

1885.

BOROUGH OF CARDIFF.

REPORT

ON THE

Sanitary Condition of Cardiff,

FOR THE YEAR 1884,

BY

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PRINTED BY ORDER OF THE URBAN SANITARY AUTHORITY.

CARDIFF:

DANIEL OWEN AND COMPANY, LIMITED.

1885.

TO THE
CARDIFF URBAN SANITARY AUTHORITY.

Cardiff, February, 1885.

GENTLEMEN,

I have now to submit my Report on the sanitary condition of the Urban District of Cardiff for the year 1884.

Within the later months of the year some anxiety was evinced in consequence of the high death rate recorded in the weekly returns of the Registrar-General, and as a high death rate has been usually considered to indicate defective sanitary arrangements, it will be convenient, before detailing the vital statistics incidental to the year, to call your attention to certain direct or collateral causes of general, as distinguished from zymotic, diseases, the latter being accepted as due to preventible excitants. These are Meteorology (including Climatology)—Geology, the drainage (general and house)—the condition of the streets and roadways—the water supply—the food supply, and the condition of dwelling houses.

THE METEOROLOGY.

The influences exercised by Meteorology are important factors when considering the sanitary condition of the district. It is here

to be noted that, in using the term sanitary condition, I desire to define this as meaning, in my Report, the existence of pre-disposing or preventible causes of disease, rather than the actual death rate. Thus one of the conditions of Meteorology may produce sickness and mortality directly due to it, and not to defective sanitary conditions, as the consequences of a very high or a very low temperature; each in itself may be an excitant cause; as an instance of the latter, intense cold is very fatal to individuals in advanced years, whilst excessive fluctuations of heat and cold will give rise to acute inflammatory attacks of the internal viscera, at all times dangerous; a humid condition, combined with a high temperature, will favour the development of excitant causes of zymotic diseases. A humid condition with a very low temperature, especially combined with cold winds, will interfere with the favourable progress of the exanthemata (eruptive diseases).

THE RAINFALL.

The rainfall during the year 1884, as observed by Mr. W. Adams, C.E., F.G.S., at his residence, Cambridge House, Park Place, Cardiff, is shewn by the subjoined table :—

Latitude, N., 51 deg., 9 min. 10 sec.
 Longitude, W., 3 deg., 9 min. 55 sec.
 Diameter of Receiver of Gauge, 5 inches.
 Height above ground, 1 foot.
 Height above sea-level, 43 feet.

RAINFALL. TABLE No. 1.

The following table shows the monthly rainfall, the greatest fall in 24 hours, with date, and the number of days on which 0·01 in. or more fell :—

Month.	Total Depth.	Greatest fall in 24 hours.	Date.	Days on which 0·01 inch or more fell
January ...	Inches. 6·03	Inches. 0·99	31st	21
February ...	4·40	1·35	17th	22
March ...	3·39	1·27	3rd	16
April ...	1·56	0·43	3rd	11
May ...	2·37	0·50	2nd	14
June ...	1·92	1·11	28th	9
July ...	4·05	0·94	23rd	20
August ...	2·21	0·84	31st	9
September ...	1·96	0·64	21st	15
October ...	1·01	0·35	8th	17
November ...	2·12	0·47	30th	16
December ...	5·87	0·68	5th	20
	36·89			190

TABLE No. 2.

The following is the rainfall for the year 1884, as compared with six previous years :—

Month.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
January ...	1·73	4·71	·87	·92	3·19	5·75	6·03
February ...	3·07	5·95	3·88	4·81	2·56	3·73	4·40
March ...	1·25	1·14	1·90	3·88	2·26	·60	3·39
April ...	4·10	2·64	1·98	1·44	5·68	·67	1·56
May ...	4·32	2·85	1·45	2·62	2·72	1·90	2·37
June ...	3·68	6·48	2·38	3·59	4·28	1·81	1·92
July ...	2·01	4·00	6·64	2·62	5·77	3·56	4·05
August ...	10·82	8·12	·77	6·94	6·75	2·09	2·21
September ...	3·21	4·85	3·67	2·09	3·94	6·14	1·96
October ...	5·76	1·51	4·94	3·23	8·33	4·23	1·01
November ...	3·06	0·43	3·67	4·98	6·26	6·38	2·12
December ...	2·70	2·11	6·70	4·50	4·86	1·92	5·87
	45·71	44·79	38·85	41·62	56·60	38·78	36·89

The average Rainfall of the six previous years was 44·4, that of the present year 36·8, or 7·6 below the average.

The following is a monthly summary of the Meteorological observations recorded during the year:—

TABLE A.

MONTH.	BAROMETER.			THERMOMETER.							HYGROMETER.		TOTAL RAINFALL.
	Highest.	Lowest.	Mean of Month.	Maximum.	Minimum.	Mean of Mnx.	Mean of Mth.	Mean of Month.	No. of days at or below 32 deg.	Mean of Dry Bulb.	Mean of Wet Bulb.		
January	30.717 in.	29.107 in.	30.137 in.	53°.3	22°-9	47°-8	41°-3	44°-5	0	44°-2	43°-2	6.03 in.	
February	30.435 "	29.385 "	29.888 "	51°-1	29°-4	45°-6	38°-5	42°-0	3	41°-8	40°-4	4.40 "	
March	30.200 "	29.238 "	29.920 "	59°-8	33°-4	49°-0	42°-4	45°-7	0	43°-7	41°-7	3.39 "	
April	30.083 "	29.236 "	29.811 "	58°-2	33°-9	51°-1	39°-7	45°-4	0	45°-5	42°-3	1.56 "	
May	30.415 "	29.416 "	29.989 "	76°-0	36°-5	60°-6	44°-9	52°-7	0	54°-0	50°-0	2.37 "	
June	30.334 "	29.618 "	30.057 "	79°-7	41°-2	66°-9	50°-3	58°-6	0	60°-1	55°-3	1.92 "	
July	30.185 "	29.580 "	29.923 "	75°-4	46°-5	67°-9	51°-8	59°-8	0	61°-9	53°-9	4.05 "	
August.	30.252 "	29.029 "	29.974 "	82°-8	45°-8	71°-8	54°-5	63°-1	0	63°-8	60°-1	2.21 "	
September	30.357 "	29.110 "	29.960 "	75°-7	42°-8	66°-7	52°-9	59°-8	0	58°-4	56°-2	1.96 "	
October	30.661 "	29.312 "	30.540 "	62°-5	32°-9	55°-0	43°-9	49°-4	0	59°-6	47°-3	1.01 "	
November	30.491 "	29.694 "	30.121 "	59°-2	25°-8	48°-3	39°-3	43°-8	2	43°-8	42°-2	2.12 "	
December	30.228 "	29.157 "	29.839 "	53°-9	31°-2	45°-1	38°-3	41°-7	3	41°-9	40°-0	5.87 "	

TABLE B.—The Temperature of the Year, as compared with that of the previous Five Years.

Months.	1879.	1880.	1881.	1882.	1883.	Mean of 5 years.	1884.
January	32°·9	34°·6	32°·1	42°·1	40°·5	36°·4	44°·5
February	44°·0	42°·7	39°·6	43°·6	42°·2	42°·4	42°·0
March	42°·8	45°·4	40°·7	46°·3	37°·5	42°·5	45°·7
April	45°·8	47°·4	47°·7	48°·7	48°·1	47°·5	45°·4
May	51°·2	53°·4	55°·0	52°·5	52°·5	52°·9	52°·7
June	57°·5	58°·0	57°·4	56°·2	57°·4	57°·3	58°·6
July	59°·2	61°·6	62°·1	60°·1	58°·4	60°·3	59°·8
August	60°·1	63°·2	58°·7	60°·2	60°·0	60°·4	63°·1
September	55°·8	59°·6	56°·0	54°·3	56°·9	56°·5	59°·8
October	49°·9	46°·8	47°·3	50°·3	50°·1	48°·9	49°·4
November	41°·3	43°·7	49°·7	44°·1	43°·8	44°·5	43°·8
December	34°·0	44°·1	41°·1	40°·3	41°·2	40°·1	41°·7

JANUARY.—The month of January was unusually mild, being 8° above the mean of the corresponding months of the previous years ; it was wet, and the prevailing winds were W. and S. The barometer was generally high, but unsteady ; its highest reading was 30·717 in. on the 29th ; its lowest 29·107 in. on the 27th, the mean for the month being 30·137 in. The maximum temperature registered was 58°·3 on the 29th ; the minimum 32°·9 on the 2nd. The mean of maximum 47°·8 ; of minimum 41°·3. The mean of month was 44°·5. There was no day when the temperature was at or below 32°. The mean reading of hygrometric dry bulb was 44°·2 ; of wet bulb 43°·2. There were 21 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 0·99 in. on the 31st. The total rainfall of the month was 6·03 in. The death rate from all causes was 25·4 per 1,000 inhabitants ; that of the seven chief zymotic diseases 3·2.

FEBRUARY was mild and wet, with variable winds, E., however, predominated. The barometer was high and steady until the 9th, it then oscillated very much until the end of the month ; its highest reading was 30·435 in. on the 3rd ; its lowest 29·385 in. on the 9th. The mean for month 29·888 in. The maximum temperature was 51°·1 on the 9th ; the minimum 29°·4 on the 3rd. The mean of maximum 45°·6 ; of minimum 38°·5. The mean of month 42°. There were 3 days on which the temperature was at or below 32°. The mean of hygrometric dry bulb was 41°·8, of wet bulb 40°·4. There were 22 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 1·35 in. on the 17th. The total rainfall was 4·40 in. The death rate from all causes was 18·3 ; that of the seven chief zymotic diseases 1·2.

MARCH was also mild and wet, being 3° above the mean of the previous five years. The wind was Easterly during the first week, then W. until the 23rd, after which date it became N.E. The barometer was high and fairly steady ; its highest reading was 30·200 in. on the 6th ; its lowest 29·238 in. on the 10th. The mean for the month 29·920. The maximum temperature was 59°·8 on the 16th ; the minimum 33°·4 on the 7th. The mean of maximum was 49° ; of minimum 42°·4. The mean of month 45°·7. The mean of hygrometric dry bulb was 43°·7 ; of wet bulb 41°·7. There were 16 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 1·37 in. on the 3rd. The total rainfall was 3·39 in. The death rate from all causes was 20·0 ; that of the seven chief zymotic diseases 1·2.

The mean of temperature for the quarter at Cardiff, as compared with Greenwich, is as under :—

MONTH.	CARDIFF.	GREENWICH	ABOVE.	BELOW.
January	44°5	43°9	0°6	
February	42°0	41°9	0°1	
March	45°7	44°5	1°2	
Mean of Quarter	48°0	43°4	0°6	

APRIL was cold, being 2°1 below the mean of previous 5 years. The weather was dry, the prevailing winds more or less N.E. throughout the month. The barometer was low, but steady, its highest reading 30·083 in. on the 14th; its lowest 29·236 in. on the 5th. The mean of month 29·811 in. The maximum temperature was 58°2 on the 8th; the minimum 33°9 on the 23rd. The mean of maximum 51°1; of minimum 39°7. The mean of month 45°4. The mean of hygrometric dry bulb 45°5; of wet bulb 42°8. The number of days on which 0·01 in. or more rain fell was 11. The greatest fall in 24 hours was 0·43 in. The total rainfall for the month was 1·56 in. The death rate from all causes was 26·9; that of the seven chief zymotic diseases 3·2.

MAY was a warm and dry month; the winds were very variable, E. and W. alternating. The barometer oscillated somewhat in the early part of the month, but was high and steady from the 9th to the 31st; its highest reading was 30·415 in. on the 21st; its lowest 29·416 in. on the 4th. The mean of the month was 29·989 in. The maximum temperature was 76°6 on the 24th; its minimum 36°5 on the 21st. The mean of maximum was 60°6; of minimum 44°9. The mean of the month 52°7. The mean of hygrometric dry bulb 54°0; of wet bulb 50°0. There were 14 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 0·50 in. on the 2nd. The total rainfall for the month measured 2·37 in. The death rate from all causes was 21·0; that of the seven chief zymotic diseases 2·1.

JUNE was dry and warm, being 1°3 above the average. The prevailing winds were E. The barometer was high throughout the whole of the month; its highest reading 30·334 in. on the 15th; its lowest 29·618 in. on the 2nd. Mean for the month 30·057 in. The maximum temperature registered 79°7 on the 28th; the lowest 41°2 on the 1st. The mean of maximum 66°9; of minimum 50°3. The

mean of the month $58^{\circ}6$. The mean of hygrometric dry bulb $60^{\circ}1$; of wet bulb $55^{\circ}3$. There were 9 days only on which 0.01 in. or more rain fell. The greatest fall in 24 hours was 1.11 in. on the 28th. The total rainfall of the month was 1.92 in. The death rate from all causes was 19.9; that of the seven chief zymotic diseases 4.3.

The mean of temperature for the quarter at Cardiff, as compared with Greenwich, is as under:—

MONTH.	CARDIFF.	GREENWICH	ABOVE.	BELOW.
April	$45^{\circ}4$	$45^{\circ}1$	$0^{\circ}3$	...
May	$52^{\circ}7$	$54^{\circ}3$		$1^{\circ}6$
June.....	$58^{\circ}6$	$58^{\circ}0$	$0^{\circ}6$	...
Mean of Quarter	$52^{\circ}2$	$52^{\circ}5$	$0^{\circ}3$	$0^{\circ}3$

JULY was moderately warm and wet for the first 5 days. The wind was from the E., after that it became very variable, but Westerly winds predominating until the 28th, when they were Easterly. The barometer was very fluctuating throughout the month; the highest reading was 30.185 in. on the 1st; its lowest 29.580 in. on the 10th. The mean for the month 29.923 in. The maximum temperature registered was $75^{\circ}4$ on the 8th; of minimum $46^{\circ}5$ on the 26th. The mean of maximum $67^{\circ}9$; of minimum $51^{\circ}8$. The mean of month $59^{\circ}8$. The mean of hygrometric dry bulb $61^{\circ}9$; of wet bulb $58^{\circ}9$. There were 20 days on which 0.01 in. or more rain fell. The greatest fall in 24 hours was 0.94 in. on the 23rd. The total rainfall was 4.05 in. The death rate from all causes was 21.8; that of the seven chief zymotic diseases 5.9.

