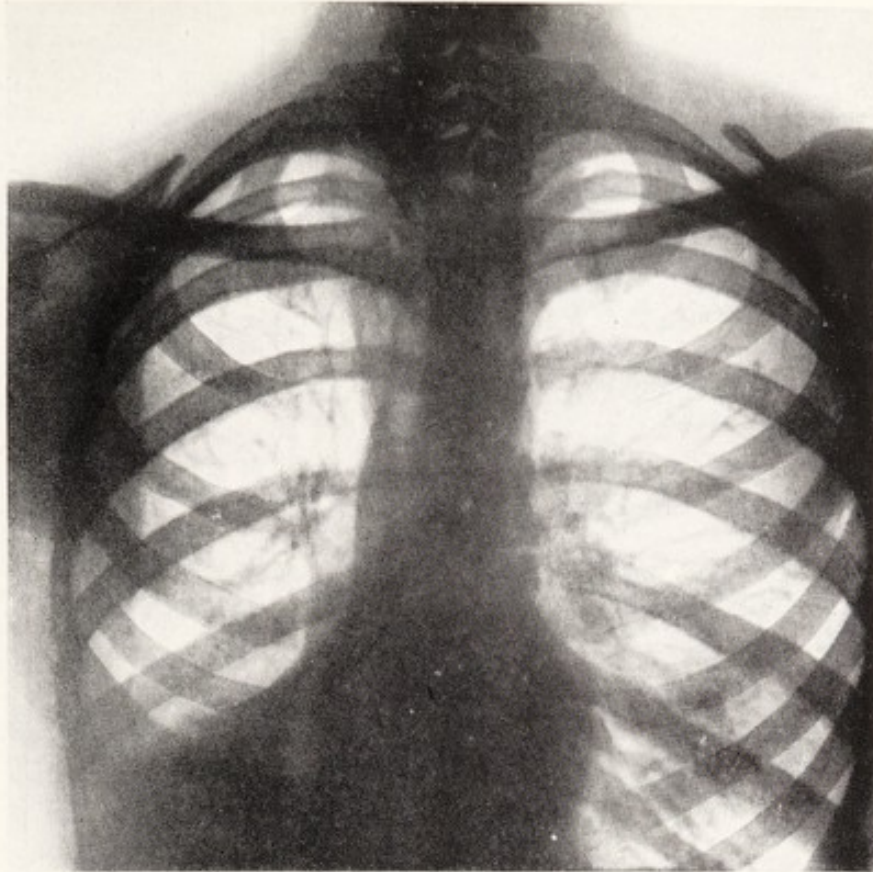
L.2(b).—Same patient. Skiagram taken 10-12-32 after lipiodol injection shows large cavity right base, probably tuberculous. Saccular bronchiectasis internal to cavity.

[Skiagrams taken at Wrightington Hospital.]

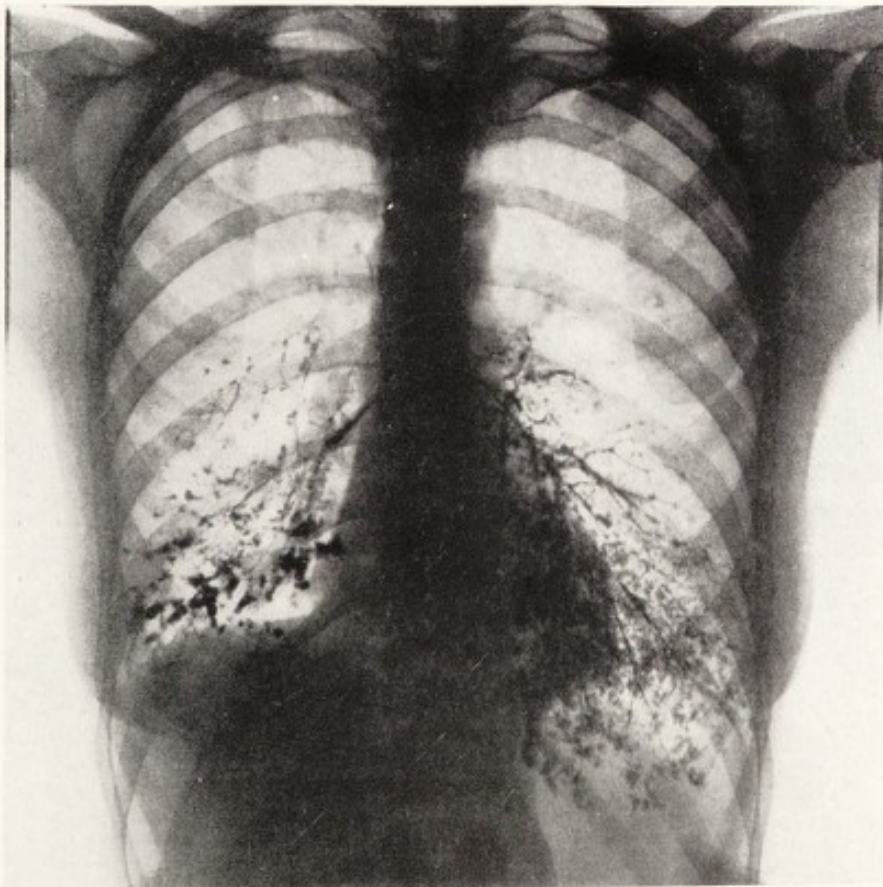
Right side.

Left side.

SKIAGRAMS ILLUSTRATING THE USE OF LIPIODOL (contd.).



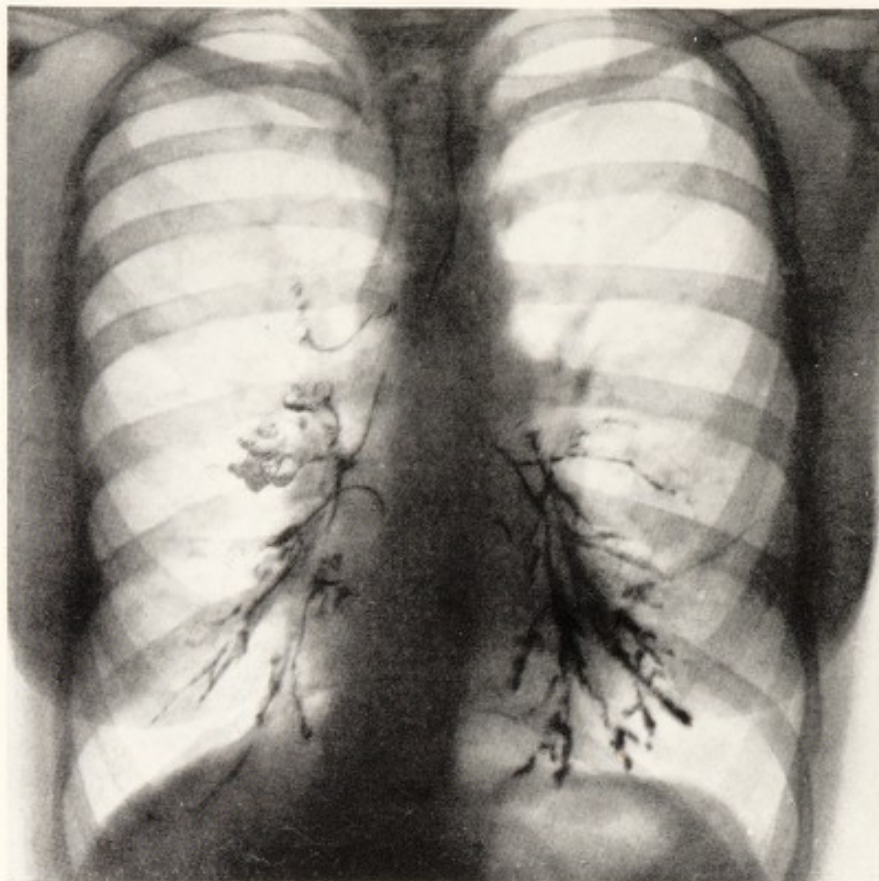
L.3(a).—Case No. 15, S.C., female, aged 39 years. Cough at least 20 years. Present symptoms: slight cough and sputum. Physical signs: faint crepitations right base. Skiagram taken at High Carley 7-6-28—diagnosis of right basal pleurisy.



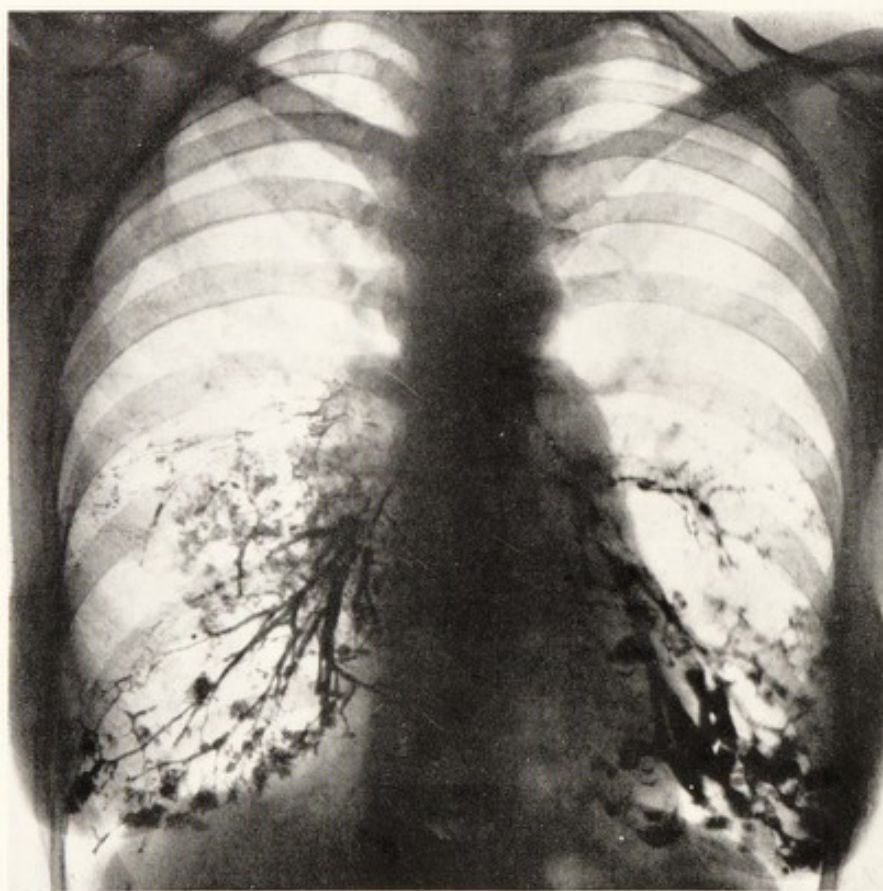
L.3(b).—Same patient. Skiagram taken 13-3-33 after injection of lipiodol shows right basal saccular bronchiectasis. The evidence of pleurisy is now confined to the cardio-phrenic sulcus.

*Right side.*

*Left side.*



L.4.—Case No. 8, M.G., female, aged 23. Pneumonia in childhood. Gradual increase cough and sputum. Recurrent haemoptyses 2 years. Physical signs: occasional crepitations right lower lobe. Skiagram taken 17-12-32 after injection of lipiodol shows sacular bronchiectasis upper and outer branches right "descending" bronchus.



L.5.—Case No. 14, M.R., female, aged 38. Cough for many years. Present symptoms: cough and slight sputum only. Physical signs: weak breath sounds right base, no adventitious sounds. Skiagram taken 27-4-33 after lipiodol injection shows a mixed type of bronchiectasis, fusiform and sacular dilatations being present together.

[Skiagrams taken at Wrightington Hospital.]

Right side.

Left side.

These figures are not in accordance with the general view that the left lower lobe is the commonest site.

It will be noted that in only one case (No. 7) of the series of 19 was pulmonary tuberculosis present in addition to bronchiectasis.

An interesting fact is to be noted with regard to the amount of sputum. Of the 19 cases, only 3 have the profuse, offensive expectoration of the classical case. In 5 cases the amount is "moderate" and in 11 cases it is either slight (*i.e.*, one or two expectorations per day, usually in the morning) or absent. These 11 cases (58 per cent.) must, therefore, for want of a better term, be classified as "dry" bronchiectasis. Wall and Hoyle<sup>3</sup> believe that this condition is commoner than has generally been supposed and the present figures lend strong support to their statement. It is possible that some of the group with moderate sputum are cases of "dry" bronchiectasis which are slowly changing into the "wet" type as the result of secondary infection.

The ætiology of bronchiectasis is still a matter of doubt. The most important factors to be considered are those of post-inflammatory changes occurring in the lungs. Whatever the mechanism—be it fibrotic traction, stagnation of secretions or interference with air intake—it is known that many cases of bronchiectasis have their origin in a condition of chronic pulmonary inflammation.

The specific fevers of childhood are not infrequently followed by a chronic pulmonary catarrh, basal in character and pathologically resembling a bronchiolectasis. This condition, in those cases which do not clear up, is undoubtedly a forerunner of bronchiectasis in later years.

Box<sup>4</sup> states that two-thirds of the cases of bronchiectasis and fibrosis of the lungs can be traced to the pulmonary complications of measles and whooping-cough. The point has also been stressed by Banks and Weir.<sup>5</sup>

In the adult, unresolved pneumonia, pleurisy or chronic bronchitis may follow the same course, although here the pathology is not so clearly defined. Bronchitis, of course, is often an associated factor without necessarily being a causative agent.

Reference to the last column in Table 17 shows that at least 9 patients (47 per cent.) can recall inflammatory chest trouble in childhood, whilst in every case there is a long history of either pleurisy or bronchitis, or attacks of broncho-pneumonia.

Bronchiectasis in an atelectatic lobe is also recognised by some authorities. Ballou, Singer and Graham<sup>6</sup> believe this type to be comparatively rare. Ellis<sup>7</sup> points out that the atelectasis need not necessarily be congenital but that bronchial dilatation may occur in

a lobe which has permanently collapsed following broncho-pneumonia in infancy.

The x-ray examination of the present series showed definite atelectatic lobes in 2 cases (Nos. 3 and 6 in the table). Lipiodol injection demonstrated a mixed bronchiectasis in one (No. 3), and an early bronchiectasis of a fusiform type in the other (No. 6.). The latter has a history of pneumonia at 4 years of age, and the former one of measles, whooping-cough and "bronchitis" at 8 months.

#### SUMMARY.

1. By the use of lipiodol the diagnosis in 32 doubtful cases has been completed at the dispensary, thus avoiding the inconvenience and expense of admission to an institution.
2. Lipiodol injection has produced no harmful reactions in these cases and appears to be a safe method to use for out-patients.
3. The crico-thyroid, oral and nasal catheter methods have all been employed. The first choice is the oral method, the next the nasal catheter method; the final choice, however, depends on the particular type of patient.
4. Of the 32 cases, definite evidence of bronchiectasis was seen after lipiodol in 19 (59.4 per cent.). In only one case of the 19 was pulmonary tuberculosis present in addition to the bronchiectasis. These cases are analysed and certain of the findings are reviewed from the point of view of modern conceptions of this condition.

I am indebted to Dr. E. H. Allon Pask for permission to make the investigation and for his helpful criticism and advice.

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- <sup>3</sup> WALL, C. and HOYLE, J. C. *B.M.J.*, 1933, i, 597.
- <sup>4</sup> BOX, C. R. Lumleian Lectures, *Lancet*, 1933, i, 1271.
- <sup>5</sup> BANKS, H. S. and WEIR, J. H. *Tubercle*, 1933, xiv, 385.
- <sup>6</sup> BALLON, H., SINGER, J. J. and GRAHAM, E. A. *Amer. J. Thor. Surg.*, 1931, i, 154.
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## IX.—THE TREATMENT OF MULTIPLE TUBERCULAR SKIN LESIONS BY SANOCRY SIN.

By E. H. W. DEANE, M.B., B.S.,  
*Assistant Medical Superintendent, Wrightington Hospital.*

Sanocrysin has been used now for some years in the treatment of pulmonary tuberculosis. In other forms of tuberculosis, however, it has not been tried extensively. To test its value it has been used in a considerable number of cases of surgical tuberculosis at Wrightington Hospital during the past 18 months.

The improvement shown in four patients with cutaneous tubercle has been so striking that the results are recorded here. These were cases of infection in which multiple small subcutaneous abscesses developed and broke down leaving an ulcerated area which showed little tendency to heal.

The treatment was first used on two children (girls aged 13 and 14 years), who were admitted with several small abscesses which had not broken down. It was possible by examining the pus aspirated from these abscesses to prove the nature of the infection, and in each case guinea-pig inoculation of the aspirated pus demonstrated the presence of tubercle bacilli. Improvement in these two cases was so marked that two adult male patients, each of whom had extensive areas of skin similarly involved, were given sanocrysin.

In the case of one adult (H.B.) the ulcerated area, which had shown no sign of healing in two years, immediately improved and was so soundly healed in ten weeks that the patient sought his discharge. In the other, a skin reaction developed after seven weeks' treatment, so that injections were stopped; the ulceration rapidly healed, however, and the patient was discharged.

### DOSAGE.

TABLE 18.

Patient.	Age.	No. of injections.	Maximum.	Total.
			grms.	grms.
J. B. ... ..	50	7	0.4	1.6
H. B. ... ..	31	10	0.6	2.8
E. C. ... ..	13	15	0.4	2.8
M. F. ... ..	14	16	0.4	3.3

The initial dose used in each case was 0.025 grms., gradually increased at weekly intervals to the maximum.

It will be noted that the total amount of sanocrysin given to these patients is smaller than is usual in cases of pulmonary tuberculosis, but as the necessary therapeutic result was obtained with the amounts used it was deemed unnecessary to proceed to the full dosage as usually recommended for pulmonary tuberculosis.

#### REACTIONS.

All patients were kept in bed for the day following the injection. No reactions were observed in three of the patients; in the fourth, an adult, dermatitis developed after the seventh injection, but this gradually cleared up, the ulceration coincidentally healing. No reactions have been observed in children, an experience which coincides with that of Heaf, who has stated<sup>1</sup> that reactions are very rare in children.

#### SEDIMENTATION INDEX AND GAIN IN WEIGHT.

TABLE 19.

Patient.	Sedimentation index.		Gain in weight (lbs.)
	Before	After	
J. B. ... ..	17 m.m.	14 m.m.	21
H. B. ... ..	7 m.m.	4 m.m.	16
E. C. ... ..	8 m.m.	5 m.m.	16
M. F. ... ..	28 m.m.	17 m.m.	17

The blood sedimentation test was done on each patient before and after treatment, and in each case improvement is shown by decrease in the sedimentation index. All the patients received the usual rest and fresh-air therapy associated with a tuberculosis institution, and had general and local ultra-violet light treatment, but as these measures had not previously produced any improvement in their condition sanocrysin injections were given.

#### CASE REPORTS.

J.B., aged 50. Onset in 1929 with an abscess in the gluteal region—under observation and treatment since then. Admitted with many sinuses discharging over sacrum and left buttock, considerable subcutaneous thickening but no evidence of bone infection. After five injections of sanocrysin the skin lesions had almost healed; after the seventh injection (0.4 grms., total 1.6 grms.) when the lesions were practically healed, dermatitis developed. No further injections were given. The ulcerated area healed completely. The patient is now working, the area remaining soundly healed. The blood Wassermann reaction of this patient was strongly positive both before and after the course of sanocrysin. In view of this fact and the rapid healing under sanocrysin we regard the lesion as definitely tuberculous. The clinical appearance supported this view.

<sup>1</sup> Personal communication to Dr. E. H. Allon Pask.

H.B., aged 31. Tuberculous lesions of scapular region, left elbow, right thigh, leg, and right wrist, in 1922. Left arm amputated 1923. All other areas healed except right foot, where the skin was thickened, dusky red, and œdematous, and presented many small discharging sinuses. X-ray showed no involvement of bone. Several abscesses required incision, but in spite of local and general light treatment and general hospital treatment the ulcers refused to heal. Sanocrysin commenced 16-8-32, and a fortnight later the skin condition was reported as "considerably improved, better now than for past two years." After six injections the ulcers were all healed and the patient asked for his discharge from hospital. A total of 2.8 grms. of sanocrysin was given in 10 doses, maximum 0.6 grms. There were no harmful reactions. This patient's Wassermann reaction was negative. The ulcerated area has remained healed since discharge from hospital.

E.C., aged 13. Admitted with ulcerating granulomatous areas both arms, right forearm, thighs, and buttock. Present eight weeks before entry into hospital. Commenced as areas of subcutaneous induration which softened and broke down. An area on the forearm which had not discharged was aspirated. The pus was found to contain tubercle bacilli. The Wassermann reaction was negative. Sanocrysin—15 injections, maximum 0.4 grms., total 2.8 grms. No reactions. All lesions healed before last injection.

M.F., aged 14. Was under treatment for pleurisy, developed a sore on the nasal septum, then dactylitis left index finger, and multiple subcutaneous abscesses on the legs, thighs, buttocks, back, and arms. When the patient was admitted to hospital her general condition was poor, she was very toxic, and the evening temperature had been raised for some weeks. Many of the abscesses had broken down, leaving a circular ulcer. One of the unbroken areas was aspirated and the pus examined, this revealed the presence of tubercle bacilli. The blood Wassermann reaction was negative. Sanocrysin treatment was commenced, and 16 injections were given at weekly intervals to a maximum dosage of 0.4 grms., and a total of 3.3 grms. All lesions were soundly healed shortly after the completion of the course of injections, and have remained so since discharge from hospital. The patient is at present working.

## X.—NOTIFICATION OF TUBERCULOSIS CASES.

It is the statutory duty of every medical practitioner to notify within 48 hours to the local medical officer of health any case of tuberculosis occurring in his practice, and the medical officer of health is charged with the duty of keeping a corrected register of such cases reported in his sanitary district.

The statutory notifications are made under the Public Health (Tuberculosis) Regulations, 1930, which came into force on 1st January, 1931. These regulations consolidate the regulations issued in 1912, 1921 and 1924, and they also include several minor amendments of an administrative nature.

## NON-NOTIFICATION.

I have continued to direct special attention to the notification of cases of tuberculosis, and have engaged in correspondence with medical practitioners, medical officers of health, and medical superintendents, over many individual cases.

The extent of non-notification of pulmonary cases in the Administrative County is shown in the following Table 20 :—

Year.	Number of deaths from pulmonary tuberculosis recorded.	Deaths not notified under Regulations during life.	
		Number.	Percentage to pulmonary deaths.
1918	1652	303	18·3
1919	1339	221	16·5
1920	1323	177	13·3
1921	1301	135	10·3
1922	1362	105	7·7
1923	1250	85	6·8
1924	1215	64	5·2
1925	1205	67	5·5
1926	1158	58	5·0
1927	1105	54	4·8
1928	1066	56	5·2
1929	1102	62	5·6
1930	1046	46	4·3
1931	1021	61	5·9
1932	975	37	3·8 *

\* Of the 37 deaths which, in 1932, escaped statutory notification as tuberculous cases during life, it should be stated that 7 were known to the tuberculosis officer, and 7 died in mental hospitals, public assistance hospitals, and general hospitals. If these 14 deaths which

were known otherwise than by the official primary notification under the Regulations be deducted, then the percentage of 3·8 *non-notified fatal cases would be reduced to 2·3, which figure may be taken as the real extent of missed notifications resulting in cases escaping supervision by the health authorities.*

The improvement which has been secured in recent years in the notification of cases of pulmonary tuberculosis before death would not have been practicable without the cordial co-operation of the local medical officers of health and, of course, the general practitioners who make the notifications.

There is no doubt that in this Administrative County a much smaller proportion of cases of tuberculosis escapes notification than is frequently the experience in other parts of the country. Thus, we have a smaller proportion of unknown cases or unknown sources of infection remaining outside the measures for the control of tuberculosis.

For non-pulmonary tuberculosis, there were 28 non-notified fatal cases in 1932, which on the total deaths from this form of the disease equalled 11·7 per cent. The percentage in the previous year was 19·1.

#### SPECIAL ENQUIRY INTO NON-NOTIFIED FATAL CASES.

Commencing in October 1920, special investigations have been carried out in regard to every individual death recorded which had not been previously notified. The procedure followed has been to examine the names of persons dying from tuberculosis given in the weekly returns of deaths sent, by arrangement, to the tuberculosis department by the district registrars. The names are compared with the notification register, and the death of every person not previously reported as a case under the Public Health (Tuberculosis) Regulations is enquired into; information as to the circumstances attending non-notification is obtained from the tuberculosis officer and, if necessary, the medical attendant.

In 1932, there were 65 such deaths, and the enquiry for that year gave the following important results:

(1) That 22 (7 pulmonary, 15 non-pulmonary) of the 65 deaths in 1932 occurred in public institutions.

(2) That of the remaining 43 deaths, the circumstances of non-notification were as stated in the following table:—

TABLE 21. *Circumstances of non-notification of fatal cases.*

	Period 1st January to 31st December, 1932		
	Pul- monary	Non-pul- monary	Total
Doctor in attendance shortly before death—			
1 week or less .. .. .	—	—	—
1 to 2 weeks .. .. .	3	—	3
2 to 3 weeks .. .. .	—	—	—
Complicated cases, presenting difficulty in diag- nosis .. .. .	4	3	7
Misinterpretation of Tuberculosis Regulations and notification believed to be unnecessary—			
Cases previously notified in another area ..	9	—	9
Cases known to tuberculosis officers—con- siderable doubt as to diagnosis in some of these cases .. .. .	7	2	9
No doctor in attendance .. .. .	2	1	3
Temporary residents .. .. .	1	—	1
Attended by more than one doctor, and notifi- cation believed to have been made by first practitioner .. .. .	2	3	5
Notified after death .. .. .	—	1	1
No apparent reason for non-notification .. ..	2	2	4
	30	12	42
Tuberculosis not primary cause of death .. ..	—	1	1
TOTAL .. .. .	30	13	43

(3) *This table shows that in only 4 of the 43 deaths was there no reasonable excuse for non-notification.*

The efficiency of notification varies directly with the efficiency of the county council or county borough scheme dealing with tuberculosis. If there is no really comprehensive scheme, if there are poor and newly qualified, part-time, and badly paid tuberculosis officers, if there are insufficient means for expert diagnosis, and too few beds for treatment, then a high proportion of non-notified fatal cases will be the rule and not the exception.

**TOTAL "KNOWN SOURCES OF POSSIBLE INFECTION."**

One effect of the better notification of cases by practitioners has been to add to the number of new cases in recent years and statistically to make the figures disadvantageously comparable with the earlier years when a larger number of cases escaped notification.

It is, however, possible to obtain a truer record of the number of new cases of pulmonary tuberculosis occurring year by year by adding together (a) the notifications and (b) the deaths which occurred without notification being made during life; this total gives clearly the number of known sources of possible infection as Table 1 on page 2 shows.

12	218	18	402	202	Women
5	158	1	90	104	Boys
15	102	8	40	120	Girls
31	478	27	432	910	TOTAL

Applications received in previous years were:—1918-21 average, 2,204; 1922-25 average, 2,188; 1926-29 average, 2,177; 1930-33 average, 1,855; compared with 1932, 1,938. Thus there were 83 more applications than in 1931.

During 1932, there were 1,938 notifications under the Public Health (Tuberculosis) Regulations as suffering from tuberculosis (all forms), whereas the number of persons who applied for treatment to the County Council was 1,858, equal to 84 per cent. of the notifications.

**CLASSIFICATION OF NEW PATIENTS**

(a) Pulmonary tuberculosis

During 1932, applications for treatment were received from 1,917 new patients, and these were reported by the tuberculosis officers to be in the undermentioned stages of the disease on the first examination:—

T.H. minus (sputum negative at start)	475	of 50.0 per cent.
T.H. plus 1 (Early case, sputum positive)	85	of 4.4
T.H. plus 2 (Intermediate case, sputum positive)	478	of 25.0
T.H. plus 3 (Advanced case, sputum positive)	180	of 9.4

It is well known that throughout the country, tuberculosis officers do not see many of the new cases in the early stages of the disease. Some patients through ignorance, others on account of economic reasons, neglect to consult a doctor when in the early stage, and so lessen their chance of recovery. In the Administrative County we have for several years made special investigations into the reasons under

## XI.—APPLICATIONS FOR TREATMENT.

Table 22 below shows the number of "new" patients (1,938) who applied for treatment under the County scheme during the year 1932 :—

	Number of applications received during 1932.	Diagnosis of new applicants for treatment.			
		Pulmonary cases.	Pulmonary and non-pulmonary.	Non-pulmonary cases.	Diagnosis not confirmed (non-tuberculous).
Men ... ..	789	607	17	156	9
Women ... ..	735	492	18	213	12
Boys ... ..	194	30	1	158	5
Girls ... ..	220	40	3	163	5
<b>TOTAL ...</b>	<b>1,938</b>	<b>1,178</b>	<b>39</b>	<b>690</b>	<b>31</b>

Applications received in previous years were :—1918–21 average, 2,294 ; 1922–25 average, 2,183 ; 1926–29 average, 2,177 ; 1930, 2,090 ; 1931, 1,855 ; compared with 1932, 1,938. Thus there were 83 more applications than in 1931.

During 1932, there were 2,302 cases notified under the Public Health (Tuberculosis) Regulations as suffering from tuberculosis (all forms), whereas the number of persons who applied for treatment to the County Council was 1,938, equal to 84 per cent. of the notifications.

