COUNTY BOROUGH OF CARDIFF.

ANNUAL REPORT

For the Year 1889

OF THE

MEDICAL OFFICER OF HEALTH,

EDWARD WALFORD, M.D., D.P.H. CAMB.,

FELLOW OF THE SANITARY INSTITUTE,
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CARDIFF:
ROBERTS BROS., CORPORATION PRINTERS, DOCKS AND HIGH STREET ARCADE.
1890.

CARDIFF URBAN SANITARY AUTHORITY.

TOWN HALL,

CARDIFF,

APRIL 14TH, 1890.

TO THE CHAIRMAN AND MEMBERS OF THE CARDIFF URBAN SANITARY AUTHORITY.

Gentlemen,

I have the honour of submitting to you my Report for the year 1889, and of laying before you the usual tables of vital statistics.

The regulations of the Local Government Board prescribe "that the Medical Officer of "Health shall prepare an annual report to be made to the end of December in each year, comprising "a summary of the action taken during the year for preventing the spread of disease, and an account "of the sanitary state of his district generally at the end of the year. The report shall also contain "an account of the inquiries which he has made as to conditions injurious to health existing in his "district, and of the proceedings in which he has taken part or advised under the Public Health Act, "1875, so far as such proceedings relate to those conditions. And also an account of the supervision "exercised by him or on his advice for sanitary purposes, over places and houses that the Sanitary "Authority have power to regulate with the nature and results of any proceedings which may have "been so required, and taken in respect of the same during the year. It shall also record the action "taken by him, or on his advice during the year in regard to offensive trades and to factories and "workshops. The report shall also contain tabular statements (on forms to be supplied by the "Local Government Board or to the like effect) of the sickness and mortality within the district, "classified according to diseases, ages, and localities."

This report is therefore made in compliance with the above quoted regulations.

The Urban Sanitary district of Cardiff comprises an area of 8,409 acres, and an estimated population of 112,712 or 13·3 persons per acre.

The above estimate of population is that of the Registrar General calculated in the ordinary way and based on the assumption that the late increase which prevailed between the last two census enumerations is taken, the estimate thus obtained becomes the basis upon which the birth-rate, death-rate, and other rates are calculated, consequently the nearer the estimate approaches the actual number of the population the more strictly reliable will be the statistical results. It has however been pointed out in former reports that in certain cases this method is not strictly applicable, and that owing to the rapid development of commercial enterprise in Cardiff and the consequent immgration of large number of labourers and others the population is considerably under-estimated.

The Registrar-General in his weekly returns therefore appends the following foot-note :—

"The populations of the twenty-eight towns is estimated on the hypothesis that the rate of increase in the last intercensal period has been maintained since 1881. There are however reasons to believe that by this method the populations of Leicester, Salford, and Bradford are over-estimated, and that of Cardiff under-estimated, if the population be estimated by the increase of inhabited houses in the rate books, the death-rates of Leicester, Salford, and Bradford are understated by one-fifteenth, one-thirteenth, and one-tenth respectively, and those for Cardiff over-stated by one-eighth."

In this report the death-rates are calculated on the two estimates of population, the lesser calculated on the usual basis and the greater in accordance with the special formula applicable to Cardiff. The former method gives 112,712, and the latter 126,801 as the estimated population for the middle of the year 1889.

The method of estimating the population by multiplying the number of inhabited houses by the average number of inhabitants in each house, although in most instances it gives an approximately correct result, still involves the fallacy that new houses may be of a different class from those previously in existence, and may therefore have a different number of occupants.

A more frequent examination would go far to remedy the uncertainty which exists as to the population of rapidly growing towns like Cardiff, and it is to be hoped that the Government, which has recently been memorialised on the subject, will recognise the desirability of causing a quinquennial census to be made. In the meantime it is necessary to bear in mind that the accuracy of vital statistics diminishes as the interval from the preceding census increases in consequence of the increasing uncertainty as to the population upon which these calculations are based.

MARRIAGES.

The total number of marriages during the year 1889, as furnished by the District Registrar, was as follows :—

At the Established Churches	467
,, Nonconformist do.	841
Roman Catholic do.	120
Synagogue	3
	1,431

BIRTHS.

During the year the Births registered in the Borough were 4,361; of these 2,258 were males, and 2,103 females, giving a birth-rate of 38·6 per 1,000 persons living.

Table I. gives the birth-rate for Cardiff and for the 28 large towns in England during the years 1882—89, inclusive.

TABLE I.

28 LARGE TOWNS.	Annual Birth-rate per 1000 living.							
	1882	1883	1884	1885	1886	1887	1888	1889
London	34·3	33·9	33.6	32·5	32·3	31·6	30·7	30·3
Brighton	30·6	39·1	28·3	26·0	25·4	25·7	23·3	24·4
Portsmouth	34·0	35·3	34·8	34·5	36·2	36·8	35·8	35·1
Norwich	33·9	34·1	34·2	33·5	34·7	33·9	34·6	33·8
Plymouth	32·1	31·5	32·0	30·5	31·6	31·5	31·7	31·9
Bristol	33·0	32·2	31·5	31·1	30·5	29·7	29·3	29·2
Wolverhampton ...	36·1	36·2	34·6	34·8	35·1	33·2	32·9	32·4
Birmingham... ...	36·5	35·6	35·1	33·8	33·0	31·7	30·7	30·9
Leicester	38·5	37·0	36·5	34·3	34·9	32·8	32·7	31·7
Nottingham	38·1	39·5	39·9	37·6	35·7	33·2	29·9	28·0
Derby	35·5	35·9	34·5	34·2	33·2	30·0	29·4	28·5
Birkenhead	36·6	35·4	38·0	34·6	33·7	32·4	30·7	31·2
Liverpool	36·7	35·2	35·2	33·6	33·5	31·1	29·7	29·2
Bolton	36·4	34·6	33·3	34·5	34·1	32·5	32·7	32·8
Manchester	36·7	35·9	36·1	36·3	36·2	35·8	35·3	35·3
Salford	38·8	35·7	35·6	34·3	34·3	31·9	31·6	29·9
Oldham	34·9	35·2	35·4	35·6	32·5	31·3	30·1	28·4
Blackburn	38·4	39·1	37·2	36·6	34·7	35·7	34·1	34·3
Preston	39·7	38·2	38·7	39·1	39·4	38·4	37·5	38·1
Huddersfield... ...	30·8	39·5	29·4	29·1	27·0	27·7	24·6	24·5
Halifax	30·0	29·0	29·4	28·8	28·8	28·4	28·5	28·0
Bradford	31·8	29·2	29·2	29·1	28·7	27·7	27·4	26·7
Leeds	36·1	34·7	34·7	34·6	33·8	33·3	32·6	32·8
Sheffield	37·4	36·7	36·9	35·0	34·1	32·9	30·7	33·2
Hull	36·6	36·7	37·8	33·8	33·5	32·8	31·1	32·6
Sunderland	41·2	41·8	42·6	37·7	36·3	34·6	34·7	36·0
Newcastle	37·2	36·7	39·5	38·3	39·4	39·1	37·9	38·2
Cardiff	**39·2**	**39·2**	**42·3**	**43·0**	**42·6**	**41·1**	**40·8**	**38·6**
28 Large Towns ...	35·3	34·6	34·6	33·5	33·1	32·2	31·2	31·0

From the preceding table it will be seen that during the past eight years the birth-rate of Cardiff has considerably exceeded that of the 28 large towns. The average during that period being 40·8 as compared with 33·2 that of the large towns.

Birth-rates vary considerably under different circumstances, the highest rates occurring in large Urban districts amongst mining and industrial populations, and the lowest rates in rural and agricultural districts. These high birth-rates in the densely-populated places, are, doubtless, in part due to the higher marriage-rate and in part to the greater mortality amongst infants in large towns which diminishes the intervals of child-bearing. The birth-rate has an important bearing on the death-rate, affecting as it does the age distribution of a population, some authorities considering that a high birth-rate is a direct cause of a high death-rate owing to the great mortality amongst infants; this view, however, ignores the fact that a continuously high birth-rate not only causes an excess of infants, but also an excess of young persons amongst whom the death-rate is low. Dr. Farr has shewn that populations having a high birth-rate should have lower death-rates than populations having low birth-rates, because a continuously high birth-rate means a large proportion of young adults and an unduly small proportion of old people, and a low birth-rate means a small proportion of young adults and a large proportion of adults and old people.

Table II. shows the comparison of births and deaths in Cardiff in successive years.

TABLE II.

Years.	Births.	Birth-rate per 1000 Inhabitants.	Deaths from all causes.	Death-rate per 1000 Inhabitants.	Death-rate from the seven Chief Infectious Diseases per 1000 Inhabitants.	Deaths under one year per 1000 births registered.
1880	2893	37·8	1634	19·7	3·7	165
1881	3145	39·8	1556	18·2	1·9	130
1882	3399	39·2	1724	19·4	3·3	144
1883	3526	39·2	1807	19·8	2·7	139
1884	3920	42·3	2250	24·0	5·0	167
1885	4164	43·0	2481	25·5	5·3	189
1886	4270	42·6	2269	22·5	3·2	168
1887	4277	41·1	2280	21·8	2·6	172
1888	4409	40·8	2212	20·3	2·9	143
1889	4361	38·6	2190	19·4	2·1	156

Table III. shows the population, the births, deaths, excess of deaths over births, and excess of births over deaths annually.

TABLE III.

Year.	Population.	Births.	Deaths.	Excess of Deaths over Births.	Excess of Births over Deaths.
1845	13,385	320	324	4	...
1846	14,212	381	321	...	60
1847	15,039	331	484	153	...
1848	15,866	428	579	151	...
1849	16,693	466	864	395	...
1850	17,520	504	485	...	19
1851	18,354	575	585	...	50
1852	19,724	696	620	...	76
1853	21,094	865	644	...	221
1854	22,464	950	925	...	25
1855	23,834	1,079	641	...	438
1856	25,204	1,227	772	...	455
1857	26,574	1,367	883	...	484
1858	27,944	1,356	753	...	603
1859	29,314	1,336	826	...	510
1860	30,684	1,346	662	...	584
1861	32,054	1,223	837	...	386
1862	32,804	1,267	695	...	373
1863	33,552	1,302	862	...	440
1864	34,300	1,369	932	...	467
1865	35,048	1,382	867	...	515
1866	35,796	1,331	882	...	449
1867	36,544	1,397	873	...	524
1868	37,292	1,387	843	...	544
1869	38,640	1,414	1,005	...	409
1870	38,788	1,406	903	...	503
1871	59,494	1,391	891	...	500
1872	62,086	1,358	916	...	442
1873	64.674	1,430	995	...	435
1874	67,262	1,550	885	...	665
1875	69,850	2,716	1,547	...	1,169
1876	72,438	2.707	1,455	...	1,252
1877	75,026	2,772	1,475	...	1,297
1878	77,614	2,795	1,468	...	1,327
1879	80,202	2,969	1,428	...	1,541
1880	82,790	2,893	1,634	...	1,295
1881	85,378	3,145	1,556	...	1,589
1882	{ 88,603 / 95,168 }	3,399	1,724	...	1,675
1883	{ 91,204 / 97,767 }	3,526	1,807	...	1,719
1884	{ 93,468 / 100,033 }	3,920	2,250	...	1,670
1885	{ 97,034 / 103,599 }	4,164	2,487	...	1,683
1886	{ 100,736 / 107,301 }	4,270	2,269	...	2,001
1887	{ 104,580 / 111,145 }	4,277	2,280	...	1,997
1888	{ 108,570 / 115,135 }	4,409	2,212	...	2,197
1889	{ 112,712 / 126,801 }	4,361	2,190	...	2,172

DEATHS.

2,190 deaths occurred within the Borough during the year 1889. The death-rate was equal to 19·4 per 1,000 of the population as estimated by the Registrar General at the middle of the year. and 17·2 per 1,000 as calculated on the basis of the number of inhabited houses. The death-rate of 1889 compares favourably with that of previous years, being 3·4 below the average of the past five years, indeed, only on three occasions since the year 1845 has the death-rate been so low.

The deaths comprised 1,160 males and 1030 females which were registered and distributed as shewn in Table IV.

TABLE IV.

Diseases.	Cardiff.	Roath.	Canton.	Total.
Measles	13	21	7	41
Scarlet Fever	6	6	3	15
Diphtheria	3	3	2	8
Whooping Cough	35	24	21	80
Typhoid Fever	17	6	7	30
Diarrhœa	27	22	26	75
Other Zymotics	20	14	6	40
Parasitic	0	0	0	0
Dietic	4	2	0	6
Constitutional	236	96	79	411
Developmental	123	66	35	224
Local	454	305	261	1020
Violence	60	52	10	122
Ill defined, &c.	59	30	29	118
	1057	647	486	2190

The following table gives the annual death-rate per 1,000 of the 28 large towns in England for the years 1885—1889 inclusive.

TABLE V.

Death-rate of the large English Towns during the past five years.

28 LARGE TOWNS.	Annual Death-rate per 1,000 living.				
	1885	1886	1887	1888	1889
London	19·7	19·9	19·6	18·5	17·4
Brighton	17·1	17·1	16·9	16·1	15·1
Portsmouth	19·7	23·8	19·5	18·7	18·1
Norwich	20·3	23.3	20·4	20·2	18·3
Plymouth	22·3	23·5	22·7	22·3	25·2
Bristol	19·7	19·3	20·4	16·9	17·6
Wolverhampton ...	20·2	22·2	21·7	20·7	20·6
Birmingham	19·3	19·9	19·7	17·8	18·7
Leicester	19·4	19·6	19·0	18·3	16·9
Nottingham	19·9	20·4	18·7	17·3	17·0
Derby	18·1	18·2	17·1	16·3	16·3
Birkenhead	19·5	19·1	21·0	17·8	17·8
Liverpool	23·8	23·8	23·7	20·3	21·5
Bolton	20·8	23·1	21·3	21·6	22·0
Manchester	26·5	26·3	28·7	26·1	26·7
Salford	21·1	22·1	22.2	21·1	20·4
Oldham	22·0	22·8	23·8	20·3	20·4
Blackburn	21·8	25·5	25·5	23·9	25·4
Preston	27·1	28·9	27·9	23·9	30·0
Huddersfield	20·1	19·6	23·0	18·5	18·8
Halifax	19·7	22·7	21·0	19·1	21·5
Bradford	17·7	19·2	19·9	17·1	19.1
Leeds	19·9	21·9	21·1	20·6	22·0
Sheffield	20·7	19·8	21·6	20·5	20·8
Hull	17·2	18·8	19·3	16·4	20·2
Sunderland	23·8	19·5	19·7	18.1	22·8
Newcastle	26·1	22 2	25·3	20·5	25·1
Cardiff	**25·7**	**22·6**	**21·9**	**20·3**	**19·4**
28 Large Towns ...	20·5	20·9	20·8	19·2	19·3

Table VI. shows the death-rate for Cardiff based on two estimates of population, namely 112,712 and 126,801 during each quarter, and that of the entire year as compared with the death-rates of the large towns :—

TABLE VI.

	QUARTERS ENDING Mar. 31	June 30	Sept. 29	Dec. 29	Death-rate of year.
Cardiff Registrar General's Estimate...	23·1	18·1	19·9	16·6	19·4
Estimate according to inhabited houses	20·5	16·1	17.6	14·7	17·2
Twenty-eight Large Towns ...	20·9	18·2	18·6	19·4	19·3

The deaths at ages were :—

Under one year of age	685
One and under five years	322
Five and under fifteen years	105
Fifteen and under twenty-five years	134
Twenty-five and under sixty years	592
Sixty years and upwards	352
Total	2,190

Table VII. gives the population of each year, the annual deaths from all causes, from the seven chief zymotic diseases, and the death-rates from 1845 to 1889 inclusive :—

TABLE VII.

Year.	Population.	Deaths from all causes.	Death rates.	Mean of 10 years.	Death-rate, Zymotic Diseases.	Death rate.	Mean of 10 years.
1845	13,385	324	24·2		51	3·8	
1846	14,212	321	22·6		50	3·5	
1847	15,039	484	32·2		133	8·8	
1848	15,856	579	36·5		186	11·7	
1849	16,693	864	51·7		483	28·9	
1850	17,520	485	27·7		116	6·6	
1851	18,354	525	28·6		81	4·4	
1852	19,724	620	31·4		175	8·8	
1853	21,094	644	30·5		129	6·1	
1854	22,464	925	41·1	32·7	353	15·7	9·8
1855	23,834	641	26·9		665	2·7	
1856	25,204	772	30·6		136	5·3	
1857	26,574	883	33·2		254	8·8	
1858	27,944	753	26·9		128	4·5	
1859	29,314	826	28·1		212	7·2	
1860	30,684	662	21·5		95	3·0	
1861	32,054	837	26·1		100	3·1	
1862	32,804	695	21·2		132	4·0	
1863	33,552	862	25·7		268	7·0	
1864	34,300	932	27·1	26·7	250	7·3	5·4
1865	35,048	867	24·7		161	4·5	
1866	35,796	882	24·6		192	5·3	
1867	36,544	873	23·8		116	3·1	
1868	37,292	843	22·6		109	2·9	
1869	38,040	1,005	26·4		156	4·1	
1870	38,788	903	23·2		133	3·4	
1871	59,494	891	22·5		158	3·9	
1872	62,086	916	22·7		234	5·8	
1873	64,674	995	24·2		103	2·5	
1874	67,262	885	21·2	23·6	154	3·6	3·9
1875	69,850	1,547	22·1		294	4·2	
1876	72,438	1,455	20·8		339	4·6	
1877	75,026	1,475	19·6		255	3·5	
1878	77,614	1,468	18·9		197	2·5	
1879	80,202	1,428	17·6		137	1·7	
1880	82,790	1,634	19·7		306	3·7	
1881	85,378	1,556	18·2		164	1·9	
1882	88,603	1,724	19·4		293	3·3	
1883	91,204	1,807	19·8		253	2·7	
1884	93,468	2,250	24·3	20·0	476	5·0	3·3
1885	97,034	2,481	25·5		521	5·3	
1886	100,736	2,269	22·5		332	3·2	
1887	104,580	2,280	21·8		278	2·6	
1888	108,570	2,212	20·3		324	2·9	
1889	112,712	2,190	19·4		248	2·1	

The following table shows the total deaths registered and the death-rates during each week in the year 1888.

TABLE VIII.

No.	Week ending.	No. of Deaths.	Death-rate estimated Population as per Registrar General (112,712)	Death-rate estimated Population inhabited houses (126,801
1	January 5 ...	71	32·7	29·0
2	,, 12 ...	69	31·7	28·2
3	,, 19 ...	73	33·6	29·9
4	,, 26 ...	53	24·4	21·7
5	February 2 ...	50	23·0	20·5
6	,, 9 ...	45	20·8	18·4
7	,, 16 ...	41	19·0	16·8
8	,, 23 ...	48	22·0	19·6
9	March 2 ...	33	15·3	13·5
10	,, 9 ...	39	18·1	15·9
11	,, 16 ...	37	17·1	15·1
12	,, 23 ...	50	23·1	20·5
13	,, 30 ...	42	19·4	17·2
14	April 6 ...	41	18·9	16.8
15	,, 13 ...	39	17·9	15·9
16	,, 20 ...	50	23·0	20·5
17	,, 27 ...	38	17·5	15·5
18	May 4 ...	42	19·4	17·2
19	,, 11 ...	32	14·8	13·1
20	,, 18 ...	51	23·6	20·1
21	,, 25 ...	32	14·8	13·1
22	June 1 ...	38	17·6	15·5
23	,, 8 ...	31	14·3	12·7
24	,, 15 ...	38	17·6	15·5
25	,, 22 ...	39	17·9	15·9
26	,, 29 ...	40	18·5	16·4
27	July 6 ...	42	19·4	17·2
28	,, 13 ...	45	20·8	18·4
29	,, 20 ...	38	17·6	15·5
30	,, 27 ...	51	23·6	20·9
31	August 3 ...	47	21·8	19·2
32	,, 10 ...	53	24·5	21·7
33	,, 17 ...	39	18·1	15·9
34	,, 24 ...	55	25·5	22·5
35	,, 31 ...	30	13·9	12·3
36	September 7 ...	41	19·0	16·8
37	,, 14 ...	35	16·2	14·3
38	,, 21 ...	44	20·4	18·0
39	,, 28 ...	41	19·0	16·8
40	October 5 ...	24	11·1	9·8
41	,, 12 ...	20	9·3	8·0
42	,, 19 ...	32	14·8	13·1
43	,, 26 ...	30	13·9	12·3
44	November 2 ...	30	13·9	12·3
45	,, 9 ...	38	17·6	15·5
46	,, 16 ...	33	15·3	13·5
47	,, 23 ...	23	10·6	9·4
48	,, 30 ...	41	18·9	16·8
49	December 7 ...	55	25·3	22·5
50	,, 14 ...	53	24·4	21·7
51	,, 21 ...	47	21·6	19·2
52	,, 28 ...	41	18·8	16·8

As the conditions of the various sub-districts differ in many respects it will be useful to ascertain the vital statistics of the divisions separately. With this view Table IX. has been compiled, from which it will be seen that the general death rate in all the sub-districts was higher in the south than in the north of the town.

TABLE IX.—STATISTICS OF SUB-DISTRICTS.

Sub-districts.	Estimated Population middle of 1889.	Total Deaths.	ANNUAL DEATH-RATE PER 1,000.											
			All causes.	Seven chief Zymotic Diseases.	Small Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping-Cough.	Typhoid Fever.	Diarrhœa.	Phthisis.	Disease of Respiratory Organs.	Tuberculosis.
Cardiff North	20,512	400	19·5	1·54	0·00	0·19	0·00	0·04	0·39	0·34	0·57	3·21	2·87	0·19
,, South	32,793	657	20·0	2·10	0·00	0·27	0·18	0·06	0 82	0·30	0·45	2·25	3·81	0·06
Roath North	14,831	172	11·5	1·28	0·00	0·13	0·20	0·06	0·47	0·06	0·33	1·07	1·61	0·26
,, South	24,131	475	19·6	2·61	0·00	0·78	0·12	0·08	0·70	0·20	0·70	0·95	3·81	0·08
Canton North	11,993	181	15·0	2·00	0·00	0·50	0·16	0·08	0·41	0·16	0·66	1·58	3·16	0·08
,, South	20,161	305	15·1	2·08	0·00	0·04	0·04	0·04	0·79	0·24	0·89	1·19	2·92	0·29

INFANT MORTALITY.—The rate of infant mortality as measured by the proportion of deaths of infants under one year to 1,000 birth registered, was 157. The following table gives the rates for Cardiff, as compared with those of the large towns, during the years 1885-1889 inclusive :—

TABLE X.

28 LARGE TOWNS.	Deaths under 1 year to 1,000 births registered.				
	1885	1886	1887	1888	1889
London	148	159	158	146	141
Brighton	131	160	149	148	131
Portsmouth	131	174	143	134	139
Norwich	136	202	158	165	164
Plymouth	156	154	196	164	166
Bristol	152	149	149	123	146
Wolverhampton ...	140	175	176	168	181
Birmingham	157	175	176	149	170
Leicester	193	216	215	203	208
Nottingham	157	180	170	151	182
Derby	137	150	142	143	149
Birkenhead	137	162	156	152	170
Liverpool	174	188	186	168	188
Bolton	160	186	171	173	166
Manchester	175	183	191	177	176
Salford	174	198	195	184	182
Oldham	166	174	187	150	178
Blackburn	170	209	201	189	203
Preston	218	233	214	188	265
Huddersfield	157	167	181	157	167
Halifax	132	171	153	154	175
Bradford	143	167	178	154	183
Leeds	155	181	172	173	177
Sheffield	164	168	177	178	174
Hull	128	164	165	139	184
Sunderland	158	151	151	132	181
Newcastle	172	155	174	136	174
Cardiff	**189**	**168**	**172**	**143**	**157**

The preceding table shows that the rate of infant mortality in Cardiff has of late years steadily declined, and that it compares favourably with that of the other large towns. In 1885 there were twenty-five towns with a lower rate of infant mortality than Cardiff, in 1886 there were eleven, in 1887 twelve, in 1888 five, and in 1889 five also. The mortality of young infants forms, perhaps, one of the most valuable tests of the sanitary condition of a town, it is, moreover, a test which, being based on a known proportion, is not subject to the errors which have been shewn to apply to the general death-rate. It is found that the vast range of infant mortality in different districts of England is due in great measure to the differences in the sanitary conditions in the various localities, and that the causes which operate in the production of a high rate of infant mortality are those unwholesome conditions, which Sanitary Authorities are specially empowered to counteract. The most common causes of death amongst infants are the ordinary infectious diseases of childhood, diseases of the nervous system, diarrhœal and pulmonary disorders.

Table XI. shows the chief causes of death amongst infants under one year of age. The deaths at this age amounted to 685, and comprised 31 per cent. of all the deaths :—

Table XI.

Chief causes of death under one year of age.

