

1878.

BOROUGH OF CARDIFF.

THE

OFFICER OF HEALTH'S REPORT

Sanitary Condition of Cardiff,

DURING THE YEAR 1877.

BY H. J. PAINE, M.D., M.R.C.S., &c., &c.,

MEDICAL OFFICER OF HEALTH,

HONORARY MEMBER OF THE EPIDEMIOLOGICAL SOCIETY, EXTRA URBAN MEMBER OF THE

METROPOLITAN ASSOCIATION OF OFFICERS OF HEALTH.

PRINTED BY ORDER OF THE LOCAL BOARD OF HEALTH

CARDIFF :

DANIEL OWEN AND COMPANY,

ST. MARY STREET.

TO THE

CARDIFF LOCAL BOARD OF HEALTH.

Cardiff, February, 1878.

To the Cardiff Urban Sanitary Authority.

GENTLEMEN,

I have to-day to submit to your notice my Annual Report on the Sanitary condition of the Urban District of Cardiff for the year 1877, and to direct your attention to any matters which appear likely to exercise an influence on the public health.

The area of the combined District, exclusive of that portion covered by water, is 7,374 acres; but practically the whole of the populous portion is contained within an area of 1,312 acres, giving a proportionate rate of 60·28 persons to each acre.

For Sanitary purposes, I observe the same sub-divisions as on former occasions, namely, Cardiff Proper, Roath, and Canton.

I have, therefore, to speak first of the drainage of the sub-district of Cardiff, which, as a whole, may be said to have been completed as far as its main trunks are concerned in 1876; all the new sewerage works of this sub-district during the year 1877 have been limited to branches, constructed for carrying away the sewerage of newly formed streets. These being near the northern extremity of the district at Cathays, comprising the following streets:—Woodville Terrace East, Daniel Street, Robert Street, and Lucas Street. In these streets sewers have been constructed of the dimensions 3ft. 3in. by 2ft., having an inclination varying from 1 in 200 to 1 in 300, and

1 in 64, and are connected with the main trunk sewer in this locality. The system of drainage in this district was originally designed by Mr. Hawkeshaw, in 1853, the first portion of which was completed in 1856, at a cost of £26,624 15s. 6d. Two years after, the rapidly increasing growth of the town necessitated a further extension, raising the cost to £37,000. From this date to the end of 1877 large extensions in the main sewers have been made from time to time; the total cost to the latter date has been £94,760. The sewerage is as perfect and as efficient now, after a test of twenty years, as it was at its commencement.

In the sub-district of Roath some revision of its system of drainage will before long require your serious consideration. The Roath drainage is not equal to the requirements of a district increasing so rapidly in its proportions. In the meantime street sewers have been constructed in Bertram Street, Comet Street, Eclipse Street, and Adamsdown Square, with dimensions of 3ft. 3in. by 2ft., and an inclination varying from 1 in 111 to 1 in 131.

In the Canton sub-district during the year the following sewerage works have been executed. The main trunk of the Llandaff Road Extension has been continued to near Penhill, the size being 3ft. 3in. by 2ft., with an inclination of 1 in 170.

The Ely Road Extension has been made from the termination of main trunk sewer No. 2, near Canton Cross, to the west end of Devonshire Place, its size being 3ft. 9in. by 2ft. 6in., with an inclination of 1 in 1,300.

Another main trunk sewer has been constructed, being No. 4, from the end of main trunk sewer No. 1, near the river Taff, to Albion Terrace, Cowbridge Road; this is a barrel sewer of 4ft. inside diameter, with an inclination of 1 in 1,900. Another sewer has been constructed from main trunk sewer No. 4 along Cowbridge Road to bottom of Severn Road, its dimensions being 3ft. 3in. by 2ft., with an inclination of 1 in 235.

Street sewers have been made through part of Romilly Road, Stacey Lane, Union Street, Harvey Street, Harvey Lane North, Harvey Lane South, and North Market Road, the several dimensions being 3ft. 3in. by 2ft., with inclinations varying from 1 in 24 to 1 in 200.

All these sewers are provided with convenient ventilating shafts, charcoal cages, manhole shafts, and side entrances.

The sewerage expenditure of the year was £9,503. This is exclusive of the cost of the last mentioned street sewers with the exception of Union Street.

Other streets in this district require deep drainage, especially Halket Street, North Morgan Street, Edward Street, Picton Place, Mary Anne Street, Thomas Street, Wellington Street, and Canton Square. At the present time only pipe drainage for surface drainage exists in these streets (with the exception of Wellington Street.) Closet matter is removed into cesspits, which constantly overflow during wet weather, and are a fertile source of disease.

METEOROLOGY.

The Meteorology of the year was as follows :—

The Rainfall at Cardiff during the year 1877 as observed by Mr. W. Adams, C.E., F.G.S., at his residence, No. 53, Crockherbtown, is shewn by the subjoined table :—

Latitude, N. 51deg., 9min. 10sec.
 Longitude, W. 30deg., 9min. 55sec.
 Diameter of Receiver, 5 inches.
 Height above ground, 1 foot.
 Height above mean water level, 35 feet.

Month.	Total Depth.	Greatest fall in 24 hours		Days on which "01 or more fell.
		Depth.	Date.	
January	5·77	0·72	3rd	27
February	2·79	0·42	11th	20
March	2·66	0·55	23rd	21
April.....	2·90	0·52	20th	20
May	2·47	0·99	16th	14
June.....	1·48	0·41	1st	12
July .. .	4·94	1·27	14th	18
August.....	5·70	1·14	27th	21
September	3·25	1·39	2nd	8
October.....	4·89	1·15	24th	16
November	6·54	1·06	24th	25
December.	3·40	0·88	28th	25
	46·79			227

The total Rainfall in 1877 was 2·96 inches above the average of the previous five years, as shown by the following table:

Month.	1872.	1873.	1874.	1875.	1876.	1877.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
January.....	7·79	4·76	4·63	5·87	1·91	5·77
February	4·24	1·17	2·91	2·08	5·33	2·79
March	3·16	3·60	2·03	1·66	3·92	2·66
April	1·33	0·39	1·67	2·65	2·70	2·90
May	2·11	2·72	0·67	2·93	0·23	2·47
June	3·71	1·93	1·71	5·34	1·91	1·48
July	4·67	4·63	1·78	6·27	1·24	4·94
August	3·12	3·66	4·57	3·82	6·06	5·70
September ..	3·67	2·75	5·45	4·05	7·08	3·25
October	4·45	4·42	4·83	7·80	3·84	4·89
November.....	5·56	2·29	2·71	7·78	5·27	6·54
December	6·03	1·16	4·35	1·74	7·13	3·40
	50·36	32·88	37·31	51·99	46·62	46·79

The weather during the month of January was very wet and stormy. The Barometer was low and fluctuating. The highest point was on the 21st when it reached 30·534in., and the lowest on the 1st, when it stood at 28·176in. The mean being 29·726in. The temperature was very mild, and far above the average. It was highest on the 5th, rising to 58·4deg., and lowest on the 13th, the reading being 29·6deg. The mean of maximum Thermometer was 49·8deg. The mean of minimum 37·8deg. The wind was chiefly from the W. and S.W. The rainfall was heavy and measured 5·77in.

