

VI.

Report on an Investigation of Epidemic Influenza in the County
Borough of South Shields, 1919,

By

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For the purpose of this investigation South Shields is divided into two districts. In each district five groups of ten dwellings are selected which represent the various types peculiar to the County Borough. The investigation was carried out by the Assistant Medical Officers, Dr. Lyons and Dr. Martin, each being allotted one district.

The method of inquiry was to visit each dwelling, make notes of name, age, and sex of each occupant, and the disposition of the occupants in the various rooms. Inquiry was next directed to the occurrence of influenza, notes being made of each attack, its date of onset, duration, result, and complications. The date of the doctor's first visit was asked for, also the name of the person who nursed the patient. The previous medical history of each person attacked was obtained and an expression of opinion as to the source of infection was encouraged.

In all, 102 dwellings with 462 occupants were visited. Among these were 72 cases of influenza; 5 of the latter were attacked twice, a total of 77 attacks.

Table 1 shows the age and sex distribution of the area investigated, and Table 2 the age and sex distribution arranged in the various groups of houses with the incidence of influenza, recurrences, and death.

It will be seen that females were more affected than males, the percentage of the population affected being, females, 20·1 per cent., and males, 11·9 per cent., while the age groups most affected among the total cases are from 55-65 and from 25-35. The former produced 31·4 per cent, and the latter 24·2 per cent, of cases. (The total population of the borough obtained from ration cards in 1917 was 105,344.)

The total deaths from influenza in the borough in 1918 and in the first quarter of 1919 are detailed in Table 1.

TABLE 1.
Deaths from Influenza.

Age.	1918.	1919, First Quarter.
Under 1 year - - - - -	9	10
1 - - - - -	21	5
2 - - - - -	17	6
3 - - - - -	18	3
4 - - - - -	18	4
5 - - - - -	54	16
10 - - - - -	37	3
15 - - - - -	33	9
20 - - - - -	31	9
25 - - - - -	92	34
35 - - - - -	52	30
45 - - - - -	31	19
55 - - - - -	26	17
65 - - - - -	16	6
75 - - - - -	5	2
85 years and over - - - - -	1	—
Total - - - - -	461	173*

* Of these 94 were males and 79 females.

TABLE 3.
Age and Sex of Persons attached.

	Under 1 year.		1-		2-		5-		10-		15-		20-		25-		35-		45-		55-		65-		75 and over.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Hill Street	-	-	-	-	1	2	2	3	5	3	2	3	4	2	2	3	2	2	2	4	2	2	-	-	-	-	46
Double Row	-	-	-	-	1	4	1	4	3	4	6	5	2	7	4	2	1	1	4	6	5	2	2	-	1	-	65
Egglesfield Road	-	-	-	-	1	1	2	(1)	3	3	1	(1)	3	1	3	1	6	2	4	2	1	3	1	2	3	-	43
West Park View	1	-	-	-	2	1	1	2	2	5	2	4	1	1	3	8	2	4	4	6	2	1	-	-	-	-	52
Simon Street	3	3	1	-	1	5	4	6	3	(1)	(1)	3	3	5	1	2	(1)	(1)	(2)	(1)	2	1	-	-	-	-	56
					(2)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	-	-	-	-	(11)
The Lawe	-	1	1	-	1	1	1	1	2	2	1	2	-	2	3	7	3	4	1	3	3	3	-	1	1	-	44
Hepple's Court	1	1	-	-	1	1	1	3	1	(1)	6	1	3	1	3	-	1	1	5	3	1	1	1	-	-	-	37
Thames Street	1	1	1	-	-	2	2	4	-	3	1	2	2	-	5	5	1	1	-	1	1	2	-	1	-	-	36
		(1)				(1)									(2)	(4*)					(1)						(9)
Marsden Street	-	1	2	1	-	2	2	4	2	2	2	2	2	4	5	2	2	2	-	1	1	-	1	-	-	1	41
Osborne Avenue	-	-	-	-	1	-	-	2	2	(2)	(1)	(1)	(1)	3	3	2	3	2	3	5	6	2	2	-	-	-	(18)
					(2)	(2)	(3)	2	2	3	2	1	3	3	2	3	2	3	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(9)
Total persons	6	7	5	1	8	19	15	33	23	34	21	30	17	27	27	39	20	30	23	30	21	14	5	5	2	2	462
Total cases of influenza	-	1	-	-	-	4	3	6	3	7	2	3	1	1	5	11	-	9	4	4	4	7	1	-	-	1	77