Causes of Deaths.	Number of Deaths under One Year of Age.
Premature Birth and Debility ...	55
Congenital Defects	7
Measles	7
Whooping Cough	32
Diseases of the Respiratory System ...	147
,, ,, Nervous System ...	137
,, ,, Digestive System ...	28
Diarrhœa	66
Tabes Mesenterica	12
Tubercular Meningitis	19
Other Tuberculous Diseases ...	6
Violence	10
Other Diseases	159

ZYMOTIC DISEASES.—The 272 deaths classified under this head included 248 from what are termed the seven chief zymotic diseases (certain diseases belonging to the miasmatic order), viz. :—Measles 41, Scarlet Fever 15, Whooping Cough 79, Diphtheria 8, Typhoid or Simple Fever 30, Diarrhœa 75. The mortality from the chief zymotics was equal to a death-rate of 2·19 per 1,000 persons living, as compared with 2·72, that of the 28 large towns, and with 3·67, the mean rate of the previous six years. With the two exceptions of 1879 and 1881, the death-rate from this class in 1889 was the lowest recorded since 1845.

The number of deaths due to the zymotic diseases and the death-rates during each quarter of the year are given in Table XII., which also shows the number of cases reported to me by medical practitioners on the forms supplied by the Sanitary Authority, and for which a fee of 2s. 6d. was paid in each case :—

TABLE XII.

Seven Chief Zymotic Diseases.	1st Quarter.			2nd Quarter.			3rd Quarter.			4th Quarter.			Year.		
	Cases reported.	Deaths.	Death-rate.	Cases reported.	Deaths.	Death-rate.	Cases reported.	Deaths.	Death-rate.	Cases reported.	Deaths.	Death-rate.	Cases reported.	Deaths.	Death-rate.
Small-Pox ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Measles ...	...	31	1·1	...	3	0·1	...	4	0·1	...	3	0·10	...	41	0·36
Scarlet Fever ...	22	3	0·1	31	3	0·1	38	1	0·0	75	8	0·28	166	15	0·13
Diphtheria ...	4	...	...	7	2	0·0	7	2	0·0	24	4	0·14	42	8	0·07
Whooping Cough ...	...	28	1·0	...	35	1·2	...	16	0·5	...	...	...	...	79	0·70
Typhoid Fever ...	20	8	0·2	27	5	0·2	41	6	0·2	44	10	0·35	132	29	0·25
Diarrhœa ...	...	6	0·2	...	4	0·1	...	58	2·0	...	7	0·24	...	75	0·66

Table XIII. gives the total deaths and the death-rates of the seven zymotic diseases for each year during the six years (1883-1889) with the mean of the same :—

TABLE XIII.

Year ...	1883.		1884.		1885.		1886.		1887.		1888.		Mean of Six years.		1889.	
Estimated Population according to Registrar General	91,204		93,468		97,034		100,736		104,580		108,570				112,712	
Seven Chief Zymotic Diseases.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.
Small-Pox	1	0·010	8	0·085	2	0·020	1	0·009	11	0·105	4	0·036	4·3	0·044	...	...
Measles	11	0·120	83	0·888	198	2·040	17	0·168	62	0·592	108	0·994	79·5	0·800	41	0·363
Scarlatina	42	0·460	128	1·369	26	0·267	17	0·168	11	0·105	32	0·294	42·4	0·444	15	0·133
Diphtheria	22	0·241	35	0·374	39	0·402	14	0·139	20	0·191	8	0·074	23·0	0·237	8	0·070
Whooping Cough ...	68	0·745	31	0·330	118	1·216	46	0·456	47	0·449	54	0·497	60·1	0·615	79	0·701
Fever	35	0·383	34	0·363	39	0·402	73	0·724	17	0·162	36	0·331	39·0	0·394	30	0·258
Diarrhœa	74	0·811	157	1·679	99	1·020	164	1·624	110	1·051	82	0·768	114·2	1·159	75	0·665
Total ...	253	2·770	476	5·088	521	5·367	332	3·295	278	2·658	324	2·994	364·0	3·693	248	2·191

The following table shews the distribution of mortality from the seven chief zymotic diseases, from Phthisis, from diseases of the Respiratory Organs, and from Tuberculosis in each Street in the Borough during the year 1889:—

TABLE XIV.—CARDIFF NORTH.

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Diseases.	Tuberculosis.	Total.
Bedford Street ...	...	...	...	...	...	3	...	1	...	...	4
Cairn Street ...	...	1	...	...	1	...	3	2	1	...	8
Cathays Terrace ...	...	...	...	...	1	...	...	3	3	...	7
Cathedral Road ...	...	...	...	...	...	...	2	1	1	...	4
Castle Road	...	...	...	...	...	...	...	2	1	...	3
Coburn Street ...	...	...	...	...	1	...	...	1	1	1	4
Cowbridge Street ...	...	...	...	...	1	...	...	...	...	...	1
Cranbrook Street ...	...	...	...	...	...	...	...	...	2	...	2
Crwys Road	...	...	...	...	...	1	1	...	1	...	3
Dalton Street ...	...	...	...	...	...	...	...	...	1	...	1
Darron Street ...	...	...	...	...	...	...	...	...	1	...	1
Dumfries Place ...	...	...	...	...	...	...	...	...	1	...	1
East Grove	...	...	...	...	...	...	...	...	1	...	1
Fitzroy Street ...	...	...	...	...	...	...	...	...	1	...	1
Flora Street ...	...	...	...	...	...	...	...	1	3	1	5
Gordon Road ...	...	1	...	...	...	...	...	...	1	...	2
Harriet Street ...	...	...	...	...	...	...	1	1	1	...	3
Hirwain Street ...	...	...	...	...	...	...	...	...	1	...	1
Llantrissant Street...	...	...	...	...	...	...	...	1	3	...	4
Letty Street ...	...	...	...	...	...	...	...	2	...	...	2
May Street ...	...	...	...	...	...	...	2	...	3	...	5
Merthyr Street ...	...	...	...	...	...	1	...	1	2	...	4
Minny Street ...	...	...	...	...	...	...	...	...	3	...	3
Miskin Street ...	...	...	...	1	...	...	...	...	1	...	2
Munday Place ...	...	...	...	...	...	...	...	...	6	...	6
Mason's Arms Court ...	...	...	...	...	...	...	...	...	1	...	1
North Road	...	1	...	...	...	...	...	...	1	...	2
Park Grove	...	...	...	...	...	...	...	1	...	...	1
Queen Street ...	...	...	...	...	...	...	...	...	1	...	1
Russell Street ...	...	...	...	...	1	...	...	...	...	1	2
Richard Street ...	...	...	...	...	...	...	...	1	1	...	2
Salisbury Road ...	...	...	...	...	...	...	1	...	1	...	2
The Barracks ...	...	1	...	...	...	...	...	...	1	...	2
Treorky Street ...	...	...	...	...	...	...	...	1	1	...	2
Treherbert Street ...	...	...	...	...	...	...	...	1	...	...	1
Union Workhouse ...	...	...	...	...	1	2	3	45	13	1	65
Woodville Road ...	...	...	...	...	1	...	...	...	1	...	2
Total ...	...	4	...	1	7	7	13	65	60	4	161

CARDIFF SOUTH.

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Adam Street ...	...	...	...	...	2	...	...	...	1	...	3
Adelaide Street ...	...	...	...	...	...	...	...	2	1	...	3
Augusta Street ...	...	...	...	...	...	...	...	2	1	...	3
Baker's Row ...	...	...	...	...	1	...	...	...	2	...	3
Beauchamp Street ...	...	...	...	...	...	...	...	1	...	...	1
Bridge Street ...	...	...	...	...	...	...	...	1	1	...	2
Bute Street ...	...	3	...	...	...	1	2	3	5	...	14
Bute Terrace ...	...	...	...	...	...	...	...	1	1	...	2
Buzzard Street ...	...	...	...	...	...	...	...	2	...	...	2
Canal Street ...	...	...	...	...	...	...	1	...	...	...	1
Christina Street ...	...	...	...	...	...	...	1	1	2	...	4
Coldstream Terrace	...	...	...	...	...	...	...	...	1	...	1
Crichton Street ...	...	...	...	...	...	...	...	1	1	...	2
Dav.d Street ...	...	...	1	...	...	...	...	...	3	...	4
Davis Street ...	...	...	...	...	...	...	...	...	2	...	2
Dudley Street ...	...	...	...	...	...	...	...	...	2	...	2
East Street ...	...	...	...	...	...	...	...	...	2	...	2
East Terrace ...	...	...	...	...	...	...	...	1	...	...	1
Edwards Place ...	...	...	...	...	...	...	...	...	2	...	2
Edwards Terrace ...	...	1	...	...	...	...	...	...	...	...	1
Ellen Street ...	...	...	...	...	1	...	...	...	2	...	3
Eleanor Street ...	...	...	...	...	...	1	...	...	...	...	1
Evan's Court ...	...	...	...	...	1	...	...	...	1	...	2
Evelyne Street ...	...	...	...	...	...	...	...	...	2	...	2
Eisteddfod Street ...	...	...	...	...	...	...	...	2	1	...	3
Frederica Street ...	...	...	1	...	...	...	...	...	1	...	2
Frederick Street ...	...	...	...	...	...	...	1	...	2	...	3
Garth Street ...	...	...	...	...	3	...	...	...	1	...	4
Garth Court ...	...	1	...	...	...	...	...	...	...	...	1
George Street ...	...	...	...	...	...	...	...	1	2	...	3
Giles Court ...	...	...	...	...	...	...	...	...	1	...	1
Gloucester Street ...	...	...	...	...	...	...	1	1	2	...	4
Gough Street ...	...	...	...	...	...	...	2	...	2	...	4
Green Street ...	...	...	...	...	...	...	...	...	1	...	1
Hamilton Street ...	...	...	...	...	...	...	...	3	3	...	6
Havelock Street ...	...	...	...	...	1	...	...	3	1	...	5
Herbert Street ...	...	...	...	...	1	...	...	...	5	...	6
Hill's Terrace ...	...	...	...	...	...	...	1	2	1	...	4
Hodges Row ...	...	...	...	...	...	...	...	...	1	...	1
Hospital Ship ...	...	...	...	...	...	3	...	6	1	...	10
Ivor Street ...	...	...	...	...	...	...	...	...	1	...	1
Jenkin's Court ...	...	...	...	...	...	...	...	...	1	...	1
Loudoun Square ...	...	...	...	...	..	...	...	...	2	...	2
Louisa Street ...	...	...	...	...	...	...	...	...	2	...	2
Love Lane ...	...	...	...	...	...	...	...	...	1	...	1
Machen Street ...	...	...	...	...	...	...	...	1	...	...	1
Margaret Street ...	...	...	...	...	1	...	...	1	...	...	2
Maria Street ...	...	...	1	...	...	...	...	...	2	...	3
Mark Street ...	...	...	...	...	..	...	...	1	...	...	1
Mary Ann Street ...	...	...	1	...	1	..	...	2	5	...	9
Millicent Street ...	...	...	...	...	...	..	...	2	4	...	6
Moira Street ...	...	...	...	...	2	...	...	1	...	...	3
Moira Place ...	...	...	...	...	...	...	...	1	2	...	3
Mount Stuart Square	...	...	...	...	...	1	...	...	...	...	1
Nelson Street ...	...	...	...	...	...	...	..	1	...	...	1

CARDIFF SOUTH.—*Continued.*

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fevers.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Neville Street ...	...	...	...	...	1	...	...	...	1	...	2
Noah Street ...	...	...	...	...	...	...	...	...	1	...	1
North Church Street ...	...	...	...	...	...	...	...	1	...	...	1
North William Street ...	...	...	...	...	...	...	...	...	5	...	5
Plantagenet Street ...	...	...	...	...	...	1	...	1	...	...	2
Patrick Street ...	...	...	...	...	...	...	...	...	1	...	1
Pendoylan Street ...	...	...	...	...	...	...	...	...	2	...	2
Penarth Road ...	...	...	...	...	1	...	...	...	...	...	1
Pellet Street ...	...	...	...	...	1	...	...	...	...	...	1
Peel Street ...	...	...	...	...	...	...	...	...	2	...	2
Plasturton Street ...	...	...	...	...	...	...	...	1	1	...	2
Peters Court ...	...	...	...	...	...	...	...	...	...	1	1
Queen Street ...	...	...	...	...	...	...	...	1	1	...	2
Rawden Place ...	...	...	...	1	...	...	...	...	...	...	1
Rodney Street ...	...	...	...	...	...	...	...	...	2	...	2
Rosemay Street ...	...	...	...	...	...	...	...	1	...	...	1
Rowes Square ...	...	...	...	...	...	...	...	...	1	...	1
Ruperra Street ...	...	...	...	...	...	...	...	...	...	1	1
Sandon Street ...	...	1	...	...	...	...	...	...	...	...	1
Sandon Place ...	...	...	...	...	...	...	...	1	1	...	2
St. Mary Street ...	...	...	...	...	1	...	...	...	1	...	2
Scott Street ...	...	...	...	...	1	...	...	1	2	...	4
Sophia Street ...	...	1	2	...	1	...	...	...	...	...	4
South Church Street ...	...	...	...	...	...	...	...	1	...	...	1
South Luton Place ...	...	...	...	...	...	...	...	1	...	...	1
South William Street ...	...	...	...	...	...	...	1	...	3	...	4
Spring Garden Court ...	1	...	...	...	...	...	...	...	...	...	1
Stanley Street ...	...	...	...	...	1	...	...	1	2	...	4
Stuart Street ...	...	...	...	...	1	...	...	2	1	...	4
Taff Street ...	...	...	...	...	...	...	...	...	2	...	2
Talbot Street ...	...	...	...	...	...	...	...	2	...	...	2
The Hayes ...	...	...	...	...	...	...	1	...	...	...	1
Thomas Street ...	...	...	...	...	1	...	...	...	2	...	3
Tredegar Street ...	...	...	...	...	...	...	...	2	5	...	7
Tressillian Terrace ...	...	...	...	...	...	...	...	1	...	...	1
Tudor Road ...	...	...	...	...	...	1	2	1	...	...	4
Tyndall Street ...	...	...	...	...	2	1	...	5	2	...	10
Union Street ...	...	...	...	...	...	...	1	1	1	...	3
Union Building ...	...	...	...	...	1	...	...	1	1	...	3
Upper George Street ...	...	...	...	...	1	...	...	1	...	...	2
Victoria Street ...	...	...	...	...	...	...	...	...	1	...	1
Wellington Terrace ...	...	...	...	1	1	...	...	...	...	...	2
West Bute Street ...	...	...	...	...	...	...	...	...	1	...	1
West Church Street ...	...	...	...	...	...	...	...	1	...	...	1
West Canal Wharf ...	...	...	...	...	...	1	...	...	...	...	1
Windsor Terrace ...	...	...	...	...	...	...	...	...	1	...	1
Windsor Road ...	...	...	...	...	...	...	...	4	2	...	6
Wood Street ...	...	...	...	...	...	...	...	1	3	...	4
Total ...	...	10	6	2	28	9	14	75	125	2	270

ROATH NORTH.

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Alexander Street ...	...	...	...	...	...	...	...	1	...	...	1
Arabella Street ...	...	...	1	...	...	...	1	...	...	...	2
Beresford Road ...	...	...	...	...	1	...	1	...	...	...	2
Castle Road ...	...	...	...	...	...	...	...	...	1	1	2
Charles Street ...	...	...	...	...	...	...	...	...	1	...	1
Claude Street ...	...	...	...	...	...	...	...	...	...	1	1
Cotteral Road ...	...	...	...	1	...	...	...	...	1	...	2
Croft Street ...	...	...	...	...	1	...	...	...	...	...	1
Crwys Road ...	...	...	...	...	...	...	...	1	...	...	1
Cyfarthfa Street ...	...	...	...	...	...	...	...	2	1	...	3
Daniel Street ...	...	...	...	...	...	...	...	...	1	...	1
Donald Street ...	...	...	...	...	...	...	...	...	1	...	1
Elm Street ...	...	...	...	...	...	...	...	1	2	...	3
Glenroy Street ...	...	...	...	...	...	...	...	1	1	...	2
Gower Street ...	...	...	...	...	1	...	...	...	...	...	1
Inverness Place ..	...	...	1	...	...	...	...	...	...	...	1
Keppoch Street ...	...	...	1	...	...	...	1	...	2	...	4
Kingcraig Street ...	...	...	...	...	1	...	...	...	...	1	2
Lilly Street ...	...	...	...	...	...	...	...	...	1	...	1
Mackintosh Place ...	...	1	...	...	...	...	...	2	1	...	4
Milton Street ...	...	...	...	...	...	...	...	...	3	...	3
Moy Street ...	...	...	...	...	...	...	...	...	1	...	1
Newport Road ...	...	...	...	...	...	1	...	...	1	...	2
Norman Street ...	...	...	...	...	...	...	...	1	...	...	1
Partridge Road ...	...	...	...	...	1	...	1	...	...	1	3
Penylan Road ...	...	...	...	...	...	...	...	1	...	...	1
Robert Street ...	...	...	...	...	...	...	1	...	2	...	3
Rose Street ...	...	1	...	...	...	...	...	...	1	...	2
Ruthven Street ...	...	...	...	...	...	...	...	...	1	...	1
Shakespeare Street ...	...	...	...	...	...	...	...	2	...	...	2
Snipe Street ...	...	...	...	...	...	...	...	1	...	...	1
Treharris Street ...	...	...	...	...	1	...	...	1	2	...	4
Vere Street ...	...	...	...	...	1	...	...	1	...	...	2
Woodland Place ...	...	...	...	...	...	...	...	1	...	...	1
Totals ...	...	2	3	1	7	1	5	16	24	4	63

ROATH SOUTH.

Strects.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Adeline Street ...	...	1	1	...	...	...	2	...	...	...	4
Agate Street ...	...	...	...	...	...	...	...	...	1	...	1
Arthur Street ...	...	...	...	...	...	...	...	...	1	...	1
Ascog Street ...	...	...	...	...	...	...	...	...	1	...	1
Bertram Street ...	...	1	...	...	...	...	...	...	1	...	2
Blanch Street ...	...	...	...	...	1	...	...	...	2	...	3
Broadway ...	...	1	...	...	1	...	1	...	3	...	6

ROATH SOUTH.—*Continued.*

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Carlisle Street ...	...	...	...	...	...	...	...	1	3	...	4
Cecil Street ...	...	...	...	...	1	...	2	1	3	...	7
Clifton Street ...	...	...	...	...	...	...	...	1	4	...	5
Comet Street ...	...	...	...	...	1	...	...	...	2	1	4
Constellation Street ...	...	...	...	...	...	1	...	...	2	...	3
Cumnock Street ...	...	...	...	...	...	...	...	...	1	...	1
Cumrae Street ...	...	...	...	...	...	...	1	...	...	...	1
Coveny Street ...	...	...	...	...	...	...	...	...	1	...	1
Diamond Street ...	...	...	...	...	...	...	...	...	3	...	3
Emerald Street ...	...	...	...	...	1	...	...	1	...	...	2
Eyre Street ...	...	...	...	...	...	...	...	1	1	...	2
Fort Street ...	...	...	...	...	...	...	...	...	1	...	1
Gold Street ...	...	...	...	...	1	...	...	...	...	...	1
Gwendoline Street ...	...	...	...	...	...	...	...	...	2	...	2
Habershon Street ...	...	...	...	...	...	...	...	...	6	...	6
Harold Street ...	...	1	...	...	...	...	...	1	1	...	3
Helen Street ...	...	...	1	...	4	...	1	1	2	...	9
Howard Street ...	...	...	...	...	...	1	...	...	...	...	1
Infirmary Street ...	...	1	...	...	...	...	...	5	5	1	12
Iron Street ...	...	...	...	1	...	...	...	1	...	...	2
Janet Street ...	...	1	...	...	...	...	1	...	2	...	4
John Street ...	...	4	...	...	1	...	1	...	2	...	8
Killcatton Street ...	...	...	...	...	...	...	...	...	1	...	1
Lead Street ...	...	...	...	...	...	...	1	...	1	...	2
Maud Street ...	...	1	...	...	...	1	1	...	1	...	4
Marion Street ...	...	...	...	...	...	...	...	1	4	...	5
Metal Street ...	...	1	...	...	...	...	...	...	3	...	4
Meteor Street ...	...	...	...	...	1	...	...	...	...	...	1
Milford Street ...	...	...	...	...	...	...	1	1	2	...	4
Orbit Street ...	...	...	...	...	...	...	...	1	2	...	3
Ordell Street ...	...	...	...	...	3	...	...	1	3	...	7
Pearl Street ...	...	3	...	...	1	...	2	...	4	...	10
Piercefield Place ...	...	...	...	...	...	...	...	1	...	...	1
Platinum Street ...	...	...	...	...	...	...	...	...	2	...	2
Pontypridd Street ...	...	...	...	...	...	...	...	...	2	...	2
Railway Street ...	...	...	...	...	...	1	...	...	6	...	7
Richard's Terrace ...	...	...	...	...	...	1	...	...	1	...	2
Ruby Street ...	...	1	...	...	...	...	1	...	1	...	3
Sapphire Street ...	...	...	...	...	...	...	...	...	1	...	1
Sanquhar Street ...	...	...	...	...	...	...	...	1	...	...	1
Splott Road ...	...	1	...	...	...	...	...	...	1	...	2
Spring Garden Ter.	...	...	...	...	...	...	...	...	1	...	1
Stacey Road ...	...	...	...	...	...	...	1	...	1	...	2
System Street ...	...	1	...	...	...	...	...	1	1	...	3
Theodore Street ...	...	...	...	1	1	...	1	...	...	...	3
Topaz Street ...	...	...	...	...	...	...	...	1	2	...	3
Tyler Street ...	...	1	...	...	...	...	...	...	...	...	1
Walker's Road ...	...	...	1	...	...	...	...	...	1	...	2
Zinc Street ...	...	...	...	...	...	...	...	...	2	...	2
Total ...	...	19	3	2	17	5	17	21	93	2	179

CANTON NORTH.

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Carmarthen Street ...	...	...	...	...	...	...	1	...	1	...	2
Clive Road ...	...	...	...	...	1	...	...	...	...	...	1
Conway Road ...	...	...	...	...	...	...	...	...	...	1	1
Cowbridge Road ...	...	...	...	...	...	1	1	...	1	...	3
Daisy Street ...	...	...	...	...	...	...	1	...	3	...	4
Ethel Street ...	...	4	...	...	1	...	...	...	1	...	6
Gladstone Place ...	...	...	...	...	...	...	...	...	1	...	1
Glamorgan Street ...	...	2	...	...	...	...	...	1	2	...	5
Glynne Street ...	...	...	...	...	...	...	...	1	...	...	1
Halket Street ...	...	...	...	...	1	...	1	1	...	...	3
Harvey Street ...	...	...	...	...	...	...	...	...	1	...	1
Kings Road ...	...	...	...	...	...	...	...	1	5	...	6
Loftus Street ...	...	...	...	...	...	...	...	...	1	...	1
Market Road ...	...	...	...	...	...	...	...	...	1	...	1
Mortimer Road ...	...	...	...	...	...	...	...	...	3	...	3
Penypeel Street ...	...	...	...	1	...	...	...	...	1	...	2
Pembroke Road ...	...	...	...	...	...	...	...	1	1	...	2
Pencisely Street ...	...	...	...	...	...	...	...	...	1	...	1
Pontcanna Place ...	...	...	...	...	...	...	1	...	2	...	3
Radnor Road ...	...	...	...	...	...	...	...	...	1	...	1
Romily Road ...	...	...	...	...	...	...	1	...	...	...	1
Romily Crescent ...	...	...	...	...	...	...	1	1	2	...	4
Severn Road ...	...	...	...	...	1	1	...	2	1	...	5
Springfield Place ...	...	...	...	...	...	...	...	5	...	...	5
Stag Terrace ...	...	...	...	...	...	...	...	1	1	...	2
Thornhill Street ...	...	...	...	...	...	...	...	...	1	...	1
Union Street ...	...	...	...	...	1	...	...	2	2	...	5
Westbury Terrace ...	...	...	...	...	...	...	1	...	...	...	1
Wyndham Crescent...	...	...	...	...	...	...	...	...	4	...	4
Total ...	...	6	...	1	5	2	8	16	37	1	76

CANTON SOUTH.

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Diseases.	Tuberculosis.	Total.
Alexander Road ...	...	...	...	...	2	...	...	3	...	...	5
Blackstone Street ...	...	...	...	...	...	...	...	...	2	...	2
Chancery Lane ...	...	...	...	...	...	...	...	2	1	...	3
Commercial Street ...	...	...	...	...	...	...	...	1	...	...	1
Cowbridge Road ...	...	...	...	...	...	...	...	...	1	...	1
Craddock Street ...	...	...	...	...	...	...	...	...	5	...	5
De Croche Place ...	...	...	...	...	...	...	...	...	1	...	1
De Burgh Street ...	...	...	...	...	...	...	...	...	1	...	1
East Street ...	...	...	...	...	...	...	...	...	2	...	2
Edward Street ...	...	...	1	...	...	...	2	2	4	...	9
Eldon Road ...	...	...	...	...	...	...	2	2	1	...	5
Evan's Terrace ...	...	...	...	...	...	...	...	...	1	...	1
Heath Street ...	...	...	...	...	...	...	1	1	...	...	2
Littleton Street ...	...	...	...	...	...	...	...	...	1	...	1
Lewis Street ...	...	...	...	...	...	...	...	...	1	...	1
Leckwith Road ...	...	...	...	...	...	...	...	1	...	...	1

CANTON SOUTH.—*Continued.*

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Mansfield Street ...	...	...	...	...	...	...	1	...	...	...	1
Mandeville Place ...	...	...	...	...	...	...	...	...	...	1	1
Mary Ann Street ...	...	...	...	...	...	...	...	1	...	...	1
North Morgan Street	...	...	...	...	...	...	1	...	...	...	1
Penlline Street ...	...	...	...	...	...	...	...	...	1	...	1
Railway Terrace ...	...	...	...	...	...	...	...	...	2	...	2
Rennie Street ...	...	...	...	...	1	...	...	1	...	...	2
Rolls Street ...	...	...	...	...	...	...	1	...	3	...	4
St John's Crescent ...	...	...	...	...	...	...	...	1	...	...	1
Smeaton Street ...	...	...	1	...	...	...	...	...	...	...	1
South Morgan Street	...	...	...	...	...	...	1	1	...	...	2
Stephenson Street ...	...	...	...	...	1	...	...	...	...	...	1
Thomas Street ...	...	...	...	...	...	...	...	...	2	...	2
Wyndham Street ...	...	...	...	...	...	...	...	2	2	...	4
Wellington Street ...	...	...	...	...	1	...	1	2	2	...	6
Total ...	...	...	2	...	5	...	10	20	33	1	71

GRANGETOWN.