AUGUST was very hot and unusually dry, being $2^{\circ}4$ above the mean. The prevailing winds were Westerly. The barometer was again higher than the average of the month; its highest reading was 30.252 in. on the 5th; its lowest 29.029 in. on the 24th. The mean of month 29.974 in. The maximum temperature registered $82^{\circ}8$ on the 11th; the lowest $45^{\circ}8$ on the 26th. The mean of maximum $71^{\circ}8$; of minimum $54^{\circ}5$. The mean of month $63^{\circ}1$. The mean of hygrometric dry bulb $63^{\circ}8$; of wet bulb $60^{\circ}1$. There were only 9 days on which 0.01 in. or more rain fell. The greatest fall in 24 hours was 0.84 in. on the 31st. The total rainfall for the month was 2.21 in. The death rate from all causes was 28.8; that of the seven chief zymotic diseases 9.1.

SEPTEMBER was very warm, being 3°·3 above the mean. Winds variable. The barometer was low to the 8th, afterwards became high and more steady; its highest reading 30·357 in. on the 18th; its lowest 29·110 in. on the 1st. The mean of month 29·960 in. The maximum temperature was 75°·7 on the 18th; the minimum 42°·8 on the 30th. The mean of maximum 64°·5; of minimum 53°·2. The mean of month 59°·8. The mean of hygrometric dry bulb 61°·9; of wet bulb 58°·9. There were 15 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 0·64 in. on the 21st, the total rainfall being 1·96 in. The death rate from all causes was 29·4; that of the seven chief zymotic diseases 8·4.

The mean of temperature for the quarter at Cardiff, as compared with Greenwich, is as under:—

MONTH.	CARDIFF.	GREENWICH	ABOVE.	BELOW.
July	59°·1	63°·4	...	4°·3
August	63°·1	65°·3	...	2°·2
September ...	59°·8	59°·3	0°·5	...
Mean of Quarter	60°·6	62°·7	0°·5	2°·1

OCTOBER was warm during the first half of the month, but towards the end was cold and wet; N. and N.W. winds predominating. The barometer was high, but fluctuated very much towards the end of the month; its highest reading was 30·661 in. on the 16th; its lowest 29·312 in. on the 12th. The mean for the month was 30·540 in. The maximum temperature registered 62°·5 on the 3rd; the minimum 32°·9 on the 29th. The mean of maximum 55°·0; of minimum 43°·9. The mean of month 49°·4. The mean of hygrometric dry bulb 59°·6; of wet bulb 47°·8. There were 17 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 0·35 in. on the 8th. The total rainfall was 0·01 in. The death rate from all causes was 21·8; that of the seven chief zymotic diseases 5.

NOVEMBER was a wet and cold month, with strong Westerly winds. The temperature was below the average; there was a great absence of sun, with humidity of atmosphere approaching complete saturation. The barometer was high; its highest reading was 30·491 in. on the 19th; its lowest 29·694 in. on the 7th. The mean for the month 30·121 in. The maximum temperature was 59°·2 on the 1st; the minimum 25°·8 on the 30th. The mean of maximum was 48°·3; of minimum 39°·3. The mean of the month 43°·8.

There were 2 days on which the temperature was at or below 32°. The mean of hygrometric dry bulb was 43°·8; of wet bulb 42°·2. There were 16 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 0·45 in. on the 5th. The total rainfall 2·12 in. The death rate from all causes was 25·7; that of the seven chief zymotic diseases 7·6.

DECEMBER was cold and wet, with excessive humidity of atmosphere, strong Westerly and North-westerly winds predominating, with frequent storms and gales. The mean reading of the barometer was below the average; its highest was 30·228 in. on the 22nd; its lowest 29·157 in. on the 20th. The mean for the month 29·839 in. The maximum temperature was 53°·9 on the 13th; the minimum 31°·2 on the 18th. The mean of maximum 45°·1; of minimum 38°·3. The mean of the month 41°·7. There were 3 days on which the temperature was at or below 32°. The mean of hygrometric dry bulb was 41°·9; of wet bulb 40°. There were 20 days on which 0·01 in. or more rain fell. The greatest fall in 24 hours was 0·68 in. on the 5th. Total rainfall of the month was 5·87 in. The death rate from all causes was 28·5; that of the seven chief zymotic diseases 6·6.

The mean of temperature for the quarter at Cardiff, as compared with Greenwich, is as under:—

MONTH.	CARDIFF.	GREENWICH	ABOVE.	BELOW.
October	49°·4	48°·9	0°·5	....
November ...	43°·8	42°·4	1°·4	...
December ...	41°·7	41°·0	0°·7	...
Mean of Quarter	44°·9	44°·1	0°·8	...

TABLE C.—Illustrates the daily Direction of Winds throughout the Year

Direction of Wind.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
N.W. ...	5	4	1	1	2	1	1	2	1	3	1	8	30
N. ...	3	1	2	3	...	3	1	2	2	2	3	2	24
N.E. ...	...	...	...	...	2	...	7	...	...	...	...	...	9
E. ...	2	10	10	18	12	15	7	10	15	10	4	8	121
S.E. ...	...	...	...	...	...	...	1	2	1	1	2	1	8
S. ...	4	4	7	2	...	5	...	1	2	2	1	1	29
S.W. ...	4	5	...	...	...	...	1	1	...	...	1	...	12
W. ...	13	5	11	6	15	6	13	13	9	13	18	11	133

THE WATER SUPPLY.

The public water supply, as I have previously stated, is good in quality, it is free from solid impurities, but somewhat hard. That from the Llanishen Reservoir has 18 degrees of hardness, and from the Ely Pumping Station 26 degrees. It is considered that 22 degrees is a fair average. Neither of these are for drinking prejudicial, but the latter is undesirable for domestic purposes. The daily quantity supplied to the town through the main conduit is about 1,750,000 gallons. The population to be supplied probably exceeds 113,000; this gives about 15 gallons per head, and it is therefore very deficient in quantity. The quantity usually considered to be necessary should certainly not be less than 25 gallons. Dr. PARKES'S estimate is, however, greater; he states that the quantity should be as under:—

	Gallons per head of Population.			
Domestic supply	12
General baths	4
Water closets	6
Unavoidable waste	3
				<hr/>
Total house supply	25
Municipal purposes	5
Trade purposes	5
				<hr/>
Total	35

This may, perhaps, be considered as somewhat excessive, but it is based on the principle that so much is necessary for thorough cleanliness and for the efficient clearance of sewers; it therefore certainly is not excessive in Cardiff, where the sewers, from their low gradients, require more than an average for flushing purposes.

During the past Session of Parliament you have acquired powers to obtain a water supply from a new source, namely, the Brecon Beacons. When this is obtained the water will be excellent in quality and inexhaustible as a supply, but it will probably be some four or five years before it becomes available; in the mean time the construction of a new reservoir for the purpose of increasing your storage capacity is being proceeded with at Llanishen, and is being pushed on with great activity. When this is completed it is confidently hoped it will meet your requirements until the new source is available.

THE FOOD SUPPLY.

A constant supervision has been exercised over the Abattoirs and Meat Market. Upon the whole the food supply has been very satisfactory. 396 lbs. beef, 104 lbs. pork, and 6,776 lbs. of fish have been destroyed by order of the Magistrates; in one case only was it deemed necessary to take further proceedings, and in this instance the owner was fined £20 and costs, or two months' imprisonment.

THE DWELLINGS OF THE WORKING CLASSES.

These are under the constant observation of your Inspectors who report to me the result of their day and night visits; with few exceptions they have been in a satisfactory state as regards cleanliness and ventilation. Overcrowding has not been discovered to any great extent, and when such does occur, notices are immediately served on the occupier to reduce the number of inmates; these notices have been complied with except in two instances, in these proceedings were taken and penalties of 40/- and costs in each case inflicted.

THE DRAINAGE.

In my Report for 1882 I detailed, at some considerable length your entire system of drainage. I then explained that, in consequence of the natural configuration of this district, a considerable part of it was low and flat, especially on the eastern and western sides; this occasioned the sewers to be constructed with very low gradients, some of the mains being only 1 in 1,500ft.; this necessarily occasioned a great difficulty in the passage of their contents, more particularly the solid excremental matter, while the available means in your power of flushing, owing to the deficiency of your water supply, during the present year, at the very time when this was most required, namely, the hot weather, there was an absence of storm water. These circumstances occasioned a congested condition of gases, and by reason of their escape at the ventilating shafts it led to many complaints being made, and operated unfavourably on the public health. The pressure of these gases caused an escape in houses where the house drains were defective, and conduced to specific diseases, as I have spoken of in other portions of this Report.

As an instance of the injurious effect of sewer gases I may mention that last year I directed your attention to the fact that

infantile diarrhœa was very fatal in the southern portion of the Roath sub-district, and I attributed this to the condition of the sewers. On that occasion I pointed out, that while the sewers in the Canton sub-district were constructed with equally low gradients, there had hitherto been sufficient sub-soil water entering the sewers in this district to keep them thoroughly flushed; this was owing to the circumstance that the superincumbent thick clay deposit on the southern border prevented its escape in that direction, and as a consequence the district was comparatively free from this disease; but during the drought of the late autumn the sub-soil water failed, and the mortality from diarrhœa was greater in Canton than at Roath. In Roath I tried the effect of throwing disinfectants into the ventilating shafts of several of the streets, the result being that in 1884 there was a less mortality from diarrhœa than in 1883, although the temperature causes were excessive.

HOUSE DRAINAGE.

For some time a growing feeling of anxiety has occupied the public mind, namely, that the house drainage in this town is very unsatisfactory, especially among that class usually called residential, and that to it many cases of serious illness have been attributed. After making careful enquiries I have ascertained it to be not without reason. I have therefore considered it to be my duty to institute a thorough house to house inspection. Tables D, E, and F give the results so far as this inspection has been carried up to the present date.

TABLE D. HOUSE INSPECTION.
CARDIFF DISTRICT.

Name of Street.	Number of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Siphons 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
Windsor Esplanade ...	19	...	1	2	1	18	11	14	1
Windsor Terrace	4	...	...	...	...	4	1	4	...
Bute Esplanade	11	...	...	...	1	7	9	8	...
Adelaide Street	44	...	...	9	11	...	...	44	14
Evelyn Street	36	...	1	9	9	...	...	36	12
Louisa Street	49	1	...	5	18	...	...	49	7
George Street	53	1	1	4	10	...	...	52	9
South William Street...	25	...	...	5	3	...	...	24	1
Alice Street	20	...	...	5	4	...	...	20	5
Henry Street ...	17	...	...	3	3	...	...	17	3
Loudoun Square, North	19	...	...	4	4	...	...	19	...
Christina Street	41	...	1	2	15	...	...	39	16
Hodge's Row	12	...	...	6	1	...	...	12	3
Canal Row	7	...	...	4	...	...	...	7	...
Francis Street	25	3	...	7	4	...	...	25	4
Stanley Street	31	...	...	6	4	...	...	31	2
Love Lane	46	...	3	7	1	...	...	46	8
Pendoylan Street	29	...	...	2	11	...	...	29	11
Thomas Street	30	1	...	3	...	...	...	30	11
Ellen Street	35	...	2	...	6	...	...	35	6
North William Street...	34	3	...	4	6	...	..	34	5
Pellett Street	36	...	...	7	4	...	...	26	1
Duffryn Street	25	...	...	8	1	...	...	25	6
Garth Street	31	...	1	3	5	...	...	31	7
	679	9	10	105	117	24	21	657	132

TABLE E. HOUSE INSPECTION—*continued.*

ROATH DISTRICT.

Name of Street.	Number of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Siphons 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.
Railway Street	26	...	...	2	3	...	...	26	5
Pearl Street	48	...	...	2	6	...	...	48	5
Blanch Street.....	25	...	1	2	...	...	...	25	4
Theodore Street.....	22	...	...	...	4	...	...	22	7
Carlisle Street.....	48	...	...	2	5	...	...	48	2
Ordell Street	63	...	...	5	11	...	...	63	6
Sanquhar Street.....	22	...	...	2	1	...	...	22	2
Kilcattan Street.....	34	...	...	...	...	...	...	34	5
Kerrycroy Street	36	...	...	...	...	...	...	34	6
Adeline Street	46	...	...	...	...	...	...	46	14
Marion Street.....	47	...	1	...	...	...	...	37	2
Janet Street	70	...	...	2	2	...	...	70	25
Bertram Street	27	...	...	5	...	...	...	27	5
John Street	41	...	...	5	1	...	...	41	11
Helen Street	51	4	3	2	5	...	...	51	10
Constellation Street ...	44	...	...	2	...	...	...	44	4
Shakespeare Street.....	78	...	2	3	...	...	...	78	4
Charles Street.....	43	...	2	...	1	...	...	43	6
Milton Street	24	...	...	3	6	...	...	24	5
Rose Street.....	32	...	4	...	2	...	...	32	8
Lily Street	21	...	...	...	4	...	...	21	3
Daniel Street	14	...	2	...	5	...	...	14	6
Newport Road	11	4	...	2	...	4	2	...	...
	873	8	15	39	56	4	2	850	145

TABLE F. HOUSE INSPECTION—continued.
CANTON AND GRANGETOWN DISTRICT.