February resembled the previous month in its humid and tempestuous character, with heavy rainfall, but in a slighter degree. The Barometer was unsteady, it stood highest on the 5th at 30·263in. and lowest on the 26th, at 29·333in. The mean was 29·898in. The temperature was mild, and full 6deg. above the average. The highest reading was 56deg. on the 14th, the lowest 27deg. on the 28th. The mean of maximum Thermometer was 50·3deg., of minimum 40·5deg. The month was more or less wet throughout, the rainfall was 2·79 inches. North and Westerly winds prevailed.

March was a variable month, with a mixture of frost, snow, thunder, rain, and wind. The Barometer was low and oscillatory. The maximum height 30·355in. was on the 1st, the minimum height 28·252 on the 25th, the mean being 29·724in. The highest Thermometer point was 58·9deg. on the 28th, and the lowest 23·6deg. on the 2nd. The mean of maximum Thermometer was 50·7deg., minimum

35·9deg. Easterly and Westerly winds alternated pretty equally. The rainfall 2·66 inches.

The weather of April was mild in the early part of the month, but became cold toward the middle and continued so to the end. The atmospheric pressure was low and unequal. The Barometer was highest 30·234in. on the 20th, and lowest 29·023in. on the 4th, the mean was 29·704in. The temperature was below the average. The Thermometer was highest on 22nd, reaching 59·5deg., and lowest 33deg. on the 4th, the mean of maximum Thermometer was 53·9deg. of minimum Thermometer 41·3deg. Prevailing winds, S.E. and S.W. The rainfall was 2·90 inches.

May was cold throughout and especially during the first week. The Barometer was below 30in. on 18 days; being highest on the 1st, when it was 30·327in., and lowest on 28th, when it was 29·146in. The mean for the month was 29·814in. The Thermometer was highest on the 26th, when it reached 67deg., and lowest on the 4th when it fell to 32·5deg. The mean of maximum Thermometer was 59·5deg., of minimum 43·9deg. The winds were chiefly from the E. The rainfall was 2·47 inches.

The weather after the first few days of June was warm, and continued so to the end of the month. The Barometer was high and steady, being highest 30·195in. on the 28th, and lowest on the 1st, when it was 29·297in. The mean for the month 30·90in. The temperature was genial throughout. The Thermometer stood highest on the 18th, when it reached 82·5deg., and lowest on the 25th, when it fell to 53·5deg. The mean of maximum Thermometer was 53·5deg., of minimum 35·5deg. The rainfall of this month was the lowest of the year, measuring only 1·48 inches.

July was cold throughout, the temperature being below the average. The Barometer was 30·289in. on the 29th, and 29·413in. on the 16th. The mean being 29·846in. The Thermometer was highest on the 30th, when it reached 75deg., and lowest on the 12th, when it was 40deg. The mean of maximum Thermometer was 68·2deg., of minimum 49·3deg. The winds were chiefly S.W. and W. The rainfall was heavy, measuring 4·94 inches.

August was also more or less cold and chilly, especially during the latter part of the month. The Barometer was depressed and unsteady, being below 30in. on 18 days. The mean was 29·80in. The Thermometer was 80deg. on the 20th, and lowest on the 2nd, when it fell to 41deg. The mean of maximum Thermometer was 68·7deg., of minimum Thermometer 56·7 deg. The prevalent winds were W. and S.W. The rainfall was considerably above the average, measuring 5·70 inches.

September was also very cold. The Barometer was high and steady, being 30.498in. on the 27th, and 29.686in. on the 11th. The mean was 30.020 inches. The Thermometer was highest on the 11th, when it read 72deg., and lowest on the 5th, when it was 36.8deg. The mean of maximum Thermometer was 62.8deg., of minimum 46deg. E. and N.E. winds prevailed. The rainfall was 3.25in., and fell chiefly between the 9th and 16th.

October was cold throughout. During the beginning of the month the weather was dry but subsequently wind and rain prevailed. The Barometer was at first steady then it fluctuated; it stood highest on the 6th, at 30.60in., and lowest on the 25th, being 29.14in. The mean of the month was 29.97in. The Thermometer was highest on the 14th, when it reached 64.5deg., and lowest on the 25th, when it fell to 29.14deg. The mean of maximum Thermometer, was 57.8deg. of minimum 42.9deg. N.W. winds prevailed. There was a great gale on the 14th and 15th. The rainfall was heavy, measuring 4.89 inches.

November was wet and gloomy. Barometer low and oscillating. The highest reading was on the 1st, viz : 30.408in., and the lowest on the 30th at 29.028in. The mean being 29.361in. The Thermometer was highest on the 9th, being 59.2deg., and lowest on the 14th, registering 32deg. The mean of maximum Thermometer was 52.4deg., of minimum 40.08deg. The winds were from S.W. and W. The rainfall was excessive, measuring 6.54 inches.

December was damp and mild, but occasionally frosty. Barometer high but fluctuating. It was highest on the 20th, when it was 30.590in., and lowest on the 15th, when it was 29in., the mean being 29.91in. The Thermometer reached its highest point on the 6th, at 52.6deg., and lowest on the 15th, when it was 29deg. The mean of maximum thermometer was 47.1deg., of minimum 36.5deg. There was frost on 10 nights. The winds were chiefly S.W. The rainfall was 3.40in. distributed over 25 days.

THE WATER SUPPLY.

In the report for 1876 which I made to your Board I entered at some length into the water supply of the district. I then drew your attention to the circumstance that a considerable number of houses, especially in the sub-districts of Roath and Canton, obtained their water supply from shallow wells, and that these from the special nature of the geological stratification of the district were exposed to pollution. The experience of the past year has materially corroborated an opinion I then expressed, that frequently the most palatable and agreeable drinking water from its brisk and sparkling

quality was the most dangerous. A notable instance of this came under my observation in a neighbouring district. I was called in consultation to a family where six members were suffering from fever. The absence of any other excitant cause of the disease induced me to enquire into the water supply of the house. I was then told that not only was the quality of the water everything that could be desired, but that it had been examined by the Sanitary Inspector of the district, who pronounced it to be exceedingly good. I however examined the premises and found that in close proximity to the well an urinal existed, and an offensive open surface drain. The light porous nature of the subsoil would readily admit of percolation into the well, and I caused a sample of the water to be carefully analysed by the Borough Analyst with the following result:—

Total Solid Impurities	...	...	...	88.5	per 100,000
Albuminoid Ammonia	...	...	...	.015	"
Free Ammonia	...	...	...	.04	"
Nitrogen as Nitrates and Nitrites	...	...	...	3.265	"
Previous Sewage Contamination...			32,330		"
Chlorine	...	...	...	5.6	"

I afterwards found that the adjoining house had also obtained its supply of water from the same well, and that three of the inmates were suffering from fever.

In the report for 1876, to which I have just alluded, I appended a table of the results of the analysis of several samples of water procured from these shallow wells, which had been closed peremptorily by orders obtained from the magistrates on the application of your executive. At the foot of that table I gave a recommended standard of purity of water for drinking and domestic purposes, and, also, of another standard of impurity, beyond which it would be dangerous to drink. These two standards I again introduce in the annexed table of the results of the analysis of samples of water obtained from wells which have been ordered to be closed during the past year.

RESULTS OF ANALYSES OF SAMPLES OF WATER, expressed in parts per 100,000.

By J. W. THOMAS, F.C.S.