Streets.	Small-Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Phthisis.	Respiratory Disease.	Tuberculosis.	Total.
Allerton Street ...	...	...	...	...	...	...	...	...	1	...	1
Amherst Street ...	...	...	...	...	1	1	...	...	1	...	3
Bradford Street ...	...	...	...	...	...	...	...	...	1	...	1
Bedwas Street ...	...	...	...	...	...	...	...	...	1	...	1
Bishop Street ...	...	...	...	...	2	...	...	...	...	...	2
Bromfield Street ...	...	...	...	...	...	...	...	...	1	2	3
Bromsfield Street ...	...	1	...	...	...	...	...	...	...	1	2
Cambridge Terrace...	...	...	...	...	...	...	...	1	1	...	2
Clive Street ..	...	...	...	1	...	3	1	...	2	...	7
Cornwell Street ...	...	...	...	...	...	...	...	...	1	...	1
Court Road ...	...	...	...	...	...	...	1	1	2	...	4
Devon Street ...	...	...	...	...	...	...	...	...	1	...	1
Francis Street ...	...	...	...	...	2	...	...	...	...	...	2
Hewell Street ...	...	...	...	...	1	...	2	...	2	1	6
Havelock Street ...	...	...	...	...	...	...	1	...	1	...	2
Holmsdale Street ...	...	...	...	...	...	...	...	1	1	...	2
Knole Street ...	...	...	...	...	...	...	...	...	2	...	2
Lucknow Street ...	...	...	...	...	1	...	...	...	...	1	2
Ludlow Street ...	...	...	...	...	...	...	...	1	...	...	1
Mathews Terrace ...	...	...	...	...	1	...	...	...	...	...	1
North Clive Street ...	...	...	1	...	1	...	...	2	1	...	5
Oakley Street ...	...	...	...	...	1	...	1	...	1	...	3
Rudry Street ...	...	...	...	...	...	...	...	...	1	...	1
Rutland Street ...	...	...	...	...	...	..	...	...	2	...	2
Redlaver Street ...	...	...	...	...	...	...	1	...	...	...	1
St. Fagans Street ...	...	...	...	...	...	...	...	...	1	...	1
Sevenoak Street ...	...	...	...	...	1	...	...	2	1	...	4
Thomas Street ...	...	...	...	...	...	1	..	...	1	...	2
York Place ...	...	...	...	...	...	...	1	...	...	...	1
Total ...	...	1	1	1	11	5	8	8	26	5	66

SMALL-POX.—No deaths were registered from this disease during the year, and no cases occurred in the Urban Sanitary District.

SCARLET FEVER.—The 15 deaths registered as due to scarlet fever were equal to an annual death-rate of 0·13 per 1,000, as compared with 0·29, the rate in the preceding year, and with 0·44, the mean death-rate of the six previous years.

The deaths were distributed as follows :—

TABLE XV.

Sub-districts.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Year.
Cardiff ...	0	3	0	3	6
Roath ...	2	0	1	3	6
Canton ...	1	0	0	2	3
Total	3	3	1	8	15

The number of cases of this disease reported to me during the year amounted to 166, as compared with 151 in the preceding year.

The following table gives the death-rate and the number of cases reported during each quarter of the year :—

TABLE XVI.

	Death-rate per 1000.	Cases reported.
1st Quarter ...	0·1	22
2nd ,, ...	0·1	31
3rd ,, ...	0·0	38
4th ,, ...	0·2	75

WHOOPING COUGH.—There were 79 deaths registered from this disease during the year. The death-rate was 0·70 per 1,000, as compared with 0·49, that of the preceding year, and with 0·61, the mean death-rate of the six previous years.

Whooping Cough was prevalent during the first half of the year, but rapidly diminished in the latter half. No deaths were recorded from it during the fourth quarter.

MEASLES.—The total number of deaths from measles registered during the year was 41, giving a death-rate of 0·36 per 1,000, as against 0·80, the mean of the previous six years.

Twenty-nine of these deaths occurred in the month of January, and two in February, and were connected with the outbreak of measles which commenced in October of the previous year, and which caused altogether 128 deaths. In my report for that year I mentioned that I had advised the Sanitary Authority to use the power conferred on them by the Education Code, and to issue a written notice to the Managers of the Public Elementary Schools requiring them to close their schools from the 10th of December until the 7th January, 1889.

This advice was acted on, and at a meeting of the Town Council held in the early part of December, it was resolved to require the managers to close their schools for the above-mentioned period. I have now the satisfaction of recording the results of your action in this matter, and the influence which it had upon the epidemic.

The following table gives the distribution of this mortality from measles in the sub-districts of Cardiff during the outbreak :—

TABLE XVII.

	1888.			1889.		
	October.	November.	December.	January.	February.	March.
Cardiff, North ...	2	3	**7**	3	0	0
Do. South ...	5	6	4	5	2	0
Roath, North ...	0	4	1	2	0	0
Do. South ...	0	6	13	12	0	0
Canton, North ...	3	**7**	3	0	0	0
Do. South ...	2	10	15	6	0	0
Upper Grangetown ...	0	4	1	0	0	0
Lower Do. ...	2	8	1	1	0	0
Total ...	14	48	35	29	2	0

From the commencement every effort was made to check the spread of the disease by a careful inspection of the district, and by enforcing and advising the ordinary precautionary measures ; printed and verbal instructions were circulated, school masters were required to exclude from school children from infected houses, but, notwithstanding these endeavours towards the end of November, as many as 2,385 children were found absent from various schools, including in this number children suffering from measles, as well as healthy children belonging to infected households.

The disease continued to spread rapidly until the middle of December (the time of the closure of the schools), after which date it showed a decided and sudden decline in severity. The beneficial effect of this measure is seen in the immediate decline in the mortality.

The returns for the month of February show that only two deaths were registered from measles, as compared with 29 in the immediately preceding month ; moreover, on enquiry, I found that, with two exceptions, all the deaths which took place in January occurred amongst children who had contracted the disease before the closure of the schools.

But, perhaps, the most striking evidence of the influence of the closure is to be found in the returns of new cases of measles on the books of the District Medical Officers of the Cardiff Union. The returns are given below :—

TABLE XVIII.

Week ending	Cardiff.	Roath.	Canton.	Total.
November 25	10	17	6	33
December 2	3	7	10	20
,, 9	8	9	6	23
Total	21	33	22	76

The number of new cases reported during each week following the re-opening of the schools up to the week ending March 30th, is given below :—

TABLE XIX.

Week ending			Cardiff.	Roath.	Canton.	Total.
January	19	... ...	0	0	0	0
,,	26	... ...	0	0	0	0
February	2	... ...	3	0	0	3
,,	9	... ...	0	0	0	0
,,	16	... ...	0	0	0	0
,,	23	... ...	0	0	0	0
March	2	... ...	0	0	0	0
,,	9	... ...	0	0	0	0
,,	16	... ...	1	0	0	1
,,	23	... ...	0	0	0	0
,,	30	... ...	0	0	0	0
	Total	...	4	0	0	4

From these returns it will be seen that seventy-six cases were reported during the three weeks previous to the closure of the schools, compared with three during the three weeks following the opening, and that from that time up to the end of March no fresh cases came under the care of the District Medical Officers. Again, the information derived from the schools was instructive. During the week ending February 2nd, a list of absentees was obtained from every public elementary school in the district, and an enquiry made which resulted in the discovery of only four cases of measles amongst the 20,000 scholars of the various schools.

At the same time an inspection of the district was made and 1,362 houses visited, in which only five fresh cases of measles was found. This rapid decrease in the number of cases, following as it did so closely upon the closure of the schools, cannot, in my opinion, be accounted for by the natural decline of the epidemic, but may, I think, be rightly attributed to the more effectual separation of the sick from the healthy consequent upon the closure.

It may be useful to compare the results given above with what occurred in Cardiff in the year 1884–85, as shown by the number of deaths registered in each month during an epidemic of measles at that time, and when the Sanitary Authority, instead of closing the schools in accordance with the advice of their Medical Officer of Health, endeavoured to check the spread of the disease by other means. The following table gives the number of deaths in 1884–85, compared with that of 1888–89 :—

TABLE XX.

Months.	Deaths, 1884-85. Population, 107,034.	Deaths, 1888-89. Population, 122,141.
October	12	14
November	50	48
December	21	35
Total ...	83	97
January	73	29
February	42	2
March	39	0
April	23	0
May	13	0
June	8	0
Total ...	198	31
Total deaths during epidemic, 1884–85		281
,, ,, ,, 1888–89		128

I am aware that it is frequently stated that on the closure of the schools children will play together in the streets, and meet in houses, and that the epidemic will thus spread still more. Doubtless, under these circumstances, there is a probability of some infected children coming into contact with healthy ones, but the danger of spreading the infection must be infinitely greater when a large number of children are congregated together for hours in over-crowded and badly-ventilated schoolrooms. It must be borne in mind that measles is probably infectious in the early or catarrhal stage before it is recognised by anyone, so that with the most efficient supervision it is impossible to prevent children attending school who are really suffering from the premonotory symptons, and in a condition in which they are likely to disseminate the disease.

TYPHOID FEVER.—The 30 deaths registered from typhoid or enteric fever were equal to an annual death-rate of 0·25, as compared with 0·33, the rate in the preceding year, and with 0·39, the mean death-rate of the six previous years.

The deaths were distributed as follows :—

TABLE XXI.

Sub-districts.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Year 1889.
Cardiff ...	4	3	4	6	17
Roath ...	1	0	1	4	6
Canton ...	4	2	1	0	7
Total	9	5	6	10	30

Dividing the Sub-districts into North and South, the death-rate per 1,000 from typhoid fever was as follows :—

TABLE XXII.

Cardiff, North ... 0·34	Roath, North ... 0·33	Canton, North ... 0·41
,, South ... 0·30	,, South ... 0·70	,, South ... 0·79

The number of cases of this disease reported to me during the year amounted to 112, as compared with 114 in the preceding year.

The following table gives the death-rate and the number of cases reported during each quarter :—

TABLE XXIII.

	Death-rate per 1000.	Cases reported.
1st Quarter	0·2	20
2nd ,, ...	0·2	27
3rd ,, ...	0·2	41
4th ,, ...	0·3	44

From the above it will be seen that there was no marked incidence of the disease upon any particular area in the Borough, but that the greatest mortality occurred in the southern part of the town, where the aggregation of the population is greatest. The milk supply was inquired into, but there was no evidence that this article of diet was in any way connected with any of the cases. The water supply was pure and derived from the town mains. Most of the cases probably owed their origin to some sanitary defect in the dwelling of the patient.

DIARRHŒA.—Seventy-five deaths were registered during the year, giving a death-rate of 0·66 per 1,000, as compared with 1·16, the mean of the previous six years.

The deaths at ages were :—

TABLE XXIV.

	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
Under one year of age ...	5	3	53	5
One year and under five years ...	1	0	3	1
Five years and upwards ...	0	1	2	1
Total	6	4	58	7

From the above it will be seen that the majority of deaths were amongst infants under one year of age, and that they occurred during the third or summer quarter. The number of deaths from this disease during this quarter was 58, giving a death-rate of 2·0 per 1,000, as compared with 1·4, the rate of the corresponding quarter of 1888, with 3·0, the average rate in the third quarters of the preceding five years.

The average annual death-rate from diarrhœa in Cardiff during the summer quarters of the decennial period (1880–89) was 2·6, as compared with 2·5, that of the decennium (1872–81).

In the 28 large towns of England the diarrhœal death-rate was, for the same periods, 2·7 and 3·5 respectively.

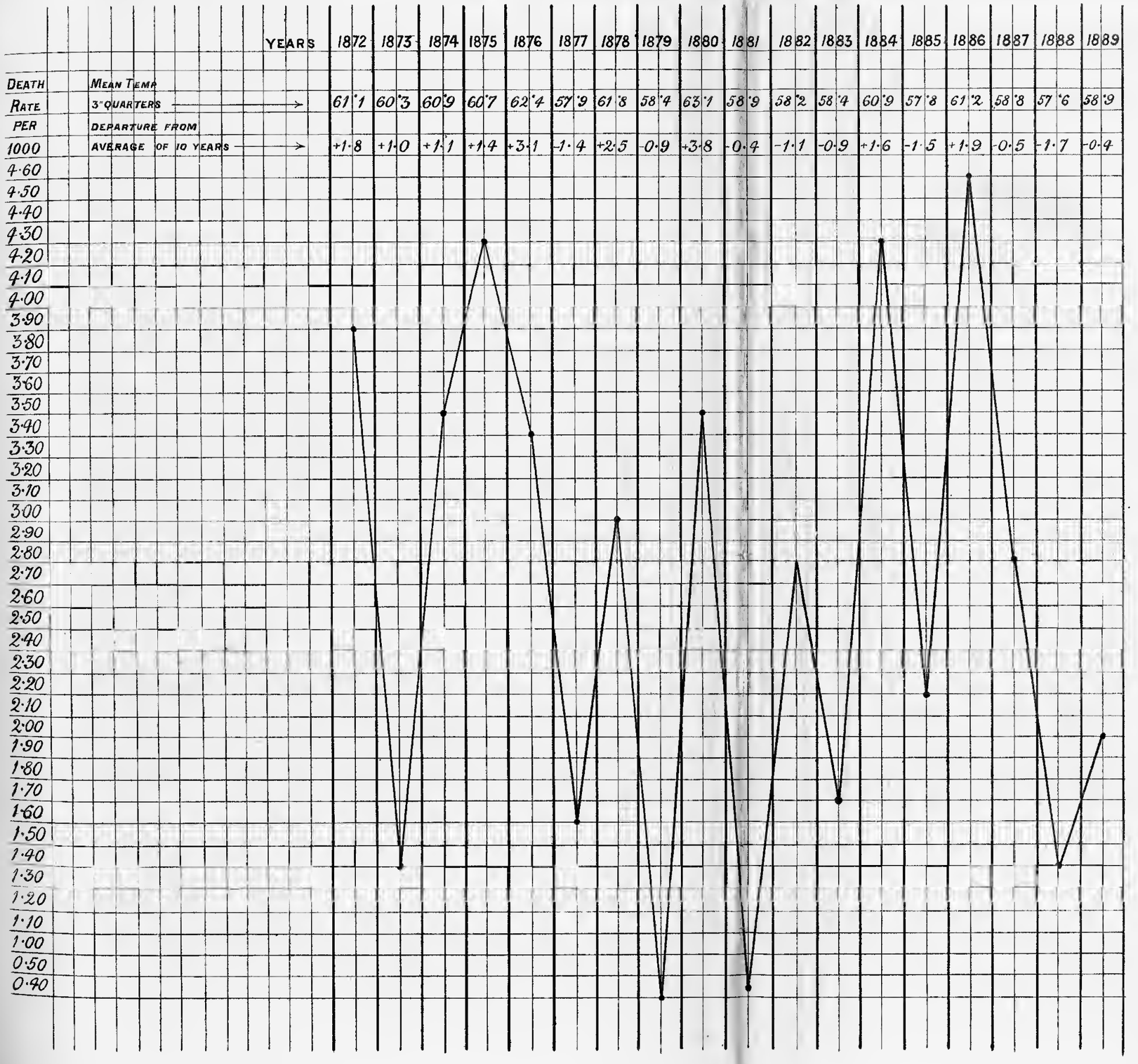
It will thus be seen that Cardiff has not shared in the general decline in the death-rate from this disease, which has taken place throughout the county. To a certain extent this may be accounted for by the fact that the proportion of infants in the population of this town is greater than formerly, whereas the proportion is smaller in the large urban districts than was formerly the case. The birth-rate in these districts has of late years progressively diminished, whilst that of Cardiff has steadily increased.

The etiology of this disease is of special interest to us, as this town was at one time noted for a high mortality from diarrhœal diseases. During the years 1847–54 the mean diarrhœal death-rate from diarrhœa was 17·5 per 10,000 of the population, then the highest rate in the Kingdom, Leicester, which has always obtained a bad pre-eminence in this direction, coming next with a death-rate of 16·0 per 10,000. During the succeeding period of 1859–66, that is subsequent to the carrying out of great sanitary works, the diarrhœal death-rate in Cardiff was reduced to 4½, whilst that of Leicester had risen to 19½ per 10,000.

In this country diarrhœa is still the most fatal of all the zymotic diseases, and indeed for children, with the two exceptions of convulsions and bronchitis it is the most frequently registered cause of death, and amongst children under five years of age its mortality is as much as one-tenth part of all other causes put together.

Many different views prevail as to its origin—teething, improper food, insanitary surroundings, certain conditions of soil and temperature, have all been considered as probable causes. There is much evidence to show that the mortality from diarrhœa is influenced by dampness and pollution of soil. The number of deaths from diarrhœa in towns which are naturally dry is much less than in towns situated on a wet soil. Some years ago, Dr. Buchanan, Medical Officer to the Local Government Board, very carefully investigated this subject, and demonstrated the fact that the diarrhœal death-rate is higher in those districts situated on a retentive geological formation, and that where much drying of the sub-soil has taken place in consequence of the drainage of the

Chart showing the influence of temperature on the diarrheal death-rate in Cardiff during the summer quarters of the years 1872-89.



district the diarrhœal death-rate has been lowered. A most important report has recently been published embodying the results of the comprehensive investigations of Dr. Ballard, of the Local Government Board. Dr. Ballard shows that the influence of soil on diarrhœal mortality is a decided one, and that the presence of much organic matter in any soil renders it distinctly more favourable to high diarrhœal mortality than it otherwise would be; that the mortality is apt to be high when dwellings are built upon made ground, the refuse of towns, or upon the sites of market gardens, or when the earth beneath and about dwellings is polluted by neighbouring collection of liquid filth. Even in small areas it is sometimes possible to notice the influence of the lower and damper parts of a district on the diarrhœal mortality. The Urban Sanitary District of Cardiff may be roughly divided into a northern part, of which the soil is a mixture of clay and gravel, more or less pervious in character, and a southern part, situated on a retentive alluvial clay. The mean annual death-rate from diarrhœa in the northern part for the years 1882–88 inclusive was 1·0 per 1,000, as compared with 1·2 in the southern part of the town. The extent of this influence, is not, however, easily estimated on account of the disturbance of the results by other causes; for instance, in the southern districts there is a large Irish community, amongst whom we find the diarrhœal death-rate exceedingly low. With regard to the meteorological conditions which influence the mortality from diarrhœa, it would appear that a mean temperature of the air above 60° Fah. predisposes to it, but the recent investigations of Dr. Ballard indicate that the influence thus exerted is indirect, and that the temperature of the earth is a far more important condition, the rise of the diarrhœal mortality commencing when the mean temperature recorded by the 4-ft. earth thermometer has obtained somewhere about 56° Fah.

The enclosed chart shows the influence of temperature on the diarrhœal death-rate in Cardiff during the summer quarters of the past eighteen years.

(See Chart.)

It will be seen that the rise and decline of the diarrhœal mortality coincide generally with the rise and decline of the mean temperature. It would seem, also, that certain other meteorological conditions influence the prevalence of this disease, and that when a hot and comparatively dry summer month follows a decidedly wet one diarrhœa prevails evtensively. This was, I think, first pointed out by the late Dr. Shea, of Reading, in his annual report for 1880. The following table shows this to be the case in Cardiff:—

TABLE XXV.

ANNUAL DEATH-RATE FROM DIARRHŒA, AND METEOROLOGICAL OBSERVATIONS IN CARDIFF DURING THE THIRD QUARTER OF THE YEARS 1876–89.

	1876.	1877.	1878.	1879.	1880.*	1881.	1882.*	1883.	1884.*	1885.	1886.*	1887.	1888.	1889.
Death-rate per 1,000.	3.4	0·6	3·0	0·6	3·5	0·8	2·8	1.7	4·3	2·2	4·6	2·8	1·4	2·0
Mean temp. in each month.														
July ...	66·2	58·7	64·2	59.2	61·6	62·1	60·1	58·4	59·8	63·1	63·0	64·6	58·1	60·8
August ...	63·5	61·2	63·0	60·1	68·2	58·7	60·2	60·0	63·1	59·1	62·9	60·2	58·9	59.5
September ...	57·6	54·0	58·1	55.8	59·6	56·0	54·3	56·9	59·8	51·3	57·6	51·7	55·8	56·7
Rainfall in inches in each month.														
July ...	1·43	4·53	2·01	4·00	6·64	2·62	5·77	3·56	4·05	0·72	4·85	1·51	6·83	3·85
August ...	5·79	6·74	1·82	8·12	0·77	6·94	6·75	2·09	2·21	2·74	1·68	2·88	3·50	3·90
September ...	6·14	3·58	3·21	4·85	3·67	2·09	3·94	6·14	1·96	6·51	3·08	4·07	1·21	2·09

Recent observations point very strongly to the conclusion that the essential cause of diarrhœa is a micro-organism, though the method in which the microbe operates remains to be decided. The investigations made from time to time in Cardiff shew that improper food is intimately associated with the disease, and that artificial feeding is one of the conditions principally concerned in its production. Amongst 395 fatal cases in the Borough in which the diet was inquired into, it was found that 6 only had been fed entirely from the breast, 352 on cows' milk, and the remainder on other kinds of food.

It is usually stated that artificial feeding amongst the Irish is extremely rare, and this statement is fully confirmed by my own enquiries. It will be of interest, therefore, as bearing upon this point, to compare the mortality amongst a purely Irish population with that of the mixed population of the entire town. This is possible in Cardiff, as certain streets are occupied solely by the Irish poor, and for this purpose I have taken a population of 2,000 living in these streets.

The following table gives the diarrhœal death-rate amongst this population compared with that of the entire town for the years 1883–89 inclusive :—

TABLE XXVI.

Years.	Diarrhœal Death-rate in U.S.D., Cardiff.	Diarrhœal Death-rate in Irish Streets.
1883	0·811	0·000
1884	1·679	0·500
1885	1·020	0·500
1886	1·624	0·500
1887	1·051	0·500
1888	0·768	0·000
1889	0·660	0·000

Summarising this table we find that the mean diarrhœal death-rate amongst the Irish population was 0·28, compared with 1·08, that of the entire town. These facts shew the comparative immunity from summer diarrhœa amongst the Irish, an immunity which may, I think, be attributed in great part to the custom which prevails amongst them of feeding their infants at the breast. Artificial feeding is, I believe, responsible for a great number of deaths from diarrhœa, but, as the same mode of feeding infants prevails more or less all the year round, the source of evil does not probaby lie in the food itself, but rather in the putrefactive or other obscure changes in the food caused by micro-organisms, which are developed only under certain conditions of soil and temperature.

From a consideration of the above-mentioned facts it would appear that a variety of causes operate in the production of infantile diarrhœa, and amongst the most important may be mentioned :—

(1) A continued mean temperature of the air above 60° Fah., and of the earth at a depth of 4-ft., above 56° Fah.

(2) An undrained, waterlogged soil, polluted with organic filth.

(3) A peculiar sequence of meteorological conditions, *i.e.*, a wet month followed by a hot dry one.

(4) The development, depending on and favoured by the above conditions, of micro-organisms, which are the essential causes of the disease, and which find a suitable nutrient material in the various foods given to infants, more especially in cows' milk.

It is obvious that some of these conditions are beyond our control, that some depend largely on the ignorance of the community, and that some are such as a Local Authority has power to deal with. To these latter conditions I would then beg to direct your attention. Amongst the most important agents in the production of this and some other diseases are the dampness and pollution of the soil on which dwellings are placed. The decomposition which goes on in a soil is owing to four factors, viz., the presence of decomposable organic matters (animal and vegetable), heat, air, and moisture. Professor Parkes states that dampness of soil may presumably affect the health in two ways—(1st) by the effect of the water *per se*, causing a cold soil, a misty air, and a tendency in persons living on such a soil to catarrhs and rheumatism; (2nd) by aiding in the evolution of organic emanations. These emanations are at present known only by their effects, they may be mere chemical agencies, but more probably they are low forms of life which grow and propagate in these conditions, at any rate moisture appears to be an essential element in their production.