Name of Street.	Number of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Siphons 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.
Westbury Terrace	20	...	...	...	...	...	...	20	10
Conybeare Road.....	29	7	...	1	1	1	...	29	6
Loftus Street	35	1	...	...	3	...	...	35	...
Clive Road	58	...	3	...	4	4	4	54	1
Penypeel Street	32	1	...	...	4	...	...	32	1
Egerton Street	28	...	...	...	7	1	...	28	...
Devonshire Place	19	...	...	3	3	...	...	19	...
Union Street	55	...	4	3	3	...	...	55	10
Glynne Street.....	57	4	...	1	...	...	...	57	7
Harvey Street.....	35	...	2	...	2	...	...	35	4
Severn Road	133	3	2	3	2	6	5	130	11
Wyndham Crescent ..	24	...	...	3	2	...	...	24	3
Stag Terrace	13	...	2	...	...	...	...	13	...
King's Road	123	2	3	1	8	23	15	120	2
Leckwith Road	28	...	...	2	5	...	...	28	3
Evan's Terrace	10	3	2	...	...	...	...	10	1
Theobald Gardens	5	...	3	...	...	...	...	5	...
Jones' Court	8	...	...	...	...	...	...	4	5
Harris' Court	6	...	...	...	...	...	...	2	2
Union Buildings	16	...	...	1	...	...	...	13	4
Francis Terrace	3	...	...	2	...	...	...	3	...
Bedwas Street	13	...	...	1	2	...	...	13	...
Machen Street	8	...	...	...	...	...	...	8	...
Van Street	9	...	1	...	...	...	...	9	...
Rudy Street	9	...	...	...	...	...	...	9	...
Oakley Street.....	11	...	6	...	...	...	...	11	...
Knole Street	55	...	...	4	3	...	...	55	4
Sevenoak Street.....	37	...	...	2	3	4	...	37	2
Holmesdale Street	21	...	...	3	2	...	...	21	...
Cambridge Street	17	...	...	...	...	6	...	16	1
	917	21	28	30	54	45	24	896	77

THE POPULATION.

The population of Cardiff in the middle of the year 1884 has been estimated by the Registrar-General at 93,468, and it is on this estimate statistical returns have been constructed.

The Registrar-General's estimate is based on the census return of 1881, adding to it the mean yearly increase that had taken place during the decennial period 1871-1881. The total increase was 25,884, or a yearly increment of 2,588. The census is taken on the 1st day of April, so that three whole years and one fourth of a year have to be calculated and added to the census return. This formula is sufficiently accurate as regards the entire Kingdom, or those districts wherein no disturbing causes come into operation, as it fairly marks the increase of the natural productive powers; but there are towns where the increase is not alone due to these, as where a rapid growth in the industrial or commercial interests attracts a corresponding influx of new comers. Cardiff is a most notable instance of such an element of increase; this is established by the extraordinary numerical addition of new houses, as also the birth rate.

The total plans for new houses passed by your Board during the last four years are as under:—

Years.		Total Number.
1881	... ..	904
1882	... ..	686
1883	... ..	980
1884	... ..	1,445

The censuses of 1851-61-71 gave an average number of inmates to each inhabited house relatively 6.25, 6.75, and 6.50. I therefore caused a careful survey of the town to be made by your three Inspectors at the latter part of the year, so as to obtain an accurate number of houses in the district, with the following result:—

TOTAL NUMBER OF HOUSES.

Sub-District	Inhabited.	Vacant.	Building.
Cardiff, North	2,798	38	104
„ South	4,767	9	3
Roath, North	1,181	30	52
„ South	3,321	34	70
Canton, North	1,599	20	97
„ South	1,318	13	190
Grange, Upper	331	19	—
„ Lower	748	2	21
Total	16,063	165	537

This return appears to me to offer a correct basis for estimating the population. I therefore multiplied the total number of inhabited houses by 6·25, the lowest average of the three censuses. This gives an estimated population at the end of the year of 100,393; to this is to be added 7,000, the mean floating population, making an aggregate number of estimated population at the end of the year 107,393.

The average number of inmates in each house may appear somewhat large compared with the average of ordinary towns, but I have explained before that this is to be attributed to the circumstance that practically all houses in Cardiff are built on lease tenure. The demand for ground for houses, especially those occupied by the working classes, is great, resulting in a high ground rent, causing a larger house to be erected for this class than in other towns, and the rent varies from 6/6 upwards. To meet this rent each house has to be occupied by two or more families.

THE MARRIAGES.

The marriages during the year were as follows :—

Churches	264
Nonconformist Chapels	193
Catholic Chapels	94
Synagogue	3
Registrar's Office	469
	<hr/>
	1,023
	<hr/>

THE BIRTHS.

The births registered during the year were 3,920; showing an excess of 394 over the previous year. The birth rate was 42·04, the mean birth rate of the Kingdom being only 33·4. It must, however, be remembered that this birth rate is calculated on an estimated total population, which includes 7,000 seamen, the average number constantly in the Port whose families reside elsewhere, and who do not contribute to the birth rate. If we deduct these 7,000 from the total population, and estimate the birth rate with the population proper, the birth rate would be 45·33.

The births were distributed over the district as under :—

Quarter ending.	Cardiff.	Roath.	Canton.	Total.	Rate per 1,000.	Large Towns.	Rate of Kingdom.
March	453	321	246	1020	43·8	35·4	33·2
June	455	275	216	946	40·6	35·0	34·2
September ..	458	303	222	983	42·2	35·0	33·0
December ...	453	297	221	971	42·9	34·2	33·2
Total ...	1819	1196	905	3920	42·4	34·9	33·4

Of the 3,920 births there were 1,998 males and 1,922 females.

THE DEATHS.

The total deaths registered in the district during 1884 were 2,250, arranged in conformity with sub-divisions and periods of the year. These were as follow :—

Quarter ending.	Cardiff.	Roath.	Canton.	Total.
March	293	117	81	491
June	281	131	112	524
September ...	324	194	115	633
December ...	292	133	177	602
Total ...	1,190	575	485	2,250

There were 1,229 males, and 1,021 females.

TABLE G.

Shews the weekly register of deaths, with death rates during the year.

Week ending	Popu- lation of Cardiff.	TOTAL DEATHS.		DEATH RATE		COMPARATIVE DEATH RATE.				QUARTER DEATH RATE.		
		Car- diff.	28 Lge Towns	Cardiff	28 Lge Towns	Under.	Over.	Cardiff	28 Lge Towns	Cardiff	28 Lge Towns	
1884.												
January 5	93,468	56	3731	31.3	22.2		9.1	5.0	2.7			
" 12	"	44	3523	24.6	21.0		3.6	2.2	2.7			
" 19	"	46	3479	25.7	20.7		5.0	2.8	2.7			
" 26	"	35	3410	19.5	20.3	0.8		2.2	2.5			
February 2	"	24	3448	13.4	20.5	7.1		0.6	2.5			
" 9	"	43	3466	24.0	20.6		3.4	1.7	2.4			
" 16	"	27	3367	15.1	20.1	5.0		1.1	2.5			
" 23	"	37	3538	20.7	21.1	0.4		1.7	2.6			
March 1	"	39	3417	21.8	20.3		1.5	1.1	2.4			
" 8	"	34	3773	19.0	22.5	3.5		1.1	2.7			
" 15	"	29	3796	16.2	22.6	6.4		0.6	3.0			
" 22	"	38	3709	21.2	22.1	0.9		2.8	2.9			
" 29	"	39	3495	21.8	20.8		1.0	1.1	2.8	21.1	21.1	
April 5	"	56	3809	31.3	22.7		8.6	3.9	3.2			
" 12	"	54	3418	30.2	20.4		9.8	3.4	3.1			
" 19	"	47	3773	26.2	22.5		3.7	2.2	3.3			
" 26	"	36	3751	20.1	22.3	2.2		2.2	3.4			
May 3	"	31	3804	17.3	22.7	5.4		2.2	3.3			
" 10	"	40	3666	22.3	21.8		0.5	2.2	3.3			
" 17	"	39	3540	21.8	21.1		0.7	3.4	3.2			
" 24	"	41	3343	22.9	19.9		3.0	2.2	3.0			
" 31	"	44	3354	24.6	20.0		4.6	3.9	3.0			
June 7	"	29	3286	16.2	19.6	3.4		3.4	3.0			
" 14	"	42	3326	23.5	19.8		3.7	3.4	3.0			
" 21	"	28	3133	15.6	18.7	3.1		2.8	3.0			
" 28	"	37	3230	20.7	19.2		1.5	5.0	3.1	22.5	20.8	
July 5	"	39	3279	21.8	19.5		2.3	3.4	3.4			
" 12	"	33	3726	18.4	22.2	3.8		5.6	5.2			
" 19	"	33	4031	18.4	24.0	5.6		6.1	7.5			
" 26	"	53	4176	29.6	24.9		4.7	8.9	7.4			
August 2	"	51	3905	27.4	23.3		4.1	6.1	6.2			
" 9	"	48	3670	26.8	21.9		4.9	7.3	5.4			
" 16	"	44	4052	24.6	24.1		0.5	7.8	6.6			
" 23	"	66	4293	36.9	25.6		11.3	13.4	7.8			
" 30	"	53	4245	29.6	25.3		4.3	8.9	7.5			
September 6	"	67	4053	37.4	24.1		13.3	11.2	6.8			
" 13	"	58	3588	32.4	21.4		11.0	7.8	4.8			
" 20	"	46	3518	25.7	21.0		4.7	4.5	4.3			
" 27	"	43	3200	24.0	19.1		4.9	7.8	3.6	27.1	22.8	
October 4	"	33	3379	18.4	20.1	1.7		5.0	3.3			
" 11	"	45	3319	25.1	19.8		5.3	4.5	2.8			
" 18	"	39	3545	21.8	21.1		0.7	5.0	2.7			
" 25	"	42	3517	23.5	20.9		2.6	4.5	2.3			
November 1	"	50	3464	27.9	20.6		7.3	6.1	2.3			
" 8	"	49	3569	27.4	21.3		6.1	7.3	2.3			
" 15	"	44	3505	24.6	20.9		3.7	9.5	2.2			
" 22	"	37	3512	20.7	20.9	0.2		5.6	2.3			
" 29	"	55	3994	30.7	23.8		6.9	7.8	2.4			
December 6	"	53	4102	29.6	24.4		5.2	8.4	2.3			
" 13	"	58	3798	32.4	22.6		9.8	5.0	2.3			
" 20	"	52	3634	29.0	21.6		7.4	7.8	2.4			
" 27	"	46	3386	25.7	20.2		5.5	3.9	1.9	25.9	21.7	

The death rate was 24·07. This, compared with the 28 typical large towns, the 134 districts, and 57 sub-districts comprising chief towns; and the remaining districts and sub-districts, comprising small towns and country parishes, may be seen by the following table :—

	QUARTERS ENDING.				Death Rate of Year.
	March.	June.	Sept.	Dec.	
Cardiff	21·1	22·5	27·1	26·5	24·07
28 large towns	21·1	20·8	22·8	21·7	21·6
134 districts and 57 sub-districts, comprising chief towns	20·5	20·0	21·8	21·7	21·0
The remaining districts and sub-districts, comprising chiefly small towns and country parishes	18·0	17·3	16·5	17·6	17·4
Death rate of the whole Kingdom	19·5	18·9	19·7	20·1	19·6

It will thus be seen that the mortality of Cardiff was the same as that of the large towns during the first quarter, it was somewhat larger in the second, and excessive during the third and fourth quarters; this was owing to the prevalence of certain zymotic diseases, measles, scarlatina, whooping cough, and diarrhoea.

The deaths at ages were :—

Under one year of age	657
One year and under five years	417
Five years and under fifteen years	136
Fifteen years and under twenty-five years	158
Twenty-five years and under sixty years	581
Sixty years and upwards	301

2,250

The proportion of deaths under the age of one year is 167·6 per 1,000 births. This was greater than the average of the Kingdom, but very slightly under the mean of the large towns.

Quarter ending.	The Kingdom.	The Large Towns.	Cardiff.
March	134	139	121
June	121	137	149
September	191	242	230
December	142	156	168
Average of year	147	168	167

The large infantile mortality was during the autumnal quarter, when infantile diarrhoea was very fatal throughout the district.

The following is a classification of the registered causes of death during the year :—

Zymotic Disease	551
Constitutional	320
Local	950
Developmental	305
Violent	124
Total... ..	2,250

The deaths were registered and distributed over the sub-districts thus :—

	Cardiff	Roath	Canton
Zymotic Disease	192	183	176
Constitutional	203	73	44
Local	578	190	182
Developmental	168	75	62
Violent	62	26	7
Not classed	17	8	4
Total	1220	555	475

In the appendix a table will be found which gives a classification of diseases, the registered cause of death in each class, the ages at death, and the proportionate death rate in the Urban Sanitary

District of Cardiff in 1884, as compared with the average death rate of the Kingdom extending over 30 years. In accordance with instructions from the Local Government Board, I have compiled two other tables : Form A, deaths during the year 1884 in the Urban Sanitary District of Cardiff, classified according to diseases, ages, and localities, also showing the population of such localities and the births therein during the year ; Form B illustrating new cases of sickness of a special character during the year, classified according to localities and diseases. In the zymotic class the Registrar-General distinguishes some which he designates "The Seven Chief Zymotic Diseases." The mortality from these diseases, if not produced, is aggravated by defective sanitary arrangements.