### CLASSIFICATION OF NEW PATIENTS.

#### (a) *Pulmonary tuberculosis.*

During 1932, applications for treatment were received from 1,217 new patients, and these were reported by the tuberculosis officers to be in the undermentioned stages of the disease on the first examination :—

T.B. minus (Sputum negative or absent) ... ..	475, or 39·0 per cent.
T.B. plus 1 (Early cases, sputum positive) ... ..	86, or 7·1 „ „
T.B. plus 2 (Intermediate cases, sputum positive) ... ..	473, or 38·9 „ „
T.B. plus 3 (Advanced cases, sputum positive) ... ..	183, or 15·0 „ „

It is well known that, throughout the country, tuberculosis officers do not see many of the new cases in the early stage of the disease. Some patients through ignorance, others on account of economic reasons, neglect to consult a doctor when in the early stage, and so lessen their chance of recovery. In the Administrative County we have for several years made special investigations into the reasons under-

lying such disastrous delay on the part of patients. These investigations have been continued in 1932, yielding the following conclusions which correspond closely with those published in previous reports :—

1.—Altogether 66·7 per cent. of the 183 advanced cases either had no doctor or had only been attending their doctor for less than two months when first examined by the tuberculosis officer or notified. The corresponding percentage in 1931 was 65·9.

2.—After making allowance for a percentage of fulminating cases ("galloping consumption"), a large proportion—nearly three-fourths—of patients had felt ill for one or more months before consulting a doctor.

3.—The reason for late notification and patients delaying their application until in an advanced stage of the disease is chiefly the disinclination or unwillingness of the patients to report themselves to their doctor when feeling ill. This is due mainly to the insidious onset of the disease, the discomfort being only slight at first.

4.—There does not appear to be evidence in any large number of cases of unreasonable delay on the part of family doctors referring cases to the tuberculosis officer.

5.—The initiative to seek treatment when ill rests with the patient himself, and the only feasible remedy lies in the education of the public as to symptoms and common dangers of tuberculosis and the need for securing prompt treatment. This cannot be too strongly or too often emphasised.

In previous reports I have mentioned the teaching of hygiene to the older children at school, a matter which the Director of Education for the County has under consideration.

The tuberculosis medical staff have to depend very largely on the general practitioners throughout the County for bringing forward tuberculous patients, and it is satisfactory to note that 89 per cent. of new cases are sent *before notification* to the tuberculosis officers for an opinion as to diagnosis. Too much importance is still laid by some doctors on sputum examinations alone, and often too long a time is allowed to elapse in order that the sputum may be tested; or steps are not taken to report the case until it is returned as "positive."

#### (b) *Non-pulmonary tuberculosis.*

There were 690 new cases diagnosed by the tuberculosis officers as suffering from non-pulmonary tuberculosis in the following forms :—

Bones, joints and spine ... ..	160
Abdomen ... ..	84
Other organs ... ..	47
Peripheral glands ... ..	346
Skin ... ..	53
	} 690

In 1931 the number of applications from non-pulmonary cases was 668.

## XII.—TREATMENT OF TUBERCULOSIS BY ARTIFICIAL LIGHT.

### PRESENT POSITION OF THE COUNTY SCHEME.

Commencing with two experimental light centres in 1925, the County scheme has been extended, and now thirteen centres have been opened at County tuberculosis dispensaries. The names of the light centres and the description of the equipment were given in the 1929 report.

The treatment of the patients has been carried out under the direct supervision of the consultant tuberculosis officer of each dispensary area and by the medical and nursing staff under him.

### RESULTS OF TREATMENT.

Tables showing the results of treatment at each light centre have been received from the consultant tuberculosis officers of the dispensary areas, and have been summarised in the following form which represents the work done at the thirteen centres in the County during the year 1932 :—

TABLE 23.

Form of tuberculosis or part of body affected.	Number of cases on treatment on 1-1-32.	Number of cases commencing treatment in 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons. *	Still under treatment at end of 1932.
			Quiescent and apparently well. ‡	Improved.	Stationary.	Worse.		
Skin ... ..	148	86	29	8	2	1	28	166
Adenitis with abscess formation and skin involvement ...	103	171	138	4	4	—	27	101
Adenitis without softening ...	60	142	89	3	2	2	19	
Bones, joints, and spine ...	29	43	18	5	4	1	18	26
Abdomen ... ..	11	12	6	1	1	—	3	12
Other non-pulmonary conditions	13	8	4	2	—	1	3	11
Pulmonary tuberculosis :—								
Lungs—sputum positive ...	5	—	—	—	3	2	—	—
Bronchial glands ... ..	—	1	—	—	1	—	—	—
Pulmonary and non-pulmonary combined ... ..	5	3	—	1	—	—	4	3
		374    466						
Total for 1932 ... ..		840 †	284	24	17	7	102	406
		423    362						
For comparison, the total in 1931 was ... ..		785 ‡	269	21	11	4	106	374

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (e.g., removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

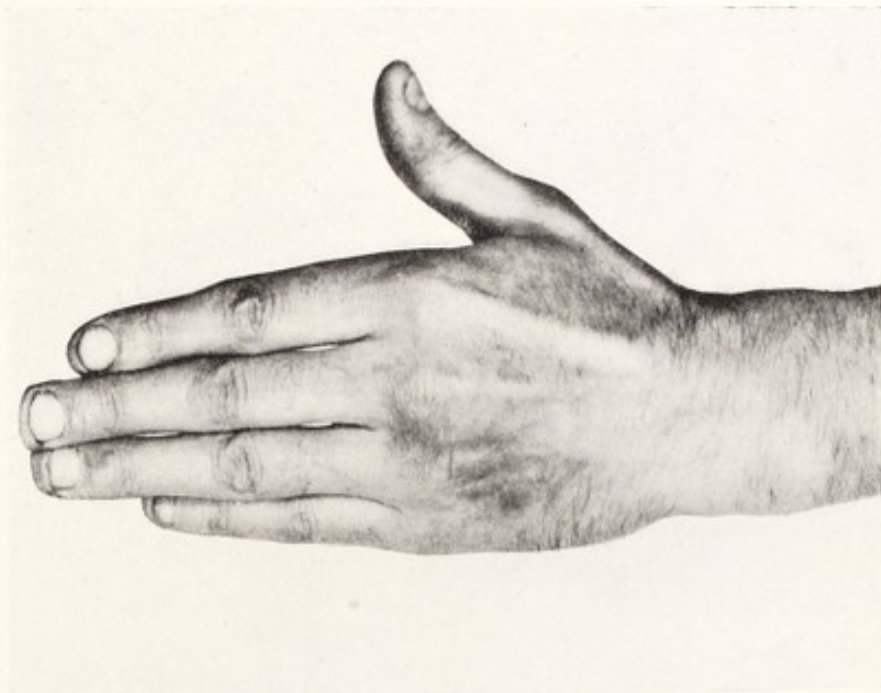
† Adults 475; children, 365.    ‡ Adults, 433; children, 352.

§ The term "quiescent and apparently well" has been chosen to express the condition of a lesion which has been healed by artificial light treatment. By direction of the Ministry of Health no case of non-pulmonary tuberculosis is written off the tuberculosis register as "recovered" until three years have elapsed without any signs or symptoms of active disease.

ARTIFICIAL LIGHT TREATMENT AT DISPENSARIES.



A.L.1(a).—Patient E.H., aged 25, male. Lupus. Duration of disease prior to light treatment 12 months. No previous treatment.



A.L.1(b).—Same patient. Photograph taken 9-1-33 after seven months' treatment with general carbon arc, local Kromayer and plaster. Pigmentation medium. Weight stationary.

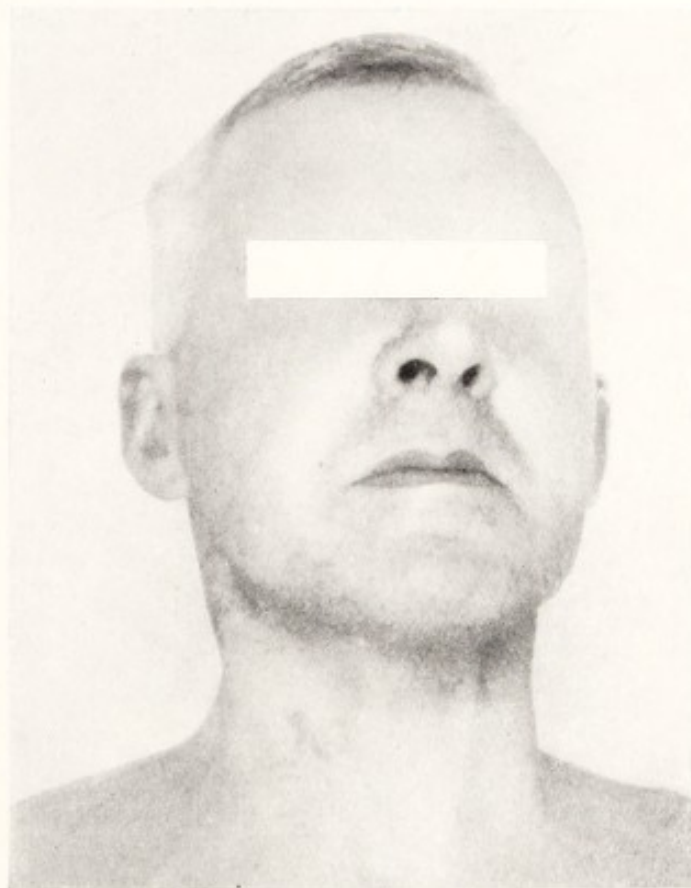
[Photographs taken at Eccles Dispensary.]



ARTIFICIAL LIGHT TREATMENT AT DISPENSARIES.



A.L.2(a).—Patient E.C., aged 50, male. Cervical adenitis. Duration of disease prior to light treatment six months. Previous treatment, operation at a general hospital.



A.L.2(b).—Same patient. Photograph taken 30-5-32 after nine months' treatment with general carbon arc. Pigmentation deep. Weight gained 6 lbs.

[Photographs taken at Eccles Dispensary.]



During the year 42 patients, who had ceased treatment in a previous year with the disease quiescent and apparently well, relapsed and returned for further treatment; the classification of these cases was as follows:—lupus, 12; adenitis with abscess formation and skin involvement, 11; adenitis without softening, 15; bones and joints, 2; and Bazin's disease, 2.

In addition to the 804 active cases dealt with in the foregoing table, there were 23 non-pulmonary cases whose condition was quiescent on commencing light treatment. The object of treatment was to prevent a possible recurrence of active disease.

The results of treatment of cases of non-pulmonary tuberculosis in 1932 may be considered satisfactory, particularly for four groups of cases, namely: (i) adenitis with abscess formation and skin involvement; (ii) adenitis without softening; (iii) bones and joints; and (iv) skin. Conditions (i) and (iv) are usually refractory to other forms of treatment.

Of the total patients attending the light centres, 74 per cent. were able to continue their normal occupation during the course of treatment.

The average gain in weight of the 284 patients who became "quiescent and apparently well" was as follows:—Adults 2.06 lbs.; children 5.89 lbs.

The degree of pigmentation attained in these 284 patients was: Deep 43, medium 70, light 112, none 59.

#### AVERAGE DURATION OF TREATMENT.

The duration of treatment has varied widely according to the type of non-pulmonary disease. Taking several groups of cases in which the disease has become quiescent and apparently well the average duration is as given in the following Table 24:—

Form of tuberculosis or part of body affected.	Number of cases (active on commencing light treatment) who became "quiescent and apparently well."	Average duration of light treatment.	<i>For comparison:</i> Average duration of disease before commencing light treatment.
		Months.	Months.
Skin ... ..	29	17.21	109.75
Adenitis with abscess formation and skin involvement ...	138	8.44	20.51
Adenitis without softening ...	89	8.14	29.09
Bones, joints, and spine ...	18	12.19	47.69
Abdomen... ..	6	7.91	13.83
Other non-pulmonary conditions	4	12.50	31.62

The frequency of attendance of patients depends on several factors, but at eleven of the centres the great majority of patients attend twice per week, and at the other centres thrice per week. Thirty-six per cent. of the patients were assisted by the payment of railway, bus or tram fares to the light centre.

PHOTOGRAPHIC RECORDS.

In order to record the progress made by patients, photographs have been taken of a number of cases treated by light—at commencement, during the course of treatment, and on termination.

COST OF LIGHT TREATMENT.

The cost of artificial light treatment at the centres has averaged 4s. 7d. per patient per week (inclusive of standing charges and a proportion of staff salaries, etc.).

AVERAGE DURATION OF TREATMENT.

The duration of treatment has varied widely according to the type of non-pulmonary disease. Taking several groups of cases in which the disease has become quiescent and apparently well the average duration is as given in the following Table 24:—

Form of tuberculosis or part of body affected.	Number of cases (active on commencing light treatment) who became "quiescent and apparently well."	Average duration of light treatment.	Average duration of disease before commencing light treatment.
Other non-pulmonary conditions	4	12-30	31-52
Abdomen	0	7-91	12-52
Bones, joints, and spine	15	12-19	27-54
Adenitis without softening	50	8-14	20-59
Adenitis with abscess formation and skin involvement	128	5-44	20-21
Skin	20	17-21	105-72

XIII.—REPORT FOR DISPENSARY AREA No. 1  
(including Lancaster Pulmonary Hospital).

Area (estimated population 266,831) embraces Lancaster, Morecambe and Heysham, Lytham St. Annes, Garstang Rural (part), Preston Rural, Walton-le-Dale, Chorley, and Horwich districts.

Consultant Tuberculosis Officer ... DR. A. D. BRUNWIN.

(Dr. Brunwin will also be the visiting physician to the Lancaster Pulmonary Hospital when erection is completed.)

Assistant Tuberculosis Officer ... DR. G. H. LEIGH.

DR. F. C. S. BRADBURY

(1 day per week).

Dr. Brunwin reports:—

A new screening stand has been supplied for x-ray work at the Lancaster Dispensary, in place of the one that had been in use for many years, and this enables the work to be done more rapidly and efficiently.

A feature of the work of the district during the year has been a considerable increase of "refilling" cases that have had artificial pneumothorax treatment while in sanatoria. Such cases require refills about every three weeks for two years or more, and as the treatment is generally successful a further increase in this side of our work is probable. The Mantoux tuberculin skin test has been used for children in a number of cases, and has proved a help in diagnosis.

The Lancaster, Chorley, and Horwich Care Committees continue to carry out most useful work in helping necessitous cases.

#### ARTIFICIAL LIGHT TREATMENT.

Artificial light centres have been established at the following tuberculosis dispensaries in Area No. 1:—Lancaster (15th July, 1925) Chorley (14th October, 1926), and Preston (29th November, 1927).

During the year 1932, the "Alpine Sun" carbon arc lamp at the Preston Centre was replaced by two "Sunrae" lamps, thus bringing the treatment in line with that at other dispensaries in the County. So far little difference in the effect has been noticed, though more patients can be treated in a given time. "Snow-white" carbons are used, and exposures up to two hours are given. Similar carbons are used at the Chorley Dispensary, and iron-cored carbons at Lancaster, where only one lamp is installed, and I cannot say that any obvious difference is apparent as regards therapeutic value. The multiple carbon arc lamp at Chorley was replaced at the beginning of 1932 by two "Sunrae" lamps. The installation of these lamps has rendered the treatment much easier, as more patients can be accommodated

at each session and it has not been necessary to treat the children with the mercury vapour lamps. There has been a definite improvement in the results.

A further detailed enquiry as to the relative value of exposures and the various kinds of lamps and carbons is about to be made.

The majority of the patients treated at the three centres were cervical gland cases, and the results on the whole are satisfactory, though the treatment is a slow one. Cases of lupus are less satisfactory, but almost all are improved or, at any rate, kept in check.

Definite improvement in the lesions treated was noticed, particularly during the exceptionally sunny weather of the summer of 1932. Light treatment, not well tolerated during the hot weather, was discontinued for several weeks and it was found that in cases of surgical tuberculosis natural sunlight was more efficacious than artificial light. Unfortunately such natural conditions are rare.

The following Table 25 shows the results for patients treated at these dispensary centres during 1932 :—

(a) *Lancaster Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	7	—	1	—	—	1	5
Adenitis with abscess formation and skin involvement ... ..	10	5	1	1	—	1	2
Adenitis without softening ... ..	8	4	1	—	—	3	—
Bones, joints, and spine ... ..	5	4	—	—	—	1	—
Other non-pulmonary conditions ... ..	1	—	—	—	—	1	—
<b>TOTAL ... ..</b>	<b>31</b>	<b>13</b>	<b>3</b>	<b>1</b>	<b>—</b>	<b>7</b>	<b>7</b>

(b) *Preston Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	7	—	—	—	—	1	6
Adenitis with abscess formation and skin involvement ... ..	18	6	1	—	—	3	8
Adenitis without softening ... ..	8	6	—	—	—	2	—
Bones, joints, and spine ... ..	9	2	—	1	1	3	2
<b>TOTAL ... ..</b>	<b>42</b>	<b>14</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>9</b>	<b>16</b>

(c) *Chorley Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	17	—	—	—	—	—	17
Adenitis with abscess formation and skin involvement ... ..	24	15	—	—	—	1	8
Adenitis without softening ... ..	20	10	—	—	—	—	10
Bones, joints, and spine ... ..	5	1	—	—	—	1	3
Abdomen ... ..	2	1	—	—	—	—	1
Other non-pulmonary conditions ... ..	4	—	—	—	—	1	3
<b>TOTAL</b> ... ..	<b>72</b>	<b>27</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>3</b>	<b>42</b>

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

## LANCASTER PULMONARY HOSPITAL.

The work of building the new isolation hospital on the northern boundary of Lancaster was commenced by the Corporation in July, 1932, and will be completed in June, 1934. There will be a separate block for 30 patients suffering from pulmonary tuberculosis; when the accommodation is ready it will meet a definite need which has existed in this area since the closing of the Luneside Hospital in October, 1927.

The consultant tuberculosis officer for Dispensary Area No. 1 will be the visiting physician of the tuberculosis block.

## SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1932  
(Definitely tuberculous, 955; doubtful, 0.) ... .. 955

Examinations by tuberculosis officer at—	Examinations of new persons and new contacts for diagnosis.	Re-visits or re-attendances of "old" cases and "old" contacts.
Patients' homes ... ..	202	1391
Lancaster Chief Dispensary ... ..	154	322
Chorley Branch Dispensary ... ..	120	695
Preston Branch Dispensary ... ..	72	428
	<u>346</u>	<u>1445</u>

## Attendances of patients at dispensaries for artificial light treatment—

Lancaster Dispensary ... ..	862	} 5250
Chorley Dispensary ... ..	2916	
Preston Dispensary ... ..	1472	

Attendances for artificial pneumothorax treatment (12 individual patients)	61
Care committee meetings attended by—	
(a) Tuberculosis officers ... ..	23
(b) Tuberculosis health visitors ... ..	34
Lectures or addresses given ... ..	3
Visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals ... ..	20
Special visits by tuberculosis officers ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.) ... ..	12
Visits by dispensary nurses to patients' homes—	
Routine visits ... ..	3855
Actual nursing ... ..	10
Application of surgical dressings ... ..	11
	3876
Sanitary defects reported to the local medical officers of health ... ..	15
Sanitary defects which after notification were remedied ... ..	7
Disinfections carried out by local sanitary authorities ... ..	216
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment ... ..	462

The work of building the new isolation hospital on the northern boundary of Langley was commenced by the Corporation in July 1927, and will be completed in June 1928. There will be a separate block for 50 patients suffering from pulmonary tuberculosis; when the accommodation is ready it will meet a definite need which has existed in this area since the closing of the Langley Hospital in October 1927.

The consultant tuberculosis officer for District Area No. 1 will be the visiting physician of the tuberculosis block.

SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1927 (initially tuberculous, 937; doubtful, 6).

Dispensary	Examinations of new patients and new contacts of "old" cases for diagnosis	Examinations of "old" cases
Patients' homes	502	1701
Langley Dispensary	154	523
Charley Branch Dispensary	120	502
Piston Branch Dispensary	72	422
	848	3148

Attendances of patients at dispensaries for artificial light treatment—

Langley Dispensary	802
Charley Dispensary	2018
Piston Dispensary	1178

XIV.—REPORT FOR DISPENSARY AREA No. 2  
(including Withnell Pulmonary Hospital).

Area (estimated population 341,101) embraces Clitheroe, Colne, Nelson, Burnley Rural, Blackburn Rural, Accrington, Darwen, Haslingden, Rawtenstall, and Bacup districts.

Consultant Tuberculosis Officer ... DR. B. MACPHEE.

(Dr. MacPhee is also visiting medical superintendent of the Withnell Pulmonary Hospital).

Assistant Tuberculosis Officers ... DR. S. C. ADAM and  
DR. F. C. S. BRADBURY

(2 days per week)

Dr. MacPhee reports :—

It gives me great pleasure to record that on the 7th September, 1932, the new dispensary, "High Lea," 108A, Whalley Road, Accrington, was honoured by a visit from the Minister of Health, the Rt. Hon. Sir Edward Hilton Young, and Sir Arthur B. Lowry, one of the principal officials of the Ministry, who were accompanied by members and officials of the County Council.

The situation and accommodation of the new premises have proved of great convenience and comfort to the patients. The better working conditions are also much appreciated by the staff.

The installation of a new x-ray apparatus and ultra-violet radiation lamps at the chief dispensary has helped to centralise the work, and has thus been a factor in saving both time and expense. During the year under review, 954 skiagrams were taken.

Refills for artificial pneumothorax treatment, formerly carried out at Withnell Pulmonary Hospital, are now undertaken at the chief dispensary, and here again the consequent saving of time and expense to the patients is recognised.

At the Accrington Dispensary laboratory, 1,331 specimens of sputum were examined with the following results :—Positive, 204 ; negative, 1,127. As a further aid to diagnosis in doubtful and difficult cases, 27 bacteriological specimens were sent to the Public Health Laboratory of the Manchester University for inoculation tests with the following results :—Positive, 3 ; negative, 24.

The County care fund has again been found extremely valuable in assisting necessitous cases, 54 individual patients or their dependants having been assisted at an approximate cost of £150.

The Care Committee for the districts of Egerton, Eagley and Dunsear has continued its useful work during the year.

ARTIFICIAL LIGHT TREATMENT.

Artificial light centres have been established at the following tuberculosis dispensaries in Area No. 2 :—Accrington (26th January 1932), Nelson (20th November, 1928), and Stacksteads (9th January, 1928).

None of the cases treated during the year calls for any special comment. The patients' attendances at the light centres have been, on the whole, very regular.

The following Table 26 shows the results for patients treated at these dispensary centres during 1932 :—

(a) *Accrington Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	16	2	—	—	—	3	11
Adenitis with abscess formation and skin involvement ... ..	18	6	1	—	—	4	7
Adenitis without softening ... ..	16	6	—	1	—	1	8
Bones, joints, and spine ... ..	12	2	3	—	—	1	6
TOTAL ... ..	62	16	4	1	—	9	32

(b) *Nelson Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	14	1	—	—	—	2	11
Adenitis with abscess formation and skin involvement ... ..	23	12	—	3	—	3	5
Adenitis without softening ... ..	14	6	2	—	1	—	5
Bones, joints, and spine ... ..	8	2	—	2	—	2	2
Abdomen ... ..	4	2	—	1	—	—	1
Other non-pulmonary conditions ... ..	2	—	—	—	1	—	1
TOTAL ... ..	65	23	2	6	2	7	25

(c) *Stacksteads Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	9	1	2	1	—	—	5
Adenitis with abscess formation and skin involvement ... ..	24	14	1	—	—	—	9
Adenitis without softening ... ..	5	3	—	—	—	1	1
Bones, joints, and spine ... ..	7	2	—	—	—	1	4
Abdomen ... ..	1	1	—	—	—	—	—
Other non-pulmonary conditions ... ..	2	—	1	—	—	—	1
TOTAL ... ..	48	21	4	1	—	2	20

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (e.g., removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

## WITHNELL PULMONARY HOSPITAL, NEAR CHORLEY.

*Matron ... MISS D. WILLMAN.*

The County Council in December, 1924, purchased Withnell Hall (including two cottages, outbuildings, and 37 acres of land) situated on the main road from Blackburn to Chorley. The first patient was admitted on the 15th August, 1927. Accommodation is provided for 52 male patients (28 in cubicles, 18 in wards and 6 in shelters). The hospital serves mainly Dispensary Area No. 2. Three houses were provided on the estate for employees.

Dr. MacPhee reports as follows:—

During the year 89 patients were admitted to the institution, 55 discharged, and 30 died. Included in the 89 admissions were 6 patients sent in for observation and diagnosis. The percentage of beds occupied during the year was 99.11.

At the laboratory 690 specimens of sputum were examined with the following results:—Positive, 328; negative 362.

In the x-ray department, 170 skiagrams were taken and 195 screenings made.

With regard to treatment, the ordinary routine was carried out, but in a few specially selected cases artificial pneumothorax was done. Seven in-patients received this treatment, and 22 patients from the dispensary area attended the institution for refills. In future, however, fewer patients will attend the hospital for this purpose as artificial pneumothorax refills are now given at the chief dispensary in Accrington.

At the end of the year, commencement was made in the construction of a new treatment block, which, when completed, will be a valuable asset to the institution and will facilitate the carrying out of special forms of treatment.

On the 6th September, 1932, the hospital was honoured by a visit from the Minister of Health, the Rt. Hon. Sir Edward Hilton Young, and Sir Arthur B. Lowry, one of the principal officials of the Ministry, who were accompanied by County Alderman Sir James T. Travis-Clegg (Chairman of the County Council), County Alderman C. J. Trimble (Chairman of the County Tuberculosis Committee), County Councillor E. Boothman (Vice-Chairman of the County Tuberculosis Committee), Sir George Etherton (Clerk of the Lancashire County Council), Dr. J. J. Butterworth (County Medical Officer of Health), and other members and officials of the County Council.

As before, the Honorary Nonconformist Chaplain, the Rev. Mr. Crosby, ministered to the spiritual welfare of the patients, and I also wish to place on record the kindly interest he has taken in the social life of the patients and our indebtedness to him for bringing from time to time concert parties to the hospital.



XV.—REPORT FOR DISPENSARY AREA No. 3  
(including from 1st July, 1933, Wolstenholme Pulmonary  
Hospital).

Area (estimated population 374,490) embraces Ramsbottom, Littleborough, Radcliffe, Heywood, Crompton, Royton, Prestwich, Middleton, Chadderton, Failsworth, Ashton-under-Lyne, Mossley, and Denton districts.

Consultant Tuberculosis Officer ... DR. G. FLETCHER.

(Dr. Fletcher is also visiting medical superintendent of Wolstenholme  
Pulmonary Hospital.)

Assistant Tuberculosis Officers ... DR. C. BERRY and

DR. J. L. ARMOUR.

Dr. Fletcher reports :—

The care committees at Ashton-under-Lyne and at Prestwich assisted the necessitous cases in these areas, expending the sums of £148 8s. 3d. and £30 15s. 7d., respectively. The patients in the Radcliffe and Whitefield areas were assisted by the Radcliffe and Whitefield Relief Fund for Consumptives; 21 cases were assisted at a cost of £129 8s. 3d. On the 5th July, 1932, the Ashton-under-Lyne Care Committee made a visit to Elswick Sanatorium. The courtesy of Dr. Charnock and his staff made the outing a very pleasant and profitable one.

In districts in which no voluntary care committee exists, 65 patients were assisted from the County care fund at a cost of £149 14s. 3d.

The x-ray work at Ashton-under-Lyne involved the taking of 2,020 skiagrams, as compared with 1,960 in 1931.

At the Ashton-under-Lyne Dispensary, 1,324 specimens of sputum were examined, 330 being positive and 994 negative.

Consultation visits were made to Aitken and Halifax Sanatoria, and to Wolstenholme and Chadderton Pulmonary Hospitals.

An address on the work of the dispensary was given to the Oldham Medical Society on the 29th November, 1932, and during the health week at Middleton a tuberculosis section was provided.

I was privileged to attend a post-graduate course in Germany during part of September, and found the comparison of British and German methods very interesting.

As in former years, I have to thank the practitioners in this area for their cordial co-operation, and my colleagues on the medical, nursing, and clerical staffs for their loyal help.

#### ARTIFICIAL LIGHT TREATMENT.

Artificial light centres have been established at the following tuberculosis dispensaries in Area No. 3 :—Ashton-under-Lyne (11th September, 1925), and Radcliffe (20th July, 1928).

The light centres at Ashton-under-Lyne and Radcliffe have carried on successfully, following the lines already established, and the results, being similar to those obtained in previous years, call for no special comment.

As was to be expected, the figures for 1932 show a diminution on those of previous years.

In addition to the patients classified in the accompanying tables, 125 cases which had received light treatment with good results attended the dispensaries for observation.

The following Table 27 shows the results for patients treated at these centres during 1932 :—

(a) *Ashton-under-Lyne Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	31	1	—	—	—	4	26
Adenitis with abscess formation and skin involvement ... ..	33	15	—	—	—	7	11
Adenitis without softening ... ..	17	6	—	—	—	3	8
Bones, joints, and spine ... ..	6	1	—	—	—	3	2
Abdomen ... ..	10	1	—	—	—	2	7
Other non-pulmonary conditions ... ..	2	1	—	—	—	—	1
Pulmonary and non-pulmonary combined:—							
† T.B. plus and adenitis with abscess formation ... ..	1	—	—	—	—	—	1
† T.B. minus and sternum ... ..	1	—	—	—	—	1	—
<b>TOTAL ... ..</b>	<b>101</b>	<b>25</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>20</b>	<b>56</b>

(b) *Radcliffe Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	16	—	—	—	—	5	11
Adenitis with abscess formation and skin involvement ... ..	26	10	—	—	—	4	12
Adenitis without softening ... ..	1	—	—	—	—	—	1
Bones, joints, and spine ... ..	2	1	—	—	—	1	—
Other non-pulmonary conditions ... ..	6	1	1	—	—	1	3
<b>TOTAL ... ..</b>	<b>51</b>	<b>12</b>	<b>1</b>	<b>—</b>	<b>—</b>	<b>11</b>	<b>27</b>

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (e.g., removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

† Local treatment only for non-pulmonary condition.