The moisture in the soil is, of course, derived partly from the rain, to which no soil is absolutely impermeable, and partly from the ground water, which by its movement of rising and falling, and by evaporation and capillary attraction, makes the upper layers of soil wet. This subterranean sheet of water is at very different depths below the surface in different soil; this depends on the permeability of the soil, and the ease or difficulty of the outflow. The ground water may thus affect health by rendering the soil above it moist, either by evaporation or capillary attraction, or by alternate wettings and dryings. The importance of a dry soil as a site for human habitations, and the advantages which have already been gained in Cardiff by draining artificially the sub-soil, are well shewn in Dr. Buchanan's "Report upon the results of works for promoting public health" (Ninth Report of the Medical Officer of the Privy Council, 1866), by which it appears that the general death-rate in Cardiff has been reduced 24 per cent., and that the death-rate from diarrhœa has fallen from $17\frac{1}{4}$ to $4\frac{1}{2}$ per 10,000 in consequence of the extensive drainage works carried out in the district. These works, intended primarily for the discharge of excretal refuse, have acted accidentally in the double capacity of drains and sewers, and have drawn out the sub-soil water rising up within it while discharging the sewage they were originally intended alone to remove.

The advantages already gained should stimulate the Sanitary Authority to still further efforts in the same direction. In cases where building operations are undertaken on a particularly damp soil, it would be desirable to carry off the sub-soil water, and dry the soil by what is called under-drainage; and the houses erected on such soils ought to be well raised above the ground surface. The ground on which they are built should be covered with concrete, or some impervious material, so as to prevent damp or foul emanations rising into the house; in addition to this base of concrete a damp course should be inserted within the walls themselves, at a short distance above the natural ground line, and moreover, an uninterrupted circulation of air throughout the basement should be provided.

Notwithstanding the well-known beneficial influence of a drained and pure soil upon the public health we find in many towns, numerous instances in which waterlogged land on the banks of rivers are covered with dwellings regardless of the height of the sub-soil water, and of the impurities of the soil itself, and further, we find that the mortality from certain diseases increases in exact proportion as wetness prevails.

The following table gives the death-rate from constitutional, local, and developmental diseases, and from violent deaths, during the years 1883–89 inclusive:—

TABLE XXVII.

Year.	Class II.	Class III.	Class IV.	Class V.
	Constitutional Death-rate.	Local Death-rate.	Developmental Death-rate.	Violent Death-rate.
1883	3·102	9·210	2·741	1·293
1884	3·423	10·097	3·263	1·326
1885	4·122	10·924	3·091	1·184
1886	4·305	10·373	3·563	1·309
1887	3·203	10·384	3·442	1·400
1888	3·306	9·275	2·947	0·994
Mean of six years	3·576	10·043	3·174	1·251
1889	3·690	9·164	1·446	1·029

SANITARY CONDITION OF THE DISTRICT AND SUMMARY OF WORK PERFORMED BY THE OFFICERS OF THE HEALTH DEPARTMENT.

During the latter part of November I caused a careful survey of the town to be made, and obtained the following information, which I have every reason to believe to be correct. According to this return the population of Cardiff at that date may be estimated as follows:—

TABLE XXVIII.

Sub-District.	Houses Inhabited.	Houses Vacant.	Houses Building.	Total No. of Houses.	Population.
Cardiff (North)	3280	143	29	3454	20512
,, (South)	5247	190	44	5481	32793
Roath (North)	2373	70	74	2517	14831
,, (South)	3861	150	36	4047	24131
Canton (North)	1919	207	25	2150	11993
,, (South)	1655	86	2	1743	10343
Upper Grargetown ...	349	14	...	363	2181
Lower Grangetown ...	900	29	33	962	5625
Salt Mead	322	12	29	363	2012
Total ...	19908	901	272	21081	124421
Floating Population					7000
Total population ...					131421

The area of the Urban Sanitary District of Cardiff is as follows :—

TABLE XXIX.

Parishes of St. Mary and St. John	2,791
Parish of Canton	2,270
,, Roath	3,348
Total	8,409 or 13·13 sq. miles.

NEW HOUSES.—The yearly increase of houses is shown by the following returns obtained from Mr. W. Harpur, M.I.C.E., Borough Engineer and Surveyor.

Number of Houses and Shops built in the Borough during the last eight years :—

TABLE XXX.

From August 1881 to August 1882	686
,, ,, 1882 ,, 1883	980
,, ,, 1883 ,, 1884	1445
,, ,, 1884 ,, 1885	1345
,, ,, 1885 ,, 1886	1201
,, ,, 1886 ,, 1887	1226
,, ,, 1887 ,, 1888	1062
,, ,, 1888 ,, 1889	603
Total	8548

During the year the question of New Building Bye-laws has been under the consideration of your Public Works Committee. Regulations have been framed and forwarded to the Local Government Board for their approval. They correspond closely with the model code of bye-laws published under the authority of the Board, and contain many valuable provisions relating to the sanitary condition of new buildings.

INSPECTION OF THE DISTRICT.—In conformity with the Regulations of the Local Government Board, a systematic inspection of the district has been made by your Inspector of Nuisances, and a large number of sanitary defects in various parts of the town have been discovered and remedied.

Owing to the increase in the duties of these officials consequent upon the vast and rapid growth of the town, it became necessary to make some alteration in their duties. Your Chief Inspector of Nuisances, Mr. Vaughan, who formerly performed the combined duties of Inspector for the Urban and Port Districts, has recently resigned the latter appointment in lieu of which he undertook the duties of Inspector under the Sale of Food and Drugs Act, and also became Inspector of Dairies, Cowsheds, and Milkshops. This arrangement will, I believe, tend to the more efficient supervision of the Urban District, whilst the appointment which you have made of a new Inspector entirely for the Port will greatly facilitate the work of that district.

The following table gives the results of the house to house inspection made during the year:—

TABLE XXXI.—HOUSE INSPECTION.

CARDIFF, 1889.

Name of Street.	Number of Houses inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting escape of Sewer Gas.	Scullery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Bridge Street	63	16	...	15	4	1	...	63	8
Bedford Place	8	3	...	1	...	...	...	8	2
Bute Street	106	13	4	12	2	...	...	60	5
Castle Court	7	...	...	...	...	...	...	7	...
Cathays Terrace	59	14	...	1	...	...	...	59	4
Castle Road	76	14	2	3	3	...	...	76	15
Cairn Street	185	80	6	4	9	...	...	185	32
Canal Bank	9	...	...	...	...	...	...	...	4
Canal Parade	28	...	3	2	1	...	...	26	6
Crwys Road	91	1	3	...	5	...	...	30	11
Duffryn Street	20	...	...	2	1	...	...	20	6
David Street	31	1	...	3	...	...	...	31	1
Dews Court	7	...	2	1	1	...	...	7	3
Ellen Street	35	1	4	3	2	...	...	35	6
Frederick Street	98	5	...	12	5	...	...	92	2
French Cottages	4	...	...	...	...	...	...	4	...
Frederica Street	49	2	5	1	2	...	...	49	4
Garth Street and Court ...	32	...	3	...	1	...	...	32	3
George Street	112	2	4	3	7	...	...	112	15
Herbert Street	34	...	4	3	2	...	...	34	7
John Street and Lane ...	22	...	...	1	...	...	...	22	6
Love Lane and Court... ...	31	3	...	2	1	...	...	31	...
Mary Ann Street	40	1	4	3	2	...	...	40	7
Pellett Street	24	2	...	4	...	...	...	24	5
Pendoylan Street	30	1	4	3	3	...	...	30	4
Rodney Street	18	...	2	...	1	...	...	18	6
Russell Street	49	2	1	...	4	...	...	49	11
Stanley Street	31	2	1	4	1	...	...	31	1
The Tunnel	11	...	2	3	...	...	...	11	3
Tyndall Street	52	2	5	7	3	...	...	52	7
Thesiger Street	64	3	5	...	2	...	...	64	5
Treorky Street	27	...	2	...	3	...	...	27	7
Total ...	1453	168	66	93	65	1	...	1329	196

ROATH, 1889.

Name of Street.	Number of Houses inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Scullery Sinks connected direct with Drain.	Inside Closets not Ventilated.	Closets not supplied with Water.	Other Nuisances.
Agate Street	16	...	2	...	...	...	...	16	3
Arthur Street	37	1	4	2	2	...	...	37	3
Adeline Street	83	2	4	...	3	...	...	83	6
Blanch Street	48	1	3	2	...	...	...	48	7
Bertram Street	63	1	5	2	3	...	...	63	4
Booker Street	14	...	2	...	...	...	...	14	3
Cycle Street	29	1	...	...	3	...	...	29	4
Charles Street	42	2	1	...	6	...	...	42	6
Church Terrace	5	...	...	...	...	1	...	...	2
Clive Street	49	...	4	...	3	...	...	49	7
Crwys Road	35	1	3	2	4	...	...	35	8
Daniel Street	61	1	1	1	1	...	...	61	24
Florenza Street	16	...	...	1	...	...	...	16	7
Helen Street	79	2	3	5	6	...	...	79	27
Harold Street	50	1	3	...	4	...	...	50	7
John Street	74	...	1	3	2	...	...	74	21
Lily Street	29	...	2	1	...	...	...	29	4
Lucas Street	5	...	1	...	2	...	...	5	...
Milton Street	62	4	3	...	6	...	...	62	8
Moy Road	26	...	2	1	3	...	...	26	4
Oakfield Street	69	2	...	...	...	...	...	...	1
Pearl Street	186	3	7	2	11	...	...	186	33
Partridge Road	87	2	...	...	...	...	...	...	...
Robert Street	60	...	2	1	1	...	...	60	26
Railway Street	142	2	5	3	5	...	...	131	15
Rose Street	47	...	3	...	5	...	...	47	5
Stacey Road	92	2	1	...	...	...	...	32	...
Shakespeare Street ...	88	1	3	...	4	...	...	88	11
Tyler Street	16	...	1	...	...	2	...	16	4
Woodland Place	10	2	...	...	2	2	...	2	3
Woodville Road East ...	35	...	1	3	5	...	...	35	7
Walker's Road	24	...	3	1	4	...	...	24	3
Total ...	1679	31	70	30	85	5	...	1439	263

CANTON, 1889.

Name of Street.	Number of Houses inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Scullery Sinks connected direct with Drain.	Inside Closet not Ventilated.	Closets not supplied with Water.	Other Nuisances.
Ethel Street	165	5	...	3	...	...	...	165	24
Fitzhammond Embankment ...	27	10	...	...	...	...	...	27	2
Fern Street	4	...	...	...	...	...	...	4	...
Harvey Street	35	1	...	1	4	...	...	35	8
Halket Street	52	...	...	1	...	...	...	52	18
Ivy Street	20	...	...	...	...	...	...	20	1
Kingston Court	10	...	...	...	...	...	...	...	...

CANTON, 1889.—*Continued.*

Name of Street.	Number of Houses inspected.	Defective Drains	Choked Drains.	W.C. Pans and Syphons Defective	Defective Stench Traps permitting an escape of Sewer Gas	Scullery Sinks connected direct with Drain	Inside Closets not Ventilated	Closets not supplied with Water	Other Nuisances.
Loftus Street	36	3	1	1	...	...	...	36	2
Llanfair Road	12	...	...	...	...	...	...	12	...
Mortimer Road	46	3	1	2	2	...	...	46	11
Mary Ann Street	12	...	...	...	...	...	...	12	...
Mark Street	34	10	...	2	...	3	...	34	3
Picton Place	44	...	...	...	2	...	...	44	8
Pontcana Place	23	...	...	...	1	...	...	23	9
Row Square	26	...	...	...	...	...	...	26	..
Romily Crescent	41	2	...	...	...	6	...	41	1
Stag Terrace	13	2	6	...	...	...	...	13	1
Union Street	60	4	1	6	...	...	...	60	7
Union Building	21	...	1	1	...	...	...	9	5
Wellington Street	139	12	...	2	9	1	...	139	15
Wyndham Street	62	1	1	2	1	1	...	62	5
Westbury Terrace	20	1	...	1	...	...	...	20	3
Allerton Street	27	...	...	...	...	...	...	27	...
Court Road	33	...	...	...	...	...	...	33	3
Devon Street	24	...	...	1	...	...	...	24	2
Devon Place	11	...	...	...	...	...	...	11	2
Dorset Street	23	...	...	...	...	...	...	23	3
Hereford Street	12	...	...	...	...	...	...	12	1
Rutland Street	26	...	...	...	...	...	...	26	3
Warwick Street and Place ...	29	...	...	...	...	...	...	29	...
Bedwas Street	13	2	...	...	...	...	...	13	4
Bishop Street	19	...	1	...	...	...	...	19	5
Holmesdale Street	86	2	1	4	5	...	...	86	6
Lucknow Street	11	...	...	2	...	...	...	11	3
Machen Street	8	...	...	...	1	...	...	8	2
North Clive Street	72	...	1	2	5	...	...	72	6
Rudry Street	10	...	...	...	...	...	...	10	...
Rookwood Street	17	...	...	1	...	...	...	17	3
Tynant Street	26	...	...	...	...	...	...	26	...
Thomas Street	45	3	1	3	1	...	...	45	10
Total ...	1394	61	15	35	31	11	...	1372	176

A glance at the above record of sanitary defects shows that many of the nuisances which the Sanitary Inspectors have had to deal with were caused by imperfections in the original construction of the dwellings. In these cases, owners have been called upon to make the necessary structural alterations, in others the occupier has been required to abate the nuisance. These systematic inspections which have been carried on during the past few years have thus effected a very material improvement in the district. The necessity for improving the sanitary condition of the dwellings of the labouring classes has recently been brought to your notice by the Right Hon. C. T. Ritchie, President of the Local Government Board, who has addressed the following important letter to you upon this subject :—

Local Government Board, Whitehall, 2nd December, 1889.

SIR,—The Local Government Board have had under their consideration the great and pressing question of the housing of the labouring classes. They cannot avoid the conclusion that a large number of the working population of this country are at present housed in tenements, which are either unfit for human habitation, or in such a condition as to be distinctly prejudicial to the health of the inmates. There can be no doubt of the gravity of the evils which result from the insanitary condition of the dwellings of the poor, or of the ability of sanitary authorities, by a strenuous and judicious exercise of the powers which the Legislature has conferred on them for this purpose, to effect a very material improvement in the present condition of these dwellings. The Board deem it right, therefore, again to bring specially under the attention of sanitary authorities the duties which are imposed on them by the Housing of the Working Classes Act, 1885, and the very large statutory powers which they possess in relation to this matter.

Section 7 of the Act in question, which was enacted in accordance with a recommendation contained in the report of the Royal Commission on the Housing of the Working Classes, expressly declares that it shall be the duty of every local authority entrusted with the execution of laws relating to public health and local government, to put in force, from time to time as occasion may arise, the powers with which they are invested, so as to secure the proper sanitary condition of all premises within the area under their control.

Every sanitary authority has the power under the Public Health Act, 1875, of taking summary proceedings for the closing of houses unfit for human habitation, and for the abatement of overcrowding in any house in their district. As the sanitary authority are aware, that Act in express terms declares that it shall be the duty of every sanitary authority to cause to be made from time to time inspection of their district, with a view to ascertain what nuisances exist calling for abatement, and to enforce the provisions of the Act for the purpose of securing the abatement of nuisances.

The word "nuisance" includes "any premises in such a state as to be a "nuisance or "injurious to health," and "any house or part of a house so overcrowded as to be dangerous or "injurious to the health of the inmates, whether or not members of the same family."

If after notice from the sanitary authority a nuisance is not abated, or if after notice it is abated, but is, in the opinion of the authority, likely to recur on the same premises, it is their duty to institute proceedings before justices. The justices are empowered by their order to require the person on whom the order is made "to comply with all or any of the requisitons of the notice or "otherwise to abate the nuisance within a time specified in the order, and to do any works "necessary for that purpose." They may also make an order prohibiting the recurrence of the nuisance, and directing the execution of any works necesary "to prevent the recurrence"; or they may make an "order both requiring abatement and prohibiting the recurrence of the nuisance." By the order the justices may impose a penalty not exceeding £5 on the person on whom the order is made.

If in the judgment of the justices the nuisance is such as to render the house unfit for human habitation, they may prohibit its being used for that purpose until it is rendered fit for habitation, and in that case the house may not be let or inhabited until by a further order the justices have declared that it is habitable. A person not obeying an order for abatement, if he fails to satisfy the justices that he has used all due diligence to carry out the order, is liable for every such offence to a penalty not exceeding 10s. per day during the default, and a person knowingly or wilfully acting contrary to an order of prohibition is liable to a penalty not exceeding 20s. per day during such contrary action. And in the case of such default the authority may enter the premises to which the order relates, and abate the nuisance, and do whatever may be necessary in execution of the order, charging the cost to the person on whom the order is made.

When two convictions in respect of the overcrowding of the same premises have taken place within a period of three months, whether the persons convicted were or were not the same, the justices may order the closing of the house for such time as they may deem necessary.

The above provisions have been found in practice to afford a simple and comparatively inexpensive means of procedure, by which a sanitary authority can, in gross cases of sanitary neglect, compel landlords either to make their houses fit for human habitation or to close them; and by which the overcrowding of houses in such a manner as to be dangerous or prejudicial to the health of the inmates can be prevented.

In addition to these powers, section 90 of the Public Health Act, 1875, as amended by section 8 of the Housing of the Working Classes Act, 1885, enables every sanitary authority to make bye-laws, enforceable by penalties, for the registration and regulation of houses let in lodgings or occupied by members of more than one family, for preventing overcrowding therein, and for securing their being kept in a clean and wholesome state. The Act also contains provisions

prohibiting, except in the exceptional cases therein mentioned, the occupation of cellar dwellings; and conferring on sanitary authorities wide powers of regulation and control as regards common lodging-houses.

Apart, moreover, from the Public Health Act, 1875, numerous Acts of Parliament have from time to time been passed, with special reference to the housing of the labouring classes, which have largely increased the powers of sanitary authorities for dealing with this important question. For example, under the Artizans' Dwellings Acts, 1868 to 1885, usually known as Torrens' Acts, urban sanitary authorities are enabled not only to secure the improvement or demolition of houses which are "in a state dangerous to health, so as to be unfit for human habitation," but also to deal with any "obstructive building," *i.e.*, a building which, although not in itself unfit for human habitation, is so situated that, by reason of its proximity to other buildings, it stops ventilation or otherwise makes or conduces to make such other buildings to be in a condition unfit for human habitation, or prevents proper measures from being carried into effect for remedying the evils complained of in respect of such other buildings.

Under these Acts it is the duty of the Medical Officer of Health to report in writing to the urban sanitary authority any premises in the district coming under either of the above descriptions; and the authority are required to refer this report to a surveyor or engineer, for the purpose of ascertaining, in the case of any house alleged to be unfit for human habitation, whether the causes of the evils complained of can be remedied by structural alterations and improvements, or whether the premises ought to be demolished, and, in the case of a building reported to be an "obstructive building," whether the surveyor or engineer corroborates the statements of the Medical Officer of Health, and what, in his opinion, will be the probable cost of acquiring the lands on which the building is erected and of pulling down the building. In the former case, if the surveyor or engineer reports that the evils complained of can be remedied by structural alterations or improvements, the sanitary authority may require the owner to execute them, and on default they may order the closing or the demolition of the premises, or may themselves execute the necessary works at the expense of the owner. On the other hand, if the report of the engineer or surveyor is to the effect that the premises should be demolished, they may order the demolition of the premises, and on default of the owner, may themselves take down and remove them. In the case of an "obstructive building," the reports of the Medical Officer of Health and of the surveyor or engineer must be taken into consideration by the sanitary authority; and if the authority decide to adopt them, they may require the demolition of the building. In that event, if the owner elects to retain the site, they must pay compensation for the demolition. Otherwise they may themselves purchase the site.

Further large powers for dealing with insanitary dwellings are conferred on all urban sanitary authorities by the Artizans' and Labourers' Dwellings Improvement Acts, 1875 to 1885, commonly known as Cross's Acts. The objects of these Acts are described in the premable to the Act of 1875, which recites that various portions of many cities and boroughs are so built, and the buildings thereon are so densely inhabited, as to be highly injurious to the moral and physical welfare of the inhabitants: that there are in such areas a great number of houses, courts, and alleys, which, by reason of the want of light, air, ventilation, or of proper conveniences, or from other causes, are unfit for human habitation, and fevers and diseases are constantly generated there, causing death and loss of health, not only in the courts and alleys, but also in other parts of such cities and boroughs: that it often happens that, owing to the above circumstances, and to the fact that such houses, courts, and alleys, are the property of several owners, it is not in the power of any one owner to make such alterations as are necessary for the public health: and that it is necessary for the public health that many of such houses, courts, and alleys, should be pulled down, and that such areas should be re-constructed, and that, in connexion with the re-construction of those areas, it is expedient that provision be made for dwellings for the working class who may be displaced in consequence thereof. These Acts are, in fact, intended to enable urban sanitary authorities to deal on a large scale with similar evils to those with which Torrens' Acts are designed to cope on a small scale, and to afford a remedy in cases where the mischief to be cured is not such as can be effectually met by proceedings against individual owners in respect of particular houses, but where what is required is a complete scheme for the re-arrangement and re-construction of the streets and houses.

Lastly, by the Labouring Classes Lodging Houses Acts, 1851 to 1885, which may be adopted by any urban sanitary authority for their district, in accordance with section 10 of the Public Health Act, 1875, urban sanitary authorities are empowered, themselves, to provide "lodging-houses for the labouring classes," which expression is to be deemed to include separate houses or cottages for the labouring classes, whether containing one or several tenements. With this object they may purchase or rent land, and on such land erect buildings suitable for lodging-houses for the labouring classes, and convert any buildings into lodging-houses for those classes, and may alter, enlarge, repair, and improve the buildings, and may fit up, furnish, and supply them with the requisite furniture, fittings, and conveniences. They may also contract for the purchase or lease of any lodging-houses for the labouring classes in their district, and may appropriate the houses to the purposes of the Acts, with such additions or alterations as they deem necessary.

It will be seen from the foregoing statement with what large powers urban sanitary authorities have been invested by the Legislature with a view to enabling them to improve the sanitary condition of the dwellings of the labouring classes. These powers have been entrusted to the sanitary authority, in order that they may be exercised for the protection of the poor, who are unable themselves, for the most part, to enforce the observance of the laws relating to the public health by their landlords. I have most urgently to impress upon the sanitary authority the grave responsibility which they incur if they neglect to put these powers in force in any case in which their exercise may be required in consequence of the insanitary condition of any dwellings in their district.

I am, Sir,

Your obedient Servant,

CHAS. J. RITCHIE.

The Clerk of the Urban Sanitary Authority.

THE NOTIFICATION OF INFECTIOUS DISEASES.—During the last Session of Parliament the Infectious Disease Notification Act became law. By this Act the immediate notification of cases of infectious disease to the Medical Officer of Health by the medical attendant, and the head of the family or occupier, became compulsory in London after October 30th, 1889, and within the districts of such other Sanitary Authorities throughout England, Wales, Scotland, and Ireland as formally adopt the Act. As this important Act has been adopted by the Urban and Port Sanitary Authorities of Cardiff in their respective districts, and came into operation on December 16th, 1889, it may be desirable to give an abstract of its provisions, and a short summary of the method which I have adopted for carrying them into effect. I may state that I had no hesitation in advising you to avail yourselves of the power which has been conferred upon you of adopting the provisions of the Act, as I believe they will materially assist in checking the spread of infectious diseases in your district, by enabling your officers to obtain early and accurate information in respect to the cases of these diseases; I was, moreover, aware that this course would be agreeable to the wishes of the general body of medical practitioners in the town, whose cordial co-operation and support will be necessary in order to carry out successfully any plan of notification. I may here, also, take the opportunity of expressing my thanks to the members of the medical profession for the very valuable assistance they have rendered me by voluntarily notifying cases of infectious disease during the past year.

Section 3 of this Act provides that where an inmate of any building used for human habitation is suffering from an infectious disease to which the Act applies :—

(a) The head of the family to which such inmate belongs, and in his default the nearest relatives of the patient present in the building, or being in attendance on the patient, and in default of such relatives, every person in charge of or in attendance on the patient, and in default of any such person the occupier of the building shall, as soon as he becomes aware that the patient is suffering from an infectious disease to which the Act applies, send notice to the Medical Officer of Health for the District.

(b) Every medical practitioner attending on or called in to visit the patient, shall forthwith, on becoming aware that the patient is suffering from infectious disease to which the Act applies, send to the Medical Officer of Health a certificate stating the name of the patient, the situation of the building, and the infectious disease from which in the opinion of such medical practitioner the patient is suffering. Every person required by this section to give a notice or certificate who fails to give the same will be liable to a fine of not exceeding forty shillings.

The Local Government Board has issued an order prescribing the form of certificate required by the Act to be sent to the Medical Officer of Health by the medical practitioner, and forms of the certificates are gratuitously supplied by the Sanitary Authority. The authority must pay to such medical practitioner for each certificate duly sent by him in accordance with the Act a

fee of two shillings and sixpence if the case occurs in his private practice, and of one shilling if the case occurs in his practice as medical officer of any public body or institution. The infectious diseases to which the Act applies will in all case include the following:—Small-pox, cholera, diphtheria, membranous croup, erysipelas, scarlet fever, and the fevers known by any of the following names:—Typhus, typhoid, enteric, relapsing, continued, or puerperal. The local authority may from time to time order that the Act shall apply to any infectious disease other than the above.