The deaths from the seven chief zymotic diseases occurred in the following streets and institutions. Tables H, I, J, K, L, and M, show zymotic deaths for 1884.

Table H. CARDIFF DISTRICT.

NORTH SIDE.—Population 17,131.

Names of Streets.	S. Fox	Measles.	Scarlatina.	Diphtheria.	W. Cough	Fever	Diarhoea.	Total.
Blackweir.....	1	...	...	...	1
Bedford Street.....	2	2
Beauchamp Street	1	...	...	...	...	1
Cairns Street	2	...	1	...	2	5
Castle Road	1	...	1	...	1	3
Cathays Terrace	1	...	...	...	1	2
Crwys Road	2	...	...	...	...	2
Coburn Street	1	...	...	3	4
Flora Street.....	1	1	...	1	1	4
Hirwain Street.....	1	1
Letty Street.....	1	...	...	...	1	2
Minnie Street	3	...	1	...	...	4
Miskin Street	1	...	1	2
Mason's Arms Court	1	1
May Street	2	2
North Street	1	...	1
Nazareth House	2	2
Rhymney Terrace	1	...	...	...	1
Richard Street.....	1	...	...	1	2
Richmond Road	1	1	2
Russell Street	1	1
Salisbury Road	1	...	1	2
St. Andrew's Crescent...	1	...	1
The Barracks	1	...	1
Thesiger Street	1	...	...	2	...	3
Treherbert Street	1	1
Treorky Street.....	1	1
Union Workhouse	1	1	2
Upper George Street	2	2
Woodville Road	2	...	...	...	...	2
TOTAL	15	5	5	8	27	60

Table I. CARDIFF DISTRICT.

SOUTH SIDE.—Population 29,698.

Names of Streets.	S. Pox	Meas- sles.	Scar- latina.	Diph- theria.	W. Cough	Fever.	Diar- rhoea.	Total.
Adam Street	1	...	...	1
Adelaide Street	1	...	...	...	...	...	1
Bridge Street	1	...	...	1	...	...	2
Bute Street	1	...	1	...	1	2	5
Brook Street	3	3
Buzzard Street.....	1	...	...	1	2
Christina Street	1	...	1	...	...	1	3
Canal Street.....	1	...	...	2	3
Crichton Place.....	1	...	...	...	1
David Street	1	...	...	...	...	...	1
Davis Street.....	1	...	...	...	...	1
Dudley Street	2	...	...	...	...	2
Dalton's Court.....	1	1
Ellen Street	1	1
Eleanor Street.....	...	1	...	...	...	...	...	1
Edward Street.....	1	...	1	...	...	2
East Terrace	1	1	...	2
Francis Street	1	...	...	...	...	1	2
Frederick Street	2	2
Garth Street	1	1
George Street	3	1	...	...	...	...	4
Godfrey Street.....	...	1	...	...	...	...	...	1
Glo'ster Street	1	1
Green Street	1	...	...	...	1
Havelock Street	1	...	...	...	...	2	3
Hospital Ship	5	...	...	...	...	...	2	7
Herbert Street.....	1	1
Hodge's Row	1	1
Hill's Terrace	1	...	...	1
James Street	1	...	1
Louisa Street	1	...	...	1
Margaret Street	1	...	...	...	...	...	1
Maria Street	1	1
Moira Street	2	...	...	...	1	3
Morgan Street.....	1	...	...	...	...	1
Millicent Street	1	1
Carried forward ...	5	13	8	6	5	3	26	66

Table I. CARDIFF DISTRICT.

SOUTH SIDE—continued.

Names of Streets.	S. Pox	Measles.	Scarlatina.	Diphtheria.	W. Cough	Fever.	Diarrhoea.	Total.
Brought forward ...	5	13	8	6	5	3	26	66
Mount Stuart Square	1	...	...	...	1
Mary Ann Street.....	1	...	...	1
North William Street	3	3
Penarth Road	1	1
Pendoylan Street.....	1	1
South Church Street	1	...	...	...	...	...	1
Sandon Place	1	...	...	...	2	3
Tredegar Street	1	...	...	1
Tyndall Street.....	3	...	3
Tresillian Terrace	2	2
Union Street	2	2
Union Buildings.....	1	1
Union Workhouse
Victoria Street	1	1
Windsor Esplanade.....	1	...	...	...	1
Wood Street	1	...	...	...	1
Wharton Place	2	...	...	2
West Wharf.....	1	1
Working Street	1	1
TOTAL	5	14	9	9	9	6	41	93

Table J. ROATH DISTRICT.

NORTH SIDE.—Population 7,381.

Names of Streets.	S. Pox	Measles.	Scarlatina.	Diphtheria.	W. Cough	Fever.	Diarrhoea.	Total.
Charles Street	2	...	...	...	2	4
Clive Street	3	1	...	...	...	4
Croft Street.....	4	...	...	...	1	5
Crwys Road.....	1	1
Carried forward	9	1	...	...	4	14

Table J. ROATH DISTRICT.

NORTH SIDE—*continued.*

Names of Streets.	S. Pox	Measles.	Scarlatina.	Diphtheria.	W. Cough	Fever.	Diar-rhoea.	Total.
Brought forward..	9	1	...	...	4	14
Elm Street	2	...	...	...	...	2
Grouse Street	1	...	...	...	1
Inverness Place	1	...	1
James Street	2	...	...	...	2	4
Lily Street	1	...	...	...	...	1
Lucas Street	1	1
Milton Street	1	...	...	...	...	1
Oxford Street	1	1	...	...	...	2
Partridge Road	1	1
Penylan Road	1	...	...	1	2
Rose Street	1	...	...	...	2	3
Robert Street	1	...	...	...	1
Shakespeare Street	1	...	...	...	...	1
Snipe Street..	1	...	...	...	1
Tredegar Street	1	...	1	...	...	...	2
Vere Street	1	1
Wordsworth Street	1	...	...	...	1
TOTAL	1	18	8	...	1	12	40

Table K. ROATH DISTRICT.

SOUTH SIDE.—Population 20,756.

Names of Streets.	S. Pox	Measles.	Scarlatina.	Diphtheria.	W. Cough	Fever.	Diar-rhoea.	Total.
Adeline Street	2	...	...	...	1	3
Arthur Street	1	1
Bertram Street	7	...	...	...	...	7
Broadway	2	...	...	...	...	2
Booker Street	1	...	1
Carried forward	11	...	...	1	2	14

Table K. ROATH DISTRICT.

SOUTH SIDE—*continued.*

Names of Streets.	S. Fox	Meas-les.	Scar-latina.	Diph-theria.	W. Cough	Fever.	Diarrhoea.	Total.
Brought forward...	11	...	...	1	2	14
Cecil Street	1	...	8	...	...	1	...	10
Clifton Street	1	1	1	...	2	...	1	6
Carlisle Street	1	...	...	...	1	2
Clyde Street.....	2	...	...	1	...	3
Comet Street	1	...	1	...	...	2
Cycle Street.....	2	...	...	...	1	3
Constellation Street	1	1	1	1	4
Diamond Street	3	1	...	2	4	10
East Flats	1	...	1	...	...	2
Eclipse Street	1	...	...	...	...	1
Emerald Street	2	...	...	...	...	2
Galstone Street	1	...	...	...	1	2
Gold Street	1	...	...	...	...	1
Habershon Street	1	...	...	...	...	1
Helen Street	1	...	4	...	...	...	3	8
Harold Street	1	...	...	1
Infirmary.....	1	...	1
Iron Street	1	...	...	...	...	1
Janet Street.....	...	1	1	1	1	...	1	5
John Street	2	...	...	...	...	2
Killcattan Street	1	1	...	...	...	1	3
Kingarth Street	1	...	...	...	...	1
Kerrycroy Street	1	...	...	1
Lady Margaret Terrace	1	...	...	...	1
Longcross Street	1	...	1
Maud Street	1	1
Moon Street.....	1	...	...	...	...	1
Newport Road.....	2	...	2
Orbit Street.....	1	...	...	...	...	1
Ordell Street	1	...	...	...	...	1
Pearl Street	2	1	1	...	4	8
Planet Street	1	...	1	...	...	2
Railway Street	1	...	3	...	1	5
Richard's Terrace	1	...	...	...	...	1
Ruby Street	2	...	...	...	...	2
Sanguhar Street	1	1	...	...	...	2
Carried forward ...	3	3	57	6	13	10	22	114

Table K. ROATH DISTRICT.SOUTH SIDE—*continued.*

Names of Streets.	S. Pox	Meas-les.	Scar-latina.	Diph-theria.	W. Cough	Fever.	Diar-rhœa.	Total.
Brought forward...	3	3	57	6	13	10	22	114
Sapphire Street	2	...	...	..	2
Stacey Road.....	1	...	...	...	...	1
Sun Street	1	...	...	...	...	1
System Street	1	...	1	...	1	3
Tin Street	1	...	...	...	1	2
Topaz Street	2	...	...	...	...	2
Tyler Street.....	1	...	...	...	2	3
Zinc Street	3	...	...	...	...	3
TOTAL	3	3	67	8	14	10	26	131

Table L. CANTON DISTRICT.

NORTH SIDE—Population 9,993.

Names of Streets.	S. Pox	Meas-les.	Scar-latina.	Diph-theria.	W. Cough	Fever.	Diar-rhœa.	Total.
Conway Road	1	...	...	...	...	1
Clive Road	1	1
Conybeare Road	1	1
Glamorgan Street	1	...	...	...	...	1
Glynne Street	2	2
Harvey Street	2	1	...	...	...	...	3
Halket Street	1	...	...	...	...	...	1
King's Road	3	3
Llandaff Road.....	1	1	2
Mortimer Road	1	...	...	...	1
North Morgan Street	1	1
Penypeel Street	1	...	...	...	...	1
Romilly Crescent.....	...	1	...	...	...	...	1	2
Wyndham Road	2	2
Union Street	1	...	...	...	...	3	4
TOTAL	5	4	1	...	1	15	26

Table M. CANTON DISTRICT.

SOUTH SIDE.—Population 14,981.

Names of Streets.	S. Fox	Meas-les.	Scar-latina.	Diph-therin.	W. Cough	Fever.	Dis-crhusa.	Total.
Andrew's Terrace	1	...	...	...	...	...	1
Albert Terrace.....	1	...	...	...	...	1
Atlas Terrace	1	...	...	...	...	1
Bradford Street	3	...	...	1	...	...	4
Bromsgrove Street	2	...	...	...	...	2	4
Bedwas Street	1	...	1
Clive Street	1	...	...	...	...	1	2
Cambridge Street	1	...	...	...	...	...	1
Canton Common	1	...	...	...	1	2
Canton Square.....	2	2
Cowbridge Road	2	...	1	...	4	7
Earl Street	2	...	...	...	...	...	2
Edward Street	1	...	...	...	2	3
Holmsdale Street	11	...	...	...	...	4	15
Havelock Street	1	...	...	...	...	...	1
Hewell Street	2	...	...	...	...	2	4
Herbert Street.....	...	1	...	...	...	...	...	1
Hannah Street.....	1	1
Knole Street	3	...	...	...	...	...	3
Kent Street	4	...	1	...	...	...	5
Ludlow Street	1	...	...	...	...	...	1
Leckwith Road	2	...	...	...	...	2
Lewis Street.....	3	2	...	...	...	5
Loftus Street	1	2	3
Matthew's Terrace	2	...	...	...	...	...	2
Mary Ann Street.....	4	4
Newport Street	2	...	...	...	...	2	4
North Clive Street	1	...	...	1	1	3
Oakley Street	7	...	...	...	...	1	8
Penarth Road	1	...	1	...	1	...	3
Railway Terrace	1	1
Springfield Place.....	...	1	...	...	...	...	1	2
Sevenoak Street	2	...	...	...	3	1	6
Sea View Terrace	2	...	...	...	...	...	2
South Morgan Street	1	1
Carried forward	50	12	4	2	7	33	108

Table M.

CANTON DISTRICT.

SOUTH SIDE—*continued.*

Names of Streets.	S. Pox	Measles.	Scarlatina.	Diphtheria.	W. Cough	Fever.	Diarrhoea.	Total.
Brought forward	50	12	4	2	7	33	108
Stacey Terrace.....	1	1
Thomas Street	7	..	..	..	..	..	7
Wellington Street	2	3	..	1	1	2	9
Windsor Terrace	1	..	..	..	..	..	1
Wyndham Street	1	..	1
TOTAL	60	15	4	3	9	36	127

Guided by the Press, a rapidly increasing general attention has been given to sanitary matters; this can but eventuate in great good, inasmuch as the more thoroughly the general public recognises the nature of infection, it will understand the object and recognise the means by which the Medical Officer endeavours to arrest the prevalence, or prevent the introduction of zymotic diseases. With this view I propose to state, in as concise a manner as possible, what is accepted as to the nature of contagium.

In 1837 Schwann announced his discovery of the connection between putrefication and microscopic life; this was an important discovery. Since then, Tyndall, while engaged in some scientific researches, ascertained that the ray of light entering a darkened room made visible a beam of what was considered dust; for the purpose of carrying on his experiment it was necessary to get rid of this dust by combustion; he then found, instead of being debris or dust, it was organic matter, and this organic matter was composed of micro-organisms; he afterwards shewed that the atmosphere was at all times loaded with these organisms, it was to these that the changes of organic matter, when undergoing decomposition, were due, and that it was not owing to chemical changes, as had hitherto been considered.