Mark on Sample.	Description.	Total Solid Impurity.	Albunoid Ammonia.	Free Ammonia.	Nitrogen as Nitrates and Nitrites.	Fervidous Sewage Contamination.	Chlorine.	Hardness.			Remarks.
								Temporary.	Permanent.	Total.	
A C	Water from Cardiff district.	59.6	.006	.0	2.018	19,860	4.2	13.5	22.2	35.7	Clear.
F	• Ditto	98.0	.006	.048	2.825	27,930	11.35	5.6	36.5	42.1	Turbid.
G	Ditto	51.2	.012	.002	5.295	52,630	5.1	5.8	27.9	33.7	Nearly clear.
H	Ditto	72.0	.012	.0	3.799	37,670	8.4	7.4	35.2	42.6	Nearly clear.
No. 1	Ditto	43.0	.008	.002	...	...	2.4	...	...	...	Clear.
No. 2	Ditto	62.8	.011	.0026	2.256	22,240	6.15	12.0	20.6	32.6	Nearly clear.
No. 3	Ditto	82.0	.028	.008	.475	4,420	10.2	27.8	23.1	50.9	Turbid.
No. 4	Ditto	61.2	.010	.533	2.398	23,660	5.1	13.9	21.1	35.0	Turbid.
No. 5	Ditto	82.0	.010	.0	3.158	31,260	8.55	16.2	22.4	38.6	Nearly clear.
6 C	Water from Canton district.	64.0	.005	.0	3.243	32,110	3.3	14.8	20.1	34.9	Nearly clear.
R	Ditto	38.8	.004	.002	.408	3,710	3.5	18.3	15.8	34.1	Clear.
A	Water from Roath district.	86.6	.013	.0026	4.202	41,700	9.3	12.2	36.5	48.7	Nearly clear.
B	Ditto	71.0	.007	.0	2.568	25,310	5.3	13.0	23.8	36.8	Clear.
C	Ditto	76.0	.010	.013	3.324	32,920	7.6	11.3	25.1	36.4	Nearly clear.
D	Ditto	89.0	.014	.0452	3.466	34,340	7.0	19.6	28.2	47.8	Turbid.
E	Ditto	54.2	.009	.0025	1.472	14,400	3.3	17.2	18.3	36.0	Clear.
	Limit of Impurity Standard.	40.0	.015	.010	.100	700	3.0	5.0	24.0	29.0	Nearly clear.
	Recommended Standard of Purity.	20.0	.004	.002	.050	nil.	1.5	14.0	3.0	17.0	Clear.

The following are the data on which I considered it my duty to bring the deleterious quality of the several waters before your notice, for the purpose of receiving your authority to take the necessary proceedings for obtaining a peremptory order for closing these wells.

Sample A C—This water has been subjected to very active filtration through a gravel subsoil, and is derived from a part of the district which has been least under the influence of polluting matters from surface drainage. It is highly charged with the oxidation products of sewage, and belongs to the class of dangerous waters.

F is a water highly polluted with urine, and contains a very excessive quantity of solid matter, which includes magnesian salts and sulphates in large proportion. There is much indication of past pollution, and the water is in every sense an exceptionally bad one and dangerous to the health of persons drinking it.

G is a water which consists chiefly of the soakage from sewers and cesspools, and belongs to the dangerous class of waters.

H is derived from a subsoil which possesses active filtration powers as shewn by the immunity from organic pollution, but the excessive previous sewage or animal contamination which it shews and the high amount of chlorine denote that it belongs to the dangerous class of waters.

No. 1 was only subjected to a partial analysis, the preliminary examination indicating that the quality was above the "limit of impurity standard." It will not be out of place to remark here that these samples No. 1 from the Cardiff sub-district, and R from the Canton sub-district, and E from the Roath sub-district, show very plainly the different grades of pollution which the waters of a town are subjected to. In the centre of the town, where there is the greatest population, there will be the greatest polluting influence. Towards the outskirts the pollution becomes less, and it is possible, especially in the case of a town, built on a gravel subsoil, that the well waters near the outskirts may be moderately pure, because the sewers are situated at some depth from the surface, and drain effectually the subsoil, inducing in consequence a current of water travelling through the gravel in the direction of the town. This current brings a fresh supply of fair drinking water, which replenishes the wells on the outskirts so frequently as to remove the greater portion of sewage which may soak from the adjacent subsoil. R from the Canton, and No. 1 from the Cardiff district are waters of this class.

No 2 is a water devoid of any redeeming feature in its character. It is a hard water, with a high *chlorine* and previous sewage contamination, and belongs to the dangerous class of waters.

No. 3 contains an excessive quantity of organic matter, much of which is in active condition. It is very unfit for drinking purposes and is altogether a bad drinking water.

No. 4 is an exceptionally bad sample of water, it evolves a putrid, offensive odour, and is largely constituted of the drainage from an ural or stable. It is a very dangerous water, and one calculated to produce evil consequences.

No. 5 is very highly charged with the oxidation products of sewage, and although tasteless and inodorous, it is nevertheless very unfit for drinking, and is likely to constitute a fertile medium for spreading disease.

No. 6 C is a water which is very free from organic matter in consequence of the powerful aeration and filtration properties of the subsoil, but it is evident that it receives a large proportion of the soakings from sewers, and is therefore water unfit for drinking.

R is a water replenished as before observed by an undercurrent from without the district, and is below the "limit of impurity standard."

A is a very highly polluted water, charged with the mineral matters common to sewage, as also to the oxidation products of nitrogenous animal matter. It is in every particular a very bad water, and dangerous to the health of persons drinking it.

B is somewhat free from organic impurity, but contains much of the filtration from sewers, and is consequently a dangerous water.

C is similarly constituted but is more highly contaminated.

D is loaded with organic matters mixed with much urine. It has a heavy smell, and is nothing less than diluted sewage.

E is a water, as previously mentioned, which is subjected to the diluting influence of a current travelling in the direction of the well towards the heart of the district, and is therefore more free from contamination than the previous samples A B C D, but this is by no means a good water, and may prove dangerous under special circumstances to persons drinking it.

THE DWELLINGS OF THE LABOURING CLASSES.

The condition of the dwellings of the labouring population of a locality must necessarily exercise an important influence on its sanitary state, especially in a district such as Cardiff, where a considerable number of such population consists of Irish labourers, little removed from mendicancy. From a careful enquiry, I have

ascertained that there are 1,148 houses in the Cardiff Urban Sanitary District occupied by Irish families, the average number of inmates exceeding 8 per house. These are under the constant supervision of your Sanitary Inspectors, and active means are taken to enforce cleanliness, with a proper amount of ventilation, and to prevent overcrowding. The houses are erected under building leases, and as the ground rent is such as to render it necessary the houses should be sufficiently large to be remunerative, they are considerably larger than the houses occupied by the working classes in other Towns. Hence, they are built for, and intended to be occupied by, more than one family. They have all been inspected, the measurement of the rooms taken, and a register kept of the number each house can accommodate, with due regard to health. Four hundred cubic feet is the minimum space allotted to each occupant of a bedroom. These bedrooms are not permitted to be occupied during the day time, when ventilation is enforced. Morning reports are daily brought to my residence by your Inspectors, detailing the results of the day and night visits of the previous 24 hours, especially as regards the number of inmates of each house, its cleanliness, and the general condition of its external area, as to nuisances arising from accumulations of refuse matter or defective drainage, and also to report any case of sickness occurring among the inmates, as in the sub-joined form.