It will be observed that the new Act prescribes the dual form of notification, that is, notication by the medical attendant and householder independently, but for all practical purposes the sanitary officers will depend upon the medical notification, as it will probably be a long time before the householder becomes accustomed to the strange and unfamiliar duty of notifying. No special form of notice has been prescribed by the Act in the case of the householder, therefore, any sufficient, written or even verbal, information would be accepted in his case.

For the present, doubtless, much of the value of this notification will be lost, as the chief object of its adoption cannot be attained until proper facilities for hospital isolation exist in the district. Experience teaches us that the attempts at isolation in the small houses of the poor are utterly useless as a preventive measure. This is particularly the case with respect to scarlet fever in the later period of desquamation, when the patient is apparently well, and the necessary restrictions have become irksome. Notwithstanding the most explicit printed and verbal cautions, I have on numerous occasions found patients freely exposing themselves to the public during the desquamation stage of the disease. On visiting infected houses the door has occasionally been opened to me by the patient in this condition. In some of these cases I advised that proceedings should be taken under the provisions of the Public Health Act, but it was found in each instance that the evidence was not of such a character as to render a conviction probable. The proceedings were therefore abandoned.

With a view of obtaining a record of the particulars connected with each case notified under the Act, I have adopted the following plan. Your Medical Officer of Health, or his assistants visit the premises with as little delay as possible and make inquiries respecting the history of the case, and take such steps as may be necessary for limiting the spread of the disease. In each case report sheets are filled up of which the subjoined are samples:—

ENTERIC, OR TYPHOID FEVER.

Dates of enquiry.	Whence is the supply of Water derived?
Notified by.	Whence is the supply of Milk derived?
Name, Age, and Occupation of Patient.	The Washing and Mangling, where and by whom done?
Residence.	Name and Residence of any Visitor from where Disease exists.
Date of first Symptoms.	Sanitary condition of Dwelling and immediate neighbourhood, probable origin of Disease.
Date and Address of any recent case in same Street.	

SCARLET FEVER.

Dates of enquiry.	Has Child within one week been to School, Church, or other Assembly, or visited any infected house, if so, when and where?
Notified by.	Date and Address of any recent case in same Street.
Name, Age, and Occupation of Patient.	The Washing and Mangling, where and by whom done?
Residence.	Whence is the supply of Milk?
Date of first Symptons?	Sanitary condition of Dwelling, remarks and probable origin of Disease.

—From these sheets the most important particulars are copied into a register of cases, each particular disease having its own book. From this register it is easy at a glance to ascertain any factor

common to several cases, and to trace the relation of the disease to the particular locality in which it occurs. This systematic register is valuable in proportion to its completeness, and it is necessary continually to impress upon the inspectors who visit the houses the importance of practising the greatest exactness and caution. Printed instructions in the following form are left at the infected houses :—

PRECAUTIONS TO BE OBSERVED RESPECTING SCARLET FEVER.

1. If the case is pronounced to be Scarlet Fever, the children in the house should be prevented from attending school or associating with other children. No child should be allowed to re-enter school without a medical certificate.
2. The patient should be isolated by being placed, if possible, in a well-ventilated room at the top of the house; all carpets, curtains, and unnecessary furniture should be removed from the rooms.
3. Fresh air should be freely admitted through the whole house by means of open windows and doors, and into the sick room by opening the upper sash of the window; the fire-place should be kept open and a fire lighted, if the weather permit.
4. A sheet should be hung up outside the door of the sick room and kept wet with a mixture made with a quartet-pint of Carbolic Acid (No. 4) and a gallon of water, or some other recognised disinfectant.
5. All bed and body linen as soon as removed from the sick person, and before being taken from the sick-room, should be first put into a solution of Carbolic Acid, of the above-named strength, or into some other disinfectant, remaining there for an hour, and afterwards boiled in water.
6. Persons attending the sick room should wear dresses of cotton or of some washable material and no other persons should be admitted into the room.
7. No child should be permitted to attend school or to associate with other children for at least six weeks after the attack.
8. The scales or dusty powder which peel from the skin in Scarlet Fever being highly infectious, their escape may be prevented by smearing the body of the patient all over every day with Camphorated Oil, this, and the use of warm baths and Carbolic Acid Soap are most essential.
9. All infected clothing and bedding may be given to the Sanitary Inspector, who will cause them to be removed to the disinfecting apparatus free of charge, after which it may be thoroughly washed at home. Clothing should not on any account or under any pretence whatever be sent to the laundress.

ATTENTION IS PARTICULARLY DIRECTED TO THE FOLLOWING PROVISIONS OF THE PUBLIC HEALTH ACT IN REFERENCE TO INFECTIOUS DISORDERS.

1. If any person suffering from any dangerous infectious disorder should enter a cab or other public conveyance without informing the driver thereof that he is so suffering he shall be liable to a penalty not exceeding £5.
2. Persons exposing themselves or those in their charge in any Public Place or vehicle whilst suffering from an infectious disease are liable to a penalty of £5.
3. Any person who lets a house, room, or part of a house in which there has been an infectious disease, without having such house or room and all articles liable to infection disinfected to the satisfaction of a qualified Medical Practitioner, is liable to a penalty not exceeding £20.
4. If any person who lets or shows for hire any house, or part of a house, make any false statement as to the fact of there being then in such house, or having within six weeks previously been therein, any person suffering from an infectious disease, such person answering falsely shall be liable to imprisonment with or without hard labour or to a penalty not exceeding £20.
5. Any person who lends, gives, sells, transmits, or exposes any bedding, clothing, rags, or other things which have been exposed to infection incurs a penalty of £5.

—The house is re-visited from time to time in order to see that due precautions are being observed, and at the proper time disinfection is carried out under the direction of an Inspector. From the above short summary it will be seen that the New Act offers most important additional powers to sanitary authorities throughout the country, and that those districts which avail themselves of them will be provided with a very effective means of controlling zymotic diseases.

Provision for the Isolation of Cases of Infectious Disease.

The question of acquiring a site for the erection of a hospital for infectious diseases has occupied the attention of your Health Committee on numerous occasions during the year. Great difficulty was experienced in obtaining a suitable piece of ground for the purpose, and after fruitless endeavours to purchase land on the high ground surrounding the town, your committee selected a spot which possesses the great advantage of being completely isolated. No possible objection, therefore, can be raised to this situation on the score of danger of infection to the neighbourhood. A provisional agreement was made with the owner, subject to the approval of th Local Government Board, for the purchase of a field consisting of twelve acres of enclosed pasture land situated in the Canton sub-district on the north side of the Ely River. Application was, therefore, at once made to the Local Government Board for sanction to borrow £1,850 for the purchase of this land as a site for a hospital, and the Board directed Thomas Codrington, Esq., M. Inst. C.E., and John Spear, Esq., their inspectors, to hold an inquiry into the subject matter of the application. The inquiry was held at the Town Hall on the 27th November. Subsequently, your Borough Engineer and Medical Officer of Health had an interview with the Medical and Architectural Staff of the Local Government Board for the purpose of discussing the details of the plans, &c., and ultimately the consent of the Board was obtained. There is, therefore, now every reason to hope that your district will soon be provided with adequate means for the isolation of infectious diseases. With a view of ascertaining the amount and kind of accommodation provided for infectious cases by other sanitary authorities, your Health Committee appointed a sub-committee to visit various hospitals, together with your Borough Engineer and Medical Officer of Health.

The Sub-Committee visited several of the hospitals of the Metropolitan Asylum Board, and some provincial hospitals. After this visit a report was presented by me to your Committee, of which the following is an extract :—

"The Sub-Committee appointed by you to visit various Hospital for Infectious Diseases, proceeded to London on April 2nd, and visited the Hospitals belonging to the Metropolitan Asylums Board. The Sub-Committee also visited the Hospital belonging to the Corporation of Brighton. The Hospitals in London were visited with the object of viewing the structural arrangements of the wards, and the details connected with the various sanitary appliances, which are of the most modern and approved kind. The Hospital at Brighton was visited in order to ascertain the amount of accommodation provided for infectious cases by a town having a population nearly corresponding in numbers with that of Cardiff.

Having regard to the experience gained on the occasion of the above visit, and to the reports published concerning Infectious Disease Hospitals constructed by other towns, I would advise that the following provision be made for the reception of Infectious cases in your district. I am of opinion that at first it would be necessary to make accommodation for about sixty patients making the administrative department sufficiently large for any future ward extension. The difficulties which attach to the acquirement of a site for a hospital of this kind are so great that it may be necessary to be content with one which is not so good as might be desired. In determining the locality where such a building should be placed it is necessary to take into consideration the wholesomeness of the site, the facilities for approach, the methods of water supply, and drainage. The site should be as dry as possible, open to free circulation of air, but protected, if possible, from the cold winds; and recreation ground, of from five to ten acres in extent, should be provided.

The Hospital should be easily accessible to the population, as it is usually found that the relatives of patients more readily assent to their removal if it be within such a distance as to enable them, without much trouble, to make occasional enquiry as to the patients' welfare.

The buildings should be as attractive as possible, having regard to economy, and should consist of (1) Administrative Department, (2) Ward Pavilions, (3) various Outbuildings, *i.e.*, Laundry, Mortuary, Disinfecting Appartus, Ambulance Shed, and Stable, arranged in the manner indicated on the enlosed plan.

The administrative block, situated within an easy distance of the wards, and, at the same time, conveniently near to the entrance of the premises, should be constructed to accommodate a caretaker and wife, and to provide sleeping room for nurses and staff, a medical officer's room and dispensary, kitchen, scullery, &c.

The wards should be constructed on the single storey pavillion system, connected with the administrative block by open covered corridors, and provided with a covered ambulance approach.

I would advise that at first three ward blocks be constructed—each containing accommodation for twenty-two patients. If it is intended to receive small-pox patients into the hospital the pavilion for these cases must be separated as far as possible from the other buildings by a fence or wall. Each patient should have not less than 2,000 cubic feet of air space, and a floor space of 144 square feet. The width and height of each ward should be about twenty-two feet, by fourteen feet respectively, the length depending on the number of patients intended to be received into it. Near the entrance of each ward would be the receiving and discharging rooms, with means of bathing the patients on their arrival and discharge. The ward pavilions should contain eleven beds each, and ten beds in each large ward, a single bed ward for special cases being attached to each ward. The male and female portions should be separated by the nurse's duty room, and the wards so arranged that the nurse can overlook the twenty-two beds in the pavilion. The w.c. lavatories, and urinals, &c., are placed in cross ventilated off-shoots at each end of the pavilion.

The heating would be best effected by providing the wards with Douglas Galtons' Stoves. The smoke flues being carried in pipes up the centre of a large extraction shaft communicating with a louvred chamber in the roof. If necessary steam pipes supplied from the laundry boiler might be added.

The ventilation of the wards should be ample, the window space being in proportion of about one square foot of window opening to about 70 cubic feet contained in the ward. The windows extending from about three feet above the floor to as near the ceiling as possible, should be divided into three sections of which the two lower are hung as sashes and made to open at top and bottom, the top portion to fall back into an apparatus fitted so as to admit the exact amount of air required, gratings should be placed at the floor level to admit air, and tobins tubes may also be provided. Extraction of foul air may be assisted by the warmed extraction shafts connected with the stoves, and the wards should be lighted by ventilated gas lights, the products of combustion being carried directly out into the open air, The internal face of the walls should be formed of some hard non-absorbent surface such as glazed bricks or Parian cement suitably coloured, they should be finished without cornices the angles being rounded off and the doors provided with flush panels so as to avoid all accumulations of dust. The floors may be made of polished pitch pine laid in narrow widths.

The buildings should of course be provided with a good disinfecting apparatus, that known as Washington Lyons steam disinfector being the best, examples of which were shewn to your Sub-Committee at several of the hospitals visited. It would be wise and in the end economical to construct the buildings of brick or stone, wooden and iron structures have not well answered their purpose, it having been found impossible to regulate the temperature in them, moreover they require continual repairs. An interval of at least 40 feet should be everywhere interposed between every building used for the reception of infected persons or things, and the boundary of the hospital. This boundary should have a close fence or wall of sufficient height, and the 40 feet of interval should not afterwards be encroached on by any temporary building or extension of the Hospital.

The drainage of an infectious disease hospital differs in no essential point from that of any other building. It is advisible to separate the drains of the administrative block from those of the wards and infected portions of the hospital. Special care should be taken to provide means of flushing the entire system of drainage, and although all excreta from patients would be disinfected before entering the drains it is right to provide apparatus for disinfection in connection with automatic flushing tanks. With these precautions the sewage from the hospital might be safely admitted into the public sewers. In connection with this part of the subject it may be well to quote from the report of Dr. Thorne-Thorne, Medical Officer of the Local Government Board, who in reporting upon the use and influence of hospitals for infectious diseases, states "that where public sewers of good construction are available the hospital drains are always connected with them, and in no instance has any ill resulted from the adoption of this plan." The house refuse containing as it would infected articles should be burnt on the premises.

It will be observed that the enclosed plan provides for the treatment of small pox in a distinct block separated from the other buildings by a wall or fence. Recent investigations have pointed to the necessity in the case of small pox for this separation being as complete as possible. and it would seem worth serious consideration whether the entire provision for that disease ought not to be absolutely distinct.

This plan however would necessitate two hospitals with separate administrative departments, and of course a very considerable increase in expense. The experience of the Metropolitan Asylums Board shews that patients suffering from small pox can be safely removed some fifteen miles by steamer, and I would suggest therefore whether it might not be desirable for your Committee to take into consideration the advisabillty of utilizing the Flat Holmes Island for the purpose of isolating and treating cases of small pox occuring amongst sailors in this port during the summer months. With an efficient system of inspection of the shipping many such cases might be

immediately removed from vessels, and the disease prevented from entering and spreading in the town. As this method could only be adopted during the summer and would be suitable more especially for seamen and others connected with the Docks, it would of course be necessary to make provision in our hospital for the isolation of small pox cases occuring in the town and during the winter, and it is found in practice that these cases can be thus safely isolated and treated without danger to the other inmates.

The system of administration in these Hospitals which is generally adopted and which is found to work well is, in most cases, somewhat similar to that carried out at Brighton. The permanent staff usually consists of a Caretaker and his wife, the former having charge of the Mortuary, Ambulance, and Disinfecting Apparatus, the latter acting as Matron or Superintendent of Nurses, and engaging other Nurses as required. The Medical Officer of Health acts as Medical Superintendent, and has administrative and medical charge of the Hospital, being directly responsible to the Sanitary Committee for its general management and sanitary condition.

The report having been adopted your Borough Engineer was instructed to prepare plans and estimates of hospital buildings, in accordance with the above suggestions.

SCAVENGING OPERATIONS.—The Scavenging of the town has as usual been efficiently performed by Mr. Woosey, Chief of the Scavenging Department from whom I have obtained the following particulars connected with the routine of the work :—

The main thoroughfares are cleared every day, commencing at 7 a.m.

Shop refuse is cleared from 8.30 a.m. to 9.30 a.m. every morning.

All main thoroughfares cleared by 11.0 a.m.

Household refuse is cleared three nights weekly, commencing at 11.0 p.m. to 6.0 a.m. on Monday, Wednesday, and Friday nights. All householders are requested to place refuse in a suitable receptacle in the channel in front of the house they occupy. 20 horses and wagons are required three nights weekly to attend to this work.

80 waggon loads is the average each night from 11.0 p.m. to 6.0 a.m.

Back lanes are cleared three days weekly from 11.0 a.m. to 1 p.m. Waggons go around with bells, when the occupier places the ash receptacle inside the yard or garden door ready for men to remove it.

The ashes and house refuse of all kinds are removed to the various tips within the Borough, and these tracts of land are thereby raised a few feet above sea level. The question of the ultimate disposal of this scavenging refuse is one which will have to be dealt with by you at no very distant date, if for no other reason than that the rapid extension of building operations renders it more and more difficult to obtain land for the purpose of tipping.

Viewing the matter, however, from a purely sanitary aspect it must be admitted that the practice of depositing large quantities of decomposing organic filth on land within the Borough and in some cases close to habitations is not free from danger to the public health. The condition of the ground on which this refuse has in some cases been tipped is such as to prevent the rapid decomposition of the organic matter, and removal of the effluvium, as when the refuse has been tipped into the undrained excavations of old brick fields. In such cases the dryness which is essential to the decomposition cannot be obtained. If the whole of the surface of the clay is not removed an impermeable basin is formed in which in the absence of drainage, water collects, and into this basin in some instances full of water, the most offensive decomposing animal and vegetable matter is deposited. The practice of using refuse for filling up roadways and for the foundations of houses is again open to many serious objections. I am aware that where roads have been made with this material it has been banked with clay, forming an impervious wall on either side, and that it is covered with a good layer of hard material, all this, however, does not arrest decomposition, but simply delays it, noxious gases are evolved which will in time find an escape into the surrounding soil and ascend into the warm houses above. It is well known that a certain proportion of the air which enters our houses is derived from what is called the ground air, it is consequently of the utmost importance that this air should be as pure as possible, any pollution of the soil in the neighbourhood of dwellings is therefore a danger to the health of the inhabitants.

Besides the general pollution of the air surrounding these deposits of refuse, another danger exists namely the practice which obtains amongst the poor of assembling in large numbers on the recent tips and collecting from them, for disposal to dealers, rags and other filth, much of this rubbish is thus brought back again to the back yards of houses and in some case, doubtless, to houses in which infectious disease exists, it is then distributed in an infected condition to other parts of the town. It is practically impossible to stop this practice as in order to do so it would be necessary to place some one constantly to watch each tip.

Having pointed out some of the disadvantages of the present system I have to suggest to you the desirability of obtaining from time to time particulars of the several modes of the disposal of house refuse which have recently been adopted in various towns with a view of ascertaining if any of them are adapted to the requirements of this district.

It is evident from the published reports which reach us, that great improvements have been made of late years in the 'destructors' used for burning house refuse, and that the inconvenience which was at first experienced in their use has been overcome. About thirty large towns have adopted some form of 'destructor,' amongst this number may be mentioned Bath, Blackburn, Bolton, Bournemouth, Bradford, Burslem, Bury, Cheltenham, Derby, Ealing, Hull, Leeds, Rochdale, Newcastle, Nottingham, Preston, Salford, and Warrington. In these places they are well spoken of, and it is stated that no nuisance is caused in their use.

SEWERAGE.—In my report for the year 1888 I called your attention to the unsatisfactory state of the sewers in Loudoun Square and the adjacent streets, and to the offensive smells arising from the ventilators connected with them. Your Borough Engineer was consequently requested to make an investigation into the condition of these sewers and to report thereon. On the 8th August, 1889, Mr. Harpur reported as follows :—

County Borough Engineer's Office, Town Hall, Cardiff, 8th August, 1889.

Gentlemen,—In compliance with your instructions I have now pleasure in presenting the following Report upon the condition of the Sewers in Loudoun Square and the adjacent streets, together with certain recommendations as to their improvement.

The Main Sewer for this district passes along the lane at the back of Bute Street, flowing from south to north, and thence along Herbert Street and Tyndall Street to the outfall; from Herbert Street to the northern side of Loudoun Square the Sewer is 3 feet 9 inches by 2 feet 6 inches egg shape, and south of that point it is 3 feet by 2 feet, also egg shape.

This sewer was designed by Sir John Hawkshaw, then Mr. Hawshaw, and constructed under his direction as Engineer, by the Corporation in or about the years 1854—5.

The level of the outlet of the Main Sewer as then designed and constructed by Mr. Hawkshaw was near about the level of high water of neap tides, and the position of the outlet was at a point at the site now occupied by the Roath Dock.

Having fixed the level of the outlet so high but very slight gradients could be obtained for the Main Trunk Sewers of the low lying districts, and those upon the line of sewer from the Eastern end of Tyndall Street to Loudoun Square are as follows, viz. :—In Tyndall Street and Herbert Street 1 in 1254, and from the Junction of Herbert Street and Bute Street to Loudoun Square 1 in 1651.

Now as to the Bute Town Sewers, we find :—

1. The Lateral Sewers have but slight gradients and are generally in bad condition, in some cases inclining in the reverse way to what they should.
2. With one exception the Lateral Sewers join the Main sewer on a level invert.
3. In the one exception referred to (North Loudoun Place) the Lateral Sewer joins the Main at a level of 1 foot 5 inches *below* the invert level of the Main Sewer.
4. The house drains almost invariably join the sewer at or near the invert level.

Certain works (which will be more particularly referred to hereafter) have previously been carried out with the object of preventing the flooding of basements in the neighbourhood of Loudoun Square, but there does not appear to have been in the past any attempt at remedying the defects above referred to.

The Main Sewer through Bute Lane has at all times a considerable quantity of sewage running through it, varying of course with the weather, and as all the Lateral Sewers join the Main on or *below* the level thereof, it is obvious that the sewage from the Main backs up the Lateral Sewers for a considerable distance, thus preventing the due flow of sewage, and converting the Sewers into what may be termed elongated cesspits.

The Sewers of this district have a thorough supply of water for flushing purposes from the fountain of Loudoun Square, but in their present condition no amount of flushing or cleansing by manual power can possibly keep them free from sewage deposits for many hours together.

I have carefully looked at the question as to whether it would be practicable to construct a new intercepting Sewer at a level low enough to properly receive and convey the sewage from the Sewers referred to, but find that nothing short of an entirely new Outfall Sewer would accomplish the object, and the only other remedy which presents itself to my mind is to raise the levels of the Lateral Sewers and house drains throughout the district.

I have prepared the accompanying plan and sections shewing the positions and levels of the existing Sewers and the proposed mode of reconstructing them at a higher level, and I estimate the cost of the works and contingencies at £2,700.

If it should be decided to carry out this suggestion, the road surfaces will of necessity be much disturbed in reconstructing the Sewers and house drains, and the question therefore naturally arises as to whether it is desirable in those streets which are at the present time pitched with pebbles to replace such pebble pitching, or to break up the entire road surfaces and restore them with macadam, the cost of which I estimate at £920.

Having disposed of the question in reference to the Lateral Sewers, the perhaps still more important question of dealing with the main Sewer remains to be solved.

The flooding which from time to time takes place in the basements on the eastern side of Loudoun Square does not arise from any of the before-mentioned defects in the Lateral Sewers, but from the main Sewer in Bute Lane, and the question therefore arises as to the cause of the nuisance complained of, and the measures to be adopted for its prevention.

There is a general impression prevailing that the flooding in the basements at Loudoun Square only occurs when heavy rain falls during high spring tides, and is due to the backing up of water from the tide doors at the outlet; now, if that were so, it would be necessary for the whole of the 10 feet and 8 feet diameter Storage Sewers, together with numerous other main trunk and Lateral sewers to completely fill before the water would rise into the basements of Loudoun Square, the idea however is an erroneous one, as the flooding occurs at other times than during high water of Spring tides, as was demonstrated on the 9th July last, when heavy rain fell and the basements were flooded. Upon that date the tide was neap, the height (according to the Bristol Channel Tide Table) being 28 feet 8 inches above the cill of the Roath Basin, or 13·17 feet above ordnance datum, while the level of the lowest basement floor in Loudoun Square is 18·21 feet above ordnance datum, or slightly over 5 feet above high-water mark upon that date, shewing clearly that the tide on that occasion could not have been a contributory cause of the flooding, but that it was entirely due to the heavy rainfall.

In seeking for the cause of the flooding it will be necessary to again revert to the Main Sewers and to the works which have heretofore been constructed with a view to prevent the flooding, not only in Loudoun Square, but also in Temperance Town, New Town, and other low lying districts of the Borough.

The Main Outfall Sewer which has been extended further eastwards on three separate occasions to make room for Dock and Railway Works, now has its discharge at a point on the foreshore near the junction of the Roath Branch of the Taff Vale Railway with the Bute Dock Railways, and about a third of a mile east of the eastern end of the Roath Dock. From the point of discharge this Sewer runs almost parallel with the coast line to the western side of the Tharsis Copper Works, where it turns in a direction almost due north, under the roadway which separates the premises of the Tharsis Copper Works from the site of the new Dowlais Iron Works; at the northern end of this road near the New Malt House it again turns to the westward, along East Tyndall Street to a point near Windsor Road, where the size reduces to 8 feet diameter for a short distance, then to an egg shape 6 feet by 4 feet a distance of about 100 yards, where it is still further reduced at the eastern end of Tyndall Street to 4 feet by 2 feet 9 inches egg shape, of which size the Sewer continues to the western end of Herbert Street, where it is joined by the before-mentioned Main Sewer from Bute Town and the South and the Main Sewer from Bute Street and the North, each of these being egg shape and at 3 feet 9 inches by 2 feet 6 inches, and both Sewers join the Herbert Street Sewer on a level invert.

There is also in Tyndall Street a supplemental Sewer 3 feet 3 inches by 2 feet 3 inches, egg shape, constructed some years ago under the direction of the then Borough Engineer, Mr. Waring,

this Sewer commences by a junction with the 8 feet diameter Sewer, and is laid along the south side of the Main Sewer and at a level of about 1 foot lower, and terminates opposite Pendoylan Street, where there are stop doors for turning the water down either Sewer for flushing purposes.