Some years after the discovery of Schwann, Mr. (now Sir Spencer) Wells promulgated, in an address delivered before a meeting of the British Medical Association at Cambridge, that the connection between putrefication and microscopic life might be extended to

living matter, and to that the putreficative and other such classes of disease, most fatal at times in Hospitals and other crowded dwellings, were to be attributed. This opinion was in accord with discoveries made by M. Pasteur, Burdon-Saunderson, Koch, and other scientific Hygienists.

Dr. William Budd, of Bristol, had at this time given considerable attention to the nature of infection; he stated, in strong terms, that infectious diseases were each due to a specific contagium, that this specific contagium could only produce one specific disease; that the contagium of small pox could give rise only to small pox, measles to measles, scarlatina to scarlatina, and the like applied to each individual zymotic disease. This was confirmed by Pasteur's inquiry, in 1867, into a very fatal epidemic amongst silk worms, that entailed an enormous loss to the silk worm cultivators in some of the French Communes. Dr. Budd then further emphatically enunciated that the contagium of an infectious disease was an organism that, how or whenever originated, could never originate spontaneously, and the same law regulated all forms of life applied to these, and that they were continued by the laws of succession; that no infectious disease could break out in a locality until its contagium had been introduced; that the opinion that had hitherto prevailed, that a fœtid cesspool or drain, or an amount of organic matter undergoing decomposition, however offensive they were, and prejudicial to health generally, could never give rise to infectious disease; but he stated, with equal force, that these conditions would powerfully develop the vitality and enormously multiply these organisms; that the exhalations from these would poison the atmosphere and intensify the prevalence and mortality in direct ratio to the extent such nuisances existed in a locality. This view was strengthened by a statement contained in one of the many valuable reports made by Mr. Simon to the Privy Council. In this report he stated that in one registration district in England for ten years there had not occurred a single case of infectious disease; it did not owe this immunity to any more perfect condition in its sanitary arrangements as compared with all other registration districts, but to the circumstance that from its insular position no infectious case had been introduced. This registration district was the Scilly Island.

The views I have thus brought before your notice constitute what is now recognised as "The Germ Theory," and they have an important bearing on my labours to prevent or minimise the prevalence of an infectious disease when it has come under my observation. The objects I have sought to obtain, and the means by which these are to be accomplished, are detailed in those portions of my report referring to the prevalence of certain infectious diseases during the past year in this district.

TABLE N.

The following Table gives the total deaths, and death rate of the seven chief zymotic diseases for each year during the six years ending 1883, with mean of same.

Years	1878		1879		1880		1881		1882		1883		Mean of six years.		1884.	
	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate	Deaths	Death Rate
Estimated Population according to Registrar General	78,251		80,839		83,427		86,015		88,603		91,204		84,723		93,468	
† Chief Zymotic Diseases.																
Small Pox	1	0·012	...	...	1	0·011	2	0·023	1	0·011	1	0·010	1·0	0·011	8	0·085
Measles	3	0·038	10	0·123	67	0·803	1	0·011	32	0·361	11	0·120	20·6	0·243	83	0·888
Scarlatina	10	0·127	44	0·544	29	0·347	20	0·232	67	0·756	42	0·460	35·3	0·416	128	1·369
Diphtheria	12	0·153	9	0·111	10	0·119	12	0·139	27	0·305	22	0·241	15·3	0·180	35	0·374
Whooping Cough ...	70	0·894	20	0·247	77	0·922	58	0·673	38	0·428	68	0·745	55·1	0·650	31	0·330
Fever	28	0·357	21	0·259	23	0·275	21	0·244	18	0·203	35	0·383	24·3	0·286	34	0·363
Diarrhoea	73	0·932	33	0·408	99	1·186	50	0·581	110	1·241	74	0·811	73·1	0·862	157	1·679
Total	197	2·513	137	1·692	306	3·653	164	1·903	293	3·306	253	2·770	224·7	2·648	476	5·088

SMALL POX.—The total deaths from small pox were 8; the death rate 0·085; the mean death rate of the six previous years 0·011; that of the Kingdom, 0·221.

During the year forty-three cases of small pox came under my observation, of these eight were fatal. This is the first year since 1873 that the disease has prevailed in an epidemic form, as I find by my annual reports that during the ten years preceding 1884 the total deaths were thirteen, or an average slightly exceeding one a year, these cases were all of them seamen who arrived in the port on board infected vessels, were immediately removed into the Hamadryad Hospital, and a strict supervision being maintained over the shipping, prevented its extension into the town.

The first case reported to me during the present year was that of a seaman on board the brigantine "Rapid." This vessel arrived in the Cardiff Docks on the early morning of the 18th of April. I immediately visited the case and ordered its removal into the Hospital. I then inquired into the circumstances connected with it, and found that the vessel left the Port of Whitstable, in Kent, bound for London, and afterwards proceeded to Cardiff; small pox was prevalent in Whitstable at this time. Some few days after leaving London, on its way to Cardiff, one of the seamen was taken ill with an eruption of small pox. After the removal of the patient the ship was thoroughly disinfected, the crew were inspected, all were found healthy and urged to be re-vaccinated; this they declined. A suggestion was made to the captain to prevent them going on shore; this suggestion was complied with. The "Rapid" was kept under observation, and up to the time of its leaving the Port no fresh case occurred. The man ultimately recovered; he had been vaccinated when a child, and the disease was in a very modified form.

The disease broke out as an epidemic about the middle of May, and continued until the end of August, extending over a period of about 12 weeks; it was confined almost entirely to the southern side of the Roath Sub-district. This Sub-district is bounded on the north by Newport Road, commencing near Pengam, and extending to the New Infirmary, on the east it is bounded by a road leading from Broadway to the East Moors, and on the west by a road leading from the Infirmary to Sanquhar Street. It contains about 3,320 houses, with a population of 20,750.

The epidemic came under my observation as follows:—Late in the evening of the 16th of May I received information that a suspected case of small pox existed at No. 31, Diamond Street, Roath Sub-district. Early the following morning I visited that house and

ascertained this to be the case, and that the person was an adult female. The house was one of ill-fame. On questioning the woman she informed me that three days previously she had left a similar house, viz., 41, Helen Street, that while living in the latter house she had been visited by a seaman who had recently arrived in a vessel from Hull; at this time deaths from small pox were being recorded at that place, and I have every reason to believe that this was the source of the outbreak. She informed me that when she left Helen Street there were two children in the house suffering from the same disease. I then visited Helen Street and ascertained this to be the fact, and that the eruption had existed for some days, but, unfortunately, had not been reported to me, so that the District was at this time practically infected; the elder of the two children, who was 13 years of age, had been vaccinated, her attack was a very mild one; she was fast becoming convalescent. The younger was four years old; she was unvaccinated; the disease in her case was in a confluent form, and the child died in three days.

I immediately placed myself in communication with Mr. Hughes, the Medical Superintendent of the Seamen's Hospital, and arranged with him to place at my disposal the infectious wards attached to that Hospital for the reception of cases of small pox. I had the case in Diamond Street removed there, but the child in Helen Street being almost moribund, this step could not be taken. I examined the inmates of the two houses. In Diamond Street there were at the time only two other inmates, viz., the occupier and a lad about 15 years of age, who was at work at the time I visited the house. I urged the woman to be re-vaccinated; this was successful, and she escaped the disease. She promised to get the lad, her son, re-vaccinated, but this was not complied with, and shortly after he was attacked with small pox.

In Helen Street, when I examined the inmates, besides the sick, there were three adults and two other children; the latter were unvaccinated. I informed the Public Vaccinator of the District of this fact, and requested him to visit the house to vaccinate the two children, and re-vaccinate the three adults; unfortunately this was not carried out until two days later. The children's arms took favourably; in one case the child escaped small pox, but in the other small pox in a modified form ran concurrent with the vaccine pustules; the re-vaccination in the adults was also successful, and they did not suffer from the disease.

For the purpose of detecting possible cases of small pox I caused a house to house visitation to be made daily by your Sanitary Inspectors in these and adjoining streets, so as to immediately

discover any fresh cases of disease; this course was also adopted in every street where a case of small pox occurred.

I also sought, and obtained, through the Inspector, the assistance of a Police Officer, who was detailed to exercise a constant supervision of all infected houses in each street, and to limit, as far as possible, all ingress and egress in the case of infected houses; these measures were very successful as the disease was chiefly confined to the immediate neighbourhood of Diamond Street, Helen Street, and Cecil Street; the latter was close to Helen Street, in fact, the backs of the houses on the western side abutted on those of the houses on the eastern side of Helen Street.

When fresh cases came under my observation, if practicable, I caused them to be immediately removed to the Small Pox Hospital; this was invariably done, unless from some special reasons it was not deemed necessary, as from the extreme mildness of the disease, or because the house admitted complete isolation, and thorough management of the case. These measures were attended with great success, as it will be seen that out of 37 cases of the disease, 30 were in the infected locality I have described, namely, the streets in the immediate neighbourhood of Diamond and Helen Streets, Roath. Of the remaining seven, two, viz., one in Salisbury Road, and one in Henry Street, had been removed from Roath by the Medical Attendant before they came under my observation; in these two cases, the removal was during the primary stage of the disease, and before the eruption appeared. As regards three other cases, viz., two in Dudley Street, and one in Cambridge Street, the infection was conveyed to them by a female who had constantly been visiting an infected house in Helen Street, Roath; the one in Hewell Street, I have reason to consider, caught the disease from the case in Cambridge Street, as no other case occurred in this locality; the remaining one, that in Richmond Road, was a professional gentleman, who, two days after returning from London, developed the eruption of small pox in a severely confluent form; he had never been vaccinated.

Immediately after a case had been removed to hospital the room occupied by the patient was given over to me, and I caused this room, and all articles of furniture contained in it, to be exposed to the action of fumes of burning sulphur, and the following day Chlorine Gas; the paper was scraped from the walls, and the latter saturated with a strong solution of Carbolic and Sulphurous Acids; the flooring and all wood-work were cleansed with the same solution, the clothes and bedding used by the sick were destroyed, and all other rooms of the house were disinfected by means of Chlorine Gas. This was very successful, out of the 35 infected houses, there were only six instances

where a second member of the same family had the disease. Two of these were the first houses coming under my observation ; here the disease had existed some days, in the four others the eruption had appeared before they were reported to me. Re-vaccination was urged on all inmates of infected houses, and, with very few exceptions, complied with.

Of the 37 cases 21 had been removed and treated at the Small Pox Hospital ; these were, for the most part, very bad cases, and in a confluent form. I can but speak in the highest terms of the great care shewn, and the skill with which these cases were treated, by Mr. Hughes, the Superintendent of the Seamen's Hospital.

With the object of ascertaining the efficiency of vaccination, I caused a daily inspection to be made, under my supervision, in all streets and those contiguous where any cases of smallpox were reported. The annexed table details the result of these visitations :—

TABLE O.

Name of Street.	Total No. of Children Inspected	Number of Vaccination Marks.				No. of Children Unvaccinated.	
		1	2	3	4 and upwards.		
Cambridge ..	51	4	14	18	8	7	13.7
Bradford ...	90	7	25	43	12	3	3.3
Newport ...	94	3	28	44	13	6	6.4
Ludlow ...	77	5	28	36	4	4	5.1
Bromfield ...	99	8	29	42	14	6	6.0
Holmsdale ..	143	21	49	44	16	13	9.0
Kent ...	143	25	44	45	15	14	9.8
Earl ...	36	1	9	16	7	3	8.3
Amherst ...	156	12	40	54	39	11	7.0
Hewell ...	238	11	51	137	21	18	7.6
Oakley ...	191	9	51	93	24	14	7.3
Knole ...	139	7	36	53	35	8	5.8
Sir Edward Terrace	83	7	26	37	9	4	4.8
Lower Clive	76	3	23	36	7	7	9.2
Thomas ...	107	5	27	63	7	5	4.7
Total ...	1723	128	480	761	231	123	7.1
Cranbrook ...	100	3	34	43	13	7	7.0
Coburn ...	266	11	78	132	28	17	6.4
Cairns ...	590	25	162	232	128	43	7.3
Salisbury Rd.	77	10	29	23	11	4	5.2
Blackweir ...	68	4	14	37	12	1	1.5
Total ...	1101	53	317	467	192	72	6.5
Eisteddfod ...	89	5	18	39	21	6	6.7
Gough ...	143	6	35	79	17	6	4.1
Havelock ...	98	2	24	44	20	8	8.2
Total ...	330	13	77	162	58	20	6.1
Love Lane ...	93	3	23	40	24	3	3.2
Stanley ...	58	3	6	27	20	2	3.4
Mary Ann ...	64	8	13	28	9	6	9.4
Total ...	215	14	42	95	53	11	5.1

TABLE O.