MORNING REPORTS OF INSPECTOR OF LODGING HOUSES TO
MEDICAL OFFICER OF HEALTH :—

Street.	No.	Occupier.	Number of families	Inmates.			Remarks.
				Adults.	Children.	Total.	
Thomas ...	2	AB	3	7	3	10	Clean
"	3	CD	2	4	3	7	
"	5	EF	3	6	6	12	Overcrowded.
"	8	GH	3	6	6	12	Dirty, cause of sickness.

Signed,
A. B., Inspector of Lodging Houses.

THE POPULATION.

The estimated population of the District at the end of the year 1877, was 79,093, but for statistical purposes in reference to its Sanitary state, it is necessary to take into consideration the increase on the year 1876, and to determine the mean.

The Registrar General's formula for calculating the total increase of a locality, is to divide the difference of the census returns of 1861 and 1871 by 10, and thus ascertain the yearly increase of the

decennial period, and to take this as the basis of increment, until the next census. This formula holds good in all districts where no disturbing influences prevail, but in special Districts where the increase depends, not simply on natural causes, but on the constant and large immigration of new comers, as in manufacturing and commercial communities, this equation does not apply. In the first number of the Registrar General's weekly return of Births, Deaths, and Marriages, he alludes to certain Towns, namely, Nottingham, Salford, and Oldham, where the rapid increase of inhabited houses indicates the disturbing element I have just referred to, and I would instance Cardiff as a locality to which the exception applies. By a return recently made to your Board, your Surveyor reports that at the expiration of the last financial year upwards of 522 plans for new buildings had been passed according to annexed return. The number of Plans submitted to and passed by the Public Works Committee during present year:—

District.	Plans submitted	Plans passed.	Number of Buildings shown on Plans passed.	Number of Houses and Buildings drained.
Central	153	110	124	184
Eastern	175	125	414	447
Western	194	150	199	479
Total	522	385	737	1110

Two persons have been summoned during the past year for infringing the Building Regulations.

From a careful enquiry made by your Inspectors of Lodging houses, during the month of December, at my request, I am enabled to shew the increase of inhabited houses in 1877 as compared with the previous year, as also the number of houses not occupied, or in course of erection at the present time.

TABLE SHEWING NUMBER OF HOUSES OCCUPIED AND UNOCCUPIED, IN THE YEARS 1876 AND 1877.

Sub-district.	Number of houses occupied 1876	Number of houses occupied 1877.	Increase in number of occupied houses 1877.	Number of houses unoccupied or in course of erection 1877.
Cardiff	6,121	6,409	288	107
Roath	2,781	3,127	346	185
Canton	1,931	2,176	245	86
	10,833	11,712	879	378

According to the census returns of 1861 and 1871 the number of inmates to each house in 1861 was 6.5, and in 1871 6.6, but believing that the rapid increase of house building will relieve over-

crowding, and that the vigilant inspection of your officials will prevent this to a considerable extent, I have reduced the pro rata calculation to 6.25 per house, a calculation which a variety of collateral tests convinces me is reliable.

The following table, for which I am indebted to the courtesy of Mr. Godfrey, H. M. Customs, Cardiff, enables me to shew the rapid increase of shipping entering this port, and to estimate the number of seamen on an average constantly in the docks.

Year.	No. of Vessels Inwards.		Total No. of Vessels Foreign and Coastwise.	TONNAGE.		Total Tonnage Foreign and Coastwise, Inwards.
	Foreign.	Coastwise.		Foreign.	Coastwise.	
1871	4,234	6,919	11,133	1,637,725	588,011	2,225,736
1872	4,942	6,994	11,836	1,951,897	600,805	2,552,702
1873	4,694	6,674	11,368	1,920,410	640,089	2,560,499
1874	4,966	6,210	11,176	2,113,987	545,692	2,659,679
1875	4,645	5,541	10,186	1,947,265	493,818	2,441,083
1876	5,511	6,957	12,468	2,367,307	601,240	2,968,547
1877	5,625	6,661	12,286	2,542,210	586,773	3,128,983

The above return shows that the total tonnage of the port in 1871 was 2,225,736. The census return gave the number of seamen in the docks on the night of the 31st of March in that year as 4,192. This was assumed to be the average, and such was reckoned in the population of Cardiff in 1871. For 1877 the total tonnage increased to 3,128,983. I have, therefore, estimated the seamen on the comparative rate of 1871. This gives 5,897, which may be taken as a fairly proximate estimate, but it will vary according to circumstances. It is sufficiently near, however, for all practical purposes.

The estimated population of the district at the end of 1877 is as follows :—

	Houses inhabited.	Houses unoccupied or erecting.	Population.
Cardiff	6,409	107	40,056
Roath	3,127	185	19,543
Canton	2,176	86	13,600
Total	11,712	376	73,199
Sailors in the Port ... ..	...	...	5,897
			79,096

But in making this a basis for estimating for sanitary purposes it is necessary to ascertain the increase of 1877 over 1876, and take the mean of the year. The population in 1876 was estimated at 74,741; that of 1877, 79,096; the difference being 4,355; the mean

2,177. The gross mean population of 1877 will therefore be 76,918.

The total number of marriages which took place in Cardiff in 1877 was 811. This was 65 in excess of the previous year, but the commercial depression throughout the district exercised an unfavourable influence on matrimony, as both 1876 and 1877 had a lesser return of marriages than 1875.

2772 births were registered during the year as under:—

	QUARTERS ENDING								TOTAL.
	March.		June		September.		December.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	
Cardiff	198	201	173	171	188	177	188	180	1476
Roath	120	109	100	127	103	107	109	100	875
Canton ...	56	49	53	51	50	51	41	70	421
	374	359	326	349	341	335	338	350	2772

Of the 2,772 births, 1,379 were males, and 1,393 were females.

The birth-rate was 36 per 1,000 population, that of the Kingdom being 36·1. The calculation of the birth-rate of Cardiff is based however on the total population of the district, this including 5,897 seamen, the average number in the port, whose families reside elsewhere. Had the estimate been based on the population proper the birth-rate would have been 39·3 per 1,000.

The total deaths of the year were 1,475, these were distributed throughout the district thus:—

		Quarters ending	Males.	Females.	Total.
Sub-division Cardiff.	}	March	103	100	208
		June	167	132	299
		September	131	97	228
		December	113	100	213
Sub-division Roath.	}	March	25	41	66
		June	39	61	100
		September	39	34	73
		December ..	36	34	70
Sub-division Canton.	}	March	31	39	70
		June	26	29	55
		September ..	21	25	46
		December	23	24	47
			759	716	1475

The excess of births over deaths was 1,297. The death-rate was 19·1 per 1,000 population. The subjoined table illustrates the

death-rate of Cardiff as compared with the average death-rate of the chief towns, as also smaller towns and rural districts :—

	March.	June.	Quarters ending.		Year
			September.	December.	
Cardiff	18·1	23·6	17·8	16·6	19·1
139 districts and sub-districts } comprising chief towns.....	23·8	22·7	19·2	22·2	22·0
Remaining districts and sub- } districts comprising chiefly small } towns and country parishes	20·2	19·1	15·7	17·2	18·2

According to the above return the Cardiff Urban Sanitary District contrasts very favourably with the mortality returns of the Registrar General, being only 1 per 1,000 in excess of the mortality of small towns and rural districts, where the excitant causes of disease exist to a minimum degree, and 3 per 1,000 less than the death-rate ruling the twenty-two typical large towns.