The ruling gradients of the Main Sewer are from the outfall to the Copper Works Road 1 in 1500 from the last mentioned point to the junction of the 8 feet diameter Sewer with the 6 feet by 4 feet Sewer near the eastern end of Tyndall Street 1 in 1300, at this point there is a sudden rise of 2 feet in the invert level, and the Sewer of Tyndall Street continues at a gradient of 1 in 1254 to the western end of Herbert Street, where it is joined by the before mentioned Sewers from the north and south.

It will be observed that the contents of the Bute Town and the Bute Street Main Sewers which converge at Herbert Street, have to pass through the Single Sewer in Herbert Street. Now the Herbert Street Sewer has a cross sectional area of 8½ feet, while each of the two other Sewers joining it at Bute Street have cross sectional areas of 7 feet, or together 14 feet; it is, therefore, obvious that when these Sewers are conveying their maximum quantity the Herbert Street Sewer is unable to dispose of the water as fast as it finds its way to the point of convergence, and here, I am of opinion, lies the cause of the flooding of basements in Loudoun Square.

In order to reduce the quantity of water finding its way into the Tyndall Street Sewer and to relieve the pressure in the Bute Lane Sewer, certain works were carried out in 1879 under the directions and instructions of the then Borough Engineer, Mr. Williams, since which flooding has been greatly reduced both as to frequency and extent.

The works comprised:—

1. The construction of what is known as the intercepting Sewer, which commences by a junction with the 10 feet diameter Main Sewer at a point near the New Malt House on the East Moors, and from thence took a course under the site now occupied by Messrs. Bland as a timber yard, through Gwendoline Street, under the Great Western Railway, through Cycle Street, Constellation Street, Moira Place and Fitzalan Road, to Newport Road at the end of Gaol Lane. A branch Sewer was also constructed from the western end of Moira Terrace through Adam Street to the end of Victoria Street. At several points along the route of these Sewers (which need not here be described), the Main and Lateral Sewers were intercepted and the contents passed into the new Sewers.
2. A relief Sewer was constructed in Patrick Street for taking the surplus storm water from the Bute Lane Sewer into the Bute Street Sewer, to the outlet at the Packet Slip.

At the junction of these two Sewers there is a weir arrangement 18 inches high above the invert level, and 5 feet 4 inches long. This weir consists of cast iron framework divided into two sections with grooves for movable doors to slide in, these doors are of 1½ inch cast iron plates, each 2 feet 6 inches long, and are too heavy and cumbersome for one man to conveniently remove or replace.

Upon all ordinary occasions the plates are placed down in position for conducting the water in the Bute Lane Main Sewer along its proper channel, but when heavy rain occurs and the water rises above the top of the weir a portion of the surplus flows over the weir into the Patrick Street Sewer, and this relieve the pressure in the Bute Lane Sewer, the object being thereby to prevent inundations in the basement at Loudoun Square. The height of the weir can be reduced by using only a portion of the stop plates to 9 inches or 6 inches as required, or can be entirely removed, but the arrangement was not intended to be so used, except under special circumstances.

When heavy rain falls, and the water overflows the weir to any great extent, it becomes almost, if not quite impossible to remove the plates.

Now, the level of the invert of the Bute Town Main Sewer, the Bute Street Sewer, and the Herbert Street Sewer, at the point of their convergence is 14·35 feet above ordnance datum, the level of the Bute Town Main Sewer invert at Loudoun Square is 15·50 feet, and at Patrick Street 16·26 feet, the top of the weir at Patrick Street 17·76 feet and the lowest basement floor in Loudoun Square 18.21 feet above the same datum, so that with 5¼ inches of water flowing over the weir at Patrick Street, the water in the Sewer in Bute Lane is on a level with the lowest basement floor in Loudoun Square, several of the basement floors, however, which were flooded on the 9th July are at a higher level by several inches than the lowest one above referred to.

It is evident from the amount of flooding which took place on the 9th July, that the Sewer into which the premises drain—and which at that place is 3 feet high—was completely full, and the sewermen report that at that time a part only of the stop plates at Patrick Street were in position, it is, therefore, certain that the flooding was due to back water.

From the several levels given above, it will be observed that the level of the Sewer invert at Loudoun Square is only 15 inches higher than the level of the Main Sewer in Herbert Street, so

that with only 15 inches of water passing down the Herbert Street Main Sewer the water would stand back level along the Bute Town Main Sewer as far as Loudoun Square, and with a great influx of water from heavy rain, it would upon the Herbert Street Sewer receiving its full quantity, the Bute Lane Main Sewer would quickly fill to the Crown at Loudoun Square.

It is certain that on the 9th July last this must have been the case or the basements referred to would not have been flooded, and as the weir at Patrict Street would have passed the surplus water into the Patrick Street Sewer, it is evident that the flooding was not due to the water flowing down the Sewer, but from back water which, I believe, under such circumstance and on the occasions of heavy rain, pass up the sewer and over the weir at Patrick Street.

I am of opinion that such arrangements as the weir at Patrick Street and the flushing doors previously referred to at Tyndall Street which depend for their successful operation upon the personal attention at all times of one or other of the sewermen should not be adopted, for after placing down any of the doors or stops in question upon a sudden downpour of heavy rain (and it should be here observed that the heaviest rainfalls almost invariably come on most suddenly) and before a man could reach either of the places in question the Sewers would from the great influx of storm water have become inaccessable, and the removal of the stops or doors could not be accomplished until the water had subsided, and in the meantime they may have seriously obstructed the due flow of the sewage and possibly caused some damage to property.

Now in making these remarks I wish it to be clearly understood that I have no information to lead me to believe that such has at any time happened, but I deem it necessary to point out that the present arrangements are in my opinion open to the grave objections referred to.

To remedy these defects, and with the object of preventing the further inundation of basements, I have to make the following recommendations, viz. :—

1. The removal of the present flushing arrangements of Patrick Street and Tyndall Street, and the substitution therefor of apparatus which will work automatically.
2. The substitution of a smaller penstock for flushing the Davies Street Sewer from Fitzalan Road.
3. The construction of an additional Sewer from the end of the supplemental Sewer at the western end of Tyndal Street to the junction of the Bute Town and Bute Street Mains at the western end of Herbert Street. It will be remembered that the supplemental Sewer in Herbert Street is 3 feet 3 inches by 2 feet 3 inches, the cross sectional area being 6 feet, which together with 8½ feet, the cross sectional area of the 4 feet by 2 feet 9 inch Sewer in Herbert Street, would be slightly in excess of the capacity of the two Sewers which converge at the junction of Herbert Street with Bute Street, and would thereby provide a greatly improved means of discharge for these Sewers, but, I am of opinion, that with a view to the possible future enlargement of one of the Sewers in Herbert Street it would be wisest to construct the new Sewer 3 feet 9 inches by 2 feet 6 inches.

In carrying out this work there is no doubt that some considerable difficulties may arise in crossing under the Bute Docks Feeder, and under both branches of the Taff Vale Railway, where the bridges are exceedingly narrow, but they are difficulties which are not insurmountable.

I estimate the cost of the foregoing work at £1,600, which to summarise with the work previously recommended in this Report would be as follows :—

	£	s.	d.
For the proposed New Sewer in Herbert Street and improved flushing arrangements at Patrick Street, Tyndall Street, and Fitzalan Road	1600	0	0
For New Sewers and Drain at Bute Town	2700	0	0
	4300	0	0
For reconstructing and macadamizing Road surfaces at Bute Town, if ordered	920	0	0
Total ...	£5220	0	0

I have the honour to be, Gentlemen,

Your obedient Servant,

W. Harpur, M. Inst. C.E.,

Borough Engineer.

To the Chairman & Members of the Public Works & Health Committees.

The above report was subsequently adopted and application was made to the Local Government Board for power to borrow the money to carry out the necessary works, the completion of which will doubtless greatly improve the sanitary condition of this neighbourhood.

As usual, during the hot weather, complaints were made of smells from the open sewer ventilators on the street level. It has been the custom to close these openings when they were found, on inspection, to emit an unusually offensive smell. This proceeding, although it had the effect of satisfying those who complained, could not be regarded as the best means of abating the nuisance, for instead of allowing the sewer gas to escape into the streets and become diluted and harmless by being mixed with pure air, it had the effect of increasing the pressure of the sewer air, and of forcing it in a dangerously concentrated state through imperfect traps into houses. A more effective remedy is to be found in the free admission of pure air into the sewers. With this view I have advised that all the openings which had formerly been closed or blocked up with charcoal (amounting altogether to some hundreds) should be re-opened, and that in future none should be closed.

I have also advised that more attention should be paid to the flushing of the sewers, and that a saturated solution of sulphate of iron should be occasionally introduced into them through the flushing tanks.

This method of dealing with the evil has been adopted this year under the supervision of the Borough Engineer. The result has been satisfactory in every respect. The air of the sewers has been rendered more pure, fewer complaints have been made, and the general health of the district has, I believe, been improved.

DAIRIES, COWSHEDS, AND MILKSHOPS.—The registered Milksellers in the district are 343 in number. 107 new applications for registration were made during the year. In 6 instances proceedings were taken against persons for infringing the regulations, and in each case fines were imposed.

The supervision of the premises occupied by all the purveyors of milk in the district has been systematically carried out during the year.

Last year your New Regulations, made under the provisions of the Dairies, Cowsheds, and Milkshops Order, 1885, came into force, since which date greater attention has been paid to the ventilation, lighting, cleansing, drainage, and water supply of these places. The danger attaching to the stowage of milk in unsuitable places, although well understood by those who have paid attention to the subject, are by no means appreciated by some of the small retail dealers in the town, and the utmost vigilance has to be exerised by your Sanitary Officers in order to prevent this important article of diet from becoming contaminated and unfit for food. In every case the proper amount of cubic space, i.e., 800 cubic feet for each cow, is rigidly enforced, and whenever there is any reason to suspect illness amongst these animals your Veterinary Inspector's attention is called to the matter. It is now well known that cows constantly kept in the ill-ventilated and dirty cowsheds of large towns are particularly liable to tuberculosis, a disease communicable from animals to man, and which there is every reason to believe may be developed in children through the medium of milk.

Infectious diseases, such as scarlet fever, typhoid fever, and diphtheria have long been known to impart their infective qualities to milk, which may then be the means of disseminating disease amongst the public. Many outbreaks originating in this manner have been recorded, but the transmission of the disease of the cow through its milk secretion has only quite recently been scientifically studied, and the subject requires still further elucidation by observation and experiment. Sufficient evidence, however, has been already produced to show the importance of a complete supervision over all places in which it is stored.

BAKEHOUSES.—The Bakehouses in the Borough have been carefully inspected during the year under the powers given by the Factory and Workshops Acts.

Regulations have been passed in accordance with the provisions of these Acts, copies of which have been supplied to each Baker in the district. Most of these places are in a good sanitary condition, but in some instances notices have been served upon the Bakehouse Proprietor to remedy certain defects.

OFFENSIVE TRADES.—The 112—114 sections of the Public Health Act give power to Urban Sanitary Authorities to restrict the establishment of and exercise supervision over offensive trades in their district such as bone boiling, tallow melting, blood boiling, soap boiling, &c.

No difficulty has arisen during the past year in connection with offensive trades. In a few cases complaints have been received of the effluvia from fish frying, and in each case an improved apparatus has been constructed and the nuisance abated. Two new trades coming under the operation of the above sections have been established during the year 1889.

SALE OF FOOD AND DRUGS ACTS.—Articles of food and drugs analysed by Mr. Hughes, F.I.C., F.C.S., the Borough Analyst, under the provisions of the above Act, during the year 1889 :—

TABLE XXV.

Sample obtained.	Number of Samples Obtained.	Number of Genuine Samples.	Number of Adulterations.	Remarks.
Milk ...	57	53	4	Four prosecutions : fines 40/-, 10/-, 10/, 5/- with costs ; one cautioned.
Whiskey ...	24	18	6	Six prosecutions : four fined £2/10 each, with costs ; 1 5/- & costs ; & 1 cautioned.
Gin ...	6	5	1	Fine £5 and costs.
Butter ...	12	12	0	
Pepper ...	12	12	0	
Flour ...	6	6	0	
Coffee ...	6	4	2	Two prosecutions, fined 5/- each and costs.
Total ...	123	111	13	

FOOD SUPPLY AND SLAUGHTER HOUSES.—No private Slaughter Houses exist in the Borough. The public abattoirs were systematically inspected. On several occasions my attention was called to diseased or unsound meat in the markets and shops in the town. Mr. J. Kemmis, the Manager of the Public Market and Slaughter Houses, reports to me that during the year the following animals were slaughtered in the Cardiff Abattoirs :—

TABLE XXVI.

Beasts	...	...	...	...	7,084
Calves	...	...	...	...	2,614
Sheep	...	...	...	...	30,548
Pigs	...	...	...	...	21,768
			Total	...	62,014

The 116th section of the Public Health Act requires the Medical Officer of Health to inspect in any case in which it may appear to him necessary any animal, carcase, meat, poultry, game, fish, or other article of food exposed for sale and intended for the food of man which is deemed to be diseased or unsound or unwholesome or unfit for food of man, and if he find that such animal or article is unfit for food he shall give such instructions as may be necessary for causing the same to be seized, taken, and carried away in order to be dealth with by a justice. Under the power given by the above section the following articles were seized and condemned as unfit for food and destroyed by order of the magistrates :—

TABLE XXVII.

Pork	...	...	...	...	559 lbs.
Kidneys	...	...	...	...	1455 ,,
Beef	...	...	...	...	854 ,,
Fish	...	...	...	...	2464 ,,
Poultry	...	...	...	...	224 ,,
Potatoes	...	...	...	...	11200 ,,
			Total	...	16756 lbs.

COMMON LODGING HOUSES.—These houses are registered and regulated in accordance with the provisions of the Public Health Act. Regulations are also contained in a Local Act of Parliament.

These provide :—

1.—For fixing the number of lodgers who may be received into a common lodging house.

2.—For promoting cleanliness and ventilation in such houses.

3.—For giving notices and taking precautions in the case of infectious diseases, and

4.—Generally for the well ordering of such houses.

Nine houses have been registered during the year, making a total of 24, and affording accommodation for 386 persons. The amount of cubic space allowed for each person is 400 feet.

No cases of overcrowding have been detected by your Inspectors of Nuisances during their day and night inspection of these premises.

INSPECTION OF CANAL BOATS.—The Chief Inspector of Nuisances, Mr. Vaughan, acts as Inspector under the Canal Boats Acts, 1877 and 1884.

During the year 1889, 36 canal boats were visited and inspected. Five new boats were registered, and one boat re-registered in consequence of its changing ownership. Two boats have been converted into coal barges and the cabins abolished. The total number of boats on the register is 46. No cases of sickness or overcrowding were discovered on board, and the boats generally were found to be in a good sanitary condition. The following defects were discovered and promptly remedied :—six boats with imperfect ventilators, one with dilapidated cabin, floor, and one without water vessel.

On the 29th April and on the 3rd October, John Brydone, Esq., H.M. Chief Inspector of Canal Boats, visited Cardiff and examined several canal boats, the books and reports connected with the Acts, and expressed his satisfaction with the work which had been carried out by your Inspector.

MAGISTERIAL PROCEEDINGS.—Legal proceedings were taken in the following cases during the year 1889 :—

TABLE XXVIII.

	No. of Cases.	Fines. £ s. d.
Depositing Refuse on Streets and Lanes	29 ...	4 16 6
Animals kept so as to be a Nuisance...	1 ...	0 16 6
Exposing unsound Meat for Sale	2 ...	20 0 0
Slaughtering in Slaughter-house at illegal hours ...	3 ...	—
Sanitary Defects on Premises	3 ...	0 10 0
Orders obtained to close Polluted Wells	7 ...	—
Selling Milk without being registered	3 ...	2 7 6
Handling Milk Vessels while attending on Infectious Disease	1 ...	5 7 6
Keeping Cows in Unregistered Shed...	1 ...	0 17 6
Overcrowding a Cowshed	1 ...	0 17 6
Sale of Food and Drugs Acts	13 ...	24 5 0
Exposing Margarine for Sale without a proper Label ...	1 ...	0 12 6
Total ...	65	£60 10 6

The following is a summary of the work performed during the year by your Inspectors of Nuisances :—

TABLE XXIX.

Nuisances Inspected	...	1778
Notices Issued	...	1729
Nuisances abated without legal proceedings	...	1719
,, ,, with ,, ,,	...	68
Animals kept so as to be a nuisance	...	37
Injurious and foul accumulations	...	401
Nuisances from Smoke	...	9
Suspected Samples of Water obtained for Analysis	...	11
Cesspools Cleansed	...	25
Cesspools Abolished	...	10
Drains Unstopped and Cleansed	...	379
,, Trapped and Repaired	...	524
House Drains tested	...	55
Foul and offensive Closets Cleansed	...	236
Defective Apparatus to Water Closets Repaired	...	11
Water laid on to Water Closets	...	7
Dilapidated and Dirty Houses Cleansed and Repaired	...	36
Articles Destroyed as Unfit for Human Food	...	16756 lbs.
Number of Houses Inspected	...	10275
,, Day Inspections of Lodging Houses	...	487
,, Night Inspections of Lodging Houses	...	208
,, Houses Disinfected	...	82
,, Articles Disinfected	...	882
,, Inspections of Dairies, Cowsheds and Milkshops	...	482
,, ,, Bakehouses	...	224
Other matters not included above	...	114
Lime Brushes given out	...	1181

In conclusion I have the satisfaction of reporting that your Inspectors have paid the greatest attention to their varied and important duties.

I have the honour to be, Gentlemen,

Your obedient Servant,

EDWARD WALFORD, M.D.,

Medical Officer of Health.

APPENDIX.

Mean temperature of each month in the year, as compared with that of the previous five years :—

	1884	1885	1886	1887	1888	Mean of 5 years	1889
January	44°·5	38°·5	37°·5	37°·5	38°·4	39°·2	38°·9
February	42°·0	44°·1	35°·6	40°·1	36°·7	39°·7	39°·1
March	45°·7	42°·1	40°·7	39°·1	39°·8	41°·4	41°·8
April	45°·4	46°·3	48°·4	44°·6	44°·6	45°·8	43°·4
May	52°·7	49°·9	53°·1	50°·9	52°·4	51°·8	55°·3
June	58°·6	59° 2	58°·8	61°·0	56°·9	58°·9	61°·6
July	59°·8	63°·1	63°·0	64°·6	58°·1	61°·7	60°·8
August	63°·1	59°·1	62°·9	60°·2	58°·9	60°·8	59°·5
September	59°·8	51°.3	57°·6	51°·7	55°·8	55°·2	56°·7
October	49°·4	45°·4	52°·3	43°·2	48°·6	47°·7	52°·2
November	43°·8	44°·0	45°·0	39°·4	47°·5	43°·9	46°·2
December	41°·7	38°·8	37°·7	38°·2	42°·2	39°·7	39°·9

The following table shows the monthly rainfall, the greatest fall in twenty-four hours, with date and the number of days on which 0·01 in. or more rain fell :—

Month	Total depth	Greatest fall in 24 hours	Date	Days on which 0·01 or more rain fell
	Inches.	Inches.		
January	1·58	0·58	9th	10
February	2·00	0·64	10th	16
March	3·89	1·17	8th	16
April	3·54	0·71	30th	18
May	2·51	0·38	31st	16
June	0·58	0·41	1st	6
July	3·85	1·16	9th	12
August	3·90	0·65	2nd	15
September	2·09	1·53	23rd	9
October	3·77	0·48	8th	25
November	1·87	0·75	24th	12
December	2·40	0.80	21st	14

THE FOLLOWING IS A MONTHLY SUMMARY OF THE METEOROLOGICAL OBSERVATIONS DURING THE YEAR.

MONTH.	BAROMETER.					THERMOMETER.							HYGROMETER.		Total Rainfall.	Death-rate per 1000 persons living.	
	Highest.		Lowest.		Mean of Month.	Maximum.		Minimum.		Mean of Maximum.	Mean of Minimum.	Mean of Month.	No. of Days at or below 32 degrees.	Mean of Dry Bulb	Mean of Wet Bulb		Registrar-General's Lesser Estimate.	
																	All Causes.	7 Chief Zymotic Diseases.
	Date.		Date.			Date.		Date.								Inches.		
January ...	3rd	30·710	9th	29·430	30·204	20th	52°·1	4th	23°·0	43°·4	34°·5	38°·9	9	39°·3	38°·6	1·58	29·1	4·6
February ...	18th	30·480	3rd	29·410	30·005	1st	51°·5	10th	25°·2	43°·8	34°·4	39°·1	13	39°·6	38°·4	2·00	19·3	1·6
March ...	15th	30·550	20th	29·050	30·020	29th	59°·8	5th	25°·5	48°·0	35°·7	41°·8	10	42°·4	40°·9	3·89	19·4	1·7
April ...	19th	30·260	4th	29·210	29·783	18th	62°·2	8 & 16	36°·0	46°·0	40°·9	43°·4	0	47°·3	45°·1	3·54	19·4	2·1
May ...	21st	30·140	1st	29·640	29·853	22nd	75°·2	1st	43°·0	62°·4	48°·3	55°·3	0	57°·1	54°·2	2·51	18·1	1·8
June ...	5th	30·400	2nd	29·730	30·038	27th	78°·2	13th	45°·0	69°·4	53°·2	61°·6	0	62°·1	59°·0	0·58	17·2	1·5
July ...	1st	30·450	10 & 25	29·620	29·970	31st	77°·2	22nd	46°·8	68°·4	53°·3	60°·8	0	62°·1	59°·0	3·85	20·4	2·6
August ...	27th	30·270	21st	29·450	29·928	20th	77°·2	25th	46°·0	66°·5	52°·5	59°·5	0	61°·2	58°·6	3·90	20·8	3·8
September ...	15th	30·440	24th	29·540	30·094	12th	77°·8	26th	37°·0	63°·7	49°·7	56°·7	0	57°·0	55°·2	2·09	18·6	2·5
October ...	25th	30·210	19 & 20	29·180	29·742	5 & 6	59°·2	14th	35°·0	54°·9	49°·6	52°·2	0	59°·0	48°·7	3·77	12·0	1·0
November ...	19th	30·620	3rd	29·650	30·239	8th	59°·0	9th	29°·0	50°·4	42°·0	46°·2	3	46°·4	45°·3	1·87	15·2	1·2
December ...	6th	30·630	11th	29·500	30·207	18 & 23	52°·0	29th	24°·0	44°·7	35°·1	39°·9	12	39°·9	38°·9	2·40	22·5	1·0

The following is the rainfall for the year 1889, as compared with six previous years :—

Month.	1883	1884	1885	1886	1887	1888	Mean of Month	1889
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches	Inches.
January	5·75	6·03	3·71	5·03	2·76	1·70	4·16	1·58
February	3·73	4·40	3·65	1·32	1·45	1·07	2·60	2·09
March	0·60	3·39	1·87	3·97	3·21	4·62	2·94	3·89
April	0·67	1·56	2·52	2·98	1·63	1·48	1·80	3·54
May	1·90	2·37	3·86	6·38	1·94	1·69	3·02	2·51
June	1·81	1·92	2·61	0·70	1·60	3·69	1·88	0·58
July	3·56	4·05	0·72	4·85	1·51	6·83	3·58	3·85
August	2·09	2·21	2·74	1·68	2·88	3·50	2·51	3·90
September...	6·14	1·96	6·51	3·08	4·07	1·21	3·82	2·09
October	4·23	1·01	5·59	5·09	2·80	1·74	3·41	3·77
November...	6·38	2·12	5·47	5·39	3·48	7·04	4·98	1·87
December	1·92	5·87	1·74	6·64	3·46	3·61	3·87	2·40

The following table illustrates the daily directions of winds throughout the year :—

Direction of winds	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
N.	2	1	...	...	...	...	1	...	3	...	...	1	8
N.E.	11	10	9	11	9	9	11	6	10	14	11	8	119
N.W.	8	7	11	8	3	4	3	9	5	4	6	11	79
N.N.E.	1	1	...	...	...	...	...	...	...	...	...	...	2
N.N.W.	1	1	...	...	...	...	...	1	...	1	...	...	4
S.	...	...	1	1	1	...	2	..	...	...	2	7	
S.E.	4	1	3	3	11	7	5	1	2	2	5	1	45
S.W.	6	7	5	7	6	3	10	11	9	8	6	8	86
S.S.E.	...	...	...	...	1	1	...	...	...	...	...	...	2
S.S.W.	...	...	...	...	...	...	1	...	...	...	...	...	1
E.	1	...	...	4	...	...	...	...	1	1	...	7	
W....	...	...	...	...	...	1	...	1	1	1	1	...	5

DEATHS REGISTERED AT AGES FROM THE SEVERAL CAUSES.