Name of Street.	Total No. of Children Inspected	Number of Vaccination Marks.				No. of Children Unvaccinated.	
		1	2	3	4 and upwards.		
Diamond ...	205	21	35	113	23	13	6.3
Helen ...	244	11	37	124	35	37	15.2
John ...	228	9	38	114	39	28	12.3
Bertram ...	191	8	18	124	32	9	4.7
Cecil ...	292	9	50	184	37	12	4.1
Harold ...	118	6	24	65	9	14	11.9
Carlisle ...	82	0	20	54	5	3	3.7
Sapphire ...	69	7	19	34	8	1	1.4
Emerald ...	199	11	36	121	19	12	6.0
Ruby ...	188	6	37	95	37	13	6.9
Topaz ...	165	13	40	100	7	5	3.0
Pearl ...	293	14	54	151	57	17	5.8
Silver ...	62	4	12	34	12	0	...
Copper ...	48	7	22	14	1	4	8.3
Iron ...	91	0	22	55	10	4	4.3
Lead ...	72	3	21	42	4	2	2.8
Tin ...	47	0	15	22	7	3	6.4
Total ...	2594	129	500	1446	342	177	6.8
Dudley ...	68	6	32	20	5	5	7.4
Eleanor ...	51	7	22	15	5	2	3.9
Evelyn ...	103	9	17	34	32	11	10.7
Alice ...	83	6	34	32	9	2	2.4
Hannah ...	27	0	8	14	5	0	...
Henry ...	25	1	4	15	4	1	4.0
Margaret ...	95	13	39	18	22	3	3.1
Patrick ...	60	3	31	19	6	1	1.7
Harrowby ...	120	13	29	44	29	5	4.2
Total ...	632	58	216	211	117	30	4.7

It will there be seen a mean of 6 per cent. of these children were unvaccinated. It is, however, but fair to the Vaccination Officer to state that a very considerable number of these were under the age of three months, consequently not within the time when the compulsory powers of the Vaccination Act could be put in force. In all cases where the children had not been vaccinated, orders were given to the parents to have them vaccinated, and I invariably found the parents complied with my instructions.

As chairman of the Vaccination Committee, I caused instructions to be given to the Vaccination Officer to visit certain sections of the district, to carry out a house-to-house visitation similar to that adopted by myself, and also to obtain from members of the School Board and others having the management of schools permission to make a thorough inspection of all children attending these schools. This request was readily granted, and every facility given to make the necessary inspection.

The following is a summary of the returns forwarded to me by that officer:—

Houses Visited.	Children Inspected.	Number Vaccinated.	Not Vaccinated. Notices Served.	Children under 3 Months Unvaccinated.
1738	4031	3717	33	110

LIST OF SCHOOLS INSPECTED BY VACCINATION OFFICER WITH RESULTS.

Name of School.	No. of Childr'n exam'd	No. Vaccinated.	No. Unvaccinated.	Notices Given.	Number of Marks.				
					1	2	3	4	5
St. Peter's Catholic School ...	332	320	12	12	10	70	167	72	1
St. Paul's Catholic School ...	319	312	7	7	4	32	183	93	0
Bute Town National School...	320	313	7	7	8	54	173	78	0
Bute Lane National School ...	104	100	4	4	17	16	39	27	1
Crofts Street School ...	156	147	9	9	...	9	118	19	1
Metal Street School ...	647	637	10	10	10	70	167	72	1
Canton School ...	325	307	18	18	21	99	98	88	1
" " ...	150	147	3	3	...	...	...	...	...
Temperance Town School ...	105	97	8	8	14	18	35	30	...
Wesleyan Schools ...	153	147	6	6	13	50	62	22	...
	2611	2527	84	84	97	418	1042	501	5
BOARD SCHOOLS.									
Splotland School ...	1147			30					
Crwys Road School ...	820			12					
Wood Street School ...	449			9					
Lower Grange School ...	546			11					
Eleanor Street School ...	98			1					
	3060			63	223	922	1300	564	42

After this epidemic no other case of small pox came under my observation until the 8th November, when a man, who had arrived in the town that morning, was found by the police in Bute Street, in a state of drunkenness. The following day he was committed to gaol for this offence. Three or four days afterwards he developed small pox, and was removed to the Small Pox Hospital by an order obtained from the Secretary of State, in which institution he died. On inquiry I ascertained that he had arrived in Cardiff by the Burnham steamer the morning he was found by the police.

Subsequently two of the warders in the gaol had small pox in a very mild form ; they had been vaccinated.

In the early part of the same month I received a letter from Ashton-under-Lyne, stating that a man belonging to that town who had been residing at Eisteddfod Street, Cardiff, had returned home convalescent after small pox. On visiting the house I found that the patient, who was a dramatic performer acting under a limited engagement, had left some days. Two or three days after his arrival in Cardiff he developed the disease, but the case had not been reported to me.

On the 11th I was requested to visit a house in Holmesdale Street. I there found a man who had not been previously vaccinated suffering from small pox in a severe confluent form ; he was a rigger or shipwright, and had been employed at one of the large works at the Docks, but I could then get no satisfactory information how he contracted the disease. He was removed to the Hamadryad, in which institution he died on the 16th. When the house was first visited, in the same room with the patient were his wife and two children ; one of the latter had not been vaccinated. I caused the whole of the inmates to be vaccinated ; this operation was successful, and no extension of the disease followed.

On the 31st another case of small pox was reported in the same house in Eisteddfod Street. The case was that of a young female, who had the disease in a modified form, having been vaccinated when young. On making inquiries respecting the inmates, I found one of the young men who had been living in this infected house when the first case occurred was working with the poor man in Holmesdale Street, and, therefore, probably communicated the disease to him.

MEASLES.—The deaths from measles were 83, the death-rate 0·888 per 1,000, as against 0·283, the mean of the previous six years, that of the Kingdom being 0·413.

The deaths from this disease were therefore excessive, they occurred and were distributed throughout the sub-districts as under :—

	Grange.	Canton.	Cardiff.	Roath.	Total.
Week ending October 25th ...	6	0	0	0	6
" " November 1st...	5	0	0	1	6
" " " 8th...	13	0	0	0	13
" " " 15th...	15	0	0	1	16
" " " 22nd...	7	0	0	1	8
" " " 29th...	6	0	0	0	6
" " December 6th...	3	4	2	0	9
" " " 13th...	1	1	2	0	4
" " " 20th...	0	3	6	1	10
" " " 27th...	1	0	4	0	5
Total	57	8	14	4	83

Measles prevails as an epidemic, wavelike, that is, on each occurrence it attacks all who are susceptible, and when these are exhausted disappears, the locality remains free from disease until the infection is again introduced. According to the length of time between each visitation its prevalence is more or less extensive.

From Table N it will be seen that during the six preceding years the district had two visitations, viz., in 1880 and 1882.

On the present occasion the epidemic broke out during the month of October, in the sub-district of Grangetown, continuing there until the end of November, then extending to the sub-districts of Cardiff and Canton. Only a few isolated cases were registered in Roath up to the end of the year.

Measles is a most infectious disease, and presents the greatest difficulties to a Sanitary Authority in the attempts to be made to arrest its progress. This arises from the circumstance that it is readily communicable from the sick to the healthy, during all its stages, and probably at no period more so than during the first or the initial stage, as at this time the symptoms are catarrhal, and attended with copious secretions from the air passages, these secretions are loaded with contagia; the constitutional disturbance at this time may be so little that the isolation of the sick from the healthy has not been attempted, hence the atmosphere of the whole house is affected, and all the inmates susceptible of the disease are attacked. Isolation, even in the subsequent stages, is difficult in a locality

where, in consequence of the great demand for houses to be tenanted by the working classes, house rent is exceedingly high; the average rent of this description of house in Cardiff probably exceeds 6s. 6d. per week; hence to meet this it necessitates the occupier to sub-let apartments, and no rooms can be appropriated to the reception of the sick only. Again the contagia are conveyed by the garments worn by those who are well, and these readily convey the infection to all those with whom they come in contact.

The severity of the epidemic is much influenced by temperature causes; thus, should the epidemic be introduced into a district in the summer, the weather operates favourably on the natural sequence of the symptoms, and conduces to recovery; but when it occurs in the winter months, especially when the weather is unusually cold and wet, one of the natural processes by which the poison is eliminated from the system is through the eruption on the skin, this may be suppressed, or retrocession may take place, localising the symptoms on the air passages, eventuating in bronchitis or pneumonia—the frequent fatal termination of measles.

The excessive mortality in Grangetown was eminently due to the influences I have just described. The epidemic appeared in this district when the cold wet weather was excessive. Grangetown is built on a low lying flat, and a clay formation, hence the foggy and humid condition of the atmosphere was intensified here. To add to this, the houses consist chiefly of that class I have described as occupied by workmen and artisans, therefore ill-adapted for the treatment necessary to be adopted in such a disease as measles. Confirmatory of this view I have made from the Registrar's records a classification of position of life in all fatal cases:—

	No. of Deaths.
Gentry and better-class tradesmen	7
Small shopkeepers and assistant shopkeepers...	20
Artisans and better-class labourers	60
Ordinary labourers	68

When the epidemic broke out I visited the district and instituted an inquiry into the possible excitant causes of the epidemic, that now gave all indications to be severe. I there ascertained that out of 78 infected houses, the children of 27 were at that particular time attending school daily, carrying with them the contagium of the disease.

These schools were large, being Board Schools, more than one of these affording accommodation for some hundreds of children; the whole of these were exposed to, and many of them did take, the disease. To meet this evil I placed myself in communication

with the Chairman of the School Board, and at my request he convened a meeting of the members; when this was held I urged (in face of the serious aspect of the epidemic) the expediency of temporarily closing the schools. This was strongly opposed, but as an alternative measure; they proposed to increase their number of attendance officers, whose duty it should be to carefully make a house to house inspection, to prevent a recurrence of this element of danger, and I have reason to believe that this has been attended with considerable advantages.

SCARLATINA.—There were 128 deaths from this disease during the year, giving a death rate of 1·369 per 1,000, as against 0·416, the average death rate of the six previous years; whilst that of the Kingdom generally, extending over a period of thirty years, has been 0·717. It will, therefore, be seen that the mortality of the year from this disease was excessive.

The deaths were registered over the sub-districts as under :—

		Deaths.		Death Rate.
Cardiff, North	...	15	...	0·86
„ South	...	9	...	0·03
Roath, North	...	18	...	2·43
„ South	...	67	...	3·22
Canton, North	...	4	...	0·40
„ South	...	14	...	1·93
Grange	...	1	...	0·48

The deaths during each month were :—

	Cardiff.	Roath.	Canton.	Total.
January	—	1	2	3
February	—	1	1	2
March	2	—	2	4
April	2	6	1	9
May	5	11	1	17
June	1	12	—	13
July	6	14	3	23
August	2	11	1	14
September	3	16	—	19
October	1	9	2	12
November	1	2	1	4
December	1	2	5	8
Total	24	85	19	128

From this it will be seen that the disease prevailed more or less throughout the entire year, but only to a limited extent during the earlier months, as we find that only a few deaths were registered up to the end of March. Afterwards it assumed a more epidemic form, increasing in intensity until it attained its greatest height in July;

after this time it gradually subsided, and in the months of November and December the deaths from Scarlatina were below the average. It will, however, be observed that the severity of the epidemic was more especially experienced in the Roath sub-districts.

The deaths at age were :—

Under one year	8
One year and under five years ...	79
Five years and under ten years ..	26
Ten years and under fifteen years ...	9
Fifteen years and under thirty-five ...	3
Thirty-five and upwards ...	3
	128

The greatest mortality was between the ages of one and five years.

The deaths incidental to life or occupation :—

Gentry and better class tradesmen ...	5
Small shopkeepers and assistant shopkeepers	13
Artisans and skilled labourers ...	57
Ordinary labourers... ..	53
	128

Scarlatina, in common with all exanthemata, is very infectious; experience has, however, shewn it is greatly amenable to sanitary precautions, hence it is necessary its etiology should be well considered when determining the means to be adopted to prevent the spread of the infection. It is equally desirable some information should be afforded to the public generally, and especially to those who have charge of the sick, of the many ways by which this disease is communicable.

According to the carefully conducted enquiries made by our most eminent authorities, it has been proved that the contagia of Scarlatina, in the forms of minute organisms, can be found to exist in the blood, the entire tissues of the body, and the secretions of the patient; these organisms pass into the atmosphere of the chamber by exhalations from the skin, the mucous passages, and the excreta of the sick; they are very volatile and diffusible; after some time they are deposited on its walls and contents, are very adherent, and retain for an almost indefinite time the power, under favourable circumstances, of taking on activity or vitality.

The sanitary measures adopted by myself in all cases coming under my observation were :—

Isolation of the sick as far as practicable.

The nursing to be entrusted to one individual, who should have little or no intercourse with the rest of the family; her dress should be composed of linen materials, as these retain the contagia with less tenacity.

Outside the door of the sick room a sheet, moistened with proper disinfectants, should be suspended; the same precaution should be adopted with the blinds of windows, as ventilation is essentially necessary.

The atmosphere of the infected room should be exposed to the action of spray distributors, as is done by surgeons in the operating theatre.

All articles of linen worn by the sick should be immersed for an hour in water containing either carbolic acid, McDougall's soluble powder (a convenient form of carbolic and sulphurous acids with a basic salt), Condy's fluid (a solution of permanganate of potassa), or chloride of lime in the proportion of 4 ozs. to a gallon of water. Afterwards to be washed well with carbolic soap and water. When convenient, before the latter process, this disinfection may be rendered more perfect by exposing the articles to the action of dry air heated in a proper chamber to a temperature exceeding 240° Fahr.

Linen rags instead of pocket handkerchiefs are to be used to wipe away the secretions from the nose and mouth; these and all soiled linen worn by the patient should be destroyed.

A small quantity, say one or two teaspoonsfull, of either of the disinfectants to which I have alluded should be placed in the vessels employed to receive the excreta.

After the room has been vacated, it, with its entire contents, should be exposed to the action of burning sulphur; the quantity to be consumed should be one pound to every 1,000 feet cubic space, this is to be effected by putting crushed sulphur into an iron vessel with some petroleum, then placing this vessel in a larger one partly filled with water, as a matter of safety, it is to be ignited, care having previously been then taken to close all the crevices and apertures of the room. The room having been exposed to this process for an hour the windows may be opened to allow the fumes to escape. Or the room may be disinfected in a similar manner by chlorine gas; this is done by placing in two or three plates equal parts of binoxide of manganese, chloride of sodium (table salt), and a small quantity of diluted sulphuric acid. Previous to either of the processes being adopted all polished steel articles should be removed, as they would be seriously injured by the action of the gases.