The following is a comparative return of marriages, births, and deaths for ten years :—

Years.	Estimated population.	Marriages.	Births.	Birth rate per 1,000 population	Deaths.	Death-rate per 1,000 population
1868	37,562	586	1387	35·8	843	22·5
1869	38,220	585	1414	39·9	1005	26·2
1870	38,878	578	1406	36·1	903	23·2
1871	39,536	558	1391	35·6	891	22·5
1872	40,431	658	1358	33·5	916	22·6
1873	41,326	741	1430	34·1	995	21·3
*1874	42,221	812	1550	36·7	885	23·5
1875	72,760	841	2716	37·3	1547	21·2
1876	74,741	746	2707	36·2	1455	19·1
1877	76,918	811	2772	36·0	1475	19·1

* After 1874 the amalgamation of the Urban Sanitary District was formed by the absorption of the Roath and Canton Districts, thus greatly increasing its area and population.

The following analysis gives the ages at which death took place :—

	Under 1 year	...	...	...	379
1 and under 2 years	...	...	...	...	131
2	5	...	...	...	148
5	15	...	...	...	92
15	25	...	...	...	106
25	35	...	...	...	115
35	45	...	...	...	136
45	55	...	...	...	121
55	65	...	...	...	114
65	75	...	...	...	76
75	85	...	...	...	48
85	95	...	...	...	7
95 and upwards	...	...	...	...	2
Total	...	...	...	...	1,475

The total deaths, under the age of one year, were 390, being at the rate of 136·6 per 1,000 births. That of 20 typical large towns, enumerated by the Register General in his report on the marriages, births and deaths for 1877, was 136· the latter being almost identical with that of Cardiff. The same authority, remarking on the infant mortality of the kingdom for 1877, attributes this low rate to the moderate temperature of the year.

In the appendix, attached to this report, No. 1 table gives analysis of the registered causes of death, as also the period of life at which each disease was fatal. Table No. 2 illustrates the death from each disease, as compared with the average death rate for the 25 years as published in the Register General's last annual report.

The annexed tables A and B are compiled according to forms issued by the Local Government Board, and required to be inserted by its direction in the Medical Officer of Health's annual report.

Table A is a classification of deaths according to diseases, ages, and localities, showing also the population of such locality, and the births during the year.

Table B has reference to the mortality and sickness of the District for the twelve months, arranged according to the mortality among all classes; the sickness and mortality among persons receiving Poor Law medical relief, and sickness and mortality among patients of any hospital or other public institution.

Table C gives the yearly total number of births and deaths, the excess of deaths over births, the excess of births over deaths, and the death rate per 1000 population annually, for a period of 30 years.

Table of Mortality and Sickness of the Urban Sanitary District of Cardiff, 1877,

FOR THE TWELVE CALENDAR MONTHS ENDING DECEMBER 31st, 1877.

[Area of District, 7,374 Acres.

NAME OF DISEASE.	(A) Deaths (among all classes) registered as having occurred in the District or Division.				(B) Sickness and Deaths among Paupers.				(C) If there be any Hospital or other Public Medical Institution in or near the District or Division, the subjoined columns are to be filled up.					
	Deaths of Persons who have come into the District or Division with their fatal illness upon them.		Sickness and Deaths among out-door paupers; and among any paupers who belong to the district or Division, and have been removed into the Workhouse on account of illness; whether the Workhouse be within or without the District or Division.		Sickness and Deaths in such institutions among inmates who belong to the District or Division.		Sickness and Deaths among persons who reside in the District or Division, and are out-patients of Hospitals or patients of Dispensaries.		IN-PATIENTS.		OUT-PATIENTS.			
	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.
	Aged under 5 years.	Aged 5 years and upwards.	Aged under 5 years.	Aged 5 years and upwards.	Aged under 5 years.	Aged 5 years and upwards.	Aged under 5 years.	Aged 5 years and upwards.	Aged under 5 years.	Aged 5 years and upwards.	Aged under 5 years.	Aged 5 years and upwards.	Aged under 5 years.	Aged 5 years and upwards.
Small-Pox	118	3	57	8	1	34	2	13	2	59	29	14	14	4
Measles	24	6	1	1	1	4	1	1	1	9	3	9	9	2
Scarlatina	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diphtheria	15	1	1	1	1	1	1	1	1	1	1	1	1	1
Croup (not of spasmodic)	37	3	2	2	2	2	2	2	2	2	2	2	2	2
Whooping Cough	1	5	8	8	8	8	8	8	8	8	8	8	8	8
"Continued" Typhus	2	25	1	1	1	1	1	1	1	1	1	1	1	1
Fevers. } Enteric	1	2	2	2	2	2	2	2	2	2	2	2	2	2
} Of other, or doubtful sorts	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diarrhoea and Dysentery	18	1	33	33	33	33	33	33	33	33	33	33	33	33
Cholera	3	3	44	44	44	44	44	44	44	44	44	44	44	44
Rheumatic Fever	2	3	8	8	8	8	8	8	8	8	8	8	8	8
Erysipelas	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pyæmia	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Puerperal Fever	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ague	16	155	58	58	58	58	58	58	58	58	58	58	58	58
Phthisis	121	108	158	158	158	158	158	158	158	158	158	158	158	158
Bronchitis, Pneumonia, and Pleurisy	2	66	32	32	32	32	32	32	32	32	32	32	32	32
Heart-Disease	13	59	107	107	107	107	107	107	107	107	107	107	107	107
Injuries	286	369	1165	1165	1165	1165	1165	1165	1165	1165	1165	1165	1165	1165
DISEASES NOT NAMED ABOVE	658	817	1676	1676	1676	1676	1676	1676	1676	1676	1676	1676	1676	1676
TOTAL	577	2511	84	1422	84	1422	84	1422	84	1422	84	1422	84	1422

(C)

Years.	Births.	Deaths	Excess of Deaths over Births.	Excess of Births over Deaths.	Death-rate per 1000 Population.
1847	331	484	153		23·8
1848	428	579	151		35·3
1849	466	864	398		54·0
1850	504	485		19	28·6
1851	575	525		50	28·6
1852	696	620		76	28·8
1853	865	644		221	26·8
1854	950	925		25	34·9
1855	1079	641		438	21·7
1856	1227	772		455	22·1
1857	1367	883		484	23·2
1858	1356	753		603	20·3
1859	1336	826		510	22·3
1860	1246	662		584	18·9
1861	1223	837		386	23·9
1862	1268	695		573	19·4
1863	1302	862		440	23·9
1864	1399	932		467	25·5
1865	1382	867		515	23·4
1866	1331	882		449	23·5
1867	1397	873		524	23·5
1868	1387	843		544	22·5
1869	1414	1005		409	26·2
1870	1406	903		503	23·2
1871	1391	891		500	22·5
1872	1353	916		442	22·6
1873	1430	995		435	21·3
1874	1550	885		665	23·5
1875	2716	1547		1169	21·2
1876	2707	1455		1252	19·1
1877	2772	1475		1297	19·1

The above table illustrates most forcibly the results to be attained by sanitary improvements. In 1847 the town had no deep drainage, its surface sewers were very imperfect, and there was no water supply, save a few pumps, the wells belonging to these being very polluted. Owing to the construction of large and important works, such as the docks and public railways, the commerce of the port rapidly increased, and with it the town; new streets were formed before means could be taken to carry off surface impurities, so that stagnant pools of fetid water, with mud, house refuse, and decaying vegetable matter existed over the whole of the roadways. The houses belonging to these streets were occupied by labourers, and in consequence of the difficulty of obtaining house accommodation from the constant immigration of this class, they were very overcrowded, and during the eight years ending 1854, the yearly rate of mortality

exceeded 33 per 1000; and in one year, that of 1849, it was 54. Again, in 1854, it was 34 per 1000. In 1855 the first portion of the new system of drainage came into operation, when it immediately fell to 21·7. In 1857 the first main of the present water supply was laid on; concurrent with these other sanitary measures were adopted, namely, an active inspection and supervision of the dwellings of the working classes, together with the enforced removal of the accumulations of refuse matter. The average mortality during the next ten years was 22 per 1,000, being the ordinary death-rate of the Kingdom. The next decennial period it was 22·1; and the subsequent or three last years it has been as low as 19·8 per 1,000.