1st Quarter, ending March 30th, 1889. *Districts—Cardiff, Roath, and Canton.*

CLASSES. CAUSES OF DEATH.	DEATHS AT AGES. Under 1 Year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 60.	60 and under 80.	80 and upwards.	Total.	Death-rate per 1000 Inhabitants. 112,712.	126,801.
I. Specific Febrile or Zymotic Diseases ...	19	45	4	2	6	5	..	81	2·87	2·55
II. Parasitic	2	.	...	..	...	...	...	2	0·07	0·06
III. Dietic	...	...	.	...	1	...	...	1	0·03	0·03
IV. Constitutional	6	15	5	14	52	15	2	109	3·87	3·43
V. Developmental	15	...	...	..	2	17	6	40	1·42	1·26
VI. Local	112	45	11	13	82	64	7	334	11·85	10·53
VII. Violence	3	4	4	6	9	1	1	28	0·99	0·88
VIII. Ill-defined and not specified causes... ...	46	4	1		2	2	1	56	1·98	1·76
Total	203	113	25	35	154	104	17	651	23·10	20·53
CLASS I. *Miasmatic Diseases.*										
Measles	6	22	2	1	...	..	...	31	1·10	0·97
Scarlet Fever	...	3	...	...	...	...	..	3	0·10	0·09
Whooping Cough	8	19	2	...	..	...	...	29	1·02	0·91
Diphtheria	...	...	...	...	...	...	..	. .	...	...
Simple and Ill-defined Fever ...	...		...	...	1	..	...	1	0·03	0·03
Enteric Fever	...	..	.	...	4	4	...	8	0·28	0·25
Diarrhœal Diseases.										
Diarrhœa, Dysentery	5	1	.	...	4	...	...	6	0·21	0·18
Venereal Diseases.										
Syphillis	...	...	...	..	.	...	...	...	. .	...
Gonorrhœa, Stricture of Urethra ...	...	...	...	..	..	...	...	...	...	...
Septic Diseases.										
Erysipelas	..	...	...	...	...	...	...	...	...	...
Pyæmia, Septicæmia	...	...	...	1	1	...	..	2	0·07	0·06
Puerperal Fever	...	.	...	...	...	1	...	1	0·03	0·03
Total	19	45	4	2	6	5	...	81	2·87	2·55
CLASS II.										
Thrush ... ... Total ...	2	..	...	...	...	..	...	2	0·07	0·06
CLASS III.										
Chronic Alcoholism . . Total ...	...	.	...	...	1	...	...	1	0·03	0·03
CLASS IV.										
Rheumatic Fever, Rheumatism of Heart ...	...	...	...	...	1	..	...	1	0·03	0·03
Rheumatism	...	...	...	..	...	2	...	2	0·07	0·06
Rickets	...	...	...	..	...	.	...	...	...	...
Cancer	...	...	...	...	6	7	...	13	0·46	0·41
Tabes Mesenterica	1	1	1	..	...	...	..	3	0·10	0·09
Tubercular Meningitis (Acute Hydrocephalus)...	2	9	2	..	1	...	...	14	0·49	0·44
Phthisis	3	1	1	13	41	5	1	65	2·30	2·04
Other Forms of Tuberculosis, Scrofula ...	...	3	...	1	1	1	1	7	0·24	0·22
Anæmia, Chlorosis, Leucocythæmia ...	...	1	1	...	1	...	...	3	0·10	0·09
Diabetes Mellitus	...	...	...	...	1	...	.	1	0·03	0·03
Other Constitutional Disorders ...	...		...	...	...	...	...	...	...	...
Total	6	15	5	14	52	15	2	109	3·87	3·43
CLASS V.										
Premature Birth	15	...	...	..	...	...	..	15	0·53	0·47
Cyanosis	...	...	...	...	...	..	...	...	...	...
Spina Bifida	...	...	...	...	...	...	...	...	..	...
Imperforate Anus	...	...	...	...	...	...	...	...	...	...
Other Congenital Defects	...	.	...	...	...	..	..	...	...	...
Old Age	..	...	.	..	2	17	6	25	0·88	0·78
Total	15	...	...	...	2	17	6	40	1·42	1·26
CLASS VI. *Diseases of Nervous System.*										
Inflammation of Brain or its Membranes ...	2	...	3	...	4	2	...	11	0·39	0·34
Apoplexy	...	...	...	...	2	4		6	0·21	0·18
Softening of Brain	...	...	..	...	...	...	...	..	...	...
Hemiplegia, Brain Paralysis ...	...	...	.	...	...	...	...	...	...	...
Paralysis	...	...	...	...	4	10	2	16	0·56	0·50
Insanity, General Paralysis of Insane ...	...	...	...	...	1	...	...	1	0·03	0·03
Epilepsy	1	...	...	...	2	1	.	4	0·14	0·12
Convulsions	42	7	1	1	...	...	..	51	1·80	1·60
Laryngismus Stridulus..	...	...	.	...	...	...	...	...	...	...
Idiopathic Tetanus	...	...	...	...	.	...	.	...	...	...
Paraplegia, Diseases of Spinal Cord ...	...	...	...	...	1	...	...	1	0·03	0·03
Other Diseases of Nervous System	...	...	...	1	...	...	..	1	0·03	0·03
Diseases of Organs of Special Sense.										
Otitis, Otorrhœa	...	...	...	...	...	...	...	...	...	...
Ophthalmia and Disease of Eye ...	...	...	...	...	...	...	...	...	...	.
Diseases of Circulatory System.										
Endocarditis, Valvular Disease ...	...	.	2	3	9	14	1	29	1·02	0·91
Pericarditis...	...	...	...	...	...	...	...	...	.	...
Hypertrophy of Heart ...										

CAUSES OF DEATH.	DEATHS AT AGES.								Death-rate per 1000 Inhabitants.	
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 45.	45 and under 65.	65 and Upwards.	Total.	112,712.	136,801.
CLASS VI. *Diseases of Circulatory System.—(Continued).*										
Angina Pectoris	...	...	...	...	...	...	...	...	...	...
Syncope	...	...	...	...	...	...	...	...	...	...
Aneurism	...	...	1	...	1	...	...	2	0·07	0·06
Other Diseases of the Circulatory System	...	...	...	...	...	1	...	1	0·03	0·03
Diseases of Respiratory System.										
Laryngitis	...	1	..	..	1	...	...	2	0·07	0·06
Croup	...	3	2	..	...	..	...	7	0·24	0·22
Other Diseases of Larynx and Trachea	...	...	...	...	...	...	...	...	...	...
Emphysema, Asthma	...	...	...	...	...	...	...	...	...	...
Bronchitis	...	41	12	1	2	12	19	4	91	3·22	2·87
Pneumonia	...	15	30	...	1	13	6	...	55	1·95	1·73
Pleurisy	...	...	...	...	1	2	1	...	4	0·14	0·12
Other Diseases of Respiratory System	...	2	1	...	..	2	...	...	5	0·17	0·15
Diseases of Digestive System.										
Stomatitis	...	...	...	...	...	...	...	...	...	...
Dentition	...	...	...	...	...	...	..	...	...	...
Dyspepsia	...	...	...	...	...	...	...	...	...	...
Hæmatemesis	...	...	...	...	...	...	...	...	...	...
Diseases of Stomach	...	1	1	...	..	2	...	...	4	0·14	0·12
Enteritis	...	...	..	...	..	1	1	...	2	0·07	0·06
Ulceration of Intestine	..	...	...	...	...	...	...	...	...	...	...
Ileus, Obstruction of Intestine	..	...	...	...	...	...	...	...	...	...	...
Stricture or Strangulation of Intestine	...	...	...	...	1	...	...	1	0·03	0·03
Intussusception of Intestine	...	1	...	...	...	...	...	1	0·03	0·03
Hernia	...	...	...	...	...	...	...	...	...	...
Peritonitis	...	...	...	1	2	5	...	9	0·31	0·28
Cirrhosis of Liver	...	...	1	2	...	1	...	1	0·03	0·03
Other Diseases of Liver	...	1	...	...	...	1	...	2	0·07	0·06
Other Diseases of Digestive System	...	1	...	...	...	1	...	2	0·07	0·06
Diseases of Lymphatic System and Ductless Glands.										
Disease of Spleen	...	...	...	1	...	..	1	0·03	0·03
Diseases of Urinary System.										
Acute Nephritis	...	...	...	...	1	...	...	1	0·03	0·03
Bright's Disease	...	...	...	...	12	3	...	15	0·53	0·47
Uræmia	...	...	...	...	...	...	...	...	...	...
Hæmaturia	...	...	...	...	...	...	...	...	...	...
Disease of Bladder and of Prostate	...	...	...	...	1	...	...	1	0·03	0·03
Other Diseases of Urinary System	..	...	...	...	...	...	...	...	..	...
Diseases of Organs of Generation.										
Ovarian Disease	...	...	...	...	...	...	...	...	...	...
Diseases of Uterus and Vagina	...	...	...	...	...	...	...	...	...	...
Diseases of Parturition.										
Abortion, Miscarriage	...	...	...	...	...	..	...	...	...	...
Puerperal Convulsions	...	...	...	...	...	...	...	...	...	...
Placenta Prævia, Flooding	...	...	...	...	...	...	...	...	...	...
Other Accidents at Childbirth	...	...	...	..	2	..	...	2	0·07	0·06
Diseases of Organs of Locomotion.										
Caries, Necrosis	...	...	...	...	.	...	...	...	...	...
Arthritis, Ostitis, Periostitis	...	...	...	...	1	2	...	3	0·10	0·09
Other Diseases of Organs of Locomotion	...	1	...	...	...	...	...	1	0·03	0·03
Diseases of Integumentary System.										
Eczema	...	...	...	...	...	...	...	...	...	...
Other Diseases of Integumentary System	...	1	...	...	...	...	...	1	0·03	0·03
Total	...	112	45	11	13	82	64	7	334	11·85	10·53
CLASS VII. *Accident or Negligence.*										
Fractures, Contusions	...	1	...	2	5	4	...	1	13	0·46	0·41
Burn, Scald	...	...	2	2	...	...	2	1	7	0·24	0·22
Poison	...	...	...	...	1	...	...	...	1	0·03	0·03
Drowning	...	...	...	...	...	3	...	...	3	0·10	0·09
Suffocation	...	2	2	...	...	...	...	...	4	0·14	0·12
Otherwise	...	...	...	...	...	...	...	...	...	...	...
Suicide.										
Cut, Stab	...	...	...	...	...	...	...	...	...	...	...
Hanging	...	...	...	...	...	...	...	...	...	...	...
Total	...	3	4	4	6	9	1	1	28	0·99	0·88
CLASS VIII.										
Dropsy	...	...	...	...	...	...	...	...	...	...
Debility, Atrophy, Inanition	...	42	4	1	..	2	1	...	50	1·77	1·57
Mortification	...	...	..	..	..	...	...	...	...	..	...
Tumour	...	...	...	...	...	...	...	...	...	...	...
Abscess	...	...	...	...	...	...	...	...	...	...	...
Hæmorrhage	...	...	...	...	...	...	...	...	...	...	...
Sudden (Cause unascertained)	...	4	...	...	...	...	1	...	5	0·17	0·15
Other Ill-defined and not Specified	...	...	...	...	...	...	...	1	1	0·03	0·03
Total	...	46	4	1	...	2	2	1	56	1·98	1·76

DEATHS REGISTERED AT AGES FROM THE SEVERAL CAUSES.

2nd Quarter, ending June 29th, 1889. *Districts—Cardiff, Roath and Canton.*

CAUSES OF DEATH.	DEATHS AT AGES.							T otal.	Death-rate per 1000 Inhabitants.	
	Under 1 Year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 60.	60 and under 80.	80 and upwards.		112,712.	126,801.
CLASSES.										
I. Specific Febrile or Zymotic Diseases ...	18	24	5	4	7	...	.	58	2·05	1·82
II. Parasitic	...	...	...	...	...	...	...	...	...	...
III. Dietic	...	...	...	...	1	...	...	1	0·03	0·03
IV. Constitutional	13	14	9	16	52	9	...	113	4·01	3·56
V. Developmental	10	1	...	...	...	16	12	39	1·38	1·23
VI. Local	66	30	15	11	80	38	2	242	8·58	7·63
VII. Violence	2	2	4	5	12	...	...	25	0·88	0·78
VIII. Ill-defined and not specified causes... ...	25	1	1	2	3	...	1	33	1·17	1·04
Total	134	72	34	38	155	63	15	511	18·1	16·1
CLASS I. *Miasmatic Diseases.*										
Measles	1	2	...	...	...	...	...	3	0·10	0·09
Scarlet Fever	...	2	1	...	...	...	...	3	0·10	0·09
Whooping Cough	14	18	2	...	...	...	...	34	1·20	1·07
Diphtheria	...	1	1	...	...	...	...	2	0·07	0·06
Simple and Ill-defined Fever ...	...	...	...	...	...	...	...	...	...	...
Enteric Fever	...	1	1	3	...	...	...	5	0·17	0·15
Diarrhœal Diseases.										
Diarrhœa, Dysentery	3	..	..	...	1	..	..	4	0·14	0·12
Venereal Diseases.										
Syphillis	...	...	...	..	1	...	...	1	0.03	0.03
Gonorrhœa, Stricture of Urethra ...	...	...	.	...	1	...	...	1	0.03	0.03
Septic Diseases.										
Erysipelas	..	...	...	...	2	...	...	2	0·07	0·06
Pyæmia, Septicæmia	...	...	...	...	1	...	...	1	0·03	0·03
Puerperal Fever	...	.	...	1	1	...	...	2	0·07	0·06
Total	18	24	5	4	7	...	...	58	2·05	1·82
CLASS II.										
Thrush ... ... Total ...	...	..	...	..	...	..	...	..	...	...
CLASS III.										
Chronic Alcoholism . . Total ...	...	...	...	...	1	...	...	1	0·03	0·03
CLASS IV.										
Rheumatic Fever, Rheumatism of Heart ...	...	...	...	...	2	...	...	2	0·07	0·06
Rheumatism	...	...	...	...	...	...	...	...	...	.
Rickets	2	1	...	...	...	..	..	3	0·10	0·09
Cancer	...	...	1	...	6	6	..	13	0·46	0·41
Tabes Mesenterica	2	3	...	..	...	...	..	5	0·17	0·15
Tubercular Meningitis (Acute Hydrocephalus)...	6	6	5	2	1	...	...	20	0·71	0·63
Phthisis	. .	1	3	13	41	3	. .	61	2·16	1·92
Other Forms of Tuberculosis, Scrofula ...	3	3	...	1	1	...	...	8	0·28	0·25
Anæmia, Chlorosis, Leucocythæmia ...	...	...	...	...	1	...	...	1	0·03	0·03
Diabetes Mellitus	...	...	...	...	..	...	...	...	...	...
Other Constitutional Disorders	..	..	...	...	...	...	...	...	...	...
Total	13	14	9	16	52	9	...	113	4·01	3·56
CLASS V.										
Premature Birth	9	1	...	...	...	...	..	10	0·35	0·31
Cyanosis	...	...	...	...	...	..	...	...	...	...
Spina Bifida	...	..	...	...	...	...	...	...	..	...
Imperforate Anus	...	..	...	..	.	...	...	...	...	...
Other Congenital Defects	1	.	...	...	...	..	..	1	0·03	0·03
Old Age	..	...	.	...	...	16	12	28	0·99	0·88
Total	10	1	...	...	...	16	12	39	1·38	1·23
CLASS VI. *Diseases of Nervous System.*										
Inflammation of Brain or its Membranes ...	1	1	2	..	...	3	...	7	0·24	0·22
Apoplexy	...	..	..	1	4	3		8	0·28	0·25
Softening of Brain	...	1	..	...	...	...	...	1	0·03	0·03
Hemiplegia, Brain Paralysis ...	...	...	.	...	1	...	...	1	0·03	0·03
Paralysis	...	...	...	...	1	2	...	3	0·10	0·09
Insanity, General Paralysis of Insane ...	...	...	...	...	...	...	...	...	...	...
Epilepsy	...	...	...	...	1	...	...	1	0·03	0·03
Convulsions	27	6	...	...	...	...	...	33	1·17	1·04
Laryngismus Stridulus.. ...	...	...	...	...	...	...	...	...	...	...
Idiopathic Tetanus	...	...	...	...	...	...	...	...	...	...
Paraplegia, Diseases of Spinal Cord ...	...	...	...	..	1	...	...	1	0·03	0·03
Other Diseases of Nervous System ..	..	...	1	...	3	1	..	5	0·17	0·15
Diseases of Organs of Special Sense.										
Otitis, Otorrhœa	...	...	..	. .	...	.	...	...	...	...
Ophthalmia and Disease of Eye ...	...	...	...	..	..	...	...	...	...	. .
Diseases of Circulatory System.										
Endocarditis, Valvular Disease ...	...	.	6	1	18	7	...	32	1·13	1·00
Pericarditis...	...	...	...	...	...	...	...	...	.	...
Hypertrophy of Heart	...	...	...	...	1	...	...	1	0·03	0·03

CAUSES OF DEATH.	DEATHS AT AGES.								Death-rate per 1000 Inhabitants.	
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 60.	60 and under 80.	80 and Upwards.	Total.	112,712.	196,801.
CLASS VI. *Diseases of Circulatory System.—(Continued).*										
Angina Pectoris	...	...	...	...	...	...	...	...	...	...
Syncope	...	...	...	...	1	...	...	1	0·03	0·03
Aneurism	...	...	...	...	2	...	...	2	0·07	0·06
Other Diseases of the Circulatory System	...	...	...	...	1	...	...	1	0·03	0·03
Diseases of Respiratory System.										
Laryngitis	...	1	1	..	...	...	...	2	0·07	0·06
Croup	...	5	...	...	...	...	...	5	0·17	0·15
Other Diseases of Larynx and Trachea	...	1	...	...	...	...	...	1	0·03	0·03
Emphysema, Asthma	...	...	...	...	1	1	...	2	0·07	0·06
Bronchitis	...	20	7	...	4	8	1	40	1·42	1·26
Pneumonia	...	14	7	1	5	12	5	...	44	1·56	1·38
Pleurisy	...	...	...	...	2	2	...	...	4	0·14	0·12
Other Diseases of Respiratory System	...	...	...	...	1	1	...	2	0·07	0·06
Diseases of Digestive System.										
Stomatitis	...	1	...	...	...	...	...	1	0·03	0·03
Dentition	...	...	...	...	...	...	...	...	...	...
Dyspepsia	...	...	...	...	...	...	...	...	...	...
Hæmatemesis	...	...	...	...	...	...	...	...	...	...
Diseases of Stomach	...	...	1	...	2	1	...	4	0·14	0·12
Enteritis	...	1	..	..	1	...	...	2	0·07	0·06
Ulceration of Intestine	...	...	...	...	...	...	...	...	...	...
Ileus, Obstruction of Intestine	...	..	...	...	2	...	...	2	0·07	0·06
Stricture or Strangulation of Intestine	...	...	...	...	1	...	..	1	0·03	0·03
Intussusception of Intestine	...	...	...	1	...	...	...	1	0·03	0·03
Hernia	...	...	..	...	1	..	..	1	0·03	0·03
Peritonitis	...	...	...	1	1	...	...	2	0·07	0·06
Cirrhosis of Liver	...	...	...	...	1	1	1	3	0·10	0·09
Other Diseases of Liver	...	1	...	...	...	.	...	1	0·03	0·03
Other Diseases of Digestive System	...	..	...	...	...	...	...	...	...	...
Diseases of Lymphatic System and Ductless Glands.										
Disease of Spleen	...	...	...	...	...	..	..	...	...	...
Diseases of Urinary System.										
Acute Nephritis	...	...	...	1	2	...	...	3	0·10	0·09
Bright's Disease	...	...	...	1	7	3	...	11	0·39	0·34
Uræmia	...	...	...	...	...	1	...	1	0·03	0·03
Hæmaturia	...	...	...	...	...	...	...	...	...	...
Disease of Bladder and of Prostate	...	...	...	...	.	...	...	1	0·03	0·03
Other Diseases of Urinary System	...	...	..	...	2	1	...	3	0·10	0·09
Diseases of Organs of Generation.										
Ovarian Disease	...	...	...	..	...	...	...	...	...	...
Diseases of Uterus and Vagina	...	...	...	...	1	...	...	1	0·03	0·03
Diseases of Parturition.										
Abortion, Miscarriage	...	...	...	...	...	...	...	...	...	...
Puerperal Convulsions	...	...	...	...	...	...	...	...	...	...
Placenta Prævia, Flooding	...	...	...	...	2	...	...	2	0·07	0·06
Other Accidents at Childbirth	...	...	...	..	3	...	...	3	0·10	0·09
Diseases of Organs of Locomotion.										
Caries, Necrosis	...	...	...	...	1	...	...	1	0·03	0·03
Arthritis, Ostitis, Periostitis	...	...	...	1	...	...	...	1	0·03	0·03
Other Diseases of Organs of Locomotion	...	...	...	...	...	...	...	...	...	...
Diseases of Integumentary System.										
Eczema	...	..	...	...	...	..	...	...	...	...
Other Diseases of Integumentary System	...	1	...	...	...	...	...	1	0·03	0·03
Total	...	66	30	15	11	80	38	2	242	8·58	7·63
CLASS VII. *Accident or Negligence.*										
Fractures, Contusions	...	...	1	3	1	7	...	...	12	0·42	0·37
Burn, Scald	...	...	...	1	...	...	...	...	1	0·03	0·03
Poison	...	...	...	...	1	...	...	...	1	0·03	0·03
Drowning	...	...	...	...	3	3	...	...	6	0·21	0·18
Suffocation	...	2	1	.	...	1	...	..	4	0·14	0·12
Otherwise	...	...	...	...	...	1	...	..	1	0·03	0·03
Suicide.										
Cut, Stab	...	...	...	...	...	...	...	...	...	...	...
Hanging	...	...	...	...	...	...	.	...	...	...	...
Total	...	2	2	4	5	12			25	0·88	0·78
CLASS VIII.										
Dropsy	...	...	...	..	...	...	...	1	1	0·03	0·03
Debility, Atrophy, Inanition	...	24	1	...	..	1	...	...	26	0·92	0·82
Mortification	...	...	.		..	...	...	...	...	..	...
Tumour	...	...	...	...	...	...	...	...	...	...	...
Abscess	...	...	...	.	...	...	...	...	...	...	...
Hæmorrhage	...	...	...	...	..	..	...	...	...	...	...
Sudden (Cause unascertained)	...	...	...	1	1	2	...	...	4	0·14	0·12
Other Ill-defined and not Specified	...	1	...	...	1	...	...	...	2	0·07	0·06
Total	...	25	1	1	2	3	...	1	33	1·17	1·04

DEATHS REGISTERED AT AGES FROM THE SEVERAL CAUSES.

Quarter ending September 28th, 1889. *Districts—Cardiff, Roath and Canton.*

CAUSES OF DEATH.	DEATHS AT AGES. Under 1 Year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and under 80.	80 and upwards.	Total.	Death-rate per 1000 Inhabitants. 112,712.	126,801.
CLASSES.										
I. Specific Febrile or Zymotic Diseases ...	68	15	1	2	7	2	..	95	3·37	2·99
II. Parasitic	...	...	...	...	...	...	...	...	...	...
III. Dietic	...	...	...	...	4	1	...	5	0·17	0·15
IV. Constitutional	14	18	7	18	52	8	2	119	4·22	3·75
V. Developmental	23	...	...	...	...	22	6	51	1·80	1·60
VI. Local	62	24	5	6	69	37	3	206	7·31	6·49
VII. Violence	1	3	11	7	11	1	...	34	1·20	1·07
VIII. Ill-defined and not specified causes...	40	3	1	...	6	...	1	51	1·80	1·60
Total	208	63	25	33	149	71	12	561	19·90	17·69
CLASS I. *Miasmatic Diseases.*										
Measles	...	3	1	...	...	...	...	4	0·14	0·12
Scarlet Fever	...	1	..	...	...	...	...	1	0·03	0·03
Whooping Cough	10	6	...	...	..	...	...	16	0·56	0·50
Diphtheria	...	2	...	...	...	...	...	2	0·07	0·06
Simple and Ill-defined Fever ...	...	...	...	...	...	...	...	...	...	...
Enteric Fever	...	...	...	2	4	...	...	6	0·21	0·18
Diarrhœal Diseases.										
Diarrhœa, Dysentery	53	3	..	...	...	2	..	58	2·05	1·82
Venereal Diseases.										
Syphillis	4	...	...	...	...	...	...	4	0.14	0.12
Gonorrhœa, Stricture of Urethra ...	...	...	...	...	...	...	...	...	...	...
Septic Diseases.										
Erysipelas	...	...	...	...	...	...	...	...	...	...
Pyæmia, Septicæmia	1	...	...	...	...	...	..	1	0·03	0·03
Puerperal Fever	...	...	...	...	3	...	...	3	0·10	0·09
Total	68	15	1	2	7	2	...	95	3·37	2·99
CLASS II.										
Thrush ... ... Total	...	..	...	...	...	...	...	..	...	...
CLASS III.										
Chronic Alcoholism . Total	...	...	...	...	4	1	...	5	0·17	0·15
CLASS IV.										
Rheumatic Fever, Rheumatism of Heart ...	...	...	...	...	...	...	...	...	...	...
Rheumatism	...	...	...	..	1	...	...	1	0·03	0·03
Rickets	...	1	...	...	...	...	...	1	0·03	0·03
Cancer	...	...	1	...	20	8	1	30	1·06	0·94
Tabes Mesenterica	3	5	...	..	...	...	..	8	0·28	0·25
Tubercular Meningitis (Acute Hydrocephalus)...	7	8	2	...	..	...	...	17	0·60	0·53
Phthisis	2	3	2	16	28	...	..	51	1·80	1·60
Other Forms of Tuberculosis, Scrofula ...	2	1	2	...	..	..	..	5	0·17	0·15
Anæmia, Chlorosis, Leucocythæmia ...	...	...	..	1	3	...	...	4	0·14	0·12
Diabetes Mellitus	...	...	...	...	...	...	1	1	0·03	0·03
Other Constitutional Disorders ...	...	...	...	1	...	...	...	1	0·03	0·03
Total	14	18	7	18	52	8	2	119	4·22	3·75
CLASS V.										
Premature Birth	20	...	...	...	...	...	..	20	0·71	0·63
Cyanosis	...	...	...	...	...	..	...	...	...	...
Spina Bifida	3	..	...	...	...	...	...	3	0·10	0·09
Imperforate Anus	...	...	...	...	...	...	...	...	...	...
Other Congenital Defects ...	...	...	...	...	...	...	...	...	...	...
Old Age	..	...	...	...	22	6	28	0·99	0·88	
Total	23	..	...	...	22	6	51	1·80	1·60	
CLASS VI. *Diseases of Nervous System.*										
Inflammation of Brain or its Membranes ...	..	1	...	...	1	...	...	2	0·07	0·06
Apoplexy	...	..	..	...	3	1	...	4	0·14	0·12
Softening of Brain	...	...	..	...	2	2	...	4	0·14	0·12
Hemiplegia, Brain Paralysis ...	...	...	.	...	2	3	...	5	0·17	0·15
Paralysis	...	...	...	...	...	3	2	5	0·17	0·15
Insanity, General Paralysis of Insane ...	...	...	...	...	...	...	...	...	...	...
Epilepsy	...	...	...	1	3	2	...	6	0·21	0·18
Convulsions	32	7	1	...	...	...	...	40	1·42	1·26
Laryngismus Stridulus.. ...	1	...	...	...	...	...	...	1	0·03	0·03
Idiopathic Tetanus	...	...	1	...	...	...	...	1	0·03	0·03
Paraplegia, Diseases of Spinal Cord ...	1	...	...	...	...	...	...	1	0·03	0·03
Other Diseases of Nervous System ...	..	...	...	...	...	3	..	3	0·10	0·09
Diseases of Organs of Special Sense.										
Otitis, Otorrhœa	...	1	...	...	...	..	...	1	0·03	0·03
Ophthalmia and Disease of Eye ...	...	...	...	..	1	...	...	1	0·03	0·03
Diseases of Circulatory System.										
Endocarditis, Valvular Disease ...	...	1	2	1	11	11	...	26	0·92	0·82
Pericarditis...	...	...	...	...	...	...	...	...	..	...
Hypertrophy of Heart	...	...	...	...	...	...	...	...	...	...