The paper should be scraped from the walls and burned, the walls and flooring of the room should be well saturated with one of the disinfecting solutions.

The woollen garments worn by the patient and the bedding and clothing should be disinfected by exposure to heated air in a disinfecting chamber.

These sanitary measures have been carried out under the supervision of your sanitary inspectors and with most successful results in all cases coming under my observation.

Diphtheria was fatal in 35 cases, giving a mortality of 0·374, as against 0·180, the mean death rate of the six previous years; that of the Kingdom 0·128. With reference to the above death rates I may state that the mean of the Kingdom has reference to an earlier annual report, and is brought up to a period close upon four years ago.

It will be seen that during the more recent years there has been a considerable increase in the death rate from this disease. In the last Annual Report of the Registrar-General he makes the following remarks:—"The increase of mortality under the heading of 'Diphtheria' may possibly be in some degree only apparent; for, as was pointed out in the last Annual Report, the returns of mortality from this disease are very untrustworthy, there being apparently no general consensus among certifying medical men as to the precise use of this term. It is not uncommon in going through the death registers to find all the fatal cases of throat disease in some one medical man's practice in a small area returned as cases of diphtheria, while all those in the same area in a second man's practice are returned as ulcerated throat or simply as sore throat."

I am able, as the result of my inquiry, to confirm this view. On some occasions when I have visited a house wherein a fatal case of diphtheria has been registered I have found other cases of sickness in the same house; these were considered by the medical attendant to be scarlatina. I then ascertained from the friends that the symptoms of the fatal case were similar to these. It was, therefore, probable that the death registered diphtheria was of the same form as would have been registered formally as scarlatina and anginosa.

Diphtheria has always been associated with sewer exhalations, and my experience in this respect is confirmatory, as on many occasions in the houses where cases of diphtheria have been fatal in these houses I have found evidences of sewer exhalations from defective house drains. A reference to the locality where fatal cases of diphtheria have been registered shows they are circumscribed, so that the disease may be termed an endemic, and I have associated this with the circumstance that in very many cases no means have been taken to destroy the contagia contained in the excreta before they have been thrown into the soil pipes communicating with the main sewers, and thus pass from these into a house where sewer gases have found an entrance.

The measures I have recommended to arrest the spread of the disease are similar to those I have described when speaking of scarlatina.

The deaths from whooping cough were 31, the death rate 0·330, the mean death rate of the six previous years 0·650; that of the Kingdom 0·228.

Whooping cough prevailed more or less throughout the year. It commenced first in Cardiff, then extended to Roath, there were few fatal cases at Canton; the extent of mortality maintained was, simply, slightly in excess of the ordinary mean. From the circumstance that each attack lasts for a considerable time, no effective isolation can be maintained, and consequently sanitary precautions are to a considerable extent inoperative.

TYPHOID FEVER.—The deaths from typhoid fever during the year were 34, giving a death rate of 0·363 per 1,000, the mean of the six previous years being 0·286; that of the Kingdom 0·300. The annexed tables indicate the period and distribution throughout the several sub-districts, the age and position in life.

Typhoid fever, in common with the whole of the zymotic diseases, cannot originate spontaneously; it is necessary a source of infection should have been introduced into a locality previously free from it. It, however, differs from all others in one important fact, that it cannot be transmitted from person to person; this arises from the circumstance that it is essentially an abdominal disease. Examinations after death have clearly demonstrated that extensive lesions are to be found in the small intestines, with frequent ulcerations, and that diarrhoea is usual in the earliest stages, and generally continues through its entire course. It is, therefore, from the lining membranes of the intestines that the contagia are thrown off from the system and pass away with the excreta of the patient; if, therefore, care is taken in the disposal of these excreta a second case of typhoid rarely occurs in the same family, then only when a local excitant cause exists in, or near to, the infected house. There have been only two instances of a second case in the same family coming under my observation throughout the whole course of my inquiries into the history of these 34 deaths, and these were typical instances of the above fact. The first was that of a house in Tyndall Street, and has been brought before your notice on a former occasion. In this house there were four deaths from typhoid fever, two of these occurred in 1883 and two during this year; it is, therefore, necessary I should here reintroduce it. When the two first cases occurred an examination of the premises was made and the junction between the soil pipe and the syphon was found to be broken, thus allowing an escape of sewer gas; this was deemed sufficient to account for these cases and the defect was remedied. Some time after, that is in the early part of

this year, the two other deaths were registered, and I considered it necessary the entire drainage of the house should be examined, the pipe leading from the w.c. to the main sewer passed under the floor of one of the rooms in the basement, and on opening this floor to examine the drain the joints were found to be defective and freely allowing its contents to pass out into the subsoil. On closely questioning the inmates of the house I learned that this room was frequently very offensive, particularly so when the w.c. was used. The drains have been thoroughly reconstructed and no recurrence of the disease has taken place.

The second instance was in a house in the same street somewhat lower down, here a death was reported to me, and on visiting the house I found it to be that of an adult woman; there were two other cases of fever at this time (children). The house was in a filthy condition, the whole of the sanitary arrangements very bad. I then selected one of the rooms, had it cleansed and put in proper order for the reception of the two sick children, and provided a nurse to take charge (the deceased woman being the mother) of these children; I had the other children removed to a probationary ward at the Union. The whole of the house was thoroughly disinfected and the sanitary defects remedied. The children recovered and the house has since been free from disease.

I may now state that the contagium of typhoid fever enters the system by the air we breathe, or the water we drink. The latter means of introduction, however, does not apply to the residents of this district, as the public water supply (the only source here) is free from organic matter; when I have found the water a vehicle of communicating the disease it has been that found on board ships entering the port and will be again alluded to. At present my remarks will apply to the first means of introduction, namely, the air we breathe. When the air is loaded with contagia sufficient to excite the disease in an epidemic form, this usually proceeds by exhalations, as from sewage, or from decomposing organic matter. Either of these will favour the vitality and rapid multiplication of contagious germs, these finding their way into them, and in direct ratio of intensity of those poisons in the atmosphere typhoid fever prevails to a greater or lesser extent.

According to Table P it will be found that the greatest mortality takes place between the age of 10 and 35, below the age of 5 the deaths from fever are probably, and I have reason to believe were, due to a form of simple continued fever rather than to typhoid. In the latter part of 1883, namely, in the month of September, fever began to prevail somewhat extensively in certain parts of the district, increasing in severity during the succeeding months, and attaining its greatest mortality in the month of January of the present year; after this it subsided rapidly, and from this time the deaths from fever fell below the average.

TABLE P.
 FEVER. DEATHS AT AGE.

MONTHS.*	YEARS.												Total				
	Under 1	1	2	3	4	5	10	15	25	35	45	55		65	75	85	95
January	1	1	...	5	1	...	...	...	...	...	...	...	8
February	2	...	...	...	...	...	...	...	...	2
March	2	...	1	...	...	...	...	...	...	...	...	3
April	1	1	...	...	...	...	...	...	...	...	...	...	2
May	1	...	1	...	...	...	...	...	...	...	...	2
June	1	...	...	...	...	...	1	...	...	...	...	2
July	1	...	1	...	...	...	...	...	...	...	...	2
August	1	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	4
September	1	1	...	...	...	...	...	...	...	2
October	1	...	...	...	...	...	...	1
November	1	...	...	...	...	...	...	...	...	1
December	1	...	...	...	...	...	2	...	1	1	...	...	...	...	...	5
Total	1	...	1	...	1	3	5	13	5	3	1	1	...	...	...	...	84

TABLE Q
DEATHS FROM FEVER.

MONTHS.	DEATHS.			Death Rate.	TEMPERATURE.						
	Districts.				Mean of Max.	Mean of Min.	Mean of Month.	Total Rainfall.	No. of Wet Days.		
	Cardiff.	Roseth.	Canton.							Total.	
January	6	1	1	8	47°8	41°3	44°5	6·08 in.	21		
February	1	1	1	2	45°6	38°5	42°0	4·40 "	22		
March	2	1	1	3	49°0	42°4	45·7	3·89 "	16		
April	1	1	1	2	51°5	39°7	52·7	1·56 "	11		
May	1	1	1	2	60°6	44°9	58°6	2·87 "	14		
June	1	1	1	2	66°9	50°8	58°6	1·92 "	9		
July	2	2	1	2	67°9	51°8	59°8	4·05 "	20		
August	1	2	1	4	71°8	54°5	63·1	2·21 "	9		
September	1	1	1	2	66°7	52°9	59°8	1·96 "	15		
October	1	1	1	1	55°0	48°9	49°4	1·01 "	17		
November	1	1	1	1	48°3	39°3	48°8	2·12 "	16		
December	1	1	4	5	45°1	38°3	41°7	5·87 "	20		
Total	14	10	10	34							

TABLE Q. FEVER.

CARDIFF.		ROATH.	
Streets.	No. of Cases.	Streets.	No. of Cases.
Flora Street	1	Inverness Place ...	1
Thesiger Street... ..	2	Total North Side ...	1
The Barracks	1	Newport Road	2
Richmond Road	1	Infirmary	1
St. Andrew's Crescent ...	1	Longcross Street ...	1
North Street	1	Booker Street	1
Union Workhouse	1	Cecil Street	1
Total North Side	8	Diamond Street	2
Bute Street	1	Clyde Street	1
Tyndall Street	3	Constellation Street ...	1
East Terrace	1	Total South Side	10
Hill's Terrace	1		
Total South Side	6		
CANTON.		GRANGETOWN.	
Streets.	No. of Cases.	Streets.	No. of Cases.
Llandaff Road	1	Bedwas Street	1
Loftus Street	1	North Clive Street ...	1
Total North Side	2	Sevenoak Street	3
Wellington Street	1	Penarth Road	1
Wyndham Road	1	Total Grange	6
Total South Side	2		

About the month of August complaints were made to me of the offensive smell emitted at the ventilating shafts in the centre of the streets, indicating a congested state of the gases in the main sewers. Conjoined with this evil, when cases of fever were reported to me, on visiting each house I found serious structural defects in the houses themselves, such as faulty w.c., faulty joints of soil pipes, untrapped waste pipes leading from back kitchen or scullery to main sewer, and oftentimes these pipes themselves broken when passing immediately beneath a basement floor; these several defects permitting an escape of sewer gas into the interior of the houses, and to these, rather than to the ventilating shafts, I attribute the excitant cause of fever in each case, as in the houses in immediate proximity to the ventilating shafts no cases were reported to me.

For the purpose of remedying the offensive smell emitted from the ventilating shafts chemical disinfectants were thrown into the sewers by means of a water cart, hose and pipe, at frequent intervals. Defects in house drainage, notices were served on owners to remedy these, requiring them to do the work within a reasonable time, these were all complied with.

Only one instance came under my observation where water was the means of communicating the contagia.

On the 16th October, my attention was called to a case of sickness on board the Barque "Sigrid," it proved to be a case of typhoid fever, and was immediately removed to the Hamadryad Seamen's Hospital. On the 23rd another case was reported on board the same ship, and this was dealt with in a similar manner. An inspection of the ship shewed it to be in a very clean and satisfactory condition. I then took a sample of the water in use by the seamen for drinking purposes and caused it to be analyzed, with the following result:—

Total solid matter	...	...	...	...	33.26
Albuminoid Ammonia	...	...	...	...	.020
Free Ammonia	...	...	...	...	.0052
Nitrogen as Nitrates and Nitrites	...	...	...	...	.3323
Total Nitrogen found	...	...	...	...	.3531
Previous Sewage or Animal Contamination	...	...	...	...	3.003
Chlorine	...	...	...	...	7.5
Magnesia Salts	...	...	...	...	moderate
Hardness	{	Temporary	...	...	4.06
		Permanent	...	...	12.60
Total	...	...	...	...	<u>16.66</u>

Yellow colour, slightly turbid, sulphates excessive.

This sample contained a moderate amount of solid impurities, with an excess of organic matter and chlorine, also a large amount of previous sewage contamination. It was, therefore, unfit for drinking purposes, and to it I attribute the cases of fever.

DIARRHOEA.—The total deaths from this disease were 157, the death rate 1·679 per 1,000, the mean death rate of the previous six years 0·862, that of the Kingdom 0·877.

The deaths were distributed throughout the district as is shewn by the accompanying tables:—

TABLE R.
DEATHS FROM DIARRHŒA.

MONTHS.	DEATHS.				Death Rate.	TEMPERATURE.						
	Districts.					Maxi- mum.	Mini- mum.	Mean of Max.	Mean of Min.	Mean of Month.	Total Rainfall.	Wet Days.
	Cardif.	Roath.	Canton.	Total.								
January	1	...	...	1	58°·3	32°·9	47°·8	41°·3	44°·5	6·03 in.	21
February	...	1	1	2	51°·1	29°·4	45°·6	38°·5	42°·0	4·40 "	22	
March	...	...	...	1	59°·8	33°·4	49°·0	42°·4	45°·7	3·39 "	16
April	2	...	1	3	58°·2	33°·9	51°·5	39°·7	45°·4	1·56 "	11	
May	...	1	2	3	76°·0	36°·5	60°·6	44°·9	52°·7	2·37 "	14	
June	3	...	1	4	79°·7	41°·2	66°·9	50°·3	58°·6	1·92 "	9	
July	7	5	7	19	75°·4	46°·5	67°·9	51°·8	59°·8	4·05 "	20	
August...	25	16	24	65	82°·8	45°·8	71°·8	54°·5	63°·1	2·21 "	9	
September	16	8	8	32	75°·7	42°·8	66°·7	52°·9	59°·8	1·96 "	15	
October	7	4	6	17	62°·5	32°·9	55°·0	43°·9	49°·4	1·01 "	17	
November	4	3	2	9	59°·2	25°·8	48°·3	39°·3	43°·8	2·12 "	16	
December	2	...	...	2	53°·9	31°·2	45°·1	38°·3	41°·7	5·87 "	20
Total	68	38	52	158								

TABLE S.
DIARRHŒA. DEATHS AT AGE.