By a reference to appendix, table No. 1, it will be seen that the total deaths from zymotic or infectious diseases were 308, and it table No. 2 that the death-rate was 4·0 per 1,000 population; that of the Kingdom on the yearly average of 25 years being 5 per 1,000.

The Registrar General in his valuable statistical returns enumerates seven which he describes as the chief zymotic diseases, these are considered to be especially due to preventable causes. The deaths from these diseases in 1877 were thus distributed throughout the district :—

	Cardiff.	Roth.	Canton.
Smallpox	3	—	—
Measles	65	31	30
Scarlet Fever	16	9	5
Diphtheria	—	—	1
Whooping Cough	19	1	9
Fever	21	5	10
Diarrhoea	9	1	4

Of the three deaths from smallpox two were imported, namely, one the captain of the s.s. Sybilla, which vessel arrived in the Penarth Docks from the Port of London, where smallpox extensively prevailed. He was ill on arrival. On visiting the ship I directed his removal to the Hamadryad Seamen's Hospital, in which Institution he died on the 17th of January. I examined the whole of the crew. Some had very imperfect marks of vaccination, and they were all re-vaccinated and successfully. The vessel and clothing of the captain were thoroughly disinfected, and no extension of the disease followed. Communication with the ship was confined entirely to those necessary to transact its business, and it was kept under observation until it left the port.

About three weeks after I was requested to visit a case in Sandon-place. I found it to be a female, aged 15 years, the daughter of the laundress employed at the Hamadryad Hospital. The case was one of confluent smallpox, the infection probably due to that in this institution. I had her immediately removed to the hospital, where

she died on the 20th of February. The house was then disinfected and the houses in the immediate neighbourhood were kept under observation and no fresh case was reported.

On the 5th of May I was requested to visit the Brigantine "Tryphina," which had arrived in port that morning, from Corunna. I found a seaman had died from confluent smallpox just before I reached the vessel. I immediately directed the corpse to be removed to the dead house, and that the coffin should be effectually cemented and closed. I examined the crew, they appeared to be in good health, the captain assuring me no other case had occurred during the voyage. I directed them all to be vaccinated and that no one should leave the ship until my next visit. The vessel was thoroughly disinfected and moved as far away from others as practicable. The next day I learned that the captain had suffered from smallpox and was only then getting convalescent, he had also gone on shore. I then examined him, and found that desquamation had not been completed. I, therefore, caused proceedings to be taken against him for exposing himself in the public streets while suffering from an infectious disease. He was fined 40s. and costs by the magistrates.

No other case of smallpox was reported during the year.

Amongst the zymotic diseases the greatest mortality has been occasioned by measles, scarlatina, and whooping cough, these diseases are incidental to childhood, and are so recognized, as practically few children escape them up to the age of 5 or 7 years; they prevail periodically, and on such occasions greatly increase the rates of mortality, they also present difficulties in the application of preventive measures, from the circumstance that isolation which is so important can rarely be effectually carried out, owing to the limited house accommodation of a town, especially such as Cardiff, where so large a proportion of the population consists of the labouring classes, and where two or more families are to be found in each house; it is therefore, satisfactory in the highest degree, as instancing the advantages to be derived from the inspection and supervision of the lodging houses and houses occupied by the families of the Irish labourers, that from a careful enquiry the number of such houses probably exceeds 1,300, and the inmates amount to nearly 11,060, that the total deaths from the seven chief zymotic diseases, registered in Cardiff in 1877, were 255, and of these only 23 were among the class of Irish labourers, these being as under:--

	Total Deaths.	Deaths from the seven chief zymotic diseases amongst Irish families.
Smallpox	...	3
Measles	...	126
Scarlatina	...	30
Whooping Cough	..	40
Diphtheria	..	1
Fever	...	36
Diarrhoea	...	19
	—	—
	255	23

Measles was unusually fatal, especially during the months of April and May, probably due to the very variable weather of the former month and the excessively cold easterly wind of the latter. The disease made its first appearance at Canton, a death being registered in that district on the 9th of January; it was confined to that locality until the middle of March, when it broke out in the northern portion of the Cardiff sub-district, in the neighbourhood of Cathays; it did not extend to the other portions of the town until the middle of May, when it spread amongst the streets at the eastern side at Adamsdown, and subsequently in the southern or Docks district; the old or central part of the town suffered but little from it. At the end of May the epidemic appeared at Roath; this district is divided into two nearly equal portions by the Newport Road; but it is remarkable that of the 30 deaths from measles registered in Roath, 26 were on the southern side of the road, and only 4 on the northern. The disease, as an epidemic, ceased throughout the whole of the Urban Sanitary District in August.

The deaths from scarlatina were 30. This infantile epidemic prevailed with great severity through the whole of 1875 and 1876, but sensibly decreasing towards the end of the latter year—it ceased altogether in the early part of May, 1877—apart from hygienic measure of isolation, which this disease of all infantile epidemics requires to be effectively maintained; there is the facility with which it is conveyed by children from infected houses attending school; to obviate this danger, whenever a case of scarlatina was reported to me, I caused a notice to be served upon the head of the family, directing him to cease sending the children to school. I also gave information to the school-master to prevent such attendance, and I gained every co-operation from the latter. Urgent appeals were also made to the occupiers of infected houses to prevent the visitation of friends. I regret to say, I was less successful in getting the latter recommendations observed, to the great prejudice of the public health. The evils likely to arise from the custom of holding wakes, which prevails amongst the Irish, were obviated by the discouragement given to such ceremonies by the Catholic clergy, in reply to my appeals.

One death was registered as due to diphtheria; this was in the Canton sub-district.

The mortality from fever was 36, of these deaths 6 were registered as from typhus; 27 enteric or typhoid—and 3 simple continued fever. These were distributed throughout the district thus:—the sub-district of Cardiff 21; Roath 5; and Canton 10. The total deaths from fever in the combined district were at the rate of 0·46 per 1,000 population; that of the kingdom generally, an average of twenty-five years being 0·51. The proportionate death rate of the sub-district were:—Cardiff 0·45; Roath 0·25; and Canton 0·72, the proportionate of Canton was sensibly higher than the two other sub-divisions, this was probably due to the defective drainage there, causing in many localities an overflow of cess pool contents; this evil is now being overcome by the sewerage works, which have been executed during the year 1877, and which are now in course of construction.