Figures in brackets = cases of influenza.

Figures in black type = death.

* = recurrence.

Seasonal Incidence.—In the first quarter of 1918 there were 4 deaths from influenza and its complications; in the second, 6; in the third, 43; and in the last quarter, 408.

In Graph 2 it will be seen that the age groups chiefly affected in the summer and autumn waxes were 10-15 and 25-35 years; while in the winter wave the age group most affected was 55-65 years.

Occupational Incidence in Persons over School Age.—Total, 49 cases; males 17 and females 32:—

Males.		Females.	
Miners	- - - 4	Household duties	- - 28
Platers	- - - 2	Clerks	- - 2
Driller	} Shipyard workers {	Teacher	- - 1
Fitter		- - 1	Shop Assistant
Sea Captain	- - 1		
Seaman	- - 1		
Fisherman	- - 1		
Marine Superintendent	- 1		
Undertaker	- - 1		
Shop Assistant	- - 1		
Clerk	- - 1		
Labourer	- - 1		
Collector of dues	- - 1		

It is of interest to note that all those who were attacked twice were females over 15 years of age, and were engaged in household duties.

Incidence among Persons nursing Cases of Influenza.—In the area investigated there were 44 persons who nursed cases of influenza; of these 12, or 27·3 per cent., were attacked, and 32, or 72·7 per cent., escaped. Only those who developed the disease within seven days from the onset of the patient's illness were considered as being infected by the patient. The similarity of the percentage figures of persons infected whilst nursing cases in the two districts is shown in the following table:—

—	Number of persons nursing cases.	Attacked.	Escaped.
		Per Cent.	Per Cent.
Dr. Lyon's district - - -	18	5, or 27·7	13, or 72·3
Dr. Martin's district - - -	26	7, or 26·9	19, or 73·1

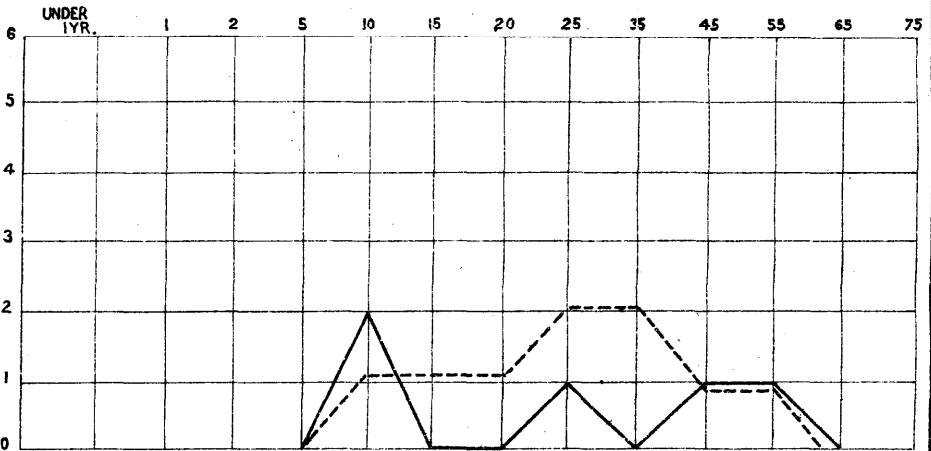
Immunity.—The following table shows the number of those attacked once and twice. It lends no support to the view that persons who have been attacked once enjoy any immunity in subsequent epidemics:—