## WOLSTENHOLME PULMONARY HOSPITAL, NORDEN.

*Matron* ... MISS S. HOLMES.

The County Council, on the 1st July, 1933, took over from the Rochdale Corporation Wolstenholme Hall, Norden, which had been used by them as a pulmonary hospital for 45 adult male patients of whom 25 to 30 were sent by the County Council. The estate is situated on the Edenfield road,  $3\frac{1}{2}$  miles west of Rochdale, and contains  $7\frac{1}{4}$  acres of land with two cottages and outbuildings. The County Council have undertaken to erect entirely new buildings for the treatment of 55 patients, the Hall being used after a certain amount of adaptation for housing the nursing and domestic staffs and for other administrative purposes. The Hall will continue to be used for the treatment of a number of patients until the new buildings are ready.

The estimated capital cost of the scheme is £17,405, representing £316 per bed, and a tender for the building work was accepted in July, 1933.

Of the 55 beds, the County Council have undertaken to lease to the Rochdale Corporation 25 beds.

## SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1932						1546
(Definitely tuberculous, 1546 ; doubtful, 0.)				...	...	...
				Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of " <i>old</i> " cases and " <i>old</i> " <i>contacts</i> .	
Examinations by tuberculosis officer at—						
Patients' homes	...	...	...	146	632	
Ashton-under-Lyne Chief Dispensary	...	...	...	455	2161	
Middleton Branch Dispensary	...	...	...	90	408	
Mossley Branch Dispensary	...	...	...	49	193	
Oldham Branch Dispensary	...	...	...	293	1079	
Radcliffe Branch Dispensary	...	...	...	239	833	
Rochdale Branch Dispensary	...	...	...	174	480	
				1300	5154	
Attendances of patients at dispensaries for artificial light treatment—						
Ashton-under-Lyne Dispensary	...	...	...	...	4559	} 6581
Radcliffe Dispensary	...	...	...	...	2022	
Attendances for artificial pneumothorax treatment (16 individual patients)						158
Care committee meetings attended by—						
(a) Tuberculosis officers	...	...	...	...	...	10
(b) Tuberculosis health visitors	...	...	...	...	...	8
Lectures or addresses given	...	...	...	...	...	1
Visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals				...	...	112
Special visits by tuberculosis officers ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.)				...	...	11



XVI.—REPORT FOR DISPENSARY AREA No. 4  
(including Peel Hall Pulmonary Hospital).

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Area (estimated population 354,134) embraces Westhoughton, Atherton, Farnworth, Leigh, Swinton and Pendlebury, Eccles, and Stretford districts.

Consultant Tuberculosis Officer ... DR. G. JESSEL.  
(Dr. Jessel is also visiting medical superintendent of Peel Hall Pulmonary Hospital).

Assistant Tuberculosis Officers ... DR. A. B. JAMIESON and  
DR. H. J. VILLIERS.

Dr. Jessel reports :—

The outstanding event of the year was the extension of the Eccles Dispensary premises by the inclusion of additional rooms. This necessitated a complete rearrangement of the accommodation. The alterations extended over several months causing no little inconvenience, but it was possible to continue the usual activities of the dispensary practically throughout the whole period. The new clinic consists of two houses so arranged that on the ground floor there is a suite of rooms comprising male and female waiting-rooms, with dressing cubicles, consulting-room, x-ray room, dark room and laboratory. On the first floor a suite of rooms is devoted to actinotherapy, while other rooms are devoted to a second consulting room, nurses' rooms and photographic room. There are also quarters for a resident caretaker. The old gas-tube x-ray apparatus, which had done good service, was replaced by a modern single-valve set by Messrs. Newton & Wright, Ltd. This has proved most satisfactory and good chest pictures are being regularly taken at exposures of one-tenth of a second. Stereoscopy is also possible by means of an electro-magnetic shift. The new single-coated paper films are being used for repetition work, and are both economical and satisfactory for the purpose. The Eccles clinic has thus become the diagnostic centre of the area, the office and records still remaining at the Leigh Dispensary, and this arrangement works satisfactorily owing to the compactness of the area.

The number of artificial pneumothorax cases requiring screening and refills has gradually increased, 46 patients making 648 attendances. The progress of these cases has been most encouraging; in addition to the clinical and radiological evidence, blood sedimentation is now being done, and the results are interesting.

The statistics furnished at the end of this report show that the volume of work is well up to the standard of previous years, and it is pleasing to record that in almost every case the condition of the patients attending is such as one would expect to present difficulty to the ordinary general practitioner. This shows that the dispensary organisation is fulfilling the purpose for which it was intended, namely, to investigate cases of difficulty, and not to perform the ordinary functions of a general practitioner or of an out-patient department. It is by no means an infrequent occurrence for practitioners to bring their patients to the Eccles clinic for diagnosis, and the medical attendant was present in 92.5 per cent. of 189 home visits paid by me.

#### ARTIFICIAL LIGHT TREATMENT.

The artificial light centre at the Eccles Dispensary was established on the 1st December, 1927.

The accompanying figures are similar to those for last year, and there is little to add to what I have already said in previous reports. The method of treatment by weak, long-flame carbons has been found convenient and satisfactory over a number of years, being entirely free from danger. The Jesionek and Kromayer mercury vapour lamps also play a useful part, the former in connection with glandular enlargement, and the latter in the local treatment of lupus. I am confident, however, that actinotherapy is not a specific; indeed, there is at present no specific for the treatment of tuberculosis. Our sheet anchor is the judicious utilisation of various general methods calculated to raise the patient's resistance, with local treatment for the diseased areas where practicable. In this connection general exposure of the body to ultra-violet rays acts as a stimulant, while the local treatment by the Kromayer lamp as by chemicals, plaster, etc., acts as a caustic. Most of the cases do extremely well, but in a small proportion relapses occur, caused, as one might expect, by a periodical lowering of the patient's resistance on returning to ordinary life. Two or three cases must also be recorded which were entirely unresponsive to any form of treatment, and this is a universal experience. The number of new cases of lupus shows a welcome decline, and the opening of the Wrightington Hospital has enabled us to send away bone and joint cases which cannot satisfactorily be treated as out-patients.

The following Table 28 shows the results for patients treated during 1932:—

*Eccles Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons *	Still under treatment at end of 1932
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	38	14	3	1	—	8	12
Adenitis with abscess formation and skin involvement ... ..	34	23	—	—	—	—	11
Adenitis without softening ... ..	41	15	—	1	—	3	22
Bones, joints, and spine ... ..	7	2	2	—	—	2	1
Abdomen ... ..	1	—	1	—	—	—	—
<b>TOTAL</b> ... ..	<b>121</b>	<b>54</b>	<b>6</b>	<b>2</b>	<b>—</b>	<b>13</b>	<b>46</b>

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

## PEEL HALL PULMONARY HOSPITAL, LITTLE HULTON.

*Matron* ... MISS E. SIMMONS.

The Hall, with about 17 acres of land attached thereto, was presented in 1914 to the Lancashire County Council by Mr. A. Wynne-Corrie, and an additional 20 acres of land, and later 8 acres, have been purchased. The adaptation of the premises as a pulmonary hospital—delayed owing to the Great War—was completed in 1921.

The hospital, now accommodating 56 adult males, serves principally Dispensary Area No. 4 in taking advanced, observation and educational cases.

Mr. H. Morrision Davies is the visiting consulting chest surgeon.

A motor ambulance is provided, and is available also for conveying patients to and from other hospitals.

Dr. Jessel reports as follows on the year's work at the hospital:—

Although the ordinary conception of a hospital is that of an institution for the cure of disease, for some reason or other there has been allowed to grow up in the mind of the public the idea that tuberculosis hospitals are the last refuge for hopeless cases. The sanatorium was regarded as an institution for the treatment of patients in the so-called early stage, but nowadays it is fairly generally accepted that the outlook of an "early" case with slight involvement of lungs may be less favourable than that of a person with a more extensive

lesion. The word "sanatorium" has also been used in connection with infectious diseases hospitals, the result being that the public mind has become generally confused. The fact is that the modern conception of pulmonary tuberculosis demands the provision in one and the same institution of the advantages of the sanatorium and of the modern hospital. The Peel Hall Hospital exists for the following objects :—

1. To improve and, if possible, restore the health of the patients ;
2. To provide nursing and care such as is unobtainable at home ;
3. To prevent the spread of infection.

The patients admitted are mainly from Area 4 and represent the bulk of the male adults passing through the area clinics for diagnosis, or on notification. They are thus representative of pulmonary tuberculosis in all its aspects and manifestations. It may be fairly claimed that the newer conception of the hospital-sanatorium, that is, an institution which adds to the best of the old sanatorium régime the application of modern methods of treatment, has more than justified itself. The result is an atmosphere of a general hospital, working under open-air conditions, with rest as the fundamental basis of treatment.

On admission to Peel Hall, all patients are put to bed and undergo a series of systematic tests to enable an estimate to be formed of their condition, and the best lines of treatment to pursue. The tests include ordinary physical examination, records of temperature, pulse, sputum (both as regards quantity and the presence or absence of tubercle bacilli), radiological examination, blood sedimentation, etc. If a case is suitable for artificial pneumothorax treatment, this is begun without delay as, although it is sometimes possible with unlimited time at one's disposal to obtain as good results as are obtainable by artificial pneumothorax, experience has shown that as a matter of fact few patients are willing to devote the necessary time, even when they have the opportunity. The psychological effect on patients and the hospital generally of the utilisation of artificial pneumothorax and other special methods of treatment is immense. Whereas formerly it was the practice in most institutions for a fairly large proportion of patients to take their discharge, or to behave in such a manner as to be dismissed, this is now a rarity and, furthermore, it is pleasing to see numbers of former patients turn up at the hospital on Sundays and holidays. This has all been brought about partly by the growing realisation that a pulmonary hospital is a residential treatment centre, and partly owing to the happiness and *esprit de corps* engendered through the patients' social club, which makes itself responsible for all the organisation of suitable pastimes and amusements that are outside

the regular, useful hobby-exercises which all patients who are up undertake as a matter of routine. The length of stay of patients depends in the main on their progress, and on a study of the home conditions, and this is one direction in which the advantage of having both in-patients and out-patients under the charge of a single officer is apparent. It is, moreover, possible to make a nice adjustment between discharges and admissions, based upon a careful consideration of the home circumstances of those who have already had several months' in-patient treatment, and of those who are awaiting admission and require special attention. The effect of artificial pneumothorax treatment has tended to shorten the period necessary for residential treatment, and the attendance of patients for refills serves in addition to keep them under close supervision, with resultant benefit. Apart from the patients attending the Eccles Dispensary for this purpose, there are now some men who find it more convenient to come to the hospital for refills.

It is only necessary briefly to allude to the amenities available at the hospital for patients who are able to take advantage of them, *e.g.*, putting and bowling greens, croquet lawn, billiards, piano, Kodascope, good library, and wireless in each ward as well as in the recreation rooms and staff quarters, and the annual issue of the patient's periodical, *Our Mag.* Until a specific is discovered for the treatment of tuberculosis, particular attention must be directed to strengthening and maintaining the physical and mental condition of patients in such varied ways as appear applicable to the individual patient.

The following figures give some indication of the activities of the hospital during the past year:—

Admissions :			
(a) Definite cases of pulmonary tuberculosis	...	...	121
(b) Observation cases	...	...	5
Deaths	...	...	12
Average length of stay of patients discharged :			
(a) Definite cases	...	...	153 days
(b) Observation cases	...	...	20 days
(c) Average length of stay of patients dying	...	...	93 days
Artificial pneumothorax :			
Inductions attempted	...	...	57
Unsuccessful or abandoned owing to adhesions...	...	...	15
Satisfactory collapse obtained	...	...	42
Effusions receiving gas replacements—			
1932 cases	...	...	4
Earlier cases	...	...	4 — 8
Phrenicectomies (by Mr. Morrison Davies)	...	...	26
Sanocrysin	...	...	7



XVII.—REPORT FOR DISPENSARY AREA No. 5  
(including Rufford Pulmonary Hospital).

Area (estimated population 254,414) embraces West Lancashire Rural, Great Crosby, Waterloo-with-Seaforth, Litherland, Newton-in-Makerfield, Whiston Rural, Warrington Rural, and Widnes districts

Consultant Tuberculosis Officer ... DR. C. W. LAIRD.  
(Dr. Laird is also visiting medical superintendent of the Rufford  
Pulmonary Hospital).

Assistant Tuberculosis Officers ... DR. C. H. LILLEY and  
DR. F. C. S. BRADBURY  
(2½ days per week).

The County Tuberculosis Committee decided to detach from Area No. 5 the districts around and near the Wrightington Hospital and to constitute the Wigan County Sub-Area ; such change took effect on the 1st January, 1932.

Dr. Laird reports :—

At the chief dispensary at Seaforth the attendance of patients for purposes of diagnosis or supervision during the year has been quite satisfactory and compares very favourably with that of other years. Despite the fact that for the first time the area did not include the district comprised by Wigan Rural, the radiological work carried out showed little or no decrease ; this may have been due to the fact that the Wigan cases were still sent to Seaforth during the first quarter of the year. On the other hand, the number of refills in cases of artificial pneumothorax was much greater. It has still been found necessary to hold three ordinary sessions per week, one of which is almost entirely devoted to this special form of treatment, while on a fourth day a session is held specially for the taking of skiagrams. The evening dispensary session is held once a month as heretofore, to meet the convenience of patients who are at work and cannot spare the time during the day. This evening session is always well attended.

Seaforth provides, of course, only one unit in the dispensary system for the area. At Widnes the attendance of patients is about equal to that of the ordinary sessions at Seaforth, but the special work which is undertaken at the latter does not apply to Widnes, and patients requiring x-ray examination, or refills in connection with collapse-therapy, travel to the chief dispensary. The same applies to St. Helens, but at that centre provision is made for treatment by artificial light on three days per week, while on a fourth day an ordinary session is held. From St. Helens also patients are sent, as required, to the chief dispensary for special reasons.

Progress was made on the radiological side by the provision of an up-to-date x-ray plant which permits of more rapid and almost instantaneous work, and enables one to take better skiagrams, which materially assist in accurate differential diagnosis.

I must not omit mention of the good work which is still being done by the various care committees in the area. Such committees operate over four large districts, and the extent of their work may be gauged by reference to the special figures regarding their expenditure and the number of cases assisted, which will be seen on page 90. The committees referred to are those for Prescot and District; for Widnes and its vicinity; for Earlestown, Newton and District; and for Huyton-with-Roby. Not only are deserving cases assisted by these committees, but co-operation with the dispensary organisation is such as to render the task of the latter so much easier in arranging for appropriate treatment. At the same time the care of dependants left at home in the absence of the breadwinner receives additional attention.

The following figures will give some idea of the activities associated with dispensary work at Seaforth: Sputum examinations made in the course of the year totalled 847, of which 203 were positive. The number of skiagrams taken totalled 765, and 317 screen examinations were made. Artificial pneumothorax refills given to patients from various parts of the area numbered 323.

The relations between medical practitioners and the dispensary organisation have been as usual quite satisfactory.

#### ARTIFICIAL LIGHT TREATMENT.

An artificial light centre was established in Area No. 5 at the St. Helens Dispensary on the 16th January, 1928.

During the year light treatment was administered under conditions very similar to those of the preceding year, and the usual types of case came for treatment. It is noteworthy that cases of lupus form approximately 65 per cent. of the total and appear in many instances intractable after a certain stage of improvement has been reached. Of cases which had previously been written off as "quiescent," 9 were compelled to resume treatment owing to relapse; of these, 4 were lupus cases, 3 adenitis without softening, and 2 adenitis with abscess formation and involvement of the skin.

The installation in use has been the same for the past five years and consists of two "Sunrae" carbon arc lamps and one Kromayer mercury vapour lamp.

The number of patients receiving treatment has declined gradually during the past few years owing to the fact that many have completely recovered. It has, therefore, been possible to reduce the length of the dispensary sessions from a whole day three times per week to half-a-day

three times per week ; and the almost exclusive use, since the change, of grade C carbons, with which exposures have been appreciably shorter, has enabled this arrangement to be adhered to. In a few exceptional cases, however, even the grade C exposures have been extended to 30 minutes on each side without any severe reaction and with greater benefit.

The following Table 29 shows the results for patients treated at this centre during 1932 :—

(a) *St. Helens Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	38	4	1	—	1	1	31
Adenitis with abscess formation and skin involvement ... ..	17	11	—	—	—	2	4
Adenitis without softening ... ..	18	8	—	—	—	2	8
Bones, joints, and spine ... ..	3	—	—	—	—	—	3
Abdomen ... ..	2	—	—	—	—	1	1
Other non-pulmonary conditions ...	1	1	—	—	—	—	—
<b>TOTAL ... ..</b>	<b>79</b>	<b>24</b>	<b>1</b>	<b>—</b>	<b>1</b>	<b>6</b>	<b>47</b>

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (e.g., removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

**RUFFORD PULMONARY HOSPITAL, NEAR ORMSKIRK.**

*Matron ... MISS A. JONES.*

The County Council acquired, on the 18th October, 1920, Rufford New Hall, situated on the west side of the main road from Preston to Ormskirk, together with 128 acres of land adjoining the Hall. Under pressure from the Ministry of Health, a scheme was prepared for using the Hall and land for discharged sailors and soldiers, which included training the patients in several occupations. Some additional land was also obtained with a view to training in agricultural work, but all this, however, was abandoned in 1921 by order of the Ministry of Health, owing to financial stringency. The premises, first used as a pulmonary hospital on the 7th April, 1926, provide accommodation for 52 female patients.

The hospital serves as far as possible the districts in West Lancashire, so that relatives and friends will have reasonable facilities for visiting.

A motor ambulance has been provided, available for the hospital and also for conveying County patients to other hospitals.

Dr. Laird reports as follows on matters relating to the treatment of patients and the administration of the hospital :—

The year was not marked by any unusual feature as far as treatment is concerned. In the main, therapy took the form of prolonged rest under thoroughly open-air conditions followed by limited and regulated exercise for those who became sufficiently well to have it. At all times there was a sufficiency of good nourishing food, selected so as to form a carefully balanced diet and with due regard to vitamin content at the same time. In recognition of the idea that tuberculosis is a disease of nutrition, importance is attached to the judicious administration of accessory food factors contained in cod-liver oil in various forms. Except in very advanced cases a considerable gain in weight is customary in most patients within a few months. In these, physical signs not infrequently become less marked and symptoms are not so pronounced, while energy and general well-being steadily increase. It has been observed that the rapidity with which these changes occur is as a rule more striking for those in whom a successful artificial pneumothorax has been induced and maintained, and the feeling of improvement of which they are almost at once sensible, is in itself a tonic and an encouragement to get well. Moreover, it inspires other patients to entertain greater hope. This special form of treatment for securing limitation of movement in a diseased lung and for reducing the accumulation of toxic substances so as to permit of recovery, was practically the only one adopted during the year. Inductions carried out totalled 36, and 54 individual patients were in receipt of artificial pneumothorax during the year, the total number of refills given being 421. Replacements of pleural effusion, purulent or otherwise, amounted to 21, the number of patients concerned being 7. A few ex-patients continued to attend at the hospital for further refills, including one who has had bilateral simultaneous collapse of the lungs for upwards of four years. Similarly in the case of two other patients, still resident at the end of the year, this double collapse was maintained.

Extensive use was made of the x-ray plant in connection with all these cases, and, of course, for others as well. Numerous extern patients attended for diagnosis or supervision at the hospital as an alternative to visiting the dispensary at Seaforth, which is often less conveniently reached by those who live in the northern part of the area.

The cases admitted in 1932 totalled 115 ; there were 88 discharges and 23 deaths.

The number of skiagrams taken was 268, and the total screenings amounted to 1,219. Sputum examinations numbered 296, and the positive results constituted 72 per cent. of the whole, as is to be expected in a pulmonary hospital.

Dental extractions were carried out in the theatre as required,

but the services of a dentist were not requisitioned owing to the infrequent need therefor, to say nothing of the weak physical state of many of the patients concerned, but for which extractions might have proved otherwise practicable. In cases of special difficulty, or where the questions of fillings arose, patients were permitted or advised to choose and visit a dentist outside the hospital. The number who elected to do so was small, and many were glad to avail themselves of the facilities provided within, or consented to do so after advice and persuasion. Naturally in others the almost instinctive dislike or dread of drastic measures proved too strong despite every bland inducement to overcome it. In such instances, where a chance of improvement is seriously handicapped by the retention of carious teeth, one is often justified in applying stronger forms of moral suasion, even to that of suggesting discharge in the event of refusal of treatment. The question of making further provision for dental treatment has been under consideration, and it is hoped to improve on that which is now in force.

Lectures were given to nurses in preparation for the examination under the Tuberculosis Association.

During the year the greater part of the interior was redecorated for the first time since 1926, when the first patients were received.

A special visit to the hospital was made by three Chinese medical officers, who were in this country engaged in post-graduate study. Each and all appeared favourably impressed by their tour of the building and the arrangements for the reception and treatment of patients.

Throughout the winter months the Kodascope kindly provided through the County Tuberculosis Committee a few years ago, was freely used, and fortnightly exhibitions of films were given for the entertainment of patients and staff. At Christmas, the patients organised a concert amongst themselves, and produced three character sketches.

Once again grateful acknowledgment is tendered for a gift of books from the Red Cross Society, and for the usual generous grants by the Committee to provide extra fare at Christmas, to purchase periodicals, and to replenish both the patients' and the nurses' library.

Any account of the hospital and its activities would be incomplete without reference to its surroundings. The extensive grounds, of which the greater part is let off in pasture, fringed with woodland, furnish a picturesque and restful outlook for the patients. The beauty of the place has been preserved largely owing to the personal interest taken in this matter by the Central Tuberculosis Officer, and those who reside in the hospital, as well as visitors, are keenly appreciative of its charm.

To the matron and the nursing staff I would here express my obligation for their helpful co-operation throughout the year.



## XVIII.—REPORT FOR FURNESS DISPENSARY SUB-AREA.

Area (estimated population, 38,487) embraces Dalton-in-Furness, Grange-over-Sands, Ulverston, and Ulverston Rural districts.

Consultant Tuberculosis Officer ... DR. GEORGE LEGGAT.  
(Dr. Leggat is also medical superintendent of the High Carley and Oubas House Sanatoria).

Dr. Leggat sends the following report :—

It is very gratifying to find that the close co-operation between the medical practitioners in this area and the tuberculosis staff has been maintained. During the year 87·5 per cent. of the new cases examined were sent to me for an opinion before being notified.

The number of new cases and contacts examined during the year was 153 ; of these 53 were diagnosed as tuberculous, and 96 as non-tuberculous, whilst at the end of the year 4 remained doubtful.

During the year 232 skiagrams were taken and 17 screen examinations made at High Carley in regard to dispensary patients.

The examination of sputum, as in previous years, was carried out at High Carley, 138 specimens being examined, of which 21 were positive and 117 negative.

During the year 12 individuals were assisted through the County care fund, the amount expended being £25 17s. 8d.

New dispensary premises, 69, Albion Place, Lightburn Avenue, Ulverston, purchased by the County Council, were occupied in March, 1933. I am sure the acquirement of these new premises will be greatly appreciated both by the patients and the staff.

## ARTIFICIAL LIGHT TREATMENT.

An artificial light centre was established at the Ulverston Dispensary on the 5th June, 1928.

Five cases of pulmonary tuberculosis continued this form of treatment from the previous year, but the results were not gratifying. In three cases the condition remained stationary, and in the remaining two cases the disease continued to progress.

The following Table 30 shows the results for patients treated at this centre during 1932 :—

## Ulverston Centre.

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	5	1	1	—	—	—	3
Adenitis with abscess formation and skin involvement ... ..	12	3	—	—	—	—	9
Adenitis without softening ... ..	8	2	—	—	1	1	4
Bones, joints, and spine ... ..	4	—	—	—	—	3	1
Abdomen ... ..	1	—	—	—	—	—	1
Other non-pulmonary conditions ... ..	1	—	—	—	—	—	1
Pulmonary tuberculosis:—							
Sputum positive ... ..	5	—	—	3	2	—	—
Pulmonary and non-pulmonary combined:—							
† T.B. plus and elbow ... ..	1	—	—	—	—	—	1
† T.B. minus and lupus ... ..	1	—	—	—	—	1	—
† T.B. minus and glands neck ... ..	1	—	—	—	—	1	—
† T.B. minus, wrist and thumb ... ..	1	—	—	—	—	1	—
<b>TOTAL ... ..</b>	<b>40</b>	<b>6</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>7</b>	<b>20</b>

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (e.g., removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

† Treatment for non-pulmonary condition only.

## SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1932

(Definitely tuberculous, 267; doubtful, 4.) ... .. 271

Examinations by tuberculosis officer at—	Examinations of new persons and new contacts for diagnosis.	Re-visits or re-attendances of "old" cases and "old" contacts.
Patients' homes ... ..	46	76
Ulverston Dispensary ... ..	107	475
Attendances of patients at the Ulverston Dispensary for artificial light treatment ... ..		1313
Attendances for artificial pneumothorax treatment (3 individual patients) ... ..		15
Visits by tuberculosis officer to sanatoria, and pulmonary, and special, hospitals ... ..		11
Visits by dispensary nurse to patients' homes—		
Routine visits ... ..		1935
Actual nursing ... ..		13
Application of surgical dressings ... ..		118
Adjustment of splints and surgical appliances ... ..		13
Sanitary defects reported to local medical officers of health ... ..		3
Sanitary defects which, after notification, were remedied ... ..		3
Disinfections carried out by local sanitary authorities ... ..		65
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment ... ..		119

## XIX.—REPORT FOR FYLDE DISPENSARY SUB-AREA.

Area (estimated population, 64,184) embraces Fleetwood, Thornton Cleveleys, Fylde Rural, Garstang Rural (part), and Kirkham districts.

Consultant Tuberculosis Officer ... DR. G. BARKER CHARNOCK.  
(Dr. Charnock is also medical superintendent of the Elswick Sanatorium.)

Dr. Charnock reports :—

The dispensary is at Fleetwood and serves the northern part of the area, whilst for convenience, the patients in the southern districts are seen at the Elswick Sanatorium.

At the Fleetwood Dispensary a new fireplace in the waiting-room and extra seating accommodation have been provided during the year. Various structural alterations and decorations in the rear premises, through which the patients proceed to the waiting-room, have been completed. These arrangements have added immeasurably to the comfort of the patients, and brought the dispensary up to recent standards.

The medical practitioners in the area have co-operated with me fully, and I have received much help from them.

There are no slums in the area, and very few sanitary defects required adjustment. The sanitary authorities have carried out their disinfections promptly and thoroughly.

The County care fund continues to be a most useful provision for deserving cases, and during the year 10 patients were assisted.

Efforts have been made, where deemed essential, to keep in touch with the contacts of cases which have died.

Special attention has been given to orthopædic cases which have recently received treatment in orthopædic hospitals and been discharged for after-care. Such cases are seen very often, and massage to wasted muscles is undertaken where necessary.

Artificial pneumothorax refills for the area are done at the Elswick Sanatorium.

X-ray examinations and sputum tests are also done at Elswick Sanatorium. The number of skiagrams of dispensary cases taken during the year was 210, and the screenings 78. The sputum tests numbered 180, of which 37 were positive and 143 negative.

### ARTIFICIAL LIGHT TREATMENT.

An artificial light centre was established in the Fylde Sub-Area at the Fleetwood Dispensary on the 25th June, 1928.

The accommodation consists of light room with two carbon arcs ; a dressing room with cubicles, and waiting room, together with a surgery where the Kromayer lamp is applied.

Good use has continued to be made during 1932 of the light centre. The patients have attended well without exception.

The current used is direct supply from the Fleetwood Council. The direct supply appears to give a steadier current, also a better crater in the carbons.

The output of the plant has been most satisfactory, and the Kromayer lamp has withstood intensive use very well. Further facilities have been provided by the installation of dressing cubicles. These are constructed of steel tubing as a skeleton and hung with strong washable curtains suspended by special rings easily detachable from the framework. The cubicles are private and sanitary, and allow of easy and rapid floor cleaning. They are appreciated by patients and staff.

Prior to radiation every patient is submitted to x-ray examination of the chest, to exclude the possibility of an active tuberculous focus. If the skiagram does not preclude a course of treatment a photograph of the lesion is taken for graphic record.

The cases treated include cervical adenitis, scrofuloderma, lupus, and Bazin's disease.

Auxiliary measures, such as the introduction of copper sulphate into the sinuses, or to exuberant granulations, and the zinc gelatine treatment of leg ulcers, have been adopted as in former years. The scraping of scrofulous areas, curetting of sinuses, and the total removal of hard gland nuclei, all under local borocaine anæsthesia, have been performed under strict aseptic conditions. The latter operations have given very satisfactory results. Aspiration or "puncture with the tenotomy knife and seal" have been the alternative measures in the treatment of abscesses according to their position in relation to the deep cervical fascia. Strict surgical asepsis, careful dressings, frequent supervision, and splinting where necessary, have materially helped. Splinting of the head and shoulder girdle and the use of an arm sling are greatly favoured in the treatment of cervical adenitis, and promote healing.

An effort is made to get as good a cosmetic effect as possible. Where a case presents recent exacerbation with original ugly scars, papillomata, keloids, tags, and skin bridges, the scraping, paring, and levelling of the deformities go hand in hand with the treatment of the new lesion.