It is highly satisfactory to find that there has been a very marked and progressive diminution in the death rate from fever in the Cardiff Urban Sanitary District during the three decennial periods 1856, 1866, and 1876, and the year 1877, as will be seen by the following table:—

The decennial period ending	Total Deaths.	Deaths from Fever.	Proportionate deaths from Fever to every 1,000 deaths
1856	6,339	386	59·1
1866	7,999	356	44·4
1876	10,313	315	30·05
The year 1877	1,475	36	24·4

This table shews that although the population has more than trebled itself since 1856, the average yearly deaths from fever are less.

The deaths from whooping cough were 40, of these 25 occurred in Cardiff, 6 in Roath, and 9 in Canton. The epidemic first appeared in June and continued more or less through the remainder of the year.

Diarrhoea furnished a mortality of only 19, the whole with one exception, being under the age of 4 years, therefore of the special character known as infantile diarrhoea. This disease usually makes its appearance during the autumnal months, and is then frequently very fatal. In 1877 the mortality from this disease was much below the yearly average.

The same appendix tables shew that the deaths from constitutional diseases were 274, being under the yearly rate of the Kingdom for

the period of 25 years. The death rate of the Urban District of Cardiff was 8·0, that of the Kingdom 8·4 per 1,000.

The constitutional diseases although not so directly excited by the ordinary preventable causes, are, nevertheless, largely influenced by some of these. I may especially illustrate Phthisis which produces a large yearly number of deaths. Dr. Buchanan, who has been for many years one of the Medical Officers of the General Board of Health, and afterwards continued such under the Local Government Board, made a series of careful enquiries into the etiology or causation of Phthisis. He most clearly established the fact that this disease was greatly aggravated and its mortality increased by the dampness due to defective surface drainage, especially in the clay districts. The soundness of this theory is very strongly confirmed by a consideration of the relative mortality from this disease during the decennial period ending 1857, at which period, as I have before shewn, the greater portion of the district was undrained, and fogs and damp prevailed extensively, due to the clayey subsoil on the southern side of the South Wales Railway. The mean yearly population of Cardiff for the ten years was 14,214, the mean deaths from Phthisis 78. The average annual death rate from this disease was 5·4 per 1,000 population. Now in 1877 when this excitant cause had been extensively removed, the mean population for the year being estimated as 76,918 the death rate from Phthisis has been reduced to 2·2 per 1,000, and is little more than one-third the former death rate, in other words, 450 deaths would have resulted in 1877 had this excitant cause of disease not been removed, instead of 177.

Scrofula and tabes mesenterica are diseases influenced by such of the preventable causes, which retard or pervert the formative processes of the individual, especially the absence of pure air, which is found to exist in the vitiated atmosphere of the overcrowded house occupied by the more indigent labourer; the death rate from these two diseases, scrofula and mesenterica, are relatively 0·091 and 0·247 per 1,000 population, as against 0·142 and 0·282 per 1,000, the average death rates of the kingdom, and these diminished comparative death rates afford additional evidence of the satisfactory inspection of this class of houses by your two sanitary inspectors.

Local diseases constitute a class less amenable to sanitary provisions, these are caused and much aggravated by unseasonable or disturbed weather, hence the great mortality from the acute inflammatory attacks of the internal viscera, especially the respiratory organs, of these diseases bronchitis, pneumonia, and pleurisy were very fatal during the cold spring months of March and April, and the winter months of October, November, and December. The death rate from local diseases was 8·008 per 1,000 population, against 8·4 per 1000, the average population of the kingdom.

Developmental diseases were at the rate of 2·1 per 1,000 population, that of the kingdom being 3·5 per 1000. This favourable comparative death rate in Cardiff indicates that even during the distress, which has prevailed throughout Glamorganshire and the mining counties, it has not been felt so much here, as these diseases are especially influenced by privation and destitution.

The mortality from violent causes is somewhat in excess of the average of the Kingdom, due to the risks of accidents necessarily associated with labours and employments of a large commercial town like Cardiff, with its great shipping and the extensive manufactories and other works in the immediate neighbourhood. The majority of these accidents are brought into our Infirmary and the comparative death rate from violent causes is ·936 against ·7 per 1,000 population, the average death rate of the Kingdom. The deaths from drowning were at the rate of 0·300 against 0·101, being treble the average of the Kingdom, and 0·403 against 0·314 from ordinary accidents, the great proportion of these in Cardiff are occasioned by Railway accidents, and accidents on board ship.

The deaths from causes not specified or ill defined are somewhat in excess being ·507 per 1,000 population against ·3 per 1,000 the average of the Kingdom, this is due to the circumstance that a considerable number are registered as natural causes only, in accordance with the verdict of a coroners jury.

There were 105 deaths under circumstances requiring a coroner's enquiry, these were as under :—

Accidents ordinary	...	...	...	...	22
" Railway	...	...	...	...	4
" On board ship...	...	...	...	...	4
Suicide	...	...	...	...	2
Homicide	...	...	...	...	1
Found dead	...	...	...	...	2
Burns	...	...	...	...	2
Drowned	...	...	...	...	30
Diseases, causes specified	...	...	...	...	38
					<hr/>
					105
					<hr/>

The deaths in public institutions were :—

The Infirmary	...	...	...	...	27
The Hamadryad Seamen's Hospital	...	...	...	...	18
The Gaol	...	...	...	...	2
The Union Workhouse	...	...	...	...	87
					<hr/>
					Total...
					134
					<hr/>

The sanitary works completed in the year ending December 31st, 1877, were :—

Houses reported overcrowded and orders issued to amend condition, &c.	317
Number of occupiers summoned for neglect to carry out their instructions	31
Number of convictions penalties inflicted varying from 10s. to 60s.	27
Cautioned	4
Houses ordered to be cleansed and limewashed	476
House drains ordered to be cleansed and repaired ..	329
Water-closets and cesspools reported in improper state and orders for amendment	92
Houses disinfected after infectious disease	62
Houses ordered to be supplied with water... ..	68
Wells peremptory cleared	22
House visits day	13,680
House visits nights	939
Animals kept on premises in improper state and ordered to be removed	93
Cow-houses ordered to be cleansed and limewashed	476
Brushes supplied on loan to occupiers of houses	732
Meats destroyed as unfit for food	1,406 lbs.
Oysters seized and destroyed	23 boxes.
Boxes of mackerel	20barrels.
Penalties inflicted on owners in sums varying from 20s. to 100s. and costs	9
Owners summoned for improper emptying of cess-pits, with panalties of 40s. and costs	2
Ships visited, disease on board being reported	22
„ disinfected	12
Boxes of seamen's clothes disinfected	15

In concluding this report I can but refer to the zealous and effective aid I have received from your Sanitary Inspectors Messrs. James and Gover, and to state, to their labours I can but attribute much of its satisfactory character.

I have the honour to be, Gentlemen,

Your obedient Servant,

H. J. PAINE, M.D.,

Medical Officer of Health, Urban Sanitary District.

Deaths Registered at several groups of ages from Different Causes during the year 1877.

The following Table illustrates the proportionate death-rate to every 1,000 living in Carliff compared with that of all England.