—	Males.	Females.	Total Attacks.
(a) Number of persons attacked in summer.	5	9	14
Number of persons escaped in summer.	188	260	—
(b) Number of persons attacked in autumn:—			
(1) Of those who suffered in summer.	—	1	} 28
(2) Of those who escaped in summer.	4	23	

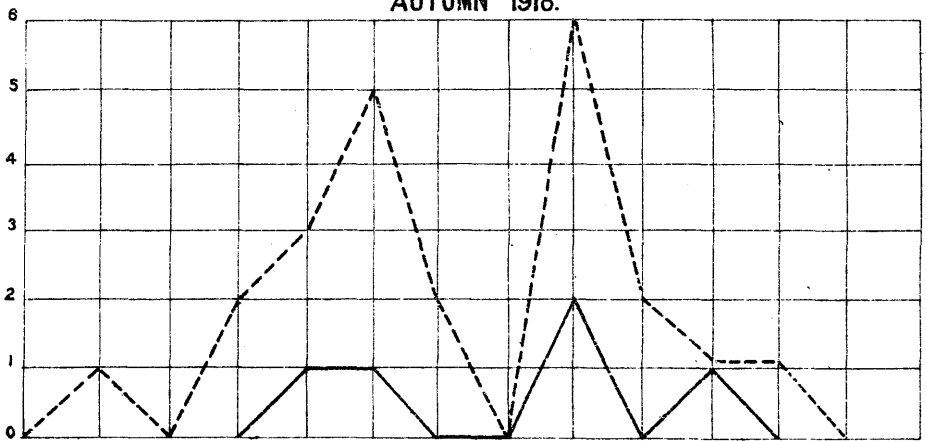
GRAPH I

Showing age and sex incidence in the several waves.
 Males ——— Females - - - -

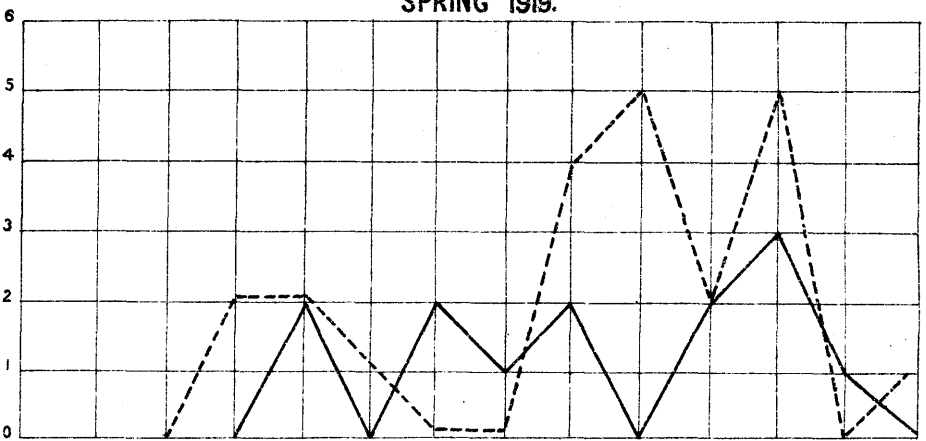
SUMMER 1918.



AUTUMN 1918.