MONTHS.	MONTHS.					YEARS.										Total					
	0	1	3	6	9	1	2	3	4	5	10	15	25	35	45		55	65	75	85	95
January ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
February ...	...	2	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
March ...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1
April ...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	3
May ...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	3
June ...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	4
July ...	4	5	3	2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19
August ...	2	10	19	14	11	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	65
September ...	2	4	4	6	7	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	32
October ...	1	4	2	2	4	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	17
November ...	...	...	1	1	3	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	9
December ...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Total ...	9	27	32	26	30	11	6	3	...	...	1	...	2	1	2	2	4	2	...	...	158

Diarrhœa may be due to sporadic or epidemic influenccs. When the former it should be considered rather a symptom than a disease *per se*, as it is usually concomitant with many constitutional diseases or disturbances, such as tabes mesenterica, phthisis, dentition, &c. When epidemic it is due to miasmatic contagia of a specific character, but there is a special form which, from the circumstance that it usually attacks young children, is designated infantile diarrhœa; this is particularly fatal during the autumnal months, and it is to this form that the excessive mortality from this disease is attributable during the year 1884.

I have, on former occasions, alluded to the predisposing and excitant causes of this disease, namely, temperature, especially when combined with dry weather, and also diet; as a matter of fact, however, these causes operate conjointly. The autumnal months of 1884 were excessively hot and dry, especially during August, September, and October. The temperature of July was rather below than above the average, and the mortality was somewhat less than is usual in that month, but in August it suddenly became very hot, on one occasion 82°·8 were registered in the shade, and the mortality became excessive, continuing in a somewhat lesser degree through September and October.

On inquiring into the history of 110 deaths below the age of one year, registered in this district, I ascertained that 99 were fed on cow's milk, alone or combined with farinaceous food, 9 on condensed milk, and 2 on breast milk, the latter were, however, only a few days old.

I have previously described the changes that take place in milk during hot weather. These changes are due to organisms that find their way into the milk; these organisms, when milk has been exposed to the action of sewer gases, are frequently specific. I exposed some samples of milk to the action of such gases and I found, in a very short time, evidences of the existence of bacteria, these increased with great rapidity, and it is to these bacteria I attribute the diarrhœa. As I have mentioned in another place, sewer gases, this year, were very prevalent throughout the district, but, in addition, I found that the milk on which the children had been fed had been kept in very improper places, such as a pantry adjacent to the back kitchen or scullery where a badly constructed or untrapped waste pipe communicating with the house drains existed, in others, a similar waste pipe was found immediately beneath, although outside, the casement-window of the pantry.

CHOLERA.—There was one death from cholera, this was a sailor who had been removed from on board the s.s. "Abyssinia," an infected vessel that had arrived in the roads from Marseilles. The

poor man had been removed to the Flat Holms, where he died. The circumstances connected with this case, as also the arrangements taken to prevent the introduction of the disease, will be detailed in my report to the Port Sanitary Authority.

Having detailed the circumstances connected with the several zymotic diseases, it is desirable I should now direct your attention to the limited accommodation at present available for the reception of infectious cases, when it is necessary these should be removed from private houses. This accommodation consists of the temporary erection contiguous to the Hamadryad Hospital: it comprises two wards, capable of containing 16 beds; this is utterly inadequate to meet the requirements of the Urban District and the shipping. During the past year all these beds contained cases of small pox under treatment at the same time; had the epidemic increased in severity the absence of adequate hospital accommodation would have entailed disastrous consequences to the public health. Although the epidemic has passed away I can but point out to you that the port is at all times liable to the importation of cases of small pox by the shipping, it may recur again at any time, possibly with greater virulence. Apart from this consideration, I may allude to the circumstance that the Local Government Board, in anticipation of the possible introduction of cholera into the country during the coming summer, have issued instructions to Local Sanitary Authorities calling their attention to the necessity of providing necessary hospital accommodation for the reception of cases of this disease.

There is nothing special to report on the constitutional, the local, or developmental classes of disease, in all three the deaths were somewhat below the average.

Deaths from violence are in excess, which is to be attributed to the circumstance that the nature of the important industries connected with this town exposes those employed to the serious accidents incidental to such employment.

Subjoined is a summary of work done by your executive:—

22,193 day and 1,633 night visits were made by your Inspectors of Lodging-houses, and their condition duly reported to me every morning.

111 houses were found to be overcrowded: in each case notices were served upon the occupiers to reduce the number of inmates, two were summoned for non-compliance, and were fined £2 and 8/6 costs.

314 houses were ordered to be lime-washed and cleansed. On application, brushes were supplied from your stores, on loan, to enable the poor people to carry out this necessary work.

12 houses were reported as unfit for habitation, being in a dilapidated condition. These were dealt with by proceedings before the magistrates.

161 houses were fumigated with sulphurous acid and chlorine gases after fever and other zymotic diseases, and the bedding and clothes belonging to the sick were exposed to the action of dry air, heated to a temperature exceeding 250° F.

778 house and surface drains in a defective state were remedied.

64 cesspools were emptied in accordance with the Bye-Laws.

85 bake-houses were inspected, 52 were ordered to be lime-washed.

129 cow-sheds were inspected, and, when necessary, lime-washing was enforced.

104 pounds of pork, 396 pounds of beef, and 6,776 pounds of fish were destroyed, being unfit for food. Proceedings were taken in one instance, when the owner was fined £20 with costs, or two months' imprisonment.

It is with much satisfaction I can again refer to the very valuable assistance and co-operation afforded me by your Chief Inspector, Mr. Gover, and Inspectors Leyshon, Vaughan, and Hellerman. These officers discharged their several duties with unwearied energy and great fearlessness, especially during the alarming epidemic of small pox; indeed it was due to their zeal and activity the prevalence of this disease was so successfully combated.

I have the honour to be, Gentlemen,

Your obedient Servant,

H. J. PAINE, M.D.,

Medical Officer of Health, Cardiff Urban
Sanitary Authority.

APPENDIX No. 1.

CARDIFF URBAN SANITARY DISTRICT.

DEATHS REGISTERED AT AGE FROM THE SEVERAL CAUSES DURING THE YEAR 1884.

CAUSES OF DEATH.	AGES.																	Total.	Estimated Population as per Registrar General's Report, 1884, per 1,000.	Estimated Population as per Census of 1881, per 1,000.	Mean Death Rate per 1,000 Inhabitants of Kingston for 30 years.	
	Under 1 year.	1 year.	2 years.	3 years.	4 years.	5 years.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.					
CLASS I. ZYMOTIC	186	74	55	43	41	58	17	9	15	17	15	8	3	2	10	2	1	551	5,995	5,252	4,845	
I. Zymotic	186	74	55	43	41	58	17	9	15	17	15	8	3	2	10	2	1	551	5,995	5,252	4,845	
II. Constitutional	28	16	3	3	9	13	7	33	38	64	55	32	11	3	7	1		320	3,422	3,050	4,108	
III. Local	255	72	29	22	10	22	12	11	30	56	96	103	50	31	125	24	2	950	10,977	9,947	8,721	
IV. Developmental	174	22	5							2	2	2	2	2	28	31	20	305	3,255	2,907	3,464	
V. Violent	14	5	1	4	2	6	2	9	14	2	21	13	3	3	3	4		124	1,322	1,182	753	
Totals	657	189	93	73	63	98	38	64	94	166	198	153	69	41	173	62	23	2250	24,072	21,450	22,105	
CLASS I. ZYMOTIC	1																	8	0,085	0,076	921	
Smallpox	1																	8	0,085	0,076	921	
Measles	15	30	21	7	3	6	1	2	1	1	1							55	0,888	0,791	413	
Scarlatina	7	16	19	23	21	25	8	2	2	1			1					128	1,369	1,230	717	
Diphtheria	3	4	3	3	6	13	2											35	0,374	0,333	123	
Whooping Cough	22	3	4	4	1	1												31	0,330	0,299	519	
Typhoid Fever	2	1	1	1	4	4	4	4	8	6	3	1	1	1	1	1	1	34	0,363	0,324	300	
Erysipelas	2	1	1							1	1	1	1					7	0,074	0,066	996	
Dysentery												1	1	1	1			4	0,040	0,036	428	
Dysentery																		156	1,669	1,486	872	
Cholera	123	12	6	2	1	1												151	0,160	0,144	115	
Cholera																		11	0,117	0,104	115	
Rheumatism								1	2	1	5	2						12	0,233	0,214	266	
Syphilis	9	1								2								1	0,010	0,009	963	
Vent of Breast Milk	1																	1	0,010	0,009	963	
Pneumonia										3								3	0,032	0,028	318	
Ill. Tremens										1	1							2	0,021	0,019	222	
Syncope								1					1					2	0,021	0,019	222	
Syncope									2				1					2	0,021	0,019	222	
Tonsillitis										1								1	0,010	0,009	963	
Septicemia										1								1	0,010	0,009	963	
Totals	186	74	55	43	41	58	17	9	15	17	15	8	3	2	10	2	1	551	5,995	5,252	4,845	
CLASS II. CONSTITUTIONAL																		2	0,021	0,019	244	
Dropsy										1								2	0,021	0,019	244	
Cancer											1	3	10	13	9	1	4	1	40	0,427	0,381	353
Sarcoma	3	1	1		2			1	3	1								12	0,126	0,114	141	
Tubercular	9	3				1	1	3	1									14	0,149	0,133	290	
Pneumonia	7	5	1	2	2	5	5	30	31	60	48	19	3	2	3			223	2,385	2,125	2,491	
Hydrocephalus	9	7	1	1	5	5				1								29	0,310	0,276	362	
Totals	28	16	3	3	9	12	7	33	33	64	58	32	11	3	7	1		390	4,123	3,979	4,708	
CLASS III. LOCAL																		38	0,399	0,366	413	
Ophthalmia	3	5	4	2	2					2		2	1	1				37	0,388	0,357	404	
Aerophagia										1	5	6	1	4	7	1		31	0,328	0,299	348	
Paralysis											2	6	3	1	13	4		31	0,328	0,299	348	
Chorea											1	1						1	0,010	0,009	963	
Epilepsy	1	2								1	2	2		1	1			15	0,159	0,143	115	
Convulsions	138	26	6	4	3	1	1	1	1	2	2							179	1,915	1,705	1,525	
Brain Disease	2									1	5	2	5	3	1	12		32	0,342	0,305	340	
Tetanus			1							3								4	0,042	0,038	428	
Aneurism										1	3	2						9	0,096	0,085	921	
Heart Disease										5	14	31	29	12	5	30	4	1	132	1,405	1,206	971
Laryngitis	1	1								1	1							2	0,021	0,019	222	
Bronchitis	55	19	4	4	1	3				2	2	17	9	5	20	9		151	1,615	1,439	1,740	
Pleurisy										1	1							3	0,032	0,028	318	
Pneumonia	40	30	10	6	2	3	4	1	5	6	14	9	4	2	13	3		141	1,508	1,344	1,741	
Asthma																		2	0,021	0,019	222	
Lung Disease										2	4	3	2	2	3	2		24	0,256	0,228	262	
Gastritis										2								5	0,053	0,047	518	
Enteritis	1									1	1							7	0,074	0,066	717	
Peritonitis	3									1	1	3	1	1	1	1	1	16	0,170	0,152	173	
Ascites										1	3	1	1					6	0,063	0,057	625	
Hernia										1	1	1						5	0,053	0,047	518	
Hæmorrhage										1	1							1	0,010	0,009	963	
Intussusception	1									1								4	0,042	0,038	428	
Fistula																		4	0,042	0,038	428	
Stricture Intestine										1	1				1			4	0,042	0,038	428	
Stomach Disease										1								8	0,085	0,076	815	
Jaundice	3									2	2	1	2	1	1			11	0,117	0,104	115	
Liver Disease	1									2	2	2	1	2	2			13	0,139	0,123	247	
Gale	1																	2	0,021	0,019	222	
Cirrhosis										1	3	2	1	4				11	0,117	0,104	115	
Nephritis										1	1	1	1					6	0,064	0,057	625	
Bright's Disease										1	1	1	1					4	0,042	0,038	428	
Joint Disease										6	10	8	3	4	4	1		45	0,481	0,429	495	
Gout										1	1							5	0,053	0,047	518	
Cystitis										1	1							2	0,021	0,019	222	
Pleurisy										1	1	1						5	0,053	0,047	518	
Stomatitis	2																	2	0,021	0,019	222	
Eczema																		2	0,021	0,019	222	
Calculus																		1	0,010	0,009	963	
Diabetes																		1	0,010	0,009	963	
Kidney Disease										1								1	0,010	0,009	963	
TOTAL	355	72	29	22	10	22	12	11	30	56	96	103	50	31	125	24	2	950	10,977	9,947	8,721	
CLASS IV. DEVELOPMENTAL	62	2																64	0,684	0,610	583	
Premature Birth	62	2																64	0,684	0,610	583	
Spina Rifics	5	</																				