CAUSE OF DEATH.	AGE.										Total	
	0 to 1	1 to 2	2 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 40	40 to 60 & upwards		
CLASS I.—ZYMOTIC DISEASES.												
I. Zymotic Diseases ...	86	64	92	30	11	6	12	6	5	2	236	308
II. Constitutional Diseases ...	35	18	18	29	48	42	37	31	13	5	37	274
III. Local Diseases ...	151	43	28	31	29	55	60	79	83	54	212	616
IV. Developmental Diseases ...	96	5	1	6	9	3	1	6	11	21	2	103
V. Violent Deaths ...	2	1	8	10	12	20	4	9	2	1	1	72
Not specified or ill defined ...	14	1	1	1	1	1	1	1	1	1	1	39
Totals ...	379	113	145	92	106	116	106	121	116	76	48	1475
CLASS II.—CONSTITUTIONAL DISEASES.												
ORDER 1.—DIETETIC.												
1. Smallpox ...						1	1					3
2. Measles ...	27	40	51	8								118
3. Scarlet Fever (Scarlatina) ...	3	2	19	4	2							24
4. Diphtheria ...	1											1
5. Quinsy ...												16
6. Croup ...	4	3	8	1								15
7. Whooping Cough ...	14	15	8									37
8. Typhus Fever ...						1	1	1				3
9. Enteric or Typhoid F. (Simple continued) ...		1	2	9	7	4	3	1	1			27
10. Typhoid ...												1
11. Krysipelas ...	2	1	1									2
12. Purpura Febr (Moria) ...												5
13. Carbuncle ...												5
14. Infusua ...												1
15. Dysentery ...												18
16. Diarrhea ...	14	2	2									19
17. Cholera ...												1
18. Ague ...												1
19. Remittent Fever ...												1
20. Rheumatism ...												2
21. Other Zymotic Diseases ...	2											2
ORDER 2.—RESPIRATORY.												
1. Syphilis ...	10					2	1	1				10
2. Stricture of Urethra ...						1	1	2				4
3. Hydrophobia ...												1
4. Glanders ...												1
ORDER 3.—DIETIC.												
1. Privation ...												1
2. Want of Breast Milk ...												1
3. Purpura and Scurvy ...												1
4. Alcoholism (a. Del. Tremens) ...												1
ORDER 4.—PARASITIC.												
1. Thrush ...	2	1										3
2. Worms, &c. ...												3
Totals ...	80	64	92	30	11	6	12	6	5	2	236	308
CLASS III.—CONSTITUTIONAL DISEASES.												
ORDER 1.—DIETETIC.												
1. Gout ...												1
2. Dropsy ...												1
3. Cancer ...						1	9	7	8	5		34
4. Cancerum Oris (Noma) ...												1
5. Mortification ...												1
ORDER 2.—TUBERCULAR.												
1. Scrophula ...	3	1	2									4
2. Tuberc Mesenterici ...	12	3	1									15
3. Phthisis ...	6	3	19	47	39	28	23	5				118
4. Hydrocephalus ...	14	11	8	6	1							33
Totals ...	35	18	18	22	48	42	37	31	19	5	4	274
CLASS IV.—LOCAL DISEASES.												
ORDER 1.—NERVOUS SYSTEM.												
1. Cephalitis ...	1	2	5	1								8
2. Apoplexy ...						1	3	6	10	7		29
3. Paralysis ...						2	4	7	9	1	1	24
4. Insanity ...												4
5. Chorea ...												1
6. Epilepsy ...												1
7. Convulsions ...	65	11	8	2								79
8. <i>Brevis Disease</i> , &c. ...	2	8	2	2	1	4	4	2	2	1		21
ORDER 2.—ORGANS OF CIRCULATION.												
1. Pericarditis ...												2
2. Aneurism ...												7
3. Heart Disease, &c. ...	1	1	3	6	7	9	16	12	10	3		2
ORDER 3.—RESPIRATORY ORGANS.												
1. Laryngitis ...	2	1										2
2. Bronchitis ...	58	18	6	1	3	8	5	20	10	4		82
3. Pleurisy ...	17	11	11	1								39
4. Pneumonia ...	1	6	7	9	12	3						39
5. Asthma ...												6
6. Lung Disease, &c. ...	2	1	2	4	1	2						3
ORDER 4.—DIGESTIVE ORGANS.												
1. Gastritis ...												2
2. Enteritis ...												7
3. Peritonitis ...												3
4. Ascites ...												1
5. Ulceration of Intestines ...												1
6. Hernia ...												2
7. Ileus ...												1
8. Intussusception ...	1	1										2
9. Stricture of Intestines ...												1
10. Fistula ...												1
11. Stomach Disease, &c. ...	1	1										1
12. Pancreas Disease, &c. ...												2
13. Hepatitis ...												2
14. Jaundice ...												1
15. Liver Disease, &c. ...	1	1	4	3	7	6	2					25
16. Spleen Disease, &c. ...												1
ORDER 5.—URINARY ORGANS.												
1. Nephritis ...												1
2. Ischuria ...												1
3. Bright's Disease (Nephria) ...												18
4. Diabetes ...												3
5. Calculus (Stone) ...												1
6. Cystitis ...												2
7. <i>Kidney Disease</i> , &c. ...												6
ORDER 6.—ORGANS OF GENERATION.												
1. Ovarian Dropsy ...												2
2. Uterus Disease, &c. ...												3
ORDER 7.—ORGANS OF LOCOMOTION.												
1. Synovitis (Arthritis) ...												1
2. Joint Disease, &c. ...												1
ORDER 8.—INTESTINARY SYSTEM.												
1. Phlegmon ...												1
2. Ulcer ...												1
3. Skin Disease, &c. ...	1	1										2
Total ...	151	43	28	31	29	55	60	79	83	54	2	222
CLASS V.—DEVELOPMENTAL DISEASES.												
ORDER 1.—DISEASES OF CHILDREN.												
1. Premature Birth ...	30											30
2. Craniocyst ...	2											2
3. Spina Bifida ...	2											2
4. Other Malformations ...												2
5. Teething ...	11	3										14
ORDER 2.—ADULTS.												
1. Paralysis ...												1
2. Childbirth (see Purpura Febr) ...												5
ORDER 3.—OLD PEOPLE.												
1. Old Age ...												5
2. Old Age ...	50	2										52
Totals ...	96	5	1	6	9	3	1	6	11	21	5	101
CLASS VI.—VIOLENT DEATHS.												
ORDER 1.—ACCIDENT OR NEGLIGENCE.												
1. Fractures and Contusions ...	2	1	4	2	3	7	5	2	2	2		7
2. Wounds (Cut, Stab) ...												1
3. Burns and Scalds ...												4
4. Poison ...												1
5. Drowning ...												30
6. Suffocation ...												1
7. Otherwise ...												1
ORDER 2.—HOMICIDE.												
1. Homicide ...												1
2. Suicide ...												1
Totals ...	2	1	4	2	3	7	5	2	2	2		18
CLASS VII.—TOTALS.												
Causes not specified or ill defined ...	14	1	1	1	1	1	1	1	1	1	1	13

CAUSE OF DEATH.	Carliff.	England on an equal average of 25 years per Registrar General's last Report.	
		Carliff.	England on an equal average of 25 years per Registrar General's last Report.
CLASS I.—ZYMOTIC DISEASES.			
I. Zymotic Diseases ...	308	4	5
II. Constitutional Diseases ...	374	3	4
III. Local Diseases ...	616	8	8
IV. Developmental Diseases ...	186	2	2
V. Violent Deaths ...	72	2	7
Not specified or ill defined ...	39		