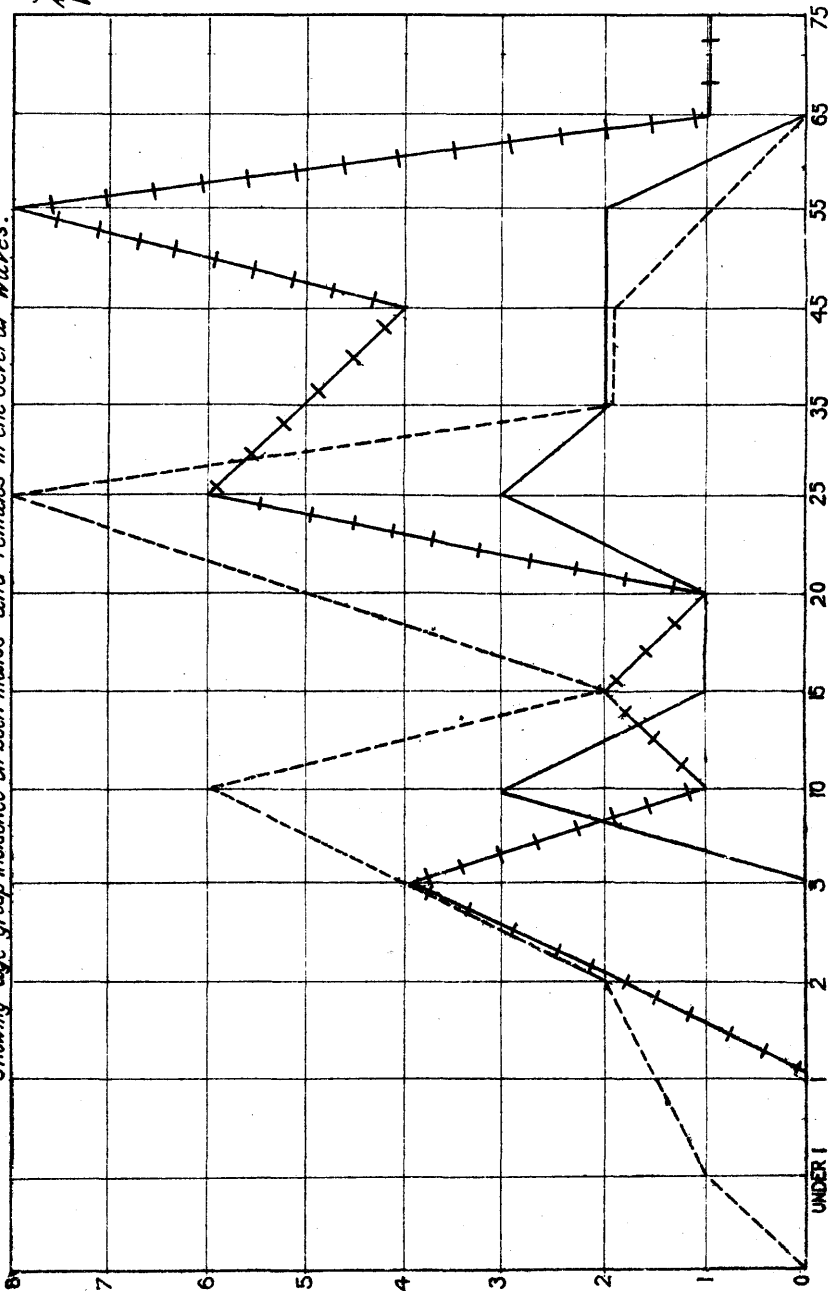
SPRING 1919.



— Summer 1918.
 - - Autumn 1918.
 + + Winter 1919.

GRAPH 2

Showing age group incidence on both males and females in the several waves.



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	Males.	Females.	Total Attacks.
(c) Number of persons attacked in winter :—			
(1) Of those who escaped in two previous waves.	13	18	} 35
(2) Of those who escaped in summer but attacked in autumn.	—	3	
(3) Of those who escaped in autumn but suffered in summer.	—	1	
(4) Of those who were attacked in both summer and autumn.	—	—	

No case suffered in all three waves. Each person who had a second attack was questioned as to its nature and severity as compared with the first. They all declared that the second attack seemed to be less severe. This view is also borne out by statements made by others with whom we have talked, but who are not included in this investigation. At the same time several cases have been known to us in which the second attack is said to have been just as bad as the first.

No case among those in the area under consideration developed complications in a second attack. Out of the 77 attacks of influenza, 13, or 16·9 per cent., developed complications; of these 8 (11·2 per cent. of cases) developed pneumonia, and 5 (6·5 per cent.) bronchitis. One of the pneumonia cases died.