Prior to January, 1932, radiations by grade A carbons were only given to patients having general light baths. During the year under review a number of patients have been given grade C radiations. There does not seem enough evidence to show that the cases having

A carbons have done any better than those using the stronger and more intensive exposures. The short exposures have produced good results, and are more economical of current and time. It has been observed that in manipulating the carbons it was advisable to allow the top carbons to burn down to five inches from the porcelain holder, and then to transfer them to the bottom holders and allow them to burn down not shorter than two-and-a-half inches.

There is some evidence to support the view that distance radiation on cervical adenitis by the Kromayer lamp leads to such rapid sclerosis of the glands, especially those associated with abscess and sinus formation, as to heal up the nucleus of the capsule rather prematurely. In this way, instead of the nucleus being sloughed off and thrown out it is retained by the matting of the surrounding tissues and gradually closing in forms a stone-like mass which, like a seton, acts as a chronic irritant at the top of the sinus, keeping it permanently open. On removal of this hard kernel the sinus heals forthwith. The Kromayer lamp, with the blue quartz light applied by compression, seems to be particularly favourable for cicatrization, producing smooth and soft scars. The lamp has been used intensively in long-standing facial lupus. The acquisition of a long, fine applicator has been found very helpful for nasal and mouth work.

The following Table 31 shows the results for patients treated at this centre during 1932 :—

*Fleetwood Centre.*

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	10	4	—	—	—	3	3
Adenitis with abscess formation and skin involvement ... ..	19	12	—	—	—	1	6
Adenitis without softening ... ..	12	6	—	—	—	—	6
Bones, joints, and spine ... ..	1	—	—	1	—	—	—
Abdomen ... ..	1	1	—	—	—	—	—
Other non-pulmonary conditions ... ..	1	—	—	—	—	—	1
Pulmonary tuberculosis :— Bronchial glands ... ..	1	—	—	1	—	—	—
Pulmonary and non-pulmonary combined :— †T.B. plus and bones ... ..	1	—	—	—	—	—	1
†T.B. plus and kidney ... ..	1	—	1	—	—	—	—
<b>TOTAL ... ..</b>	<b>47</b>	<b>23</b>	<b>1</b>	<b>2</b>	<b>—</b>	<b>4</b>	<b>17</b>

\*Includes : (1) Patients who did not receive two months' treatment ; (2) patients ceasing light treatment prematurely (e.g., removals, unwilling or unable to continue) ; and (3) patients transferred to sanatoria or hospitals.

† Treatment for non-pulmonary condition only.



## XX.—REPORT FOR WIGAN COUNTY SUB-AREA.

Area (estimated population 109,059) embraces Ashton-in-Makerfield, Hindley, Ince-in-Makerfield, and Wigan Rural districts.

Consultant Tuberculosis Officer ... DR. E. H. ALLON PASK.  
(Dr. Pask is also medical superintendent of the Wrightington Hospital.)

Assistant Tuberculosis Officer ... DR. J. EDGAR WALLACE.

The County Tuberculosis Committee constituted, as from the 1st January, 1932, the Wigan County Sub-Area, which contains the districts near the Wrightington Hospital, such districts being served by the County dispensary, 3, Mesnes Park Terrace, Wigan. The administrative, x-ray, and bacteriological work is done at the Wrightington Hospital.

The sub-area previously formed part of Dispensary Area No. 5.

Dr. Pask reports :—

The records were handed over to me by Dr. Laird and, in accepting them, my indebtedness is due to him for the smoothness with which this was done and for the advice given by him on matters relating to the work of the area. There was no break in the continuity of the routine, and the treatment and supervision of patients proceeded as usual.

The x-ray examinations (395 skiagrams), artificial pneumothorax refills (48), and sputum examinations (558—90 positive) for the area are done at the Wrightington Hospital, where also the clerical work is undertaken.

During the year a number of dispensary patients attended the hospital for lipiodol injections; 23 such injections were made for diagnostic purposes, and I should like to point out that in no case was it found necessary to retain a patient in the hospital. (See Chapter VIII.)

Following on the initial examination at the dispensary, patients who are recommended for x-ray examination are conveyed in the hospital ambulance to Wrightington where they are seen by me and consultations are held.

The two after-care committees in the area (Wigan and District, and Golborne) have continued to render valuable assistance and their services have been greatly appreciated.

Close co-operation with the medical practitioners in the area has been maintained, as is evidenced by the fact that during the year an opinion was sought in 90·9 per cent. of the total number of new cases (excluding contacts) examined prior to notification.

## ARTIFICIAL LIGHT TREATMENT.

An artificial light centre was established at the Wigan Dispensary on the 31st May, 1929.

The following notes have been compiled by Dr. J. Edgar Wallace who supervises the treatment at this centre:—

The cases treated at the Wigan Dispensary Light Clinic during 1932 consisted of lupus, tuberculous adenitis, scrofuloderma, Bazin's disease, tuberculous peritonitis and tuberculous osteitis.

Glandular infections, with and without abscess formation, continue to respond satisfactorily. Minor surgical procedures in the form of aspiration, incision, curettage and removal of keloid scars are carried out under local anæsthesia to hasten recovery and to improve the cosmetic result.

Difficulty has been experienced with certain long-standing cases of lupus; progress tends to become very slow after the initial improvement and much patience is required. Increasing use of the Kromayer lamp, together with such adjuvant methods as curettage and spiking with liquor hydrarg. nitratis, has helped to eradicate resistant areas.

General carbon arc baths are also given. In this connection it has been found that improvement is more rapid if the patient receives an occasional "rest" of 2-3 months from artificial light treatment. This method is advocated by Continental workers and prevents the development of the tolerance to "light" that may occur with continuous exposure.

Marked improvement has occurred in four cases of Bazin's disease (erythema induratum) during the year. Three of these received, in addition to artificial light, a course of calcium and parathyroid therapy; 1 c.c. collosol calcium (intramuscularly) was given weekly, together with ext. parathyroid gr. 1/10 twice daily by mouth. Treatment lasted in each case for two months and the results were such as to justify further trial. One case in particular, a girl with numerous ulcerated areas on both legs and feet, healed very quickly after proving resistant to many forms of treatment over a number of years.

Two lupus patients received special treatment through the County Council; one of these, a man whose eyelid had become deformed (ectropion) through the contraction of the skin is now able to close his eye comfortably, following a plastic operation by Mr. Bywater at the Wigan Infirmary. The other, a woman with a fungating epithelioma of the cheek secondary to a very chronic lupus, has received radium treatment at the Radium Institute, Manchester. As a result, the growth has disappeared and only a flat scar remains.

The following Table 32 shows the results for patients treated at this centre during 1932:—

## Wigan Centre.

Form of tuberculosis or part of body affected.	Number of cases treated during 1932.	Condition of patients whose treatment concluded in 1932.				Ceased treatment for other reasons.*	Still under treatment at end of 1932.
		Quiescent and apparently well.	Improved.	Stationary.	Worse.		
Skin ... ..	26	1	—	—	—	—	25
Adenitis with abscess formation and skin involvement ... ..	16	6	—	—	—	1	9
Adenitis without softening ... ..	34	17	—	—	—	3	14
Bones, joints, and spine ... ..	3	1	—	—	—	—	—
Abdomen ... ..	1	—	—	—	—	—	1
Other non-pulmonary conditions ... ..	1	1	—	—	—	—	—
<b>TOTAL ... ..</b>	<b>81</b>	<b>26</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>4</b>	<b>51</b>

\* Includes: (1) Patients who did not receive two months' treatment; (2) patients ceasing light treatment prematurely (*e.g.*, removals, unwilling or unable to continue); and (3) patients transferred to sanatoria or hospitals.

## SUMMARY OF DISPENSARY WORK.

Number of tuberculous cases under supervision on 31st December, 1932 (Definitely tuberculous, 760; doubtful, 8.)	...	...	...	...	768
Examinations by tuberculosis officer at—				Examinations of <i>new persons</i> and <i>new contacts</i> for diagnosis.	Re-visits or re-attendances of " <i>old</i> " cases and " <i>old</i> " contacts.
Patients' homes ... ..				124	307
Wigan Dispensary ... ..				302	1558
Attendances of patients at the Wigan Dispensary for artificial light treatment ... ..					3502
Attendances for artificial pneumothorax treatment (9 individual patients)					48
Care committee meetings attended by—					
(a) Tuberculosis officers ... ..					15
(b) Tuberculosis health visitors ... ..					28
Visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals ... ..					36
Special visits by tuberculosis officers ( <i>i.e.</i> , interviews with medical officers of health, general hospital officials, &c.) ... ..					4
Visits by dispensary nurses to patients' homes—					
Routine visits ... ..					2517
Actual nursing ... ..					4
Application of surgical dressings ... ..					18
Adjustments of splints and surgical appliances ... ..					146
Patients' dispensary attendances for attention by nurses—					
Application of surgical dressings ... ..					11
Adjustment of splints and surgical appliances ... ..					2
Sanitary defects reported to the local medical officers of health ... ..					11
Sanitary defects which after notification were remedied ... ..					7
Disinfections carried out by local sanitary authorities ... ..					140
Cases referred by medical practitioners, Pensions authorities, &c., to tuberculosis officer for an opinion as to diagnosis or treatment ... ..					330

## XXI.—CARE WORK.

The County care scheme was fully reviewed in the report for 1928, and as there has not been any further development, it is not proposed to recapitulate.

TABLE 33.—*Work done by voluntary care committees.*

Name of committee.	Estimated population served 1932.	Number of individual patients assisted during 1932.	Expenditure during 1932.		
			£	s.	d.
Ashton-under-Lyne and District... ..	68,502	47	148	8	3
Chorley and District ... ..	72,746	49	355	1	8
Earlestown, Newton and District ... ..	22,350	17	61	5	7
Egerton, Eagley, Dunscar and District... ..	5,623	1	0	18	8
Farnworth and District ... ..	68,146	22	77	15	9
Golborne ... ..	7,503	6	18	2	9
Horwich ... ..	15,580	30	192	19	11
Huyton-with-Roby District ... ..	5,478	3	9	1	7
Lancaster and District ... ..	87,929	20	250	8	0
Leigh and District... ..	89,145	75	138	11	7
Prescot and District ... ..	25,341	19	86	18	8
Prestwich ... ..	24,940	6	30	15	7
*Radcliffe, Whitefield and District Relief Fund for Consumptives ... ..	37,154	21	129	8	3
Stretford Civic Guild of Help ... ..	56,520	38	86	10	8
Westhoughton ... ..	15,940	20	36	15	7
Widnes ... ..	41,130	46	53	3	2
Wigan County District ... ..	109,059	86	88	2	4
<b>TOTAL ... ..</b>	<b>753,086</b>	<b>506</b>	<b>£1,764</b>	<b>8</b>	<b>0</b>

\* Relates to year ended 31st March, 1933.

The County Council has continued to make a grant of 33½ per cent. of the committees' expenditure on actual assistance to patients.

The following visits of voluntary care committees to County sanatoria and hospitals have taken place:—

Ashton-under-Lyne and District Care Committee	Elswick Sanatorium	5th July, 1932
	Wrightington Hospital	30th May, 1933
Golborne Care Committee ...	Wrightington Hospital	16th Sept., 1932
Horwich Care Committee ...	Wrightington Hospital	24th June, 1933

The County Tuberculosis Committee encourage these visits as they enable the members of the care committees to see at first hand the institutional side of the scheme.

The voluntary care committees cover less than half the County, and there is left a balance of over 1,000,000 persons to be dealt with by other means, pending the formation of new voluntary committees. In the areas without care committees the County Council have charged the tuberculosis dispensary staff with the duty of carrying out the relief work. During 1932, assistance in kind was afforded through the dispensary staff to 218 individual patients, the amount expended being £532 11s. 9d.

With the transfer of the Poor Law functions to the County Council, arrangements have been made to continue co-operation with the Public Assistance Committee and their Guardians Committees so as to prevent overlapping in rendering assistance in necessitous or destitute cases.

## XXII.—PATIENTS' DIETS AT SANATORIA AND HOSPITALS.

For the majority of patients in sanatoria and hospitals, rest, fresh air, and good food are still the essential modes of treatment. Surgical treatment (*e.g.*, artificial pneumothorax, phrenicectomy, thoracoplasty) for patients with pulmonary tuberculosis is so far only suitable for a proportion. Rest is carefully regulated and applied by the sanatorium routine; fresh air is ensured by the situation and construction of the institution. The importance of diet has always been realised and every care has been taken to give the patients a liberal supply of wholesome and nourishing food.

But in recent years advances have been made in scientifically assessing the value of certain items of food. In 1932, the Advisory Committee on Nutrition, under the chairmanship of Prof. M. Greenwood, D.Sc., F.R.C.P., presented a memorandum to the Minister of Health on "The Criticism and Improvement of Diets," in which they give valuable advice on the practical application of modern advances in the knowledge of nutrition for a normal person or group of persons.

The Committee state that for practical purposes there are four main criteria of diet: (1) The daily calorie supply per person (or per "man value"); (2) the daily quantity of first-class protein; (3) the daily supply of mineral matter; and (4) the daily vitamin content of the diet. They "emphasise the fact that a diet must satisfy all four criteria. If it is not complete as regards calories, first-class protein, mineral matter and vitamins it is to be condemned. No amount of calories will make up for any other deficiency and no amount of vitamins or mineral matter can make up for a deficiency in calories or of first-class protein. A diet must stand four-square upon calories, first-class protein, mineral matter and vitamins."

An adequate diet, it is stated, should contain not less than the following:—Per "man value"; calories, 3,000; protein, 100 grammes; fat, 100 grammes; carbohydrates, 400 grammes.

The Advisory Committee's memorandum further explains the method for calculating food values and for calculating the "man value" of persons according to a scale which fixes 1.00 for a male of 14 years or over, 0.83 for a female of 15 and over, 0.50 for a boy of three years of age, and graduations for other ages. The memorandum also contains the following table showing the quantity of foods necessary to supply 37 grammes of first-class (animal) protein which is the amount required per "man" per day:—

Cheddar cheese	...	...	...	...	...	5 ozs.
Eggs	...	...	...	...	...	11 $\frac{3}{4}$ ozs.
Fish :						
Cod	...	...	...	...	...	9 „
Eel	...	...	...	...	...	15 „
Haddock (smoked)	...	...	...	...	...	8 $\frac{3}{4}$ „
Herring (fresh)	...	...	...	...	...	8 $\frac{7}{8}$ „
Kipper	...	...	...	...	...	9 $\frac{1}{4}$ „
Mackerel	...	...	...	...	...	11 $\frac{7}{8}$ „
Oyster	...	...	...	...	8 lbs.	2 $\frac{1}{2}$ „
Plaice	...	...	...	...	1 lb.	1 „
Salmon	...	...	...	...	...	8 $\frac{7}{8}$ „
Sole	...	...	...	...	...	10 „
Sole (lemon)	...	...	...	...	...	11 $\frac{1}{2}$ „
Sprats	...	...	...	...	...	10 „
Soft Roe	...	...	...	...	...	5 „
Meat (fresh) :						
Beef	...	...	...	...	...	8 $\frac{7}{8}$ „
Mutton	...	...	...	...	...	11 $\frac{3}{4}$ „
Pork	...	...	...	...	...	8 $\frac{3}{4}$ „
Liver (calf)	...	...	...	...	...	9 „
Liver (pig)	...	...	...	...	...	7 $\frac{5}{8}$ „
Meat (cured) :						
Bacon (back)	...	...	...	...	...	14 $\frac{3}{4}$ „
Bacon (streaky)	...	...	...	...	...	13 $\frac{1}{8}$ „
Ham	...	...	...	...	...	11 $\frac{1}{4}$ „
Milk	...	...	...	...	...	2 pints.
Poultry, etc. :						
Chicken	...	...	...	...	...	10 $\frac{1}{2}$ ozs.
Duck	...	...	...	...	...	13 $\frac{1}{4}$ „
Goose	...	...	...	...	...	11 $\frac{7}{8}$ „
Rabbit	...	...	...	...	...	10 $\frac{1}{2}$ „
Sausage	...	...	...	...	...	11 $\frac{5}{8}$ „

Calculations have been made of the quantities of foodstuffs consumed at the County sanatoria and hospitals, and the particular values have been above the minimum given by the Nutrition Committee.

The medical superintendents of the sanatoria and hospitals have been furnished with a copy of the memorandum in question and they are, in collaboration with myself, making full use of it. Apart from the value of particular foods, diets are varied as widely as possible, any tendency to stereotype the menus avoided, and special attention given to a supply of fresh raw food.

The same Advisory Committee, in a separate report to the Minister of Health on "Diets in Poor Law Children's Homes," make a number of recommendations which are of interest in the management of any type of children's institutions (*e.g.*, Oubas House Children's Sanatorium and the Wrightington Hospital). The Committee suggest *inter alia* that children should be given (a) one pint of milk per day, a considerable portion of which to be taken at breakfast; (b) an ample supply of vegetables (particularly carrots and green vegetables such as cabbage, lettuce and watercress); (c) two apples or preferably two oranges weekly; larger quantities of cheese (in a cooked form if necessary) in place of a proportion of the meat ration.

## XXIII.—COUNTY SANATORIA AND HOSPITALS.

## (1) HIGH CARLEY SANATORIUM, NEAR ULVERSTON.

*Medical Superintendent* ... DR. GEORGE LEGGAT.  
 (Dr. Leggat is also visiting medical superintendent of Oubas House Children's Sanatorium, Ulverston, and consultant tuberculosis officer for the Furness Dispensary Sub-Area—*i.e.*, the area around the sanatorium—containing a population of 38,487).

*Visiting Consulting Chest Surgeon* ... MR. H. MORRISTON DAVIES.

*Assistant Medical Superintendent* ... DR. WILLIAM FETTES.

*Matron* ... MISS E. WOOSEY.

(The matron is also responsible for the Oubas House Children's Sanatorium, Ulverston).

High Carley Sanatorium is situated about three miles west of Ulverston, to the south of the main road to Barrow-in-Furness. The buildings stand in 23 acres of ground, and accommodation is provided for 118 patients (62 males and 56 females).

The medical superintendent and the assistant are accommodated on the estate; and seven houses are provided in the vicinity of the sanatorium for the male employees.

Since 1929, electricity has been obtained from the public supply in replacement of the sanatorium plant.

The construction of the new treatment block was completed in December, 1932. The block contains on the ground floor an operating theatre, waiting and anæsthetic room, sterilising room, recovery room, artificial light room with a room adjoining for the sister, laboratory, x-ray and dark room; on the first floor five bedrooms and a sick room are provided for the staff. The approved cost is £4,000.

Mr. H. Morrision Davies, M.D., M.Ch., F.R.C.S., was appointed visiting consulting chest surgeon and made his first visit to the sanatorium on the 21st January, 1933.

During the year 210 County patients received some form of dental treatment from the visiting dental surgeon (Mr. A. Miller).

Dr. Leggat reports as follows on matters relating to the treatment of the patients and the administration of the sanatorium:—

There has been no alteration in the routine sanatorium treatment during the past year except in regard to specially selected patients for whom it was deemed advisable to prescribe absolute rest. The application of special chest straps fixed to the bed ensured immobilisation

of the patient with restriction of chest movement. The results have certainly justified this method of treatment as many of the lesions, especially radiologically, showed definite improvement soon after immobilisation was commenced. I feel that, if an appreciable proportion of patients were put on absolute rest by fixation during their period of waiting to enter a sanatorium, more drastic methods of treatment would probably be unnecessary. Apart from the above, the two forms of treatment which have given most satisfactory results have been intravenous injections of gold salts and artificial pneumothorax.

The gold salts which have been tried were sanocrysin, crisalbine, and solganol - oleum B. The latter two were only tried in a few cases but I hope to report on them next year.

*Sanocrysin treatment.* A total of 75 patients received this form of treatment during the year; 12 continuing from 1931 and 63 commencing in 1932. Treatment was abandoned in 16 cases for the following reasons:—Persistent albuminuria, 3; persistent gastric trouble, 1; persistent diarrhoea, 1; ulceration of mouth, 2; ulceration of larynx, 1; dermatitis, 2; pyrexia, 1; loss of weight and malaise, 1; discontinued in favour of artificial pneumothorax, 1; transferred to another institution, 1; left at own request, 2. Of the remaining 59 cases, 40 completed the course and 19 were still under treatment at the end of the year.

At the commencement, 32 of the 40 patients completing treatment had positive sputum, but on terminating the course 12 of these had lost their tubercle bacilli giving a bacillary loss of 37.5 per cent. A further five cases became negative before discharge from the institution, giving thus a total bacillary loss of 53.1 per cent.

In three of the above cases which had each only slightly over 3 grammes of sanocrysin, the sputum again became positive after the end of the course—one case in two months, one case in 13 months, and the third in five months.

The x-ray appearances showed improvement in 62.5 per cent. of the cases and the sedimentation rate in 80 per cent.

The total number of sanocrysin injections during the year was 1,021.

With regard to dosage it has been the practice to start with 0.025 grammes, followed at the end of one week by 0.05 grammes, and progressively increasing by 0.05 at weekly intervals to 0.5 grammes, occasionally to 0.6 grammes, the doses being varied according to local or general reactions.

Even if this form of treatment is an expensive one I feel that the results justify its use in selected cases. The type of patient who appears to have benefited most has been the one in whom there has been comparatively recent spread of the disease but no evidence of any breaking down.

*Artificial pneumothorax treatment.* There were 20 patients who continued this treatment from the previous year. During 1932 there were 48 successful inductions and 12 failures; 22 per cent. of the former developed fluid, varying from a puddle upwards. Of the 68 cases in which a successful induction had been obtained the treatment was abandoned in six cases for the following reasons:—Fluid, 1; fluid and spread of disease in the contra—lateral lung, 1; unsuccessful oscillation, 1; unsatisfactory collapse, 1; neurosis, 1; temperamentally unsuited, 1.

Thirty-one patients completed the treatment and 31 were continuing at the year end. Of the 31 cases completing the course, 28 had positive sputum on commencement and 18 of these became negative, giving a bacillary loss of 64·2 per cent.

The total number of refills for the year was 878.

*Bacillary loss.* During the year 95 patients admitted with positive sputum were discharged and of these 43 had negative sputum, giving a bacillary loss of 45·2 per cent. A careful record of the bacillary loss has been kept for a number of years; the average for the last eight years was 24·43 per cent. I think the percentage increase in the bacillary loss can be accounted for by the more general use of modern methods of treatment, namely, artificial pneumothorax and sanocrysin.

*Sputum examinations.* The sputum of patients is examined as follows:—Observation cases, weekly; T.B. minus cases, fortnightly; and T.B. plus cases, monthly.

During the year 1,400 specimens of sputum were examined, of which 602 were positive.

*Patients' weights.* Patients' weights are taken at weekly intervals; the following figures show the average gain of those who completed two or more months' treatment:—

78 adult male patients, average gain in weight, 7·85 lbs.

80 adult female patients, average gain in weight, 11·86 lbs.

*X-ray examinations.* The number of skiagrams taken during the year was 1,013, compared with 640 for the previous year; 895 screen examinations were made compared with 1,390 for the previous year.

*Nurses' examinations.* Probationer nurses are prepared for the examination held under the auspices of the Tuberculosis Association.

During the year, one nurse sat for Part I and one sat for Parts I and II, both of them being successful.

*Occupational therapy.* The forms of occupational therapy practised during the year were the same as in the previous year, *i.e.*, joinery and carpentry, wattle hurdle making, boot repairing, poultry-keeping, and cane chair mending. In the joinery department all the minor repairs in connection with the institution have been carried out. In addition, a number of card-tables and several ping-pong tables were made. During the year 68 pairs of shoes were repaired. This number is considerably less than in previous years, and is accounted for by the fact that we were unable to find a suitable patient for this work during the latter half of the year.

*Social activities.* The usual outdoor amusements have been provided during the summer months, bowls and clock golf for the men, and croquet for the women. Whist-drives were held at fairly frequent intervals and during the winter months the cinema entertainments were continued.

The library still continues to be greatly appreciated by both patients and staff. During the year approximately 8,000 books were loaned. In addition to the purchases of books by the County Council we are indebted to the British Red Cross Society for a supply of books and magazines, and also to numerous friends of the institution who continue to send magazines at quite frequent intervals.

*New treatment block.* The new treatment block has proved of great benefit in carrying out the more modern methods of surgical treatment. During the time the theatre has been opened the following work has been carried out:—Artificial pneumothorax—inductions 32, failures 3, refills 651; gas replacements 19; pleural cavity wash-outs 3; major operations—thoracoplasty 1, thoracoscopy 1, phrenic evulsions 14, nephrectomy 1, gelatine-a-thorax 9, division of adhesions 1, withdrawal of fluid (only) 2; minor operations—excisions 6, incisions 7, aspirations 3, wrist reduced and set 2, sundry operations 7; pyelography 1; lipiodol injections 7; throat examinations 5.

An experiment has been started on pulmonary cases by treatment by artificial light.

*Church services.* Services are held once or twice a week, and to those who gratuitously look after the spiritual welfare of the patients we are very thankful. We are particularly pleased to have Canon Kenworthy back with us, restored to full health and vigour.

I should like to thank Dr. Fettes for the help he has given me, and Miss Woosey for her great assistance during my first year at High Carley; the staff have also rendered loyal and willing help.

The following Table 34 shows the condition of patients discharged during the year 1932 :—

Classification on admission to the sanatorium.	Condition at time of discharge.	Duration of residential treatment in the sanatorium.				Total.	
		Under 3 months.	3—6 months.	6—12 months.	More than 12 months.	No.	%
T.B. minus.	Quiescent ... ..	16	13	7	2	38	70.4
	Improved ... ..	4	1	3	—	8	14.8
	No material improvement ...	6	—	1	—	7	12.9
	Died in sanatorium ... ..	—	1	—	—	1	1.8
T.B. plus 1.	Quiescent ... ..	3	7	12	2	24	51.1
	Improved ... ..	1	—	7	9	17	36.2
	No maerial improvement ...	1	2	1	1	5	10.6
	Died in sanatorium ... ..	—	—	—	1	1	2.1
T.B. plus 2.	Quiescent ... ..	1	5	11	4	21	25.9
	Improved ... ..	6	6	21	14	47	58.0
	No material improvement ...	1	4	3	1	9	11.1
	Died in sanatorium ... ..	—	1	1	2	4	4.9
T.B. plus 3.	Quiescent ... ..	—	1	—	—	1	14.3
	Improved ... ..	—	—	1	—	1	14.3
	No material improvement ...	1	1	—	—	2	28.6
	Died in sanatorium ... ..	2	1	—	—	3	42.8
Diagnosis on discharge from observation.			Stay under 4 weeks.	Stay over 4 weeks.			
	Tuberculous ... ..		3	7	10	35.7	
	Non-tuberculous ... ..		4	12	16	57.1	
	Doubtful ... ..		1	—	1	3.6	
	Died ... ..		—	1*	1	3.6	

\*Diagnosis—neoplasm of lung.

Total ... 217

## (2) OUBAS HOUSE CHILDREN'S SANATORIUM, ULVERSTON.

The medical superintendent, assistant medical superintendent, and matron of the High Carley Sanatorium are also responsible for the work at Oubas House. The sister-in-charge is Miss D. Pope, and the certificated school teacher is Miss A. Gibson.

The house, now the property of the County Council, stands in its own grounds (about one acre in extent), and accommodates 21 girls. A portion of an army hut has been adapted for use as a classroom. Educational instruction is given to the children in conformity with the requirements of the Board of Education.

During the year, 10 patients received some form of dental treatment from the visiting dental surgeon (Mr. A. Miller).

Dr. Leggat reports as follows :—

During the year 28 cases were admitted, 30 discharged, and one died. The condition on discharge of the 30 patients was as follows :— Disease quiescent, 12 ; improved, 2 ; stationary, 2 ; worse, 8 ; diagnosis not confirmed, 6.

Natural sunlight treatment was given at every opportunity and all meals were taken out-of-doors. On a number of occasions the children were conveyed by bus to Bardsea for the purpose of undergoing natural sunlight treatment.

The Mantoux tuberculin test was carried out in 19 cases with the following results :—

Number of positive reactions after 0.1 cc. of 1/10,000 sol. 14.

Number of negative reactions after 0.1 cc. of 1/10,000 sol. 5.

Of the five negative results shown above three cases gave a positive reaction after 0.1 cc. of 1/1,000 solution, and two cases gave a negative result after 0.1 cc. of 1/100 solution.

There were 88 specimens of sputum examined during the year, 17 of which were positive and 71 negative.

Under the able supervision of Miss Gibson (the teacher), some very useful work was done in the school including knitting, basket work, embroidery and rug making. Several of the older girls helped to make some beautiful rugs as well as a full-sized carpet. This proved a very interesting occupation as the children asked to do it in recreation time and on wet days during the holidays.

County Councillors H. Bright and Dr. P. F. Mannix, members of the County Tuberculosis Committee, visited the institution on the 21st September, and County Councillor B. P. Allen on several occasions during the year. We are again indebted to Lady Fell for the continuance of her visits and for the kindly interest she takes in the children.

In addition to the special grant made by the County Tuberculosis Committee for the Christmas festivities, numerous gifts of every description were received from friends of the institution. In the autumn, many churches sent gifts of fruit, vegetables, and flowers from their Harvest Festivals.

I should like to thank Sister Pope for the assistance she has given me in looking after the children at Oubas House.

## (3) ELSWICK SANATORIUM, NEAR KIRKHAM.

*Medical Superintendent* ... .. DR. G. BARKER CHARNOCK.

(Dr. Charnock is also consultant tuberculosis officer for the Fylde Dispensary Sub-Area—*i.e.*, the area around the sanatorium—containing a population of 64,184).