CAUSES OF DEATH.	DEATHS AT AGES.								Total.	Death-rate per 1000 Inhabitants.	
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 60.	60 and under 80.	80 and Upwards.			112,712.	126,801.
CLASS VI. *Diseases of Circulatory System.—(Continued).*											
Angina Pectoris	...	...	...	...	...	...	...	...	...	...	...
Syncope	...	...	...	...	1	...	...	...	1	0·03	0·03
Aneurism	...	...	...	...	...	...	...	...	...	...	...
Other Diseases of the Circulatory System	...	...	...	...	...	...	...	...	...	...	...
Diseases of Respiratory System.											
Laryngitis	...	...	...	...	...	...	...	...	...	...	...
Croup	...	1	3	...	...	...	...	...	4	0·14	0·12
Other Diseases of Larynx and Trachea	...	...	...	...	...	...	...	...	...	...	...
Emphysema, Asthma	...	...	...	...	...	...	...	...	...	...	...
Bronchitis	...	4	4	...	5	4	1	18	0·63	0·56	
Pneumonia	...	6	4	1	1	11	...	...	23	0·81	0·72
Pleurisy	...	...	...	...	...	...	...	...	...	...	...
Other Diseases of Respiratory System	...	1	...	...	...	1	...	2	0·07	0·06	
Diseases of Digestive System.											
Stomatitis	...	1	...	...	...	...	...	...	1	0·03	0·03
Dentition	...	1	...	...	...	...	...	...	1	0·03	0·03
Dyspepsia	...	...	...	...	...	...	...	...	...	...	...
Hæmatemesis	...	...	...	...	1	...	...	1	0·03	0·03	
Diseases of Stomach	...	1	...	...	...	1	...	...	2	0·07	0·06
Enteritis	...	13	...	...	...	1	1	...	15	0·53	0·47
Ulceration of Intestine	...	...	...	...	...	...	1	...	1	0·03	0·03
Ileus, Obstruction of Intestine	...	...	...	...	2	...	...	2	0·07	0·06	
Stricture or Strangulation of Intestine	...	...	...	...	...	...	...	...	...	...	
Intussusception of Intestine	...	...	...	...	...	...	...	...	...	...	
Hernia	...	...	...	...	...	2	1	...	3	0·10	0·09
Peritonitis	...	...	...	...	...	4	1	...	5	0·17	0·15
Cirrhosis of Liver	...	...	...	...	...	2	...	...	2	0·07	0·06
Other Diseases of Liver	...	...	...	...	...	2	1	...	3	0·10	0·09
Other Diseases of Digestive System	...	...	...	...	...	...	...	...	...	...	...
Diseases of Lymphatic System and Ductless Glands.											
Disease of Spleen	...	...	...	...	...	...	...	...	...	...	...
Diseases of Urinary System.											
Acute Nephritis	...	1	...	1	1	...	...	3	0·10	0·09	
Bright's Disease	...	...	...	...	5	2	...	7	0·24	0·22	
Uræmia	...	...	...	...	...	...	...	...	...	...	
Hæmaturia	...	...	...	...	...	...	...	...	...	...	
Disease of Bladder and of Prostate	...	...	...	...	...	...	...	...	...	...	
Other Diseases of Urinary System	...	1	...	...	...	...	...	1	0·03	0·03	
Diseases of Organs of Generation.											
Ovarian Disease	...	...	...	...	1	...	...	1	0·03	0·03	
Diseases of Uterus and Vagina	...	...	...	1	3	...	...	4	0·14	0·12	
Diseases of Parturition.											
Abortion, Miscarriage	...	...	...	...	...	...	...	...	...	...	
Puerperal Convulsions	...	...	...	...	1	...	...	1	0·03	0·03	
Placenta Prævia, Flooding	...	...	...	...	1	...	...	1	0·03	0·03	
Other Accidents at Childbirth	...	...	...	...	...	...	...	...	...	...	
Diseases of Organs of Locomotion.											
Caries, Necrosis	...	...	...	...	2	...	...	2	0·07	0·06	
Arthritis, Ostitis, Periostitis	...	...	...	...	...	...	...	...	...	...	
Other Diseases of Organs of Locomotion	...	...	...	...	1	...	...	1	0·03	0·03	
Diseases of Integumentary System.											
Eczema	...	1	...	...	...	...	...	1	0·03	0·03	
Other Diseases of Integumentary System	...	...	...	...	...	...	...	...	...	...	
Total	...	62	24	5	6	69	37	3	206	7·31	6·49
CLASS VII. *Accident or Negligence.*											
Fractures, Contusions	...	...	...	4	3	7	...	...	14	0·49	0·44
Burn, Scald	...	...	3	1	1	...	...	...	5	0·17	0·15
Poison	...	...	...	...	1	...	...	...	1	0·03	0·03
Drowning	...	...	...	6	2	2	...	...	10	0·35	0·31
Suffocation	...	1	...	...	...	...	...	...	1	0·03	0·03
Otherwise	...	...	...	...	...	1	...	...	1	0·03	0·03
Suicide.											
Cut, Stab	...	...	...	...	...	...	1	1	0·03	0·03	
Hanging	...	...	...	...	...	1	...	...	1	0·03	0·03
Total	...	1	3	11	7	11	1	...	34	1·20	1·07
CLASS VIII.											
Dropsy	...	...	...	...	...	...	...	...	...	...	...
Debility, Atrophy, Inanition	...	35	2	...	...	...	...	...	37	1·31	1·16
Mortification	...	...	...	...	...	...	...	...	...	...	...
Tumour	...	...	...	...	2	...	...	2	0·07	0·06	
Abscess	...	1	...	...	...	...	...	1	0·03	0·03	
Hæmorrhage	...	...	...	...	...	...	1	1	0·03	0·03	
Sudden (Cause unascertained)	...	3	1	...	...	2	...	6	0·21	0·18	
Other Ill-defined and not Specified	...	1	...	1	...	2	...	...	4	0·14	0·12
Total	...	40	3	1	...	6	...	1	51	1·80	1·60

DEATHS REGISTERED AT AGES FROM THE SEVERAL CAUSES.

Quarter ending December 28th, 1889. *Districts—Cardiff, Roath and Canton.*

CAUSES OF DEATH.	DEATHS AT AGES.							Total.	Death-rate per 1000 Inhabitants.	
	Under 1 Year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 60.	60 and under 80.	80 and upwards.		112,712.	126,801.
CLASSES.										
I. Specific Febrile or Zymotic Diseases ...	8	16	3	3	8	...	...	38	1·34	1·19
II. Parasitic	...	...	...	...	...	...	...	...	...	...
III. Dietic	...	...	...	...	1	...	...	1	0·03	0·03
IV. Constitutional	11	9	4	9	34	8	...	75	2·66	2·36
V. Developmental	12	1	...	...	...	9	11	33	1·17	1·04
VI. Local	77	38	11	12	70	41	2	251	8·90	7·91
VII. Violence	4	5	3	2	11	4	...	29	1·02	0·91
VIII. Ill-defined and not specified causes...	28	5	...	1	5	1	...	40	1·42	1·26
Total	140	74	21	27	129	63	13	467	16·57	14·73
CLASS I. *Miasmatic Diseases.*										
Measles	...	3	...	...	...	...	...	3	0·10	0·09
Scarlet Fever	...	8	...	...	...	...	...	8	0·28	0·25
Whooping Cough	...	...	...	...	...	...	...	...	...	...
Diphtheria	...	4	...	...	...	...	...	4	0·14	0·12
Simple and Ill-defined Fever ...	...	...	...	...	...	...	...	...	...	...
Enteric Fever	...	...	3	1	6	...	...	10	0·35	0·31
Diarrhœal Diseases.										
Diarrhœa, Dysentery	5	1	...	...	1	...	...	7	0·24	0·22
Venereal Diseases.										
Syphillis	2	...	...	...	...	...	...	2	0·07	0·06
Gonorrhœa, Stricture of Urethra ...	...	...	...	...	...	...	...	...	...	...
Septic Diseases.										
Erysipelas	...	...	...	...	...	...	...	...	...	...
Pyæmia, Septicæmia	1	...	...	1	1	...	...	3	0·10	0·09
Puerperal Fever	...	...	...	1	...	...	...	1	0·03	0·03
Total	8	16	3	3	8	...	...	38	1·34	1·19
CLASS II.										
Thrush ... ... Total	...	...	...	...	...	...	...	...	...	...
CLASS III.										
Chronic Alcoholism ... Total	...	...	...	...	1	...	...	1	0·03	0·03
CLASS IV.										
Rheumatic Fever, Rheumatism of Heart	...	1	...	...	1	...	...	2	0·07	0·06
Rheumatism	...	...	...	...	...	...	...	...	...	...
Rickets	...	...	...	...	...	...	...	...	...	...
Cancer	...	...	...	...	3	2	...	5	0·17	0·15
Tabes Mesenterica	6	...	1	...	...	...	...	7	0·24	0·22
Tubercular Meningitis (Acute Hydrocephalus)...	4	6	1	1	...	...	...	12	0·42	0·37
Phthisis	...	2	1	8	30	6	...	47	1·66	1·48
Other Forms of Tuberculosis, Scrofula	1	...	1	...	...	...	...	2	0·07	0·06
Anæmia, Chlorosis, Leucocythæmia	...	...	...	...	...	...	...	...	...	...
Diabetes Mellitus	...	...	...	...	...	...	...	...	...	...
Other Constitutional Disorders ...	...	...	...	...	...	...	...	...	...	...
Total	11	9	4	9	34	8	...	75	2·66	2·36
CLASS V.										
Premature Birth	11	...	...	...	...	...	...	11	0·39	0·34
Cyanosis	1	...	...	...	...	...	...	1	0·03	0·03
Spina Bifida	...	...	...	...	...	...	...	...	...	...
Imperforate Anus	...	1	...	...	...	...	...	1	0·03	0·03
Other Congenital Defects ...	...	...	...	...	...	...	...	...	...	...
Old Age	...	...	...	...	...	9	11	20	0·71	0·63
Total	12	1	...	...	...	9	11	33	1·17	1·04
CLASS VI. *Diseases of Nervous System.*										
Inflammation of Brain or its Membranes ...	1	2	1	...	2	...	...	6	0·21	0·18
Apoplexy	...	...	...	...	2	5	1	8	0·28	0·25
Softening of Brain	...	...	...	...	2	2	...	4	0·14	0·12
Hemiplegia, Brain Paralysis ...	...	...	...	...	1	3	...	4	0·14	0·12
Paralysis	...	...	...	...	2	2	...	4	0·14	0·12
Insanity, General Paralysis of Insane	...	...	...	...	...	...	...	...	...	...
Epilepsy	...	1	...	1	1	...	...	3	0·10	0·09
Convulsions	28	4	...	...	...	...	...	32	1·13	1·00
Laryngismus Stridulus.. ...	1	...	...	...	...	...	...	1	0·03	0·03
Idiopathic Tetanus	...	...	...	...	...	...	...	...	...	...
Paraplegia, Diseases of Spinal Cord ...	...	...	...	...	2	...	...	2	0·07	0·06
Other Diseases of Nervous System ...	...	...	...	...	...	...	...	...	...	...
Diseases of Organs of Special Sense.										
Otitis, Otorrhœa	...	...	1	...	...	...	...	1	0·03	0·03
Ophthalmia and Disease of Eye ...	...	...	...	...	...	...	...	...	...	...
Diseases of Circulatory System.										
Endocarditis, Valvular Disease ...	...	...	2	2	15	2	...	21	0·74	0·66
Pericarditis...	...	...	1	...	...	...	...	1	0·03	0·03
Hypertrophy of Heart	...	...	...	...	...	2	...	2	0·07	0·06

CAUSES OF DEATH.	DEATHS AT AGES.							Total.	Death-rate per 1000 Inhabitants.	
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 60.	60 and under 80.	80 and Upwards.		112,712.	126,801.
CLASS VI. *Diseases of Circulatory System.—(Continued).*										
Angina Pectoris	...	...	...	...	...	1	...	1	0·03	0·03
Syncope	...	...	...	...	1	...	...	1	0·03	0·03
Aneurism	...	...	...	...	...	1	...	1	0·03	0·03
Other Diseases of the Circulatory System	1	...	...	...	...	...	...	1	0·03	0·03
Diseases of Respiratory System.										
Laryngitis	...	1	...	1	1	...	...	3	0·10	0·09
Croup	...	3	1	...	...	...	...	4	0·14	0·12
Other Diseases of Larynx and Trachea	...	...	...	...	...	...	...	...	...	...
Emphysema, Asthma	...	...	...	...	...	...	...	...	...	...
Bronchitis	...	33	11	1	8	12	...	65	2·30	2·04
Pneumonia	...	9	11	2	4	12	7	45	1·59	1·41
Pleurisy	...	...	...	...	1	...	...	1	0·03	0·03
Other Diseases of Respiratory System	...	...	...	...	1	...	...	1	0·03	0·03
Diseases of Digestive System.										
Stomatitis	...	1	...	...	...	...	...	1	0·03	0·03
Dentition	1	...	...	...	...	...	...	1	0·03	0·03
Dyspepsia	...	...	...	...	...	1	...	1	0·03	0·03
Hæmatemesis	1	...	...	...	...	...	...	1	0·03	0·03
Diseases of Stomach	...	...	...	...	1	...	...	1	0·03	0·03
Enteritis	1	4	...	...	...	...	...	5	0·17	0·15
Ulceration of Intestine	...	...	...	...	...	...	...	1	0·03	0·03
Ileus, Obstruction of Intestine	1	...	...	...	4	...	...	5	0·17	0·15
Stricture or Strangulation of Intestine	...	...	...	...	...	...	...	...	...	...
Intussusception of Intestine	...	...	...	...	...	...	...	...	...	...
Hernia	...	...	...	...	...	...	...	...	...	...
Peritonitis	...	...	1	...	...	1	...	2	0·07	0·06
Cirrhosis of Liver	...	...	...	...	5	2	1	8	0·28	0·25
Other Diseases of Liver	...	...	...	...	2	1	...	3	0·10	0·09
Other Diseases of Digestive System	...	...	...	...	...	...	...	...	...	...
Diseases of Lymphatic System and Ductless Glands.										
Disease of Spleen	...	...	...	...	...	...	...	...	...	...
Diseases of Urinary System.										
Acute Nephritis	...	...	...	1	2	...	...	3	0·10	0·09
Bright's Disease	...	...	...	...	3	...	...	3	0·10	0·09
Uræmia	...	...	...	...	...	...	...	...	...	...
Hæmaturia	...	...	...	...	1	...	...	1	0·03	0·03
Disease of Bladder and of Prostate	...	...	...	...	1	...	...	1	0·03	0·03
Other Diseases of Urinary System	...	...	1	...	1	...	...	2	0·07	0·06
Diseases of Organs of Generation.										
Ovarian Disease	...	...	...	...	1	...	...	1	0·03	0·03
Diseases of Uterus and Vagina	...	...	...	...	...	...	...	...	...	...
Diseases of Parturition.										
Abortion, Miscarriage	...	...	...	...	1	...	...	1	0·03	0·03
Puerperal Convulsions	...	...	...	...	...	...	...	...	...	...
Placenta Prævia, Flooding	...	...	...	...	...	...	...	...	...	...
Other Accidents at Childbirth	...	...	...	1	...	...	...	1	0·03	0·03
Diseases of Organs of Locomotion.										
Caries, Necrosis	...	...	...	1	...	...	...	1	0·03	0·03
Arthritis, Ostitis, Periostitis	...	...	...	...	...	...	...	...	...	...
Other Diseases of Organs of Locomotion	...	...	...	...	...	...	...	...	...	...
Diseases of Integumentary System.										
Eczema	...	...	...	...	...	...	...	...	...	...
Other Diseases of Integumentary System	...	...	...	...	...	...	...	...	...	...
Total	77	38	11	12	70	41	2	251	8·90	7·91
CLASS VII. *Accident or Negligence.*										
Fractures, Contusions	...	2	1	2	7	2	...	14	0·49	0·44
Burn, Scald	1	3	1	...	1	...	...	6	0·21	0·18
Poison	...	...	...	...	...	...	...	...	...	...
Drowning	...	...	1	...	3	1	...	5	0·17	0·15
Suffocation	3	...	...	...	...	...	...	3	0·10	0·09
Otherwise	...	...	...	...	...	...	...	...	...	...
Suicide.										
Cut, Stab	...	...	...	...	...	...	...	...	...	...
Hanging	...	...	...	...	1	...	...	1	0·03	0·03
Total	4	5	3	2	11	4		29	1·02	0·91
CLASS VIII.										
Dropsy	...	...	...	...	...	...	...	...	...	...
Debility, Atrophy, Inanition	25	3	...	...	...	...	...	28	0·99	0·88
Mortification	...	...	...	...	...	1	...	1	0·03	0·03
Tumour	...	...	...	...	1	...	...	1	0·03	0·03
Abscess	...	2	...	...	2	...	...	4	0·14	0·12
Hæmorrhage	...	...	...	...	...	...	...	...	...	...
Sudden (Cause unascertained)	2	...	...	1	2	...	...	5	0·17	0·15
Other Ill-defined and not Specified	1	...	...	...	...	...	...	1	0·03	0·03
Total	28	5	...	1	5	1	...	40	1·42	1·26

DEATHS REGISTERED AT AGES FROM THE SEVERAL CAUSES.

Year ending December 28th, 1889. *Districts—Cardiff, Roath and Canton.*

CAUSES OF DEATH.	DEATHS AT AGES.							Total.	Death-rate per 1000 inhabitants.	
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 45.	45 and under 65.	65 and upwards.		112,712.	126,301.
Classes.										
I. Specific Febrile or Zymotic Diseases	113	100	13	11	28	7	...	272	2·413	2·145
II. Parasitic	2	...	...	...	...	...	...	2	0·017	0·015
III. Dietic	...	...	...	...	7	1	...	8	0·070	0·063
IV. Constitutional	44	56	25	57	190	40	4	416	3·690	3·280
V. Developmental	60	2	...	...	2	64	35	163	1·446	1·285
VI. Local	317	137	42	42	307	174	14	1033	9·164	8·146
VII. Violence	10	14	22	21	12	6	1	116	1·029	0·914
VIII. Ill-defined and not specified causes	139	13	2	3	16	3	3	180	1·596	1·419
Total	685	322	105	134	592	295	57	2190	19·430	17·271
CLASS I. *Miasmatic Diseases.*										
Measles	7	30	3	1	...	...	...	41	0·363	0·323
Scarlet Fever	...	14	1	...	...	...	...	15	0·133	0·118
Whooping Cough	32	43	4	...	...	...	...	79	0·701	0·623
Diphtheria	...	7	1	...	...	...	...	8	0·070	0·063
Simple and Ill-defined Fever	...	...	...	...	1	...	...	1	0·008	0·007
Enteric Fever	...	1	4	6	14	4	...	29	0·257	0·228
Diarrhœal Diseases.										
Diarrhœa, Dysentery	66	5	...	...	2	4	...	76	0·665	0·591
Venereal Diseases.										
Syphillis	6	...	...	...	1	...	...	7	0·062	0·055
Gonorrhœa, Stricture of Urethra	...	...	...	...	1	...	...	1	0·008	0·007
Septic Diseases.										
Erysipelas	...	...	...	...	2	...	...	2	0·017	0·015
Pyæmia, Septicæmia	2	...	...	2	3	...	...	7	0·062	0·055
Puerperal Fever	...	...	...	2	4	1	...	7	0·062	0·055
Total	113	100	13	11	28	7	...	272	2·413	2·145
CLASS II.										
Thrush Total	2	...	...	...	...	...	...	2	0·017	0·015
CLASS III.										
Chronic Alcoholism Total	...	...	...	...	7	1	...	8	0·070	0·063
CLASS IV.										
Rheumatic Fever, Rheumatism of Heart	...	1	...	...	4	...	...	5	0·044	0·039
Rheumatism	...	...	...	...	1	2	...	3	0·026	0·023
Rickets	2	2	...	...	...	...	...	4	0·035	0·031
Cancer	...	...	2	...	35	23	1	61	0·541	0·481
Tabes Mesenterica	12	9	2	...	...	...	...	23	0·204	0·181
Tubercular Meningitis (Acute Hydrocephalus)	19	29	10	3	2	...	...	63	0·558	0·496
Phthisis	5	7	7	50	140	14	1	224	1·987	1·766
Other Forms of Tuberculosis, Scrofula	6	7	3	2	2	1	1	22	0·195	0·173
Anæmia, Chlorosis, Leucocythæmia	...	1	1	1	5	...	...	8	0·070	0·063
Diabetes Mellitus	...	...	...	...	1	...	1	2	0·017	0·015
Other Constitutional Disorders	...	...	...	1	...	...	...	1	0·008	0·007
Total	44	56	25	57	190	40	4	416	3·690	3·280
CLASS V.										
Premature Birth	55	1	...	...	...	...	...	56	0·496	0·441
Cyanosis	1	...	...	...	...	...	...	1	0·008	0·007
Spina Bifida	3	...	...	...	...	...	...	3	0·026	0·023
Imperforate Anus	...	1	...	...	...	...	...	1	0·008	0·007
Other Congenital Defects	1	...	...	...	...	...	...	1	0·008	0·007
Old Age	...	...	...	...	2	64	35	101	0·896	0·796
Total	60	2	...	...	2	64	35	163	1·446	1·285
CLASS VI. *Diseases of Nervous System.*										
Inflammation of Brain or its Membranes	4	4	6	...	10	2	...	26	0·230	0·205
Apoplexy	...	...	...	1	11	13	1	26	0·230	0·205
Softening of Brain	...	1	...	...	4	4	...	9	0·079	0·070
Hemiplegia, Brain Paralysis	...	...	...	...	4	6	...	10	0·088	0·078
Paralysis	...	...	...	...	7	17	4	28	0·248	0·220
Insanity, General Paralysis of Insane	...	...	...	...	1	...	...	1	0·008	0·007
Epilepsy	1	1	...	2	7	3	...	14	0·124	0·110
Convulsions	129	24	2	1	...	...	...	156	1·384	1·202
Laryngismus Stridulus	2	...	...	...	...	...	...	2	0·017	0·015
Idiopathic Tetanus	...	...	1	...	...	...	...	1	0·008	0·007
Paraplegia, Diseases of Spinal Cord	1	...	...	...	4	...	...	5	0·044	0·039
Other Diseases of Nervous System	...	...	1	1	6	1	...	9	0·079	0·070
Diseases of Organs of Special Sense.										
Otitis, Otorrhœa	...	1	1	...	...	...	...	2	0·017	0·015
Ophthalmia and Disease of Eye	...	...	...	...	1	...	...	1	0·008	0·007
Diseases of Circulatory System.										
Endocarditis, Valvular Disease	...	...	1	2	7	53	34	1	10	0·958	0·851
Pericarditis	...	...	...	1	...	...	...	...	1	0·008	0·007
Hypertrophy of Heart	...	...	...	...	...	1	2	...	3	0·026	0·023