House Incidence.—The following table shows the occurrence of the disease in houses with more than one person per room and in those with less than one per room (not including scullery); together with certain other facts observed :—

	Per Cent.
Incidence among occupants of houses with one or more persons per room	56, or 72·7
With less than one person per room	21, or 27·2
Persons sleeping in the same room as the patient	24, or 31·2
Number of houses invaded in summer	10
" " " autumn	14
" " " winter	21
" " which escaped all three waves	64
" " which were invaded in all three waves	Nil,
" " which were invaded in summer and autumn	1
" " which were invaded in summer and winter	3
" " which were invaded in autumn and winter	3

The next table shows the number of houses with one case, two cases, three cases, &c, respectively :—

Number of cases	1 case.	2 cases.	3 cases.	4 cases.	5 cases or more.
Number of houses	24	7	4	2	2*

* One house with 6 cases, and one house with 8 cases.

Incubation period.—The longest incubation period encountered in the inquiry appears to be five days; the shortest 12 hours; and the great majority appear to have been about 48 hours. The 12-hour incubation case is interesting. A house of eight rooms was occupied by a husband and wife who employed no maids. It was decided that the spring cleaning and some re-decorating should be undertaken by themselves. The husband went out during the day and worked at painting, &c., at night. The wife spring-cleaned all day and rested in the evenings. She was not out of doors for seven days and saw no person except tradesmen and her husband during that time. On the sixth evening the husband came home feeling ill and with catarrhal symptoms, which developed into an attack of influenza. Early next morning his wife also had symptoms of catarrh followed by a typical attack of the disease. On the morning preceding his attack, the husband expressed himself as feeling particularly fit.

Duration of Infectivity.—It is regretted that it has not been possible to determine how long a case may be infectious, no case being found to yield any useful information on this point. There were indications, however, that the early catarrhal stage of the disease appears to be the most infectious, and this view seems to be substantiated by the fact that the majority of the cases among contacts began usually about 48 hours after the onset of symptoms in the primary case.

Prevention and Treatment.—Little can be said with regard to preventive measures, but it would appear that where home isolation can be carried out the incidence of the disease among contacts is reduced.

Vaccine treatment of the condition, as far as observation went, was not attended by any results more satisfactory than treatment on other lines. Nor did the use of vaccine as a prophylactic appear to be of much value in the prevention of an attack, although its real value could not be estimated on account of the small number of persons so treated.

During the epidemic in the first three months of this year a number of patients were treated in the South Shields Isolation Hospital, and the value of institutional treatment was demonstrated, but only in those cases in which lung complications had not developed. In this connection it is of interest to note that only those members of the staff of the hospital who came into contact with the patients and who did not wear masks contracted the disease.

Associated Medical History.—The 72 persons attacked were classified as—

(1) Healthy previous to attack	- - - - -	63
(2) Unhealthy	"	9

The latter include five cases of chronic bronchitis, one of chronic hepatitis, one of anaemia, and two of pregnancy, *i.e.*, pregnancy at the time of the attack. Two of the cases of chronic bronchitis were females occupied on household duties and both had two attacks of influenza. As has already been stated, all those who had two attacks were females occupied at home on household duties. It is unfortunate that associated "diseases" were not met with during the investigation. Numerous cases, however, have recently attended at the Tuberculosis Clinic in South Shields where the patients definitely attribute their tuberculous condition to an attack of influenza. The fact has been noted even in former years when influenza did not assume epidemic form. Since February 1919, observation has been made of the cases of tuberculosis attending the clinic for treatment for the purpose of discovering what proportion of the patients contracted influenza, one was surprised at the very small number who did so.

With regard to the effect of the disease on pregnancy; there were two women among those investigated who were pregnant at the time of the epidemic. Both had influenza; one aborted and the other had a living child, but it only lived a few weeks. The case of chronic hepatitis is said to have had a recrudescence of liver symptoms (jaundice, &c.) during convalescence from influenza. (NOTE.—The proportion of the cases in the investigation who were medically attended was 84 • 4 per cent.)