*Visiting Consulting Chest Surgeon* ... MR. H. MORRISTON DAVIES.

*Matron* ... MISS I. G. BARCLAY.

This sanatorium is situated on the east side of Elswick village, and is about six miles from Kirkham station. The buildings and about 11 acres of land belong to the Fylde, Preston, and Garstang Joint Smallpox Hospital Board, and are held on lease by the County Council until 1955. The Council are under an obligation to vacate the premises in case of a severe epidemic of smallpox. Accommodation is provided for 38 males and 32 females; total 70 pulmonary cases. An x-ray apparatus is provided in a separate building erected in 1925.

The long open shelters on both male and female sides have been converted into pavilions.

A new treatment block, similar in structure to the existing x-ray room, has been built as an extension to the latter. The new block, which was completed in May, 1933, consists of theatre, sterilising room, consulting room, dressing rooms, and lavatory. The building has met the need for economy as well as satisfied the requirements of the hospital. This block will also serve as a dispensary for out-patients from the southern part of the dispensary area and save attendance at the Fleetwood dispensary.

During the year 103 patients received some form of dental treatment from the visiting dental surgeon.

Dr. Charnock reports as follows on matters relating to the treatment of patients and the administration of the sanatorium:—

All stages of pulmonary tuberculosis from the area around the sanatorium are received, as well as observation cases.

The routine treatment, both medical and surgical, has been maintained as detailed in a previous report. The items relative to the work of diagnosis and treatment are set forth below:—

Diagnosis: Skiagrams, 236; screenings, 415; Mantoux tests, 163; sedimentation tests, 174; lipiodol tests, 2; pleural fluids, 10; sputum examinations, 596; Wasserman tests, 3; icteric indices, 34; blood coagulation tests, 34; bismuth meal, 1; post-mortem (full), 1; blood sugar tests, 50.

Treatment : Vaccines, 8 ; tuberculin, 14 ; sanocrysin, 13 ; benzyl cinnamide, 224 ; replacements, 14 ; artificial pneumothorax inductions, 23 ; artificial pneumothorax refills, 458 ; pleural anaesthesia, 19 ; phrenicectomies, 7 ; empyema operations, 2 ; ischiorectal abscess operations, 5 ; gland curettings, 2 ; insulin injections, 467 ; mediastinal fixation, 1.

The number of skiagrams has been cut down as much as possible owing to the need for economy. Paper films have been found useful as well as economical.

Artificial pneumothorax work has increased and 60 per cent. of the positive sputum cases became negative as the direct result of the operation. The operations of phrenicectomy were all performed by Mr. Morrision Davies.

The patients have enjoyed the well-kept grounds and have benefited from the fresh fruit and vegetables produced. The library has been very well used, and thanks are due to all the donors of new books. The recreation fund has received handsome donations. Frequent whist-drives through the year have been greatly enjoyed, and the up-to-date wireless installation is a constant source of pleasure.

The three honorary chaplains have again ministered to the spiritual needs of the patients, and their visits have been much appreciated.

Light and pleasant occupational therapy has been undertaken and patients have engaged in poultry-farming, pig-farming, gardening, joinery, glazing, and wood chopping, as well as light domestic work in and around the wards.

The poultry farm has been removed within the confines of the hospital and this has improved the stock. A number of Egyptian geese have been reared.

The orchards produced an excellent crop of fruit, and in view of the generally bad returns of fruit crops throughout the country, this result was very encouraging.

The water supply has been chemically and bacteriologically examined, and satisfactory reports received. The milk supply, which is frequently examined, is pasteurised before being given to the patients. An inspection was carried out in conjunction with the County sanitary inspector and the County veterinary surgeon of the cows producing milk for the institution, and as a result certain animals were eliminated from the herd.

The following table gives the condition of patients discharged during 1932 :—

TABLE 35.

Classification on admission to the sanatorium.	Condition at time of discharge.	Duration of residential treatment in the sanatorium.				Total.	
		Under 3 months.	3—6 months.	6—12 months.	More than 12 months.	No.	%
T.B. minus.	Quiescent ... ..	5	1	8	3	17	60.7
	Improved ... ..	1	2	4	—	7	25.0
	No material improvement ...	1	—	1	—	2	7.1
	Died in sanatorium ... ..	2	—	—	—	2	7.1
T.B. plus 1.	Quiescent ... ..	—	2	2	2	6	37.5
	Improved ... ..	2	1	3	—	6	37.5
	No material improvement ...	1	—	1	—	2	12.5
	Died in sanatorium ... ..	1	—	1	—	2	12.5
T.B. plus 2.	Quiescent ... ..	1	1	6	3	11	22.9
	Improved ... ..	4	9	8	—	21	43.7
	No material improvement ...	4	1	3	1	9	18.7
	Died in sanatorium ... ..	5	1	1	—	7	14.6
T.B. plus 3.	Quiescent ... ..	—	—	—	—	—	—
	Improved ... ..	1	—	—	—	1	33.3
	No material improvement ...	1	—	—	—	1	33.3
	Died in sanatorium ... ..	1	—	—	—	1	33.3
Bones and joints.	Quiescent ... ..	—	—	1	—	1	5.0
	Improved ... ..	1	7	8	2	18	90.0
	No material improvement ...	—	—	1	—	1	5.0
	Died in sanatorium ... ..	—	—	—	—	—	—
Abdominal.	Quiescent ... ..	1	—	—	—	1	33.3
	Improved ... ..	1	—	—	—	1	33.3
	No material improvement ...	1	—	—	—	1	33.3
	Died in sanatorium ... ..	—	—	—	—	—	—
Diagnosis on discharge from observation.	Tuberculous ... ..	Stay under 4 weeks.		Stay over 4 weeks.			
	Non-tuberculous ... ..	1		3	4	80.0	
	Doubtful ... ..	—		1	1	20.0	
					Total ..	123	

The non-pulmonary cases shown in the above table were transferred to the Wrightington Hospital early in 1932.

*Tuberculosis and Diabetes: A Study of Two Cases.*

Two male adult cases of tuberculosis with diabetes were treated during the year. They have made an interesting study.

Case No. 1. O.L., aged 36 years, clerk. History of pleurisy 8 years ago. In general hospital, April, 1931 for 3 weeks, when diabetes was diagnosed. Chest x-ray reported negative. Insulin, 10 units daily, April to October, 1931. January, 1932, insulin doubled and trebled without effect. Cough all through this period. Admitted Elswick 30.9.32, having 84 units in 3 doses per diem, also 12 Line diet. General condition poor. Physical signs both upper lobes. Sputum positive 24.8.32. Sedimentation index 12. X-ray skiagram showed typical tuberculous mottling in upper halves of both lungs. Hilar shadows increased on both sides, with shadows extending upwards. Sugar present in urine. Family history negative for tuberculosis.

Case No. 2. R.A., aged 51 years, auctioneer. History of diabetes for 10 years. Cough all his life, but always an athlete. Duration of present illness 6 months. Pyelitis. On 30 units of insulin. Admitted Elswick 3.6.32. General condition poor. Signs of active disease both lungs. Sputum positive 19.6.32. Sedimentation index 25. X-ray skiagram showed both lungs heavily infiltrated with tuberculous deposits, with marked fibrosis and numerous cavities in the upper two-thirds of the right lung. Sugar present in urine. Family history of tuberculosis.

In the first case there is no evidence as to the duration of the diabetic element, but a definite history is obtainable in the second, pointing to diabetes being the forerunner of the tuberculous infection.

In tuberculosis an important essential is a full and ample diet. On the other hand in diabetes semi-starvation is the usual indication. Diabetics who go untreated seem to have very little resistance to the ravages of tubercle, but if it is possible to control the diabetes the tuberculosis can also be benefited. Diabetes, therefore, is the major element in the case. Basing the treatment in sanatorium on this argument, it would seem that the diabetes is the more important of the two lesions from the point of view of expectation of life. Therefore efforts must be made to control the diabetes in the first instance.

When sugar is found in the urine of a tuberculous person we want to know if the patient is in reality suffering from diabetes. The glycosuria present must be distinguished from renal glycosuria found in patients with a lowered "leak point." Renal glycosuria is said to have no relation to true diabetes. Whether this view will always be held is a doubtful point, but, as shown by sugar tolerance tests, the curves are different.

In order to make the distinction between true diabetes and renal glycosuria, tolerance tests have to be made and the blood sugar concentrations estimated. McLean's method of blood sugar estimation was used throughout the cases under consideration. The sugar tolerance test consists of determining the sugar content of the blood in a fasting patient. A 50 gramme dose of glucose in the form of a syrup is then administered. At the end of each half-hour an examination of the blood sugar is made. These tests go on for 1½ to 3 hours. The readings in percentage of blood sugar are then plotted out on a graph producing a "blood sugar curve."

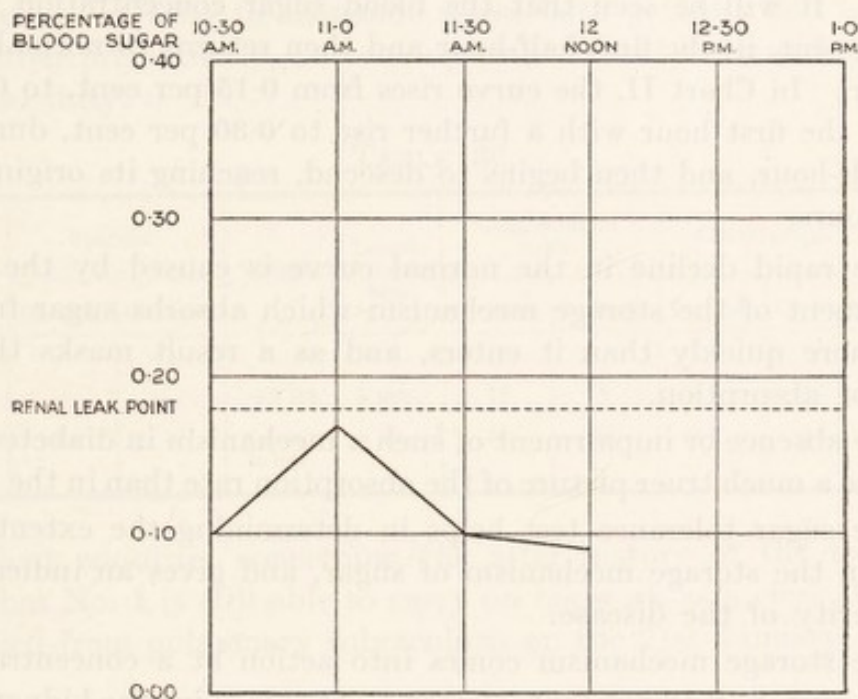
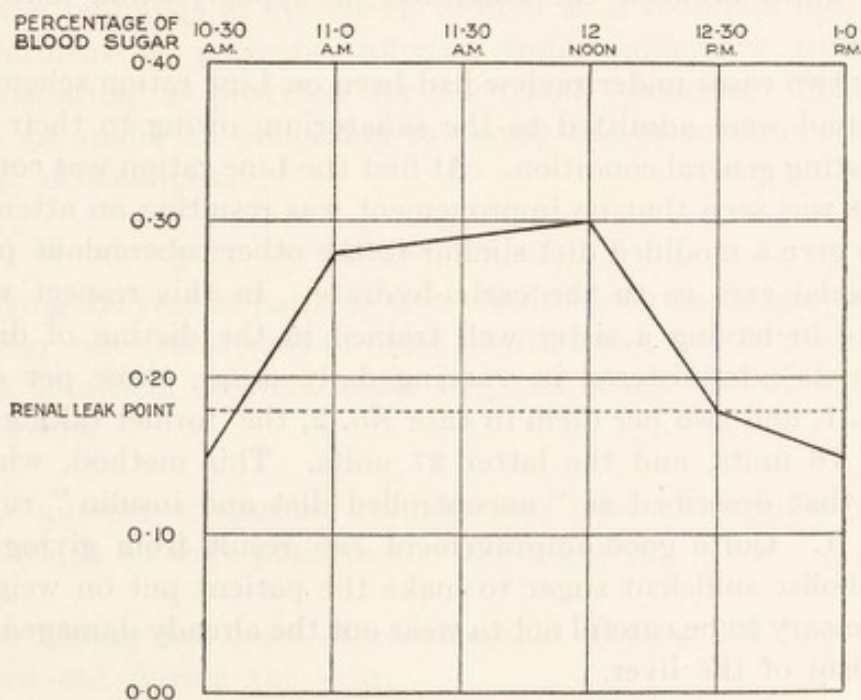
Chart I. Blood sugar tolerance test in *normal subject*.Chart II. Blood sugar tolerance test in *tuberculous diabetic*.

Chart I. shows a blood sugar tolerance test curve in a normal subject. It will be seen that the blood sugar concentration rises to 0.17 per cent. in the first half-hour and then returns to normal within the hour. In Chart II. the curve rises from 0.15 per cent. to 0.29 per cent. in the first hour with a further rise to 0.30 per cent. during the next half-hour, and then begins to descend, reaching its original level in  $2\frac{1}{2}$  hours.

The rapid decline in the normal curve is caused by the speedy development of the storage mechanism which absorbs sugar from the blood more quickly than it enters, and as a result masks the later stages of absorption.

The absence or impairment of such a mechanism in diabetes makes the curve a much truer picture of the absorption rate than in the normal.

The sugar tolerance test helps in determining the extent of the failure in the storage mechanism of sugar, and gives an indication of the severity of the disease.

The storage mechanism comes into action at a concentration of 0.16 per cent. to 0.18 per cent. or over. At this point the kidney begins to excrete sugar and any concentration above this will show sugar in the urine. This point is described as the "leak point" and is the "threshold" for sugar.

The diagnosis of diabetes having been established in the tuberculous patient, the treatment is carried on upon the usual sanatorium lines, the only difference being that insulin is used and the diet controlled by blood sugar estimations. The diet must be as ample as possible and is controlled so as to keep the blood as far as possible in the intermediate state between the condition of hypoglycæmia and hyperglycæmia.

The two cases under review had been on Line ration schemes with insulin, and were admitted to the sanatorium owing to their rapidly deteriorating general condition. At first the Line ration was continued, but as it was seen that no improvement was resulting an attempt was made to give a modified diet similar to the other tuberculous patients, with special care as to the carbo-hydrate. In this respect we were fortunate in having a sister well trained in the dieting of diabetics. Insulin was administered in varying daily doses, three per diem in case No. 1, and two per diem in case No. 2, the former taking a daily total of 76 units, and the latter 27 units. This method, whilst not exactly that described as "uncontrolled diet and insulin" runs very near to it. Quite good improvement can result from giving insulin to metabolise sufficient sugar to make the patient put on weight, but it is necessary to be careful not to wear out the already damaged storage mechanism of the liver.

Below is an analysis of the two male cases on admission and on discharge. Owing to economic stress both patients had to return home rather prematurely, but one returned to full work and the other to partial duty.

TABLE 36.

	Sputum.		Weight.	Length of stay in san.	Sedimentation Index.		Classification.		Insulin units.
	On adm.	On disch.			On adm.	On disch.	On adm.	On disch.	
No. 1 ...	+	-	+8 lbs.	3 mos.	12	9	+3	+2	76
No. 2 ...	+	+	Ceased to lose.	5 mos.	25	16	+3	+2	27

Recent enquiries concerning the after history of the two cases reveal that No. 1 is still able to carry on his work as a clerk, but that No. 2 died from pulmonary tuberculosis on the 21st January, 1933.

#### (4) CHADDERTON PULMONARY HOSPITAL, NEAR OLDHAM.

*Visiting Medical Superintendent* ... DR. JAMES WOOD.

(Dr. Wood is also medical officer to the Chadderton, Royton, and Crompton Joint Hospital Board, and the medical officer of health of the Urban District of Chadderton).

*Matron* ... MISS I. FELSTEAD.

An agreement was made on the 1st October, 1919, with the Chadderton, Royton, and Crompton Joint Hospital Board for the use of the buildings at Racefield, erected as a smallpox hospital, for the treatment of patients suffering from pulmonary tuberculosis. Accommodation is provided for 45 female patients. The County Council are under an obligation to vacate the premises in case of an epidemic of smallpox.

Dr. Wood reports as follows:—

During the year 89 patients were admitted, 60 discharged (including seven who were transferred to other institutions), and 23 died. Of the patients admitted, 13 were under 18 years of age and 22 between 18 and 21 years.

The number of sputum examinations made during the year was 278, of which 80 were positive and 198 negative.

The library has been of considerable service, 620 books having been lent out during the year.

Thanks are due to the County Council for the special Christmas fare and a further supply of books for the library, to the organisers of the various concert parties who have entertained us during the year, and to the Red Cross Society for a gift of books and periodicals.

It is with great regret that I have to record the loss of Miss Stobart—our matron—who died early in November, having been with us just under a year. Miss Holmes, the assistant matron at Wrightington Hospital, was appointed to fill the vacancy taking duty from 31st March to 8th August, 1933, when she was transferred to the Wolstenholme Pulmonary Hospital. Miss Felstead, the present matron, then came to occupy the post.

(5) HEATH CHARNOCK PULMONARY HOSPITAL, NEAR CHORLEY.

*Visiting Medical Superintendent* ... DR. J. W. RIGBY.  
(Dr. Rigby is also medical officer to the Chorley Joint Hospital Board.)

*Matron* ... MISS H. SINCLAIR.

By agreement with the Chorley Joint Hospital Board, the County Council erected, equipped, and furnished two pavilions, containing 16 and 14 beds respectively, together with a dining-hall and some staff accommodation. There are also wooden sleeping shelters for three patients. The Joint Board are responsible for the administration of the hospital, the County Council paying to them the cost of maintenance.

Dr. Rigby has kindly furnished the following report :—

The pulmonary hospital at Heath Charnock has been conducted in somewhat the same manner as in previous years ; it has been possible to make minor improvements for the comfort of the patients and the better management by the staff. Additional accommodation has been provided by a double sleeping shelter. A self-heated dinner wagon has been found of great service in delivering the meals hot to the bed patients.

The usual outings to the Ribble Valley and the seaside have taken place and a greater number of patients have been able to go. We have been grateful to the concert parties who, year after year, come to entertain us. This year one was augmented by an orchestra, which attended at the time of the distribution of gifts from the Christmas tree.

Thanks are due to the matron and staff for their loyal co-operation and their cheerful and willing assistance.

## (6) WRIGHTINGTON HOSPITAL, NEAR WIGAN.

<i>Medical Superintendent</i> ... ..	DR. E. H. ALLON PASK.
(Dr. Pask is also consultant tuberculosis officer for the Wigan County Dispensary Sub-Area—i.e., the area around and near the hospital—containing a population of 109,059.).	
<i>Visiting Consulting Orthopædic Surgeons</i> ...	MR. T. P. McMURRAY. MR. HARRY PLATT.
<i>Visiting Consulting Ophthalmic Surgeon</i> ...	MR. H. H. BYWATER.
<i>Assistant Medical Superintendent</i> ...	DR. E. H. W. DEANE.
<i>Junior Assistant Medical Officer</i> ...	DR. D. I. A. WILLIAMS. (resigned 5.10.33).
<i>Matron</i> ... ..	MISS E. MOSELEY.
<i>Assistant Matron</i> ... ..	MISS M. RICHARDS.

The Wrightington Hospital is situated close to the high road between Standish and Parbold, about six miles north-west of Wigan; altitude 300 feet above sea level. A scheme for the adaptation of the Hall as a nurses' home and the erection of new buildings to provide accommodation for 226 patients was adopted by the County Council and approved by the Ministry of Health towards the end of 1927. The accommodation provided is utilised as under:

Adults: Three one-storey pavilions (two for men and one for women). One pavilion contains 40 beds, a warm ward for four beds and single cubicles for two beds, and the other two pavilions accommodation for 30 non-pulmonary cases and cubicles for 10 combined cases of pulmonary and non-pulmonary tuberculosis ... .. 126 beds.

Children: Two one-storey pavilions for non-pulmonary tuberculosis—each pavilion containing 40 beds, a warm ward for four beds and single cubicles for two beds ... .. 92 beds.

Isolation Block ... .. 8 beds.

---

226 beds.

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In addition to the patients' pavilions, there are the following buildings:—Treatment block, kitchen block, official block, power house, laundry, quarters for nurses and maids (modern portion of the Hall and an annexe), medical superintendent's house, seven cottages for male employees, outbuildings (utilised for garages, workshops, stores, etc.).

The capital cost of the Wrightington Hospital has worked out at £621 per bed exclusive of land, or £671 per bed with land. The Ministry of Health made a grant of £180 per bed towards the capital expenditure.

The water supply is obtained from Robin Hood Well ( $1\frac{1}{4}$  miles distant), which is the property of the County Council. New sewage works are installed on the estate 250 yards from the nearest pavilion. The electric light is from the public supply.

The initial plans were drawn by the ex-County Architect, Mr. Henry Littler, and the scheme was completed by the present County Architect, Mr. Stephen Wilkinson, F.R.I.B.A.

The Contractors were Messrs. J. A. Milestone & Son, Ltd., of Wallasey.

The Lancashire Education Committee have kindly arranged for lecturers to visit the institution to speak on social history and current events to adult patients; there is a part-time instructress who teaches handicrafts to both men and women. For the children there is a head teacher, with two assistants.

During the year, 186 patients received some form of dental treatment from the visiting dental surgeon.

The first patients were admitted on the 14th December, 1931.

Here inserted are several photographs illustrating the male, female and children's wards of the hospital.

A report of the proceedings at the official opening of the hospital by Sir George Newman, the Chief Medical Officer of the Ministry of Health, is given on pages 116 to 120.

Dr. Pask reports as follows :—

The number of patients, including those transferred from Elswick Sanatorium and Rufford Pulmonary Hospital, admitted from the 14th December, 1931, to the 31st December, 1932, was 426. The number of discharges was 202, and 19 patients died; below are given particulars of the diagnosis and result of treatment of these 221 cases :—

WRIGHTINGTON HOSPITAL.

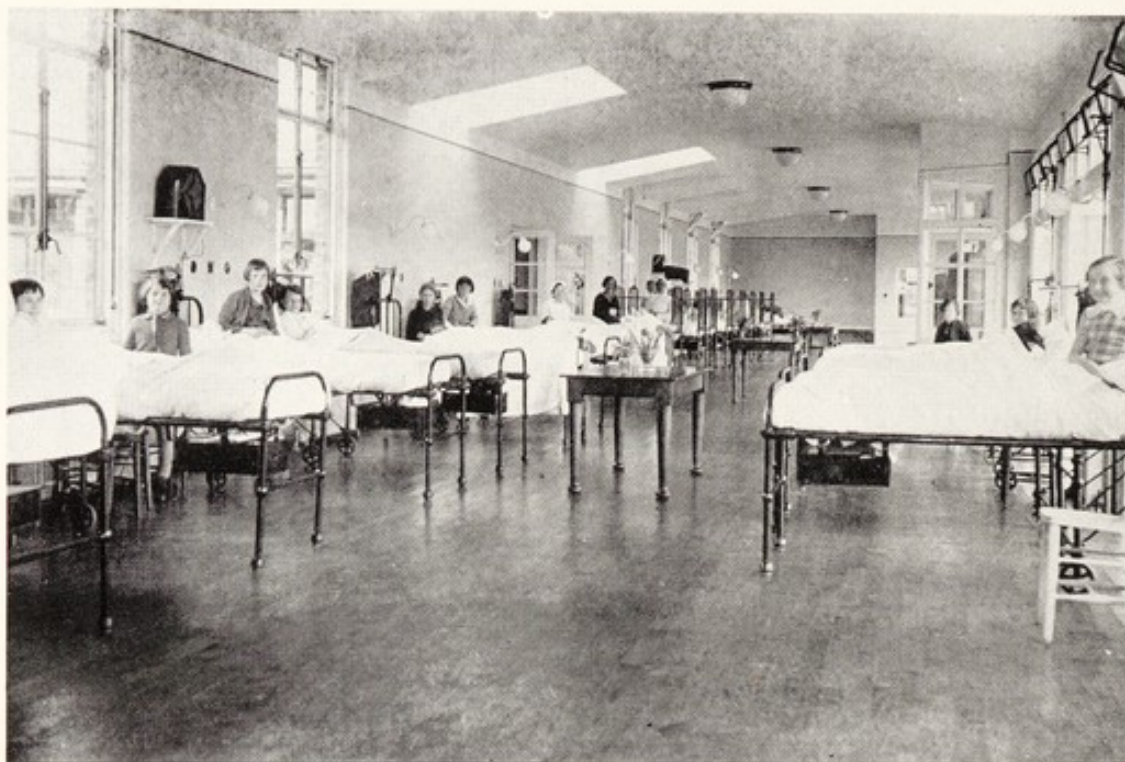


Male patients at handicraft class under instructress.

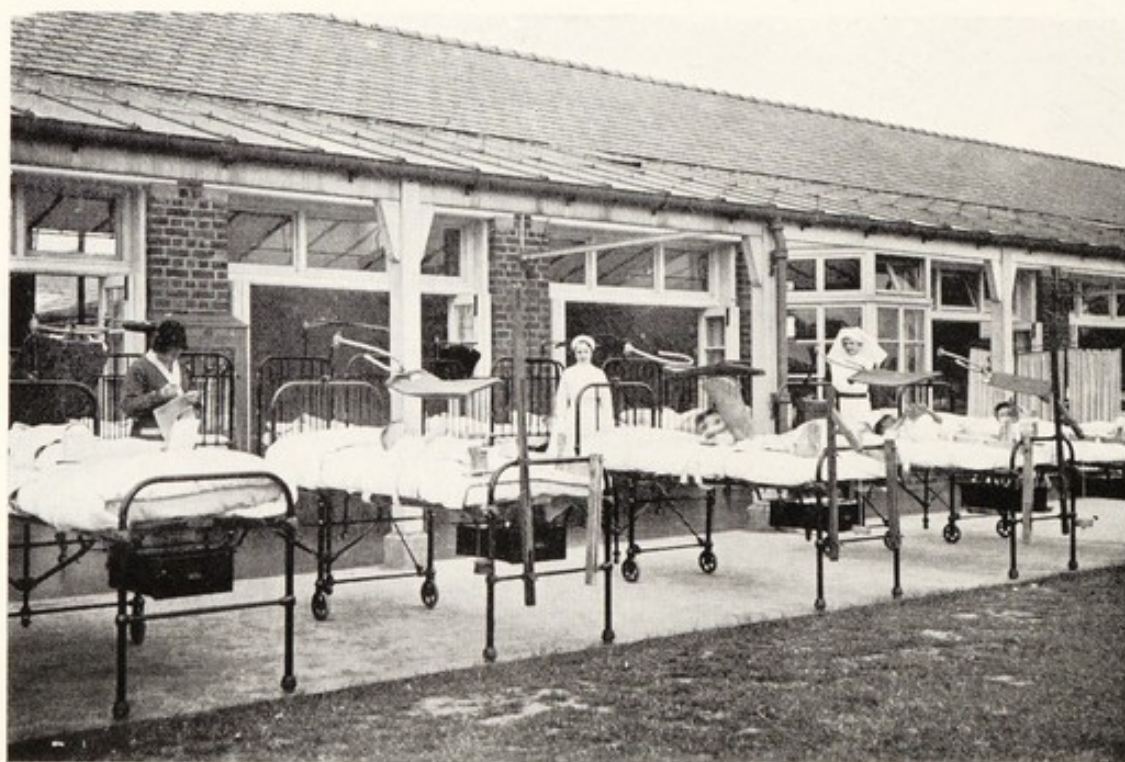


Female patients at handicraft class under instructress.

WRIGHTINGTON HOSPITAL.



A children's ward.



A portion of the boys' ward showing children at handwork under teacher.

Table 37. Condition on discharge of 177 patients suffering from non-pulmonary tuberculosis.

LESION	ADULTS					CHILDREN				
	Quies.	Imp.	ISQ.	Worse.	Died.	Quies.	Imp.	ISQ.	Worse.	Died.
Spine :										
Dorsal ... ..	1	1	—	—	2	1	—	—	1	—
Dorso-lumbar ... ..	1	2	1	—	1	1	—	—	—	—
Lumbar ... ..	4	3	1	1	1	—	—	—	1	—
Hip... ..	3	6	—	—	1	3	1	—	—	—
Ilium ... ..	—	—	—	—	1	—	—	—	—	—
Gt. trochanter ... ..	—	1	—	—	—	—	—	—	—	—
Knee ... ..	3	—	—	—	—	4	—	2	—	—
Ankle ... ..	2	4	1	—	—	1	—	—	—	—
Tarsus ... ..	1	—	—	—	—	—	—	—	—	—
Metatarsal... ..	1	—	—	—	—	—	—	—	—	—
Elbow ... ..	—	2	1	—	—	2	—	—	—	—
Wrist ... ..	—	1	—	—	—	—	—	—	—	—
Bursitis ... ..	4	—	—	—	—	—	—	—	—	—
Multiple lesions ... ..	5	5	—	—	—	—	—	—	—	—
Skin (Bazin's) ... ..	2	—	—	—	—	1	—	—	—	—
Peripheral glands ... ..	2	2	1	—	—	27	3	—	—	—
Peritonitis ... ..	8	1	—	—	3	13	—	1	—	—
Lungs ... ..	1	—	1	—	—	—	—	—	—	—
Kidney ... ..	—	1	—	—	—	—	2	1	—	—
Epididymis ... ..	1	—	—	—	—	—	—	—	—	—
Lumbar abscess ... ..	—	—	1	—	—	—	—	—	—	—
Combined pul. and non-pul. ... ..	9	6	2	1	9	—	—	—	—	—
TOTAL ... ..	48	35	9	2	18	53	6	4	2	—
	112					65				

In addition to the above, 44 patients (32 adults and 12 children), who had in most instances been admitted for purposes of observation and diagnosis, were discharged as suffering from conditions other than tuberculosis ; one of these patients died in the hospital.