The following Table shows the death rate from the principal pulmonary diseases in 1915, 1916, 1917, 1918, and the first quarter of 1919 :—

—	Bronchitis.	Pneumonia.	Pleurisy.	Phthisis.
1915 - - - -	2·21	2·07	0·05	1·67
1916 - - - -	1·81	1·50	0·01	1·73
1917 - - - -	1·83	1·81	0·05	2·09
1918 - - - -	1·85	2·01	0·02	1·93
1919 (1st quarter) - -	2·84	3·12	—	1·84

INFLUENZA INVESTIGATION—APPENDIX.

(1) *Lawe Cottages Group.*

Fairly good class of self-contained houses, and fair cottages.

Street Number.	Rent.		Number of Rooms.	Occupation of Householder.
	Rated on			
	Net.	Gross.		
5½ - - -	£ 16	£ 19	6	Dock manager.
6 - - -	21	25	6	Pilot.
7 - - -	24	28	6	Pilot.
8 - - -	24	28	6	Master butcher.
9 - - -	20	24	5	—
10 - - -	30	36	9	Pilot.
11 - - -	20	24	6	Undertaker.
12 - - -	20	24	6	—
13 - - -	Rent, 7s. 6d. ; 7s. ; and 5s. ; plus rates. Rooms divided, 6 ; 2 ; 2.		10	Labourer and sailor.
14 - - - (three tenants).	33 10s.	40	7	Marine Superintendent.

(2) *Thames Street Group.*

Section of street divided into eight one-roomed and two two-roomed tenements. Bad class of property ; one common yard ; two W.C.'s.

Street Number.	Rent.	No. of Rooms.	Occupation of Householder.
55 - - -	s. d. 2 6	1	
56 - - -	2 3	1	
	2 -	1	Cartman.
	2 3	1	Dock labourer.
	2 3	1	Boiler cleaner.
57 - - -	2 6	2	Pit labourer.
	2 6	2	Rivetter.
58 - - -	2 3	1	Fireman (Marine).
59 - - -	2 3	1	Herring curer.
60 - - -	2 3	1	Dock labourer.

(3) *Hepple's Court Group.**(Waterloo Vale.)*

Section of cul-de-sac street divided into one and two-roomed tenements.
Bad in condition and conception.

Street Number.	Rent.	No. of Rooms.	Occupation of Householder.
	<i>s. d.</i>		
2 - -	2 10	2	
2 - -	2 10	2	Gasworker.
4 - -	2 10	2	Gasworker.
2 - -	3 3	1	
2 - -	3 -	2	Pit labourer.
2 - -	2 10	2	
2 - -	2 10	2	Shipyard labourer.
2 - -	2 10	2	Sawyer.
4 - -	3 3	1	T.I.C. labourer.
2 - -	2 10	2	

(4) *Osborne Avenue Group.*

Good class of self-contained houses.

43 - -	Rated on 24 <i>l.</i> gross	6	
45 - -	" "	6	Butcher.
47 - -	" "	6	Com. agent.
49 - -	" "	6	Collector for Tyne Dues
51 - -	" "	6	Assistant Town Clerk.
53 - -	" "	6	Teacher.
55 - -	" "	6	Teacher.
57 - -	" "	6	Teacher.
59 - -	" 22 <i>l.</i> "	6	Tailor's Cutter.
61 - -	" 26 <i>l.</i> 10 <i>s.</i> "	6	House agent.

(5) *Marsden Street Group.*

Average tenement property in flats (one upper and one lower flat), yard and privy receptacle common to two tenants.

	<i>s. d.</i>		
133 - -	4 6	2	Miner.
135 - -	4 3	2	Miner.
137 - -	4 6	2	Shipyard worker.
139 - -	4 6	2	Miner.
141 - -	3 11½	2	Miner.
143 - -	3 11½	2	Miner.
145 - -	3 11½	2	Seaman.
147 - -	3 11½	2	Shipyard worker.
149 - -	4 -	2	Miner.
151 - -	3 8½	2	Miner.

(6) Hill Street Group.

Section of street consisting of three houses of 3 floors each (ground 1st and 2nd). Poor class of tenement property; fairly clean tenants; common yard (two levels); two w.c.'s and two privy receptacles.

Street Number.	Rent.	No. of Rooms.	Occupation of Householder.
	<i>s. d.</i>		
15 - -	3 7	2	General labourer.
13 - -	4 1½	3	Household duties.
11 - -	3 7	2	Cartman.
9 - -	4 1½	3	Dockyard labourer.
7 - -	4 8	3	Stoker.
14 - -	5 -	3	Household duties.
11 - -	3 4	2	Ship's fireman.
11 - -	2 9	2	Dockyard.
12 - -	3 10½	3	Holder-up.
13 - -	3 10½	3	Various kinds of work.

(7) Simon Street Group.

Section of street consisting of two houses. Bad class of tenemented property; common yards and privies.

	<i>s. d.</i>		
20	3 0	2	Foyboatman.
Bk. 20	1 9	1	Boiler cleaner.
" 20	2 0	1	Driller.
" 18	3 0	2	Boiler cleaner.
Bk. 18	1 9	1	Dock fireman.
18	2 0	1	Boiler cleaner.
16	2 0	1	" "
Bk. 16	2 0	1	Rivetter.
" 16	2 0	1	Miner.
" 16	2 0	1	"

(6) Eglesfield Road Group.

Section of street consisting of five houses. Good class of self-contained flats; separate yard and privy for each occupier.

	<i>s. d.</i>		
66	6 -	3	Engine man.
68	-8 -	6	Ships' carpenter.
70	6 -	3	Iron moulder.
72	Rated on 13 <i>l.</i> gross	5	Ships' plater.
74	5 6	3	Marine engineer.
76	Rated on 13 <i>l.</i> gross	5	Household duties.
78	6 0	3	Corporation labourer.
80	Rated on 13 <i>l.</i> gross	5	Engine fitter.
82	6 0	3	Iron moulder.
84	Rated on 13 <i>l.</i> gross	5	Engine fitter.

(9) *West Park View Group*

Section of road comprising eight self-contained houses and four self-contained flats. Of modern type and situated in a good residential part of the town.

Street Number.	Rent.	No. of Rooms.	Occupation of Householder.
145	Rated on 30 <i>l.</i>	11	Draper.
147	" "	6	Boot dealer.
149	" "	7	House furnisher.
151	" "	8	Plater (shipyard).
153	" "	8	Gun manager.
155	" "	8	Builder.
157	" "	8	Master mariner.
159	" "	8	Master plumber.
161	Rent, 7 <i>s.</i> 9 <i>d.</i>	4	Commercial clerk.
163	Rated on 16 <i>l.</i>	6	—
164	Rated on 13 <i>l.</i>	4	Marine engineer.
167	Rent, 9 <i>s.</i> 9 <i>d.</i>	7	Contractor for scaling ships' boilers.

(10) *Double Bow Group.*

(Colliery Cottages.)

Section of road comprising 10 cottages situated in the neighbourhood to fairly good class property. These cottages are old, obsolete in type, but have front garden; two rooms on the ground floor with attic in roof space; large double privy middens and ashpits serve for privy accommodation. *Rent.*—No rent is paid directly, but wages of the miner include allowances of 2*s.* for coal and 3*s.* for rent.

1	Rated on 9 <i>l.</i> gross	1 up & 2 down.	Coal hewer.
2	" "	"	Deputy overman.
3	" "	"	—
4	" "	"	Deputy overman.
5	" "	"	Coal hewer.
6	" "	"	" "
7	" "	"	" "
8	" "	"	Deputy overman.
9	" "	"	" "
10	" "	"	Coal miner.