Tuberculous glands of neck responded most favourably to treatment. Good results were also obtained in tuberculous peritonitis in children. In adults the response to treatment was not so satisfactory, especially the cases which had been operated on before admission ; the three deaths recorded were cases of this type which developed faecal fistula, and in my opinion these do much better if conservative

treatment is adopted. As regards tuberculosis of the bones and joints the figures show that the results are much better in children than in adults. It will be seen that the deaths occurring in hospital were all adults. The combined cases (*i.e.*, those with pulmonary tuberculosis and some lesion or lesions elsewhere) gave the largest number of fatalities, followed by tuberculosis of the spine.

The treatment of non-pulmonary tuberculosis is in the main similar to that of pulmonary tuberculosis, the basic principles being fresh air, sunshine, an abundant supply of nourishing food containing an adequate amount of vitamins, and rest of the affected part.

Rest is much more easily attained in bone and joint tuberculosis than in pulmonary tuberculosis, and various forms of retentive apparatus are employed, including plaster in selected cases to keep the part at rest. In addition surgical measures are adopted in certain cases.

The artificial light department is situated in the central treatment block and consists of a large room containing the various lamps; leading from this are the lupus room, shower bath, changing room, and sister's room. The apparatus consists of three 20 ampere carbon arc lamps arranged in series, two pairs of 30 ampere carbon arc lamps arranged in parallel, one large 75 ampere Finsen carbon arc lamp, one Finsen Reyn lamp, one Jesionek mercury vapour lamp, one "Alpine Sun" lamp, and two Kromayer mercury vapour lamps. The carbon arc lamps are used for general light baths.

Patients usually commence treatment with the small 20 ampere lamps, then proceed to the 30 ampere, and finish up with the large 75 ampere Finsen lamp. Exposures are given three times weekly and a maximum exposure of 40 minutes (20 minutes front, 20 minutes back) is reached with each type of lamp—grade A carbons being exclusively used.

After light treatment ambulant cases receive a shower bath commencing at a temperature of 102° F., and reducing during the course of the bath. The Finsen Reyn lamp is a special carbon arc lamp for the treatment of lupus, the mercury vapour lamps are employed for local light baths, the "Alpine Sun" and Jesionek lamps for local treatment of sinuses, etc., and the Kromayer lamps chiefly for lupus cases. One of the Kromayer lamps is fitted with special blue glass (Wood's glass), and is used for detecting ringworm, the infected hairs being fluorescent; on admission all the children's heads are examined with this lamp as a routine.

Artificial sunlight is used throughout the year; natural sunlight in the summer months is fully utilised when available and is supplementary to the artificial light baths.

As regards the results obtained by artificial sunlight, I think it must be said that this form of treatment has no specific action in tuberculosis, but it is a most useful adjunct, and properly used has a marked stimulating and general tonic effect. No form of treatment that helps to build up a patient's resistance can afford to be neglected in the treatment of a disease of such a chronic nature as tuberculosis. Approximately 65 to 70 per cent. of the patients receive this form of treatment.

The x-ray department consists of a 6-valve high tension transformer unit arranged for operation on 3-phase A.C. supply with a special couch incorporating a curved type Potter Bucky diaphragm, the diaphragm and tube carrier moving as one unit so that it is not necessary to move the patient on the couch. For chest cases a special screening stand is employed with facilities for taking skiagrams at a distance of six feet. In addition to the hospital patients, the x-ray work of the Wigan Sub-Area and Heath Charnock Pulmonary Hospital is done at Wrightington. During 1932 the following skiagrams were taken:—Hospital patients, 1,465; dispensary patients, 395; Heath Charnock Hospital patients, 24; total, 1,884.

There is a well-equipped operating theatre in the treatment block with surgeons' changing room, anæsthetic room, sterilising room, and recovery room attached. The following is a list of operations performed during the year:—

Arthrodesis of joints—hip 1, knee 2; excision of bones and joints—astragalectomy 1, head of femur 1, metatarsophalangeal 1; amputations—thigh 2, leg 4, finger 1; osteotomy—femur-Lorenz 3, transtrochanteric 2; sequestrotomy 7; bone scraping and curettage 5; removal of glands of neck 19, incision and curettage 8; incision of abscesses 30; excision of hydrocele 1; appendicectomy 1; opening up of sinuses 2; urethral calculus 1; paracentesis abdominis 2; paracentesis thoracis 3; joint manipulation under general anæsthetic 1; and aspirations 222.

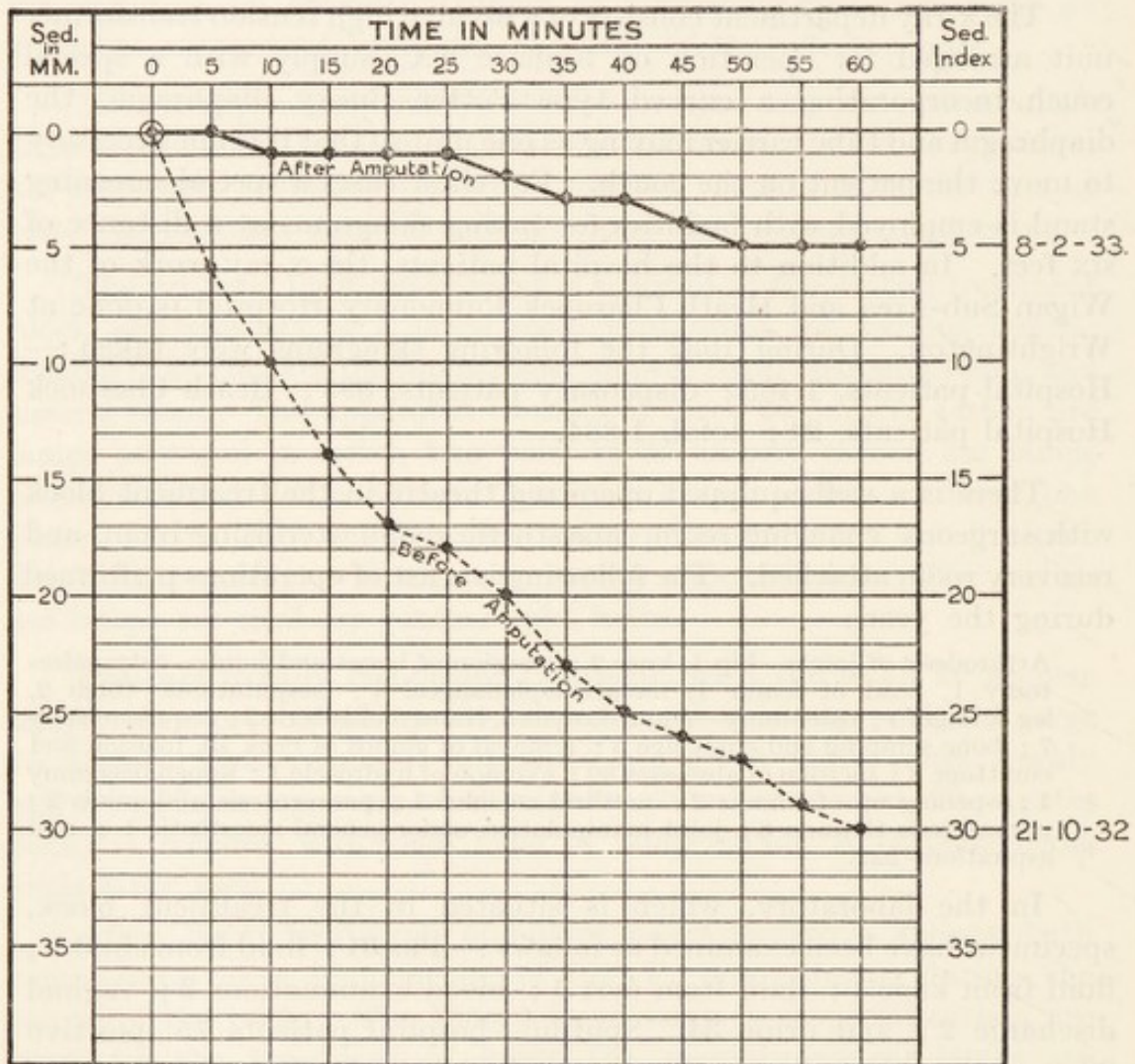
In the laboratory, which is situated in the treatment block, specimens have been examined as follows:—Pus 31; fluid from chest 2; fluid from knee 1; fluid from cyst 1; blood examinations 2; vaginal discharge 2; and urine 34. Sputum—hospital patients 75 (positive 22, negative 53); dispensary area patients 558 (positive 90, negative 468).

Material for guinea-pig inoculation, section, etc. is sent to the Public Health Laboratory, Manchester, and during the year the following examinations were made:—Urine 17; fæces 1; pus, fluid abscess, etc. 12; scrapings from tibia 1; sections from growth 1; gland of neck 1; diphtheria 1; and portions of skin 1.

The sedimentation test is done as a routine on all patients on admission and discharge. A modification of the Cutler technique is

adopted. The test forms a valuable index of the rate of progress. Cases that improve show a decrease in the rate of fall of the red cells in a given time. The following graph shows the striking improvement which has taken place in a case of advanced tuberculosis of the knee joint with multiple sinuses (before and after amputation of the leg).

WRIGHTINGTON HOSPITAL.—Blood Sedimentation Chart.  
Patient R. T. Diagnosis: Tuberculosis of knee joint.



The Mantoux test, full particulars of which were given in the 1931 annual report, is done on all children admitted, and continues to give useful help, especially when negative, in doubtful cases of tubercular peritonitis and bone lesions of a non-tubercular nature.

Sanocrysin has been tried in a certain number of patients and on the whole the results have been satisfactory, some of the cases responding particularly well. In four cases of multiple skin lesions with or without subcutaneous abscesses the results were striking (see Chapter IX).

Mr. Platt and Mr. McMurray, the consulting orthopædic surgeons, have paid monthly visits to the hospital during the year, and I gratefully acknowledge the valuable help in the diagnosis and treatment of difficult cases.

From time to time cases arise which require the services of an ophthalmic surgeon, especially children who develop some error of refraction, and Mr. Bywater visits the hospital periodically for this purpose.

For dental treatment, there is a well equipped dental room, and the following figures show the amount of useful work done during the year :—Extractions—general anæsthetic 203, local anæsthetic 298 ; fillings 219 ; scalings and cleanings 303 ; other operations 216 ; new dentures—partial 5, complete 21 ; repairs to dentures 1.

In hospitals of the type of Wrightington, where the length of stay is considerable, it is most important that some form of education should go on concurrently with treatment in order to obviate ennui and mental stagnation. This is generally recognised in the case of children. The Wrightington Hospital School is in charge of Mrs. Keyworth, the head teacher, who has two assistants, and I should like to testify to the high standard attained by their efforts. In addition to the usual school curriculum a special effort is made to develop the child's individuality. The work done in the handicraft department deserves special mention.

It is not usual in England to have any organised system of adult education in hospitals, although it is customary in Canada in hospitals and sanatoria where patients are retained for treatment for long periods. The medical superintendents at the institutions I visited three years ago spoke highly in its favour. As an experiment a start was made at Wrightington early in 1933, and the County Education Committee supplied three teachers or lecturers—Miss Roll, handicrafts ; Mr. James, current events ; and Mr. Bruce, social history. The patients have taken great interest in the classes, and the scheme which has been initiated shows every prospect of becoming a permanent feature.

As is usual in all institutions under the County Tuberculosis Committee, adequate facilities are provided for the amusement of patients. These include cinematograph entertainments, indoor games, wireless (headphones for each adult patient and loud speakers for children and staff), and a well-stocked library which is kept up to date.

In conclusion I should like to thank my medical colleagues, and the matron and nursing staff for the valuable help I have received in the difficult and arduous work entailed in the opening of a new institution. The clerical staff have also given me loyal and valuable assistance.

*The Formal Opening of the Wrightington Hospital by Sir George Newman  
on the 16th June, 1933.*

The Wrightington Hospital, near Wigan, erected by the County Council at a total capital cost of £151,620 (inclusive of land and hall), was formally opened for the treatment of non-pulmonary tuberculosis by Sir George Newman, the Chief Medical Officer of the Ministry of Health, on the 16th June, 1933. The following report of the proceedings is reprinted from the *Wigan Examiner* at the request of the Chairman of the County Tuberculosis Committee.

THE OPENING CEREMONY.

The opening ceremony was performed in front of the staff quarters. A large stand had been specially erected to accommodate the County Council representatives and those from the various local authorities in the County. The nursing staff sat in rows on the steps on each side of the dais.

Alderman Sir James Travis-Clegg, Chairman of the Lancashire County Council, presided, and was supported by Col. C. J. Trimble, Chairman of the County Tuberculosis Committee; Councillor E. Boothman, Vice-Chairman; Alderman Dr. J. C. Beckitt, a member of the County Tuberculosis Committee; Sir George Etherton, Clerk of the County Council; Mr. H. W. Cleaver, Deputy County Clerk; Dr. G. Lissant Cox, Central County Tuberculosis Officer; Dr. E. H. Allon Pask, Medical Superintendent of Wrightington Hospital; and Miss E. Moseley, Matron.

HISTORY OF SCHEME.

The Chairman said they were delighted to welcome Sir George Newman; they regarded his visit as a very great compliment. That day marked the completion of a scheme with which he had been intimately connected since its initiation. The Tuberculosis Committee was first constituted in 1912, and he was elected the first Chairman—a position he had held for about ten years. During the time of his chairmanship Wrightington Hall was purchased. They might say that it was no great credit to the Chairman that the estate had not been put into use for ten years or more since it was purchased. That was due to post-war and economic conditions of the country. Much money had to be expended before the hall could be made into one of the finest—if not the finest—hospitals in the country. What he could not accomplish had been accomplished by his old friend and colleague, Colonel Trimble, and it was entirely due to his persuasive eloquence, seconded by his

equally pertinacious friend, Mr. Boothman, that the scheme had been completed. They had drawn blood from a stone, and they had obtained money out of the depleted treasury so that those people for whom that hospital was intended should receive the benefit of treatment. The Tuberculosis Committee and the Lancashire County Council were worthy of some credit for carrying out the scheme. During the thirty-five years he had been a member of the Lancashire County Council great strides had been made to deal with the disease of tuberculosis amongst children, which had cost the country so much in the loss of life and wealth. In conclusion, the Chairman paid a tribute to Dr. Cox, who had been head of the tuberculosis department for over twenty years, and to the nursing and medical staff for helping to bring that scheme to a successful completion. (Applause.)

Colonel Trimble then handed a key to Sir George Newman, who formally opened the hospital amid great applause.

#### SIR GEORGE NEWMAN'S ADDRESS

Sir George Newman then addressed the gathering. After remarking that he was, indeed, sensible of the great courtesy and generosity of the Lancashire County Council in asking him to come and join with them in opening that great and beautiful hospital, Sir George went on to say that he would endeavour to point out why that was a great and historic occasion; why they were taking a great forward step in the establishment of that hospital. The lesson of life, as of history, was to learn to put the meaning of the centuries and years against the meaning of the days and the hours. If we wanted the true measures of history we must lay our emphasis not upon the toils and tribulations and anxieties of the days and hours, but upon the enduring meaning of the centuries and the years. They were building and founding that day something that would belong to the history of the future. The centuries and years had got something to say to them that afternoon which he begged to remind them of. We talked about the British Empire, and we talked about England, and we were proud of both with their great traditions of justice, fairness, industry, and so on. But a nation could never win through unless it was built upon a strong and enduring foundation of personal and public physical health. (Hear, hear.) We were engaged to-day in the struggle with tuberculosis, and we were winning; we were winning almost hands down. Tuberculosis was the greatest constitutional disease we now had which had its roots in the social life, character, and conduct of the English people. So if we engaged in a struggle for the banishment of tuberculosis we engaged in a crusade which deserved all our devotion and all the wisdom and statecraft of which we were capable.

Leprosy once covered this island. There were hospitals in Lancashire and in other parts of the country to deal with it. It reigned in England for six hundred years, but many of them would be puzzled to find for him a single leper in England to-day. Leprosy was a disease which had been banished from Britain on much the same principle as tuberculosis is being banished. Plague had not only been equally prevalent, but in the 14th century very nearly ended the history of England altogether. The population of this country in 1348 was four millions, and in 1349 was two millions, the other two millions having perished by the plague. Plague was the second disease which had been conquered and banished. There was the disease of smallpox. One person in every eight of the population of England used to be pitted with smallpox. To-day many of us had never seen a person pitted with smallpox, because it was a banished disease, except for those who preferred to have it. (Laughter.) There was also the disease of cholera, which on four occasions in the 19th century carried off nearly 230,000 persons. Cholera also had been banished. All these diseases which we had banished from England flourished in the world to-day. They did not leave England and were not banished from this country as natural phenomena. They were banished by the will and determination of the English people. It could not be a natural phenomenon that tuberculosis was going to disappear without a high and persistent endeavour. What had been done could be done again, and he was there to say that in Lancashire they were doing the job. That great hospital was a descendant of the two monastic infirmaries built in Athelney by King Alfred exactly one thousand years ago. Those were the first two English hospitals. The Wrightington Hospital was going to contribute not only to the healing of our fellow men and women, but it would so heal and educate them that they would educate and heal the whole of the population of which they formed part. And it would be paid for out of taxes, paid for by the ratepayers of the county in a way that King Alfred could never have dreamed. He thought not only of King Alfred as he walked around the wards; he had found signs of other great men.

There were gathered together in that hospital the ancient methods of Hippocrates, who lived 460 years before Christ. There were also being applied all the discoveries which the genius of man had given to our age, and which made our age the glorious age and epoch of the application of science to the betterment of man's history. We were living in the golden age of science in England to-day. It was so extraordinary that it seemed impossible to conceive that it could last much longer. Inside one hundred years man's mind had invented and discovered means by which his life could be made to survive in a way absolutely undreamed of two or three centuries ago. And those

means were to be found in that hospital. There they would find Greek medicine and Arabian medicine, and they would also find English medicine in its latest form being applied for the betterment of man. Wandering through the wards, he had shaken hands with the shades of many great men—Laennec, who invented the stethoscope; Koch, who first located the organism of tuberculosis; Röntgen, who invented the x-ray which revealed the innermost paths of the human body so that they could be seen by man, greatly to the embarrassment of the patient. (Laughter.) “Oh, I have had a creepy time,” added Sir George, amidst further laughter. “I met another figure too: Lord Lister, whose invention of antiseptic surgery has made possible some of the wonderful things which are being done here and all over the world.” You will see where the powers of the sun have been harnessed by the great genius Finsen. Another ghost was that of Sir Robert Jones, of Liverpool, the great orthopædic pioneer; Wrightington of all hospitals should respect Sir Robert Jones. The Wrightington Hospital, like no other temple of healing in England, was being built into a great national scheme for the prevention of tuberculosis, Sir George went on to say. They had got the best example in all England of the combination of means of prevention with methods of healing. They had in Lancashire the best scheme for attacking tuberculosis in any county.

What was the result of those labours? The result was that during the last sixty years tuberculosis in this country had been reduced by 75 per cent. (Applause.) It was, precisely, a quarter of what it was in incidence and mortality sixty years ago. We could not say that of cancer, or rheumatism, or syphilis, that disease which walked by darkness. The Lancashire scheme is saving 1,000 lives a year from tuberculosis. Was that worth doing? There would come a time, but not in his lifetime, when they would be able to place tuberculosis with leprosy, plague, smallpox and cholera as a conquered disease. Children born in Lancashire to-day had an expectation of life sixteen years longer than their grandfathers had. An improvement in general health had laid the foundations for that great change. In England we have the lowest death rate of any civilised nation in the world. Housing also had improved, and there was also an improvement in the nutrition of the people, said Sir George, who, referring to the unemployed, said that whilst they suffered in some ways, they did not die; sickness has not been affected by three years' unemployment. And there had been a great improvement in morale. All these things were coming home to roost, and his audience was fortunate enough to be living while all this was happening. The Wrightington Hospital was not only a temple of healing; it was also a temple of a most liberal education. (Applause.) Sir George then paid a tribute to the nursing profession,

especially the nurses in tuberculosis institutions and the nurses for patients in their homes, all of them helping in the fight against tuberculosis.

A vote of thanks to the Chairman and to Sir George Newman concluded the proceedings.

- (7) PEEL HALL PULMONARY HOSPITAL (DISPENSARY AREA No. 4).
- (8) RUFFORD PULMONARY HOSPITAL (DISPENSARY AREA No. 5).
- (9) WITHNELL PULMONARY HOSPITAL (DISPENSARY AREA No. 2).
- (10) WOLSTENHOLME PULMONARY HOSPITAL (DISPENSARY AREA No. 3).

It has already been explained in the chapter on the dispensary organisation (pages 5 and 6), that the Administrative County, containing a population of 1,802,700, is divided into five large dispensary areas, with an average population of 320,000, each area being in the charge of a consultant tuberculosis officer who has two assistant tuberculosis officers and other staff. The aim of the County Council has been to provide in each area a pulmonary hospital containing about 50 beds for the diagnosis of observation cases and the treatment of intermediate and advanced cases of pulmonary tuberculosis near their homes, the consultant tuberculosis officer of the particular dispensary area acting as the visiting medical superintendent. In addition to the five large areas there are three dispensary sub-areas—Furness, Fylde, and Wigan County—in the charge respectively of the medical superintendent of the High Carley Sanatorium, the Elswick Sanatorium, and the Wrightington Hospital. Thus, the dispensary side of the work is not divorced from the institutional side.

The report for each of the above-named hospitals is contained in the report of the consultant tuberculosis officer for the area, *viz.*, for Peel Hall in Dispensary Area No. 4, page 71 ; for Rufford in Dispensary Area No. 5, page 77 ; for Withnell in Dispensary Area No. 2, page 63 ; and for Wolstenholme in Dispensary Area No. 3, page 67.

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## XXIV.—THE TREATMENT OF PULMONARY TUBERCULOSIS.

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THE CONSERVATIVE USE OF INSTITUTIONAL  
ACCOMMODATION.

The most expensive part of a tuberculosis scheme is the cost of maintaining patients in sanatoria or hospitals. The practice of the tuberculosis medical staff has always been conservative in regard to diagnosis, particularly in children, and every opportunity has been taken to adopt up-to-date methods of diagnosis. For this purpose the County Council have allowed their senior medical staff to attend post-graduate courses and to undertake research.

In regard to children I reported in 1930 and in 1929 on the occurrence of pulmonary tuberculosis in relation to sanatorium accommodation, and gave figures showing that, as the result of the conservative diagnosis of pulmonary tuberculosis in children, it had only been necessary to provide relatively few sanatorium beds in Lancashire for such children, with the consequent saving of public money.

With regard to adults suspected to be suffering from pulmonary tuberculosis, a similar conservative attitude has been adopted, as may be noted from the proportion (41·0 per cent.) of pulmonary cases on the register classified as T.B. minus. In contrast five large counties, with a population in the region of a million, show an average percentage of 66·0 T.B. minus cases. For the whole of England, the proportion (according to the Annual Report for 1932 of the Chief Medical Officer of the Ministry) was 56·6.

An exhaustive examination of patients to ensure that only cases with definite tuberculosis are taken on the register and afforded treatment undoubtedly saves a considerable amount of public money by reducing the number of beds required for the treatment of patients.

A further factor seriously affecting the number of beds required is the duration of treatment allowed to a patient. Here again every

case has to be carefully weighed on its merits, but generally the following principles have been adopted:—

(a) Patients who are responding to institutional treatment are given a prolonged stay (6 months and over) so long as there is a likelihood of the disease becoming quiescent. To return such cases to their homes and to work before attaining quiescence is uneconomical because of the danger of the patient breaking down and all the good of institutional treatment being wasted.

(b) Patients, particularly the young adult group (aged 15-25), who have been given special forms of treatment (*e.g.*, artificial pneumothorax, phrenicectomy, thoracoplasty, sanocrysin) are allowed a sufficient stay (say, up to 6 months) to show progress from their treatment and are retained up to 12 months or more if their condition warrants it; cases treated by artificial pneumothorax attend at the dispensaries for a continuation of their treatment.

(c) Patients whose sputum has never been positive and who are not likely to make further progress or to require special treatment are allowed to return home at the end of two or three months' treatment. Many sputum examinations are made in this type of case and the usual practice is to make three tests of consecutive daily specimens.

(d) Patients with positive sputum who are not likely to make further progress and whose home conditions are reasonably satisfactory are allowed to return home at the end of two or three months' treatment.

The tuberculosis officers when making recommendations for institutional treatment bear in mind the following questions: (1) Is institutional treatment required to improve the patient's health? (2) Is institutional treatment desirable to secure nursing care which cannot be otherwise obtained at home? (3) Is institutional treatment necessary to prevent the spread of infection?

All the patients in sanatoria and hospitals receive the benefit of and training in hygiene which is advantageous to themselves and a protection to others when they return home.

The following Table 38 summarises the *immediate* results of treatment of patients discharged in 1932 from sanatoria and pulmonary hospitals :—

Classification on admission as to the institution.	Condition at time of discharge.	Duration of residential treatment in the institution.												Total patients discharged.	
		Under 3 months.			3—6 months			6—12 months			More than 12 months.				
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	No.	%
T.B. minus.	Quiescent ... ..	19	14	5	20	12	4	15	8	7	4	4	19	131	41.4
	Improved ... ..	22	19	3	29	22	4	12	11	6	1	1	2	132	41.8
	No material improvement	12	10	4	6	3	—	2	1	—	—	—	—	38	12.0
	Died ... ..	4	6	1	2	—	—	—	—	1	1	—	—	15	4.7
T.B. plus 1 (early)	Quiescent ... ..	1	3	—	6	6	—	12	5	—	3	3	—	39	32.8
	Improved ... ..	3	3	—	8	6	—	9	10	—	5	8	—	52	43.7
	No material improvement	4	3	—	1	3	—	1	3	—	—	1	—	16	13.4
	Died ... ..	2	3	—	2	—	—	1	2	—	—	2	—	12	10.1
T.B. plus 2 (intermediate)	Quiescent ... ..	2	2	—	10	5	—	17	10	—	9	4	—	59	9.3
	Improved ... ..	35	13	—	72	51	—	55	55	—	16	17	—	314	49.5
	No material improvement	30	19	5	28	16	2	12	17	1	4	6	1	141	22.2
	Died ... ..	27	23	1	17	17	1	8	10	1	8	7	—	120	18.9
T.B. plus 3 (advanced)	Quiescent ... ..	1	—	—	2	—	1	—	—	—	—	—	—	4	2.2
	Improved ... ..	7	3	—	10	6	—	7	7	—	4	1	1	46	25.0
	No material improvement	20	11	2	6	6	—	7	4	—	1	1	—	58	31.5
	Died ... ..	26	20	1	8	5	—	8	—	—	6	2	—	76	41.3
	<b>Total ... ..</b>	<b>215</b>	<b>152</b>	<b>22</b>	<b>227</b>	<b>158</b>	<b>12</b>	<b>166</b>	<b>143</b>	<b>16</b>	<b>62</b>	<b>57</b>	<b>23</b>	<b>1253</b>	<b>—</b>
Diagnosis on discharge from observation.								Stay under 4 weeks.			Stay over 4 weeks.				
	Tuberculous ... ..							4	3	1	5	5	5	23	41.0
	Non-tuberculous ... ..							8	1	—	14	2	5	30	53.6
	Doubtful ... ..							1	1	—	—	—	—	2	3.6
	Died ... ..							—	—	—	1*	—	—	1	1.8
	<b>GRAND TOTAL ... ..</b>													<b>1,309</b>	<b>—</b>

\* Diagnosis: Neoplasm of lung.

The table illustrates that the best results are achieved when institutional treatment is given before the sputum becomes positive—the more advanced the disease the less satisfactory progressively are the results. This only goes to prove what has been said so often, that the earlier treatment for pulmonary tuberculosis is commenced the better the chances of recovery.

Referring to the pulmonary hospitals, they are also used for patients sent for the purpose of isolation, for observation in regard to diagnosis, and particularly for education in general methods of hygiene which, when the patients return home, can be applied much more effectively after a short period of institutional treatment.

In each of the five large dispensary areas, one of these pulmonary

hospitals is in the charge of the consultant tuberculosis officer, an arrangement of the highest importance because patients come to these hospitals from the area administered by the tuberculosis officer, who is, therefore, conversant with the home conditions. Further, it is of great advantage to the tuberculosis officer, because he can himself apply certain forms of treatment and carry out valuable clinical and research work.

A number of patients are also accommodated in the pulmonary hospitals belonging to other bodies situated in or near the area. In order that the consultant tuberculosis officers may keep themselves in touch with such cases, arrangements have been made (with minor exceptions) for the tuberculosis officers to visit periodically the pulmonary hospitals in their area and confer with the medical superintendents on the following matters:—(1) The question of extension of patients' treatment or their return home, having special regard to the home conditions which are known to the tuberculosis officer; (2) the question as to patients' future treatment; (3) applications from patients for transfer to other institutions, or for their discharge home, and to settle, where possible, any difficulties or complaints by patients which may arise.

The foregoing working arrangements have enabled the highly infectious cases with unsatisfactory home conditions to remain at the pulmonary hospitals for long periods for the purpose of isolation, and the patients who have made good progress and are capable of light work to be transferred to sanatoria for the continuation of their treatment.

Brief particulars are given in the following Table 39 of the pulmonary hospitals available for the treatment of patients:—

Name of hospital.	1932 : Number of patients—		
	Admitted.	Discharged.	Died.
<i>(a)</i> County Council Institutions :			
Chadderton, near Oldham ... ..	89	60	23
Heath Charnock, near Chorley ... ..	71	43	29
Peel Hall, Little Hulton ... ..	126	115	12
Rufford, near Ormskirk ... ..	115	88	23
Withnell, near Chorley ... ..	89	55	30
<i>(b)</i> Institutions administered by other bodies :			
Burnley ... ..	48	38	11
Eccleston Hall, near St. Helens ... ..	6	3	2
Hefferston Grange, Cheshire ... ..	26	22	3
Pemberton, Wigan ... ..	5	3	2
Westhulme, Oldham ... ..	—	1	—
*Wolstenholme, Norden ... ..	46	26	22
Other institutions ... ..	1	2	—
<b>TOTAL</b> ... ..	<b>622</b>	<b>456</b>	<b>157</b>

\*The Wolstenholme Pulmonary Hospital was transferred from the Rochdale Corporation to the County Council on 1st July, 1933.



## XXV.—THE TREATMENT OF NON-PULMONARY TUBERCULOSIS.

### IMMEDIATE RESULTS OF INSTITUTIONAL TREATMENT AT GENERAL AND SPECIAL HOSPITALS.

A summary of the condition on discharge of patients treated during 1932 in approved general and special hospitals and in the Manchester and Salford Skin Hospital is given in the following Table 40 :—

Classification on admission to the institution.	Condition at time of discharge.	Duration of residential treatment in the institution.												TOTAL	
		Under 3 months.			3—6 months			6—12 months			More than 12 months				
		M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	No.	%
Bones and joints.	Quiescent ... ..	8	10	8	5	3	8	2	1	15	2	—	24	86	28.4
	Improved ... ..	46	32	9	14	10	3	16	8	6	8	6	19	177	58.4
	No material improvement ...	7	4	7	—	1	1	1	—	—	1	2	4	28	9.2
	Died in institution ... ..	2	—	—	—	2	—	2	2	1	1	1	1	12	3.9
Abdominal.	Quiescent ... ..	1	4	6	1	4	5	2	—	9	—	—	2	34	52.3
	Improved ... ..	2	8	3	—	3	1	—	—	2	—	—	1	20	30.8
	No material improvement ...	1	5	—	—	—	—	—	1	—	—	—	1	8	12.3
	Died in institution ... ..	2	1	—	—	—	—	—	—	—	—	—	—	3	4.6
Other organs	Quiescent ... ..	3	3	2	1	—	—	1	—	1	—	—	—	11	16.2
	Improved ... ..	22	15	2	—	1	3	—	—	1	—	1	—	45	66.2
	No material improvement ...	1	1	1	—	—	1	—	—	—	—	—	—	4	5.9
	Died in institution ... ..	—	—	6	—	1	—	1	—	—	—	—	—	8	11.7
Peripheral glands.	Quiescent ... ..	6	11	21	—	—	14	—	—	4	—	—	—	56	47.4
	Improved ... ..	16	17	12	—	3	2	—	1	3	—	—	1	55	46.6
	No material improvement ...	1	3	2	—	—	—	—	—	—	—	—	—	6	5.1
	Died in institution ... ..	1	—	—	—	—	—	—	—	—	—	—	—	1	0.8
Total ... ..		119	114	79	21	28	38	25	13	42	12	10	53	554	—
Diagnosis on discharge from observation.								Stay under 4 weeks.			Stay over 4 weeks.				
	Tuberculous ... ..							1	2	3	5	4	6	21	37.5
	Non-tuberculous ... ..							6	2	1	2	7	10	28	50.0
Doubtful ... ..							—	—	2	1	2	2	7	12.5	
Grand Total													610		

### AFTER-HISTORIES OF PATIENTS SUFFERING FROM NON-PULMONARY TUBERCULOSIS.

In 1929 the after-results of 1,159 adults and 1,455 children first treated during the five years 1920 to 1924 were recorded: 75 per cent. of the cases had recovered or had the disease quiescent. Although this year the after-histories have not been worked out again, the excellent results have continued. New after-histories will be given in a future report.

## XXVI.—DENTAL TREATMENT.

Patients eligible for dental treatment are those who, in the opinion of the medical superintendent or the tuberculosis officer, are unable to derive full benefit from their treatment for tuberculosis owing to defective teeth. Patients already covered by dental schemes of other bodies, *e.g.*, school children at home and tuberculous pensioners, are excluded from benefit. For insured persons who are tuberculous many approved societies make a contribution towards the cost of dental attention required.

At the following County sanatoria and hospital the dental work is carried out by a visiting dentist:—High Carley, Oubas House, Elswick, and Wrightington.

The statement below shows the dental work carried out during 1932, under the scheme approved by the County Council:—

TABLE 41.

	At High Carley and Oubas House Sanatoria.	At Elswick Sanatorium.	At Wrightington Hospital.	At other sanatoria and hospitals.	At patients' homes.	Total.
Number of individual patients who received dental attention (any form) ... ..	220	103	186	32	23	564
New dentures provided—						
(a) Complete sets ... ..	15	1	21	13	12	62
(b) Partial sets ... ..	15	10	5	7	8	45
Repairs to dentures ... ..	10	—	1	4	4	19
Number of extractions ... ..	397	192	501	175	295	1,560
Number of fillings ... ..	37	25	219	1	—	282
Number of scalings and cleanings... ..	3,484	218	303	1	—	4,006
Number of other operations ... ..	291	85	216	—	2	594

\* The figures for Wrightington Hospital are for the period 1st March to 31st December, 1932.

The dental scheme, considering the benefit derived by the patients, has proved economical, and continues to be justified.

## XXVII.—INSTITUTIONAL ACCOMMODATION.

On the 31st December, 1932, there were altogether 931 beds at sanatoria and hospitals occupied by County patients, as compared with 875 at the end of 1931. The number of beds occupied by pulmonary cases worked out at 67 per 100 pulmonary deaths. For non-pulmonary tuberculosis the proportion was 115 beds per 100 non-pulmonary deaths.

Table 42 below gives a summary of the beds occupied at the end of 1932 at the several types of institutions, the names of which are contained in Appendix X.

Type of institution.	Pulmonary tuberculosis.		Non-pulmonary tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
Sanatoria ... ..	308	41	—	3	352
Pulmonary hospitals ... ..	266	4	—	—	270
Training colonies ... ..	3	—	7	1	11
Observation cases ... ..	6	4	6	5	21
General hospitals ... ..	—	—	3	3	6
Hospitals for non-pulmonary tuberculosis ... ..	21	3	90	157	271
Total ... ..	604	52	106	169	931
	656		275		

Of the 931 beds occupied, 624 were in sanatoria or hospitals belonging to the County Council, and 307 were in non-County institutions.

The number of beds in occupation by County patients on the 31st December of each year is as follows:—1926, 825; 1927, 819; 1928, 858; 1929, 874; 1930, 906; 1931, 875; and 1932, 931.

Of the 656 beds occupied at the end of 1932 by pulmonary patients, 78 per cent. of the cases were classified as "T.B. plus," that is, sometime during treatment their sputum was positive.

The number of beds occupied fluctuates during the course of the year, there being a greater demand for beds in the summer than in the winter. The list of patients waiting for institutional treatment, averaged at monthly periods during 1932, was as follows:—Sanatoria, adults 51; pulmonary hospitals, adults 30; special hospitals, adults 15, children 2; general hospitals, adults 5, children 1.

A return was obtained from the medical superintendents of public assistance hospitals of the number of patients suffering from tuberculosis chargeable to the Lancashire County Council who were

in such hospitals on the 31st December, 1932. The following statement has been prepared from the returns so furnished :—

TABLE 43.

	Patients in public assistance hospitals on 31st December, 1932.			
	Adult males.	Adult females.	Children.	Total.
Pulmonary tuberculosis ... ..	19	9	2	30
Non-pulmonary tuberculosis ... ..	7	15	11	33
				} 63

The foregoing total of 63 cases (compared with 70 at end of 1931) in public assistance hospitals contains those tuberculous patients whose mental condition, or other complication, does not permit of their being treated in sanatoria and hospitals. Every effort is made to transfer as soon as possible patients who require special treatment for tuberculosis to the sanatoria and hospitals provided for such treatment.

Further particulars of the residential treatment for tuberculous patients in public assistance hospitals are given in Appendix VII.

TABLE 44.

Year	Total number of patients		Number of patients who completed the course		Percentage of patients who completed the course
	1931	1932	1931	1932	
1931	70	63	35	30	50.0
1932	63	63	30	33	47.6
Total	133	126	65	63	48.8

Considering that the 115 patients sent for training were carefully selected by the tuberculosis officers, the results as shown by the number completing the course are not so satisfactory as might be expected.

## XXVIII.—HOME TREATMENT AND DISPENSARY TREATMENT OR SUPERVISION.

All notified cases of tuberculosis while at home are under the supervision of the tuberculosis officers and tuberculosis health visitors, in addition to the treatment that may be obtained from their medical attendants. Ordinary medical treatment at dispensaries (as distinct from special treatment such as artificial light and artificial pneumothorax) has never been undertaken, unless the patient has no doctor or requires some special form of treatment. The number of consultations with medical practitioners in 1932 was as follows :—Personal, 773; otherwise, 5,241; total, 6,014.

## XXIX.—TREATMENT AND OCCUPATIONAL TRAINING : VILLAGE SETTLEMENTS.

The subject of this chapter was reviewed in the annual report for 1928.

The following table gives particulars of the patients so far granted a course of treatment combined with training :—

TABLE 44.

Classification on admission.	TOTAL NUMBER ADMITTED.		Total number discharged.	Average duration of stay at colony* (months).	PATIENTS DISCHARGED (1920 to 1932).			Still undergoing training, 31st December, 1932.
	August, 1920 to Dec., 1931.	1932.			Course of training completed.	Training terminated before completion of course.	Transferred to sanatoria or hospitals.	
T.B. minus ...	38	—	38	15·00	19	19	—	—
T.B. plus 1 ...	27	1	26	15·75	9	15	2	2
T.B. plus 2 ...	32	2	33	14·25	15	15	3	1
T.B. plus 3 ...	3	—	3	12·00	1	2	—	—
Non-pulmonary	8	4	4	22·75	1	3	—	8
	108	7						
Total.	115		104	15·00	45	54	5	11

\* Average duration relates to patients who completed course.

Considering that the 115 patients sent for training were carefully selected by the tuberculosis officers, the results, as measured by the number completing the course, are not so satisfactory as might be expected.

## APPENDIX I.

DEATH-RATES for 1932 from tuberculosis in 116 urban and rural districts in Lancashire, and in the 8 County dispensary areas.

Sanitary district.	Estimated population, 1932.	Pulmonary tuberculosis.			Non-pulmonary tuberculosis.	
		Number of deaths, 1932.	Death-rate per 1,000 of population, 1932.	Average Death-rate 5 years, 1927-31.	Number of deaths, 1932.	Death-rate per 1,000 of population, 1932.
URBAN.						
Abram ... ..	6,826	5	0.73	0.58	—	—
Accrington (B) ... ..	42,520	26	0.61	0.61	3	0.07
Adlington ... ..	4,212	3	0.71	0.92	2	0.47
Ashton-in-Makerfield ... ..	20,450	7	0.34	0.44	—	—
Ashton-under-Lyne (B) ... ..	51,040	31	0.60	0.79	14	0.27
Aspull ... ..	7,026	4	0.56	0.50	2	0.28
Atherton ... ..	20,370	11	0.54	0.53	4	0.19
Audenshaw... ..	8,806	5	0.56	0.50	1	0.11
Bacup (B) ... ..	20,470	12	0.58	0.54	2	0.09
Barrowford... ..	5,240	2	0.38	0.32	2	0.38
Billinge and Winstanley ... ..	5,094	2	0.39	0.76	—	—
Blackrod ... ..	3,608	1	0.27	0.37	—	—
Brierfield ... ..	7,743	9	1.16	0.56	1	0.12
Carnforth ... ..	3,280	4	1.21	0.94	—	—
Chadderton... ..	27,670	17	0.61	0.66	—	—
Chorley (B)... ..	30,720	14	0.45	0.48	6	0.19
Church ... ..	6,136	5	0.81	0.45	—	—
Clayton-le-Moors ... ..	7,729	2	0.25	0.50	—	—
Clitheroe (B) ... ..	11,980	8	0.66	0.52	1	0.08
Colne (B) ... ..	23,630	9	0.38	0.71	2	0.08
Crompton ... ..	14,700	10	0.68	0.51	4	0.27
Croston ... ..	1,903	—	—	0.20	—	—
Dalton-in-Furness ... ..	10,330	11	1.06	1.14	2	0.19
Darwen (B) ... ..	35,580	13	0.36	0.38	2	0.05
Denton ... ..	17,620	9	0.51	0.56	3	0.17
Droylsden ... ..	14,320	8	0.55	0.77	2	0.13
Eccles (B) ... ..	43,830	26	0.59	0.71	9	0.20
Fallsworth ... ..	15,830	10	0.63	0.58	2	0.12
Farnworth ... ..	28,180	10	0.35	0.68	2	0.07
Fleetwood (B) ... ..	23,020	10	0.43	0.61	2	0.08
Formby ... ..	8,243	7	0.84	0.46	1	0.12
Fulwood ... ..	7,156	2	0.27	0.23	—	—
Golborne ... ..	7,503	6	0.79	0.50	1	0.13
Grange-over-Sands ... ..	2,385	—	—	0.69	—	—
Great Crosby ... ..	20,810	9	0.43	0.42	1	0.04
Great Harwood ... ..	12,620	7	0.55	0.44	2	0.15
Haslingden (B) ... ..	16,560	12	0.72	0.93	1	0.06
Haydock ... ..	10,330	7	0.67	0.46	—	—
Heywood (B) ... ..	25,910	24	0.92	0.63	3	0.11
Hindley ... ..	21,460	19	0.88	0.70	1	0.04
Horwich ... ..	15,580	7	0.44	0.60	4	0.25
Huyton-with-Roby ... ..	5,478	2	0.36	0.60	—	—
Ince-in-Makerfield... ..	21,890	16	0.73	0.83	3	0.13
Irlam ... ..	13,010	7	0.53	0.64	—	—
Kearsley ... ..	9,763	3	0.30	0.79	1	0.10
Kirkham ... ..	4,092	1	0.24	1.11	1	0.24
Lancaster (B) ... ..	43,700	27	0.61	0.65	10	0.22
Lees ... ..	4,703	1	0.21	0.53	—	—
Leigh (B) ... ..	45,460	18	0.39	0.68	8	0.17
Leyland ... ..	10,790	5	0.46	0.32	1	0.09
Litherland ... ..	16,510	16	0.96	1.14	3	0.18
Littleborough ... ..	12,010	3	0.24	0.33	3	0.24
Little Hulton ... ..	7,701	5	0.64	0.49	—	—
Little Lever ... ..	4,984	1	0.20	0.50	—	—
Longridge ... ..	4,140	3	0.72	0.47	2	0.48
Lytham St. Annes (B) ... ..	25,110	12	0.47	0.43	2	0.07
Middleton (B) ... ..	29,210	15	0.51	0.57	5	0.17
Milnrow ... ..	8,545	2	0.23	0.56	1	0.11
Morecambe & Heysham (B) ... ..	24,820	12	0.48	0.60	3	0.12
Mossley (B)... ..	11,950	9	0.75	0.37	1	0.08
Nelson (B) ... ..	38,230	21	0.54	0.49	7	0.18
Newton-in-Makerfield ... ..	20,070	10	0.49	0.86	2	0.09
Norden ... ..	4,376	2	0.45	0.54	1	0.22
Ormskirk ... ..	17,240	13	0.75	0.51	2	0.11

## APPENDIX I. (contd.).

Sanitary district.	Estimated population, 1932.	Pulmonary tuberculosis.			Non-pulmonary tuberculosis.	
		Number of deaths, 1932.	Death-rate per 1,000 of population, 1932.	Average Death-rate 5 years, 1927-31.	Number of deaths, 1932.	Death-rate per 1,000 of population, 1932.
URBAN (contd.)						
Orrell ... ..	7,055	3	0.42	0.28	—	—
Oswaldtwistle ... ..	14,020	8	0.57	0.56	2	0.14
Padiham ... ..	11,580	6	0.51	0.60	3	0.25
Poulton-le-Fylde ... ..	3,254	2	0.61	0.31	1	0.30
Preesall ... ..	2,110	1	0.47	0.39	—	—
Prescot ... ..	11,450	3	0.27	0.68	3	0.27
Prestwich ... ..	24,940	12	0.48	0.54	3	0.12
Radcliffe ... ..	24,890	23	0.92	0.58	8	0.32
Rainford ... ..	3,491	—	—	0.48	1	0.28
Ramsbottom ... ..	14,900	8	0.53	0.67	1	0.06
Rawtenstall (B) ... ..	28,500	10	0.35	0.47	—	—
Rishton ... ..	6,514	5	0.76	0.72	1	0.15
Royton ... ..	16,750	12	0.71	0.71	2	0.11
Skelmersdale ... ..	6,172	2	0.32	0.56	—	—
Standish-with-Langtree ... ..	7,323	5	0.68	0.39	—	—
Stretford (B) ... ..	56,520	30	0.53	0.70	4	0.07
Swinton and Pendlebury ... ..	33,770	18	0.53	0.56	6	0.17
Thornton Cleveleys ... ..	10,020	11	1.09	0.65	1	0.09
Tottington ... ..	6,404	2	0.31	0.27	—	—
Trawden ... ..	2,547	—	—	0.30	—	—
Turton ... ..	11,720	5	0.42	0.55	—	—
Tyldesley-with-Shakerley ... ..	14,880	12	0.80	0.53	1	0.06
Ulverston ... ..	9,232	4	0.43	0.49	1	0.10
Upholland ... ..	5,641	5	0.88	0.34	—	—
Urmston ... ..	9,393	3	0.31	0.71	1	0.10
Walton-le-Dale ... ..	12,980	4	0.30	0.71	2	0.15
Wardle ... ..	4,455	1	0.22	0.43	1	0.22
Waterloo-with-Seaforth ... ..	30,830	25	0.81	0.89	7	0.22
Westhoughton ... ..	15,940	8	0.50	0.51	3	0.18
Whitefield ... ..	9,803	4	0.40	0.73	1	0.10
Whitworth ... ..	8,263	3	0.36	0.95	—	—
Widnes (B) ... ..	41,130	42	1.02	0.90	13	0.31
Withnell ... ..	2,931	3	1.02	0.42	—	—
Worsley ... ..	14,590	7	0.47	0.39	—	—
<b>Total Urban ...</b>	<b>1,536,200</b>	<b>875</b>	<b>0.56</b>	<b>0.61</b>	<b>204</b>	<b>0.13</b>
RURAL						
Barton-upon-Irwell ... ..	16,880	9	0.53	0.57	3	0.17
Blackburn ... ..	11,320	2	0.17	0.37	1	0.08
Burnley ... ..	17,590	10	0.56	0.49	1	0.05
Bury ... ..	8,739	5	0.57	0.42	—	—
Chorley ... ..	22,190	6	0.27	0.40	1	0.04
Clitheroe ... ..	8,872	—	—	0.39	2	0.22
Fylde ... ..	16,850	8	0.47	0.31	4	0.23
Garstang ... ..	11,590	3	0.25	0.31	1	0.08
Lancaster ... ..	9,505	3	0.31	0.41	2	0.21
Leigh ... ..	11,360	4	0.35	0.65	1	0.08
Limehurst ... ..	8,656	7	0.80	0.44	1	0.11
Lunesdale ... ..	6,624	2	0.30	0.37	2	0.30
Preston ... ..	30,830	6	0.19	0.35	—	—
Ulverston ... ..	16,540	8	0.48	0.52	4	0.24
Warrington ... ..	16,490	5	0.30	0.55	3	0.18
West Lancashire ... ..	25,300	12	0.47	0.43	4	0.15
Whiston ... ..	20,870	5	0.23	0.38	2	0.09
Wigan ... ..	6,294	5	0.79	0.53	2	0.31
<b>Total Rural ...</b>	<b>266,500</b>	<b>100</b>	<b>0.37</b>	<b>0.43</b>	<b>34</b>	<b>0.12</b>
<b>Total for Administrative County...</b>	<b>1,802,700</b>	<b>975</b>	<b>0.54</b>	<b>0.58</b>	<b>238</b>	<b>0.13</b>
DISPENSARY AREAS.						
No. 1 ... ..	266,831	117	0.43	0.49	38	0.13
No. 2 ... ..	341,101	172	0.50	0.51	33	0.09
No. 3 ... ..	374,490	223	0.59	0.61	58	0.15
No. 4 ... ..	346,631	172	0.49	0.63	43	0.12
No. 5 ... ..	254,414	158	0.62	0.68	42	0.16
Furness Sub-Area ... ..	38,487	23	0.59	0.70	7	0.18
Fylde Sub-Area ... ..	64,184	33	0.55	0.55	9	0.15
Wigan County Sub-Area ... ..	116,562	77	0.66	0.58	9	0.07

N.B.—Owing to changes in the boundaries of the following sanitary districts, consequent on the review of County districts, the rates have been adjusted to include such changes: Great Crosby, Little Crosby (incorporated in Great Crosby); Waterloo-with-Seaforth; Prescot; Whiston Rural; West Lancashire Rural, and Sefton Rural (incorporated in West Lancashire Rural).

TABLES B, C, AND D,  
ANALYSING  
NOTIFICATIONS UNDER PUBLIC HEALTH  
(TUBERCULOSIS)  
REGULATIONS, 1930.

TABLE B.

ADMINISTRATIVE COUNTY OF LANCASTER.

PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1930.

CORRECTED\* SUMMARY OF NOTIFICATIONS OF PULMONARY AND OTHER FORMS OF TUBERCULOSIS DURING THE FIFTY-TWO WEEKS ENDED 31ST DECEMBER, 1932.

(Collated from Weekly Returns of District Medical Officers of Health.)

	NOTIFICATIONS ON SCHEDULE A—Excluding Duplicates.																												Total Pulmonary and Non-Pulmonary.	Total Notifications (i.e., including cases previously notified by other Doctors).															
	PULMONARY.						NON-PULMONARY.																																						
	Lungs only.	Lungs and Larynx.	Larynx.	Pleural Cavities.	Mediastinal Glands.	TOTAL.	BONES AND JOINTS.														ABDOMINAL.			GENITO-URINARY.							PERIPHERAL GLANDS.														
							Head (including Middle Ear).	Trunk.		Arm.				Leg.								Intestines.	Peritoneum.	Mesenteric Glands.	Bladder.	Falx Tube.	Kidney.	Prostate.			Suprarenal.	Testicle and Epididymis.	Not Classified (two or more).	MENINGITIS (Brain).	MILKARY (Generalised).	SPLY (Lymph).	PERIPHERAL GLANDS.								
Ribs and Sternum.								Spine.	Shoulder.	Scapula.	Humerus.	Elbow.	Radius.	Ulna.	Hand and Wrist.	Hip and Pelvis.	Femur.	Knee.	Tibia.	Fibula.	Foot and Ankle.								Two or more different Joints.	Not Classified.							Axillary.	Cervical.	Inguinal.	MICELANEOUS.					
Thirteen weeks ended 2nd April, 1932 ...	401	5	3	2	1	412	...	3	11	...	...	...	1	...	...	3	8	4	9	1	...	8	1	...	2	27	5	...	1	2	...	...	...	4	3	15	...	12	1	92	...	7	220	632	698
Thirteen weeks ended 2nd July, 1932 ...	436	6	...	1	1	444	...	1	13	1	...	...	4	...	...	5	9	...	4	...	...	7	1	...	2	23	7	...	1	1	...	...	...	1	2	25	1	19	4	137	1	9	280	724	786
Thirteen weeks ended 1st October, 1932 ...	325	2	1	...	...	328	...	1	4	1	...	...	...	...	...	2	8	...	6	...	...	1	2	...	1	26	2	1	...	2	...	...	4	...	10	...	8	4	67	1	7	158	486	544	
Thirteen weeks ended 31st December, 1932...	285	7	1	...	...	293	1	1	9	1	...	...	1	...	...	4	12	...	5	...	...	4	1	...	9	14	8	...	...	2	...	4	1	6	1	9	2	63	1	8	167	400	529		
Total ...	1447	20	5	3	2	*1477	1	6	37	3	...	...	6	...	...	14	37	4	24	1	...	20	5	...	14	92	22	1	2	7	...	...	13	6	56	2	48	11	350	3	31	*825	*2302	2557	

	NOTIFICATIONS ON SCHEDULE A—Excluding Duplicates.																												Total Pulmonary and Non-Pulmonary.	Number of Cases Notified on Form I. (Admissions).	Number of Cases notified on Form II (Discharges from Institutions).															
	PULMONARY.														NON-PULMONARY.																															
	Year.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and up.	TOTAL.	TOTAL M. & F.	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and up.	TOTAL.	TOTAL M. & F.	Public Assistance Hospitals.				Sana-toria.														
																																	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
M.																													F.	M.	F.															
Thirteen weeks ended 2nd April, 1932 ...	M.	...	1	9	4	19	30	53	41	41	29	6	233	412	M.	...	16	30	11	6	17	9	5	4	4	2	106	220	632	11	398	311														
Thirteen weeks ended 2nd July, 1932 ...	F.	...	7	9	21	37	49	29	10	13	4	179	444	M.	...	13	24	18	20	16	12	10	7	9	4	3	125	280	724	8	389	353														
Thirteen weeks ended 1st October, 1932 ...	F.	...	2	6	12	38	35	36	29	17	11	4	190	328	F.	...	19	8	12	12	6	5	4	5	3	1	75	158	486	1	341	305														
Thirteen weeks ended 31st December, 1932...	M.	...	2	2	19	18	39	33	32	25	3	173	293	F.	...	6	19	11	21	5	7	3	6	2	1	83	167	400	3	311	352															
Total ...	M.	...	2	14	20	73	105	183	146	142	108	20	814	*1477	F.	...	7	67	70	54	38	41	34	20	22	17	6	376	*825	*2302	23	1439	1321													

\*Corrected figures after deducting 40 pulmonary and 45 non-pulmonary cases notified in error by practitioners.

TABLE C.

ADMINISTRATIVE COUNTY OF LANCASTER.  
PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1930.

ANALYSIS OF THE NOTIFICATIONS ON SCHEDULE A (EXCLUDING DUPLICATES) RECEIVED DURING THE FIFTY-TWO WEEKS  
ENDED 31st DECEMBER, 1932. († Corrected figures.)

(Collated from Weekly Returns of District Medical Officers of Health.)

AGE—YEARS.	0 — 1			1 — 5			5 — 10			10 — 15			15 — 20			20 — 25			25 — 35			35 — 45			45 — 55			55 — 65			65 & upwds.			TOTAL			...			
	Col.	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	M.	F.	Both Sexes	Col.								
<b>PULMONARY—</b>																																								
Lungs only ...	7	1	...	1	2	3	5	12	18	30	20	33	53	73	95	168	105	145	177	155	332	144	92	236	138	58	196	103	40	143	19	14	33	794	653	1447	1			
Lungs and Larynx...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Larynx ...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Bronchial Glands ...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Mediastinal Glands ...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
<b>PULMONARY TOTAL</b> ...	<b>6</b>	<b>1</b>	...	<b>1</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>14</b>	<b>19</b>	<b>33</b>	<b>20</b>	<b>33</b>	<b>53</b>	<b>73</b>	<b>97</b>	<b>170</b>	<b>105</b>	<b>146</b>	<b>251</b>	<b>183</b>	<b>160</b>	<b>343</b>	<b>146</b>	<b>92</b>	<b>238</b>	<b>142</b>	<b>58</b>	<b>200</b>	<b>108</b>	<b>41</b>	<b>149</b>	<b>20</b>	<b>14</b>	<b>34</b>	<b>814</b>	<b>663</b>	<b>1477</b>	<b>6</b>		
*Cases—Pulmonary and Non-Pulmonary combined ...	1	...	...	1	1	2	2	4	2	...	2	4	3	7	4	4	8	5	4	9	5	4	9	1	1	2	1	...	1	...	1	1	1	25	20	45	...			
<b>NON-PULMONARY—</b>																																								
Head— (Incl. Middle Ear) ...	7	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Trunk— Ribs and Sternum ...	8	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Spine ...	9	...	...	3	1	4	3	1	4	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Arm— Shoulder ...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Scapula ...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Humerus ...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Elbow ...	13	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Radius ...	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ulna ...	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Hand and Wrist ...	16	...	...	4	1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Leg— Hip and Pelvis ...	17	...	...	2	2	7	5	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Femur ...	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Knee ...	19	...	...	3	1	4	2	3	5	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Tibia ...	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fibula ...	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Foot and Ankle ...	22	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Two or more different joints ...	23	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Not Classified ...	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
ABDOMINAL— Intestines ...	25	...	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Peritoneum ...	26	...	...	9	6	15	3	6	11	2	7	9	4	16	20	6	6	12	11	13	2	3	5	1	2	3	...	...	...	...	...	...	...	...	...	...	...			
Mesenteric Glands ...	27	...	...	1	3	4	1	3	5	2	7	1	3	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Bladder ...	28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Fallopian Tube ...	29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kidney ...	30	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Prostate ...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Suprapubic ...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Testicle and Epididymis ...	33	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Not Classified (two or more) ...	34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
MENINGITIS (Brain) ...	35	5	2	7	14	9	23	8	7	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
MILIARY (Generalised) ...	36	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
SKIN (Lupus) ...	37	1	1	1	1	1	3	4	4	4	8	3	2	5	2	4	6	2	6	8	2	3	5	2	2	4	1	3	4	1	1	2	19	20	48	37				
PERI-AXILLARY MILIARY GLANDS— Axillary ...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Cervical ...	39	1	2	3	26	14	40	38	54	90	23	42	70	20	28	48	14	28	42	8	28	36	3	6	9	4	6	10	2	6	8	1	2	3	143	216	359			
Inguinal ...	40	...	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
MISCELLANEOUS ...	41	...	...	1	1	1	2	3	2	2	4	1	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
<b>NON-PULMONARY TOTAL</b> ...	<b>42</b>	<b>7</b>	<b>7</b>	<b>14</b>	<b>67</b>	<b>43</b>	<b>110</b>	<b>70</b>	<b>86</b>	<b>156</b>	<b>54</b>	<b>70</b>	<b>124</b>	<b>38</b>	<b>63</b>	<b>101</b>	<b>41</b>	<b>53</b>	<b>94</b>	<b>34</b>	<b>63</b>	<b>97</b>	<b>20</b>	<b>24</b>	<b>44</b>	<b>22</b>	<b>19</b>	<b>41</b>	<b>17</b>	<b>15</b>	<b>32</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>376</b>	<b>449</b>	<b>825</b>	<b>42</b>		
<b>GRAND TOTAL</b> ...	<b>4</b>																																							

TABLE D.

## ADMINISTRATIVE COUNTY OF LANCASTER.

## PUBLIC HEALTH (TUBERCULOSIS) REGULATIONS, 1930.

## MALE AND FEMALE NOTIFIED CASES IN THE ADMINISTRATIVE COUNTY DURING THE YEARS 1913 TO 1932.

YEAR.	Sex.	PULMONARY TUBERCULOSIS.												Total.	Total* M. & F.	NON-PULMONARY TUBERCULOSIS.												Total.	Total* M. & F.
		0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and over	0 to 1			1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 and over				
1913 ... (11 months)	M	1	24	97	70	129	131	311	292	228	114	29	1426	2700	29	128	177	137	98	58	71	48	27	18	3	794	1592		
	F	6	28	100	104	153	188	296	201	103	65	25	1274		28	118	134	132	118	86	80	47	19	7	798				
1914 ...	M	6	40	80	83	112	172	329	315	240	107	23	1507	2820	43	111	131	95	77	36	47	23	20	14	3	600	1140		
	F	3	32	115	107	140	181	336	225	107	47	20	1313		37	88	98	89	77	44	58	27	12	6	4	540			
1915 ...	M	5	47	97	79	127	138	305	303	235	117	34	1487	2872	39	109	113	93	61	46	50	29	14	5	3	562	1128		
	F	5	27	96	111	152	191	383	239	109	60	21	1385		26	88	107	88	84	53	61	33	15	7	4	566			
1916 ...	M	1	31	71	77	121	157	331	296	190	96	36	1407	2689	20	127	135	99	65	42	47	34	12	13	5	599	1180		
	F	2	24	81	96	165	186	345	220	98	52	13	1282		8	68	122	114	85	46	65	41	19	11	2	581			
1917 ...	M	4	20	77	62	113	104	262	268	190	90	30	1220	2375	21	116	109	105	61	23	42	30	8	9	1	525	1062		
	F	2	22	90	100	129	155	296	185	107	50	19	1155		7	79	97	98	89	59	49	25	23	6	5	537			
1918 ...	M	3	35	55	59	140	108	300	317	232	98	28	1375	2534	14	75	103	65	60	19	29	16	14	7	2	404	885		
	F	1	24	69	74	139	166	297	207	117	52	13	1159		10	75	84	92	80	46	46	29	9	6	4	481			
1919 ...	M	2	22	53	55	94	107	238	212	165	91	17	1056	2105	13	50	97	80	53	26	31	22	19	12	4	407	847		
	F	5	14	54	80	126	161	261	184	99	41	24	1049		10	59	98	76	61	43	41	29	11	7	5	440			
1920 ...	M	2	24	56	63	94	120	281	249	160	90	14	1153	2084	31	62	107	108	68	26	35	23	16	11	5	492	968		
	F	2	20	53	71	115	122	264	147	84	36	17	931		12	66	86	78	62	46	52	34	23	16	1	476			
1921 ...	M	1	17	43	47	94	133	222	225	162	84	19	1047	2044	12	60	110	84	53	32	41	23	17	6	4	442	899		
	F	...	12	53	77	132	160	255	156	82	50	20	997		15	62	89	81	65	41	53	15	21	9	6	457			
1922 ...	M	3	16	38	47	83	120	227	190	148	99	27	998	1863	18	101	111	79	55	37	39	22	13	7	3	485	956		
	F	4	15	45	57	135	155	292	146	61	42	23	865		13	77	80	95	61	45	50	24	14	7	5	471			
1923 ...	M	2	10	41	43	82	132	236	207	147	94	13	1007	1937	18	115	134	105	75	35	45	22	14	15	6	584	1188		
	F	1	14	43	60	115	149	251	149	83	49	16	930		14	103	110	107	68	60	64	31	28	14	5	604			
1924 ...	M	...	27	37	52	105	110	203	199	197	97	18	1045	1972	10	123	92	92	95	35	43	25	17	12	3	556	1120		
	F	3	12	29	55	144	139	223	169	94	49	10	927		6	99	87	94	80	55	72	30	17	11	13	564			
1925 ...	M	...	22	32	38	81	115	212	200	192	74	24	990	1846	17	108	106	73	58	37	53	26	15	12	5	510	1027		
	F	3	10	24	44	144	153	198	136	85	34	25	856		9	86	84	91	82	41	57	33	18	10	6	517			
1926 ...	M	1	9	27	40	91	113	210	198	158	110	23	980	1828	10	90	97	76	75	29	35	32	16	7	3	470	953		
	F	2	12	41	47	114	169	224	120	68	38	13	848		19	83	94	51	67	56	51	34	17	6	5	483			
1927 ...	M	1	11	47	39	115	111	197	187	185	85	19	997	1794	12	101	181	87	66	38	40	18	13	4	7	517	1045		
	F	...	13	37	49	129	128	195	113	71	51	11	797		15	84	95	81	61	47	75	33	20	11	6	528			
1928 ...	M	1	7	31	20	70	106	187	163	176	82	27	870	1660	16	82	114	66	67	43	40	15	14	10	7	474	956		
	F	...	6	33	32	126	147	195	125	62	44	20	790		13	69	100	70	56	63	50	27	21	8	5	482			
1929 ...	M	4	7	32	17	80	99	160	180	165	76	23	843	1517	17	98	99	67	52	37	40	22	16	7	5	460	913		
	F	...	7	18	23	111	130	186	99	53	28	19	674		3	65	92	51	54	48	63	36	22	15	4	453			
1930 ...	M	1	5	14	27	66	106	189	174	159	82	22	845	1527	6	78	105	69	67	28	45	18	12	12	7	447	982		
	F	...	3	13	29	104	122	186	107	61	37	20	682		12	67	100	80	63	63	71	35	28	13	3	535			
1931 ...	M	2	8	15	18	75	118	153	159	161	89	25	823	1460	13	67	78	63	63	34	40	15	20	10	7	410	862		
	F	...	7	10	27	99	120	149	109	57	38	21	637		8	55	77	62	69	55	55	37	16	12	6	452			
1932 ...	M	1	2	14	20	73	105	183	146	142	108	20	814	1477	7	67	70	54	38	41	34	20	22	17	6	376	825		
	F	...	3	19	33	97	146	160	92	58	41	14	663		7	43	86	70	63	53	63	24	19	15	6	449			

\* Corrected figures from 1922 after deducting the following cases found to be non-tuberculous and notifications cancelled:— 1922: 14 pulmonary, 12 non-pulmonary; 1923: 33 pulmonary, 31 non-pulmonary; 1924: 57 pulmonary, 38 non-pulmonary; 1925: 83 pulmonary, 49 non-pulmonary; 1926: 61 pulmonary, 41 non-pulmonary; 1927: 68 pulmonary, 51 non-pulmonary; 1928: 63 pulmonary, 52 non-pulmonary; 1929: 61 pulmonary, 44 non-pulmonary; 1930: 63 pulmonary, 55 non-pulmonary; 1931: 38 pulmonary, 49 non-pulmonary; and 1932: 40 pulmonary, 45 non-pulmonary.

## APPENDIX II.

## NOTIFICATION OF TUBERCULOSIS CASES.

Since 1st February, 1913, tuberculosis—both pulmonary and other forms—has been compulsorily notifiable under the Public Health (Tuberculosis) Regulations.

Tables B and C, here inserted, analyse the notifications received, giving the part of the body affected and the age-groups.

Table D, also inserted, compares the male and female notifications since 1913.

TABLE 45.—Deaths of 302 persons notified as suffering from pulmonary tuberculosis in 1932 which took place within three months of the date of notification.

Period between date of case notification and death.	Certified cause of death.			Total.
	Pulmonary.		Non-pulmonary	
	Primary.	Secondary.		
Under 1 week ... ..	57	2	8	67
1 to 2 weeks ... ..	33	2	1	36
2 to 3 weeks ... ..	30	1	—	31
3 to 4 weeks ... ..	30	1	1	32
1 to 2 months ... ..	80	2	2	84
2 to 3 months ... ..	49	—	3	52
Total under 3 months ...	279	8	15	302
	287			

Included in the above table are 31 deaths which occurred outside the County area.

In addition to the foregoing 302 deaths which occurred within three months of notification, in 21 instances (12 pulmonary and 9 non-pulmonary) death took place *before* the actual receipt of the notification, against 16 (7 pulmonary and 9 non-pulmonary) in the preceding year.

TABLE 46.—*Actual number of deaths from pulmonary and non-pulmonary tuberculosis since 1918 not previously notified under the Public Health (Tuberculosis) Regulations.*

Year.	Non-notified fatal cases.		
	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Total.
1918 ... ..	303	137	440
1919 ... ..	221	104	325
1920 ... ..	177	122	299
1921 ... ..	135	96	231
1922 ... ..	105	83	188
1923 ... ..	85	74	159
1924 ... ..	64	65	129
1925 ... ..	67	57	124
1926 ... ..	58	32	90
1927 ... ..	54	42	96
1928 ... ..	56	51	107
1929 ... ..	62	61	123
1930 ... ..	46	61	107
1931 ... ..	61	51	112
1932 ... ..	37	28	65

The 65 deaths in 1932 of cases not previously notified under the Regulations are further analysed below :—

TABLE 47.

	Cause of death.			Total.
	Pulmonary.		Non-pulmonary.	
	Primary.	Secondary.		
Deaths of persons at private addresses	26	4	13	43
Deaths in County mental hospitals of persons belonging to County area ...	—	—	1	1
Deaths in public assistance hospitals of persons belonging to County area ...	4	1	1	6
Deaths in other public institutions of persons belonging to County area...	2	—	13	15
Total ... ..	32      5 37		28	65

During 1932, 91 pulmonary and 61 non-pulmonary deaths occurred outside the County area of persons usually residing in the Administrative County. Of these, 86 pulmonary and 60 non-pulmonary occurred in public institutions. In 57 instances no case notification could be traced. These are not included in Table 47.

N.B.—The tables mentioned in Appendix II. have been prepared in the County public health department.

## APPENDIX III.

CENSUS OF TUBERCULOUS CASES on the dispensary registers on the 31st December, 1932 (inclusive of 931 patients in sanatoria and hospitals).

Dis- pensary area.	Sex.	Number of cases under supervision on 31-12-32.						Number of doubtful cases on 31-12-32	
		Pulmonary tuberculosis.		Non-pulmonary tuberculosis.		Total	Number of cases per 1,000 of population		
		Under 15 years of age.	15 years and over.	Under 15 years of age.	15 years and over.		Pulm.		Non-pul.
No. 1 ...	M. F.	14 10	213 189	121 119	125 164	955	1.59	1.98	—
No. 2 ...	M. F.	8 5	316 273	82 118	154 188				
No. 3 ...	M. F.	19 16	457 391	129 109	191 234	1,546	2.35	1.77	—
No. 4 ...	M. F.	20 12	518 377	142 124	215 250				
No. 5 ...	M. F.	37 43	374 267	120 103	93 121	1,158	2.83	1.71	7
Furness ...	M. F.	12 11	90 70	16 18	27 23				
Fylde ...	M. F.	5 9	105 94	52 51	39 45	400	3.31	2.91	—
Wigan County	M. F.	24 36	183 159	85 68	89 116				
TOTAL ...	M. F.	139 142	2,256 1,820	747 710	933 1,141	7,888	2.41	1.96	23
		4,357		3,531					

The populations of the dispensary areas are :—Area No. 1, 266,831 ; Area No. 2, 341,101 ; Area No. 3, 374,490 ; Area No. 4, 346,631 ; Area No. 5, 254,414 ; Furness Sub-Area, 38,487 ; Fylde Sub-Area, 64,184 ; Wigan County Sub-Area, 116,562 ; Total for County, 1,802,700.

## APPENDIX III. (contd.).

ANALYSIS OF CASES on the dispensary registers on the 31st December, 1932.

## (a) PULMONARY TUBERCULOSIS.

Age-groups.	Sex.	T.B. minus.		T.B. plus 1.		T.B. plus 2.		T.B. plus 3.		TOTAL.	
		Active.	Quies.	Active.	Quies.	Active.	Quies.	Active.	Quies.	Active.	Quies.
0-5 years ...	M.	2	1	—	—	—	—	—	—	2	1
	F.	1	—	—	—	—	—	—	—	1*	—
5-15 years ...	M.	43	87	—	1	2	1	2	—	47	89
	F.	41	83	2	1	12	—	2	—	57	84
15-25 years ...	M.	70	164	33	22	107	34	26	4	236	224
	F.	91	133	44	17	191	39	33	4	359	193
25-35 years ...	M.	47	115	50	40	172	56	26	3	295	214
	F.	80	133	55	38	180	55	23	1	338	227
35-45 years ...	M.	49	94	57	53	154	51	28	6	288	204
	F.	38	98	31	37	101	34	11	1	181	170
45-55 years ...	M.	70	82	42	45	156	38	14	5	282	170
	F.	37	51	17	18	56	23	8	2	118	94
55-65 years ...	M.	43	55	14	18	98	26	16	4	171	103
	F.	14	24	8	14	23	11	9	—	54	49
65 and over ...	M.	13	15	3	4	18	9	7	—	41	28
	F.	7	9	—	2	12	5	2	—	21	16
All Ages ...	M.	337	613	199	183	707	215	119	22	1362	1033
	F.	309	531	157	127	575	167	88	8	1129	833
GRAND TOTAL ...		1790		666		1664		237		4357	

## (b) NON-PULMONARY TUBERCULOSIS.

Age-groups.	Sex.	Bones and joints (excluding spine).		Spine.		Abdomen.		Other organs.		Peripheral glands.		Skin.		TOTAL.	
		Act.	Quies.	Act.	Quies.	Act.	Quies.	Act.	Quies.	Act.	Quies.	Act.	Quies.	Act.	Quies.
0-5 years ...	M.	15	4	3	—	2	8	1	—	20	20	1	—	42	32
	F.	9	6	4	—	3	3	1	1	15	26	—	—	32	36
5-15 years ...	M.	71	70	32	23	18	54	1	6	95	261	26	16	243	430
	F.	63	61	25	17	16	41	2	7	99	278	24	9	229	413
15-25 years ...	M.	58	82	19	25	11	34	8	10	52	134	40	17	188	302
	F.	28	51	14	11	23	39	2	7	67	179	38	22	172	309
25-35 years ...	M.	30	37	15	13	1	8	13	7	20	41	20	10	99	116
	F.	19	26	18	10	12	16	6	9	39	102	31	11	125	174
35-45 years ...	M.	14	15	10	5	1	2	4	18	2	15	17	6	48	61
	F.	15	13	7	9	5	7	4	6	10	46	30	10	71	91
45-55 years ...	M.	7	11	5	6	1	—	6	4	4	3	10	2	33	26
	F.	8	14	5	3	4	4	2	2	11	12	27	7	57	42
55-65 years ...	M.	10	9	4	—	—	—	3	3	2	3	2	1	21	16
	F.	6	8	4	5	2	1	1	1	6	10	20	4	39	29
65 and over ...	M.	5	6	—	—	—	—	3	1	2	1	3	2	13	10
	F.	8	3	—	—	1	1	1	—	2	5	5	6	17	15
All Ages ...	M.	210	234	88	72	34	106	39	49	197	478	119	54	687	993
	F.	156	182	77	55	66	112	19	33	249	658	175	69	742	1109
GRAND TOTAL...		782		292		318		140		1582		417		3531	

## APPENDIX IV.

HOUSING CONDITIONS of patients in each dispensary area at the end of 1932.

	Pulmonary cases considered infectious.		Pulmonary cases considered not infectious.		Non-pulmonary cases.	
	Under 15 years.	15 years & over.	Under 15 years.	15 years & over.	Under 15 years.	15 years & over.
<b>Patients occupying a separate bedroom :</b>						
Area No. 1 ...	3	148	3	95	50	96
Area No. 2 ...	—	195	1	134	31	100
Area No. 3 ...	—	255	5	172	28	99
Area No. 4 ...	1	285	4	241	35	111
Area No. 5 ...	2	197	15	128	32	54
Furness Sub-Area ...	—	34	4	46	5	24
Fylde Sub-Area ...	—	38	4	55	14	18
Wigan County Sub-Area ...	1	63	7	61	10	39
<b>TOTAL ...</b>	<b>7</b>	<b>1215</b>	<b>43</b>	<b>932</b>	<b>205</b>	<b>541</b>
<b>Patients occupying a separate bed but not a separate bedroom :</b>						
Area No. 1 ...	1	36	8	29	79	28
Area No. 2 ...	1	130	5	54	106	93
Area No. 3 ...	2	153	12	103	94	99
Area No. 4 ...	3	65	16	103	94	91
Area No. 5 ...	1	51	28	61	89	41
Furness Sub-Area ...	—	6	16	24	26	11
Fylde Sub-Area ...	2	22	8	28	44	27
Wigan County Sub-Area ...	1	56	31	65	57	57
<b>TOTAL ...</b>	<b>11</b>	<b>519</b>	<b>124</b>	<b>467</b>	<b>589</b>	<b>447</b>
<b>Patients not occupying a separate bed :</b>						
Area No. 1 ...	*	†	8	78	111	165
Area No. 2 ...	—	16	6	60	63	149
Area No. 3 ...	—	23	16	142	116	227
Area No. 4 ...	1	10	7	191	137	263
Area No. 5 ...	—	46	34	158	102	119
Furness Sub-Area ...	—	7	3	43	3	15
Fylde Sub-Area ...	—	4	—	52	45	39
Wigan County Sub-Area ...	—	5	20	92	86	109
<b>TOTAL ...</b>	<b>2</b>	<b>127</b>	<b>94</b>	<b>816</b>	<b>663</b>	<b>1086</b>
<b>GRAND TOTAL ...</b>	<b>20</b>	<b>1861</b>	<b>261</b>	<b>2215</b>	<b>1457</b>	<b>2074</b>

\* These children were both in sanatoria or pulmonary hospitals at the end of 1932.

† Of the adult infective patients without a separate bed, there were in sanatoria or hospitals at the end of 1932 the following patients:—Area No. 1, 2; Area No. 2, 3; Area No. 3, 12; Area No. 4, 5; Area No. 5, 10; Furness Sub-Area, 1; Fylde Sub-Area, 1; and Wigan County Sub-Area, 2; Total 36.

## APPENDIX V.

## Return showing the work of the dispensaries during the year 1932

(Tables A and B of Memorandum 37/T (Revised) of the Ministry of Health).

DIAGNOSIS.	PULMONARY.				NON-PULMONARY.				TOTAL.				GRAND TOTAL.	
	Adults.		Children.		Adults.		Children.		Adults.		Children.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
<b>A.—NEW CASES examined during the year (excluding contacts):</b>														
(a) Definitely tuberculous ...	592	476	24	41	154	210	151	155	746	686	175	196	1,803	
* (b) Diagnosis not completed	—	—	—	—	—	—	—	—	5	7	4	5	21	
(c) Non-tuberculous... ..	—	—	—	—	—	—	—	—	990	901	379	346	2,616	
<b>B.—CONTACTS examined during the year:</b>														
(a) Definitely tuberculous ...	13	18	3	3	1	4	5	4	14	22	8	7	51	
* (b) Diagnosis not completed	—	—	—	—	—	—	—	—	1	—	1	—	2	
(c) Non-tuberculous... ..	—	—	—	—	—	—	—	—	177	314	225	224	940	
<b>C.—CASES written off the dispensary register as:</b>														
(a) Recovered ... ..	126	132	15	7	108	137	82	69	234	269	97	76	676	
(b) Non-tuberculous (including any such cases previously diagnosed and entered on the dispensary register as tuberculous) ... ..	—	—	—	—	—	—	—	—	1173	1221	606	571	3,571	
<b>D.—NUMBER OF CASES ON dispensary register on 31st December, 1932:</b>														
(a) Definitely tuberculous ...	2256	1820	139	142	933	1141	747	710	3189	2961	886	852	7,888	
(b) Diagnosis not completed	—	—	—	—	—	—	—	—	6	7	5	5	23	

1. Number of cases on dispensary register on 1st January, 1932 ... ..	7910	8. Number of visits by tuberculosis officers to homes (including personal consultations) ... ..	5590
2. Number of cases transferred from other areas and cases returned after discharge under Head 3 in previous years ... ..	165	9. Number of visits by nurses or health visitors to homes for dispensary purposes	40692
3. Number of cases transferred to other areas, cases not desiring further assistance under the scheme, and cases "lost sight of" ... ..	441	10. Number of (a) Specimens of sputum, etc., examined (b) X-ray examinations made in connection with dispensary work. ... ..	5347 8499
4. Cases written off during the year as dead (all causes) ... ..	909	11. Number of "recovered" cases restored to dispensary register, and included in A(a) and A(b) above ... ..	42
5. Number of attendances at the dispensary (including contacts) ... ..	23255	12. Number of "T.B. plus" cases on dispensary register on 31st December ... ..	2567
6. Number of insured persons under domiciliary treatment on the 31st December	1372	13. Number of dispensaries for the treatment of tuberculosis (excluding centres used only for special forms of treatment)	
7. Number of consultations with medical practitioners:—		Provided by the Council ... ..	24
(a) Personal ... ..	773	Provided by voluntary bodies ... ..	—
(b) Other ... ..	5241		

\* *i.e.*, remaining undiagnosed on 31st December.

## APPENDIX VI.

Return showing the extent of residential treatment and observation during the year 1932 in institutions (other than Poor Law institutions) approved for the treatment of tuberculosis.

(Table D of Memorandum 37/T (Revised) of the Ministry of Health).

		In institutions on Jan. 1.	Admitted during the year.	Discharged during the year.	Died in the institutions.	In institutions on Dec. 31.	
Number of doubtfully tuberculous cases admitted for observation. ... ..	Adults	M.	8	48	47	1	8
		F.	6	27	29	—	4
	Children.	5	39	35	—	9	
	Total...	19	114	111	1	21	
Number of definitely tuberculous patients admitted for treatment ... ..	Adults	M.	372	874	718	129	399
		F.	294	680	571	104	299
	Children.	190	307	271	14	212	
	Total...	856	1861	1560	247	910	
GRAND TOTAL	...	875	1975	1671	248	931	

## APPENDIX VII.

Return showing the extent of residential treatment provided during the year 1932 in Poor Law institutions for persons chargeable to the Council.

(Table E of Memorandum 37/T (Revised) of the Ministry of Health).

		In institutions on Jan. 1.	Admitted during the year.	Discharged during the year.	Died in the institutions.	In institutions on Dec. 31.	
Number of patients suffering from pulmonary tuberculosis admitted for treatment. ... ..	Adults	M.	22	126	83	46	19
		F.	11	64	43	23	9
	Children.	2	10	7	3	2	
	Total...	35	200	133	72	30	
Number of patients suffering from non-pulmonary tuberculosis admitted for treatment	Adults	M.	4	34	23	8	7
		F.	12	25	18	4	15
	Children.	19	39	36	11	11	
	Total...	35	98	77	23	33	
GRAND TOTAL	...	70	298	210	95	63	

## APPENDIX VIII.

Return showing the results of observation of doubtfully tuberculous cases discharged during the year 1932 from institutions approved for the treatment of tuberculosis.

(Table F of Memorandum 37/T (Revised) of the Ministry of Health).

Diagnosis on discharge from observation.	For pulmonary tuberculosis.						For non-pulmonary tuberculosis.						TOTALS.		
	Stay under 4 weeks.			Stay over 4 weeks.			Stay under 4 weeks			Stay over 4 weeks					
	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.	M.	F.	Ch.
Tuberculous ... ..	4	3	1	5	5	5	1	2	3	5	4	6	15	14	15
Non-tuberculous ... ..	8	1	—	14	2	5	6	2	1	2	7	10	30	12	16
Doubtful ... ..	1	1	—	—	—	—	—	—	2	1	2	2	2	3	4
Died ... ..	—	—	—	1*	—	—	—	—	—	—	—	—	1	—	—
Totals ... ..	13	5	1	20	7	10	7	4	6	8	13	18	48	29	35

\* Diagnosis: Neoplasm of lung.



## APPENDIX X.

## INSTITUTIONAL ACCOMMODATION.

Number of beds occupied by County patients undergoing residential treatment for pulmonary and non-pulmonary tuberculosis on the 31st December, 1932 :—

Institution.	Pulmonary tuberculosis.		Non-pulmonary tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
<i>(a) Sanatoria.</i>					
Aitken, near Bury ... ..	50	—	—	—	50
Bowdon, Cheshire ... ..	1	—	—	—	1
Crossley, Cheshire ... ..	1	—	—	—	1
East Lancashire, Cheshire ... ..	53	—	—	—	53
Eastby, near Skipton ... ..	—	20	—	2	22
Elswick, near Kirkham ... ..	60	—	—	—	60
Halifax, Shelf ... ..	16	—	—	—	16
High Carley, near Ulverston ... ..	107	5	—	—	112
King Edward VII, Sussex ... ..	1	—	—	—	1
Meathop, Grange-over-Sands ... ..	14	—	—	—	14
Oubas House, Ulverston ... ..	—	16	—	1	17
Wilkinson, Bolton ... ..	5	—	—	—	5
Total ... ..	308	41	—	3	352
<i>(b) Pulmonary hospitals.</i>					
Burnley ... ..	13	—	—	—	13
Chadderton, near Oldham... ..	42	—	—	—	42
Eccleston Hall, St. Helens ... ..	4	—	—	—	4
Heath Charnock, Chorley ... ..	32	—	—	—	32
Hefferton Grange, Cheshire ... ..	11	—	—	—	11
Peel Hall, Little Hulton ... ..	54	—	—	—	54
Pemberton, Wigan ... ..	4	—	—	—	4
Rufford, near Ormskirk ... ..	47	3	—	—	50
Withnell, near Chorley ... ..	43	1	—	—	44
Wolstenholme, Norden ... ..	16	—	—	—	16
Total ... ..	266	4	—	—	270
<i>(c) Training colonies.</i>					
Burrow Hill Sanatorium Colony, Frimley ... ..	1	—	—	—	1
Cambridgeshire Tuberculosis Colony, Papworth ... ..	2	—	1	—	3
Derwen Cripples' College, Oswestry ... ..	—	—	6	—	6
St. Vincent's Orthopaedic Hospital, Pinner ... ..	—	—	—	1	1
Total ... ..	3	—	7	1	11
<i>(d) Observation cases.</i>					
Eastby Sanatorium... ..	—	2	—	—	2
Elswick Sanatorium ... ..	2	1	—	—	3
High Carley Sanatorium ... ..	2	—	—	—	2
Liverpool Open-air Hospital, Leasowe ... ..	—	—	—	1	1
Oubas House Sanatorium ... ..	—	1	—	—	1
Withnell Pulmonary Hospital ... ..	2	—	—	—	2
Wrightington Hospital ... ..	—	—	6	4	10
Total ... ..	6	4	6	5	21

## APPENDIX X. (contd.).

Institution.	Pulmonary tuberculosis.		Non-pulmonary tuberculosis.		Total.
	Adults.	Children.	Adults.	Children.	
<i>(e) General hospitals.</i>					
Ashton-under-Lyne Infirmary ... ..	—	—	1	—	1
Manchester Royal Infirmary ... ..	—	—	2	—	2
Warrington Infirmary ... ..	—	—	—	3	3
Total .. ..	—	—	3	3	6
<i>(f) Hospitals for non-pulmonary tuberculosis.</i>					
Alton, Hants. (Lord Mayor Treloar Cripples' Hospital) ... ..	—	—	—	9	9
Coleshill (Warwickshire Orthopædic Hospital for Children) ... ..	—	—	—	10	10
Heswall, Cheshire (Royal Liverpool Children's Hospital) ... ..	—	—	—	14	14
Leasowe, Cheshire (Liverpool Open-air Hospital for Children) ... ..	—	—	—	13	13
Oswestry (Robert Jones and Agnes Hunt Orthopædic Hospital) ... ..	—	—	14	1	15
Sheffield (King Edward VII Hospital for Crippled Children) ... ..	—	—	—	6	6
United Services Fund— Heatherwood, Berks.... ..	—	—	—	4	4
Melton Lodge, Great Yarmouth ... ..	—	—	—	4	4
West Kirby (Children's Convalescent Home) ... ..	—	—	—	1	1
Wrightington, near Wigan ... ..	21	3	76	95	195
Total ... ..	21	3	90	157	271
Grand Total ... ..	604	52	106	169	931
	656		275		

N.B.—The number of beds occupied fluctuates during the course of the year, there being a greater demand for beds in the summer than in the winter. In July, 1932, the beds occupied totalled 1,009, and in July, 1933, 944.

