1881.

BOROUGH OF CARDIFF.

REPORT

ON THE

Sanitary Condition of Cardiff,

FOR THE YEAR 1880,

BY

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TO THE

CARDIFF URBAN SANITARY AUTHORITY.

Cardiff, February, 1881.

GENTLEMEN,

I have to-day to bring before your notice my report on the Sanitary condition of this district during the past year. In doing so I shall as heretofore direct your attention to those causes which in a greater or lesser degree influence the public health; these are the meteorology; the state of the sewer arrangements; the water supply; the food supply; and the house accommodation for the working classes.

THE METEOROLOGY.

The Meteorology of the year was as follows:—The rainfall of the year 1880, 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 Guage, 5 inches.
Height above ground, 1 foot.
Height above sea-level, 43 feet.

Month.	Total depth.	Greatest fall in 24 hours.	Date.	Days on which ·01 inch or more fell.
January	·87	·42	13th.	11
February	3·88	1·06	18th.	22
March	1·90	·75	2nd.	12
April	1·98	·40	5th.	13
May	1·45	·46	26th.	11
June	2·38	·53	17th.	19
July	6·64	·95	17th.	23
August	·77	·27	2nd.	7
September ...	3·67	·77	17th.	15
October	4·94	1·45	25th.	15
November ...	3·67	·90	15th.	15
December ...	6·70	1·09	14th.	20
	38·85			183

The following table illustrates the rainfall for the year 1880 and six previous years :—

Month.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
January ...	4·63	5·87	1·91	5·77	1·73	4·71	·87
February ...	2·91	2·08	5·33	2·79	3·07	5·95	3·88
March ...	2·03	1·66	3·92	2·66	1·25	1·14	1·90
April ...	1·67	2·65	2·70	2·90	4·10	2·64	1·98
May	0·67	2·93	0·23	2·47	4·32	2·85	1·45
June ...	1·71	5·34	1·91	1·48	3·68	6·48	2·38
July	1·78	6·27	1·24	4·94	2·01	4·00	6·64
August ...	4·57	3·82	6·06	5·70	10·82	8·12	·77
September	5·45	4·05	7·08	3·25	3.21	4·85	3·67
October ...	4·83	7·80	3·84	4·89	5·76	1·51	4·94
November	2·71	7·78	5·27	6·54	3·06	0·43	3·67
December...	4·35	1·74	7·13	3·40	2·70	2·11	6·70
	37·31	51·99	46·62	46·79	45·71	44·79	38·85

The rainfall for 1880 has been 6·68 inches below the average of the six previous years.

JANUARY was a very cold and dry month, the prevailing winds being more or less easterly. The barometer readings were high throughout the month. The highest was 30·621in., on the 30th; the lowest, 29·918in., on the 1st; the mean of the month being 30·340in. The temperature was much below the average. The mean of the month in the shade 42·8° Fahr. The thermometer registered 54·8° as its highest point on the 1st, and the lowest point was 18° on the 21st. The mean of maximum was 38·3°. The mean of minimum 30·9°. There were 18 days when the temperature was at or below 32°. From the observation of aqueous vapour, the hygrometric readings were, dry bulb, 38·4; wet bulb, 32·7. The rainfall measured 0·87in. The greatest amount in 24 hours was on the 13th, when 0·42in. fell. There were 11 days when it measured 0·01 in. or more.

The total deaths registered during the month were 134. The death-rate was 18·9 per 1,000 inhabitants per annum.

FEBRUARY was mild and moist. The barometer was high during the first week, but was below the average throughout the rest of the month. It was highest on the 3rd, reading 30·364in., and lowest on the 16th, at 28·769in. The mean of the month was 29·729in. The average temperature of the month was 42·7°; the highest recorded being 54·8° on the 18th, and the lowest on the 1st, when it was 27·8°. The mean of maximum was 48·1°, of minimum, 37·3°. The temperature was at or below 32° on three days. The hygrometric dry bulb indicated 41·8; wet bulb, 41·0. The rainfall was 3·88in. There were 22 days on which ·01in. or more rain descended. The greatest fall in 24 hours was on the 18th, when it measured 1·06in.

The deaths during the month were 160; the death-rate 25 per 1,000 per annum.

MARCH was mild and dry; the prevailing winds were S.W. The barometer was generally low during the month; its highest point was 30·426in. on the 8th; its lowest, 29·308, on the 2nd. The mean temperature of the month was 45·4°. The maximum was on the 25th, when it was 60°. The minimum, 28·6°, on the 29th. The mean of maximum was 52·1°, of minimum, 38·7°. It was at or below 32° on two days. The hygrometric dry bulb shewed 44·9; wet bulb, 42·7, as the average. The total rainfall was 1·90 in. There were 12 days in which it measured ·01 or more inches. The greatest fall in 24 hours was ·75in. on the 2nd.

The deaths during the month were 169; death-rate 23·8 per 1,000.

APRIL was a variable month, being at times mild, at others very cold. The prevailing winds were S.W. and N.E. The barometer was

low during the first half of the month, then high; it was highest on the 30th, when it stood at 30·429in., and lowest on the 4th, when it fell to 29·240in. The mean of the month was 29·820in. The mean of thermometer for the month was 47·4°; it reached its highest point, 61°, on the 25th; its lowest, 35·6°, on the 26th. The mean of maximum, 53·9°; of minimum, 40·9°. The mean of hygrometric dry bulb, 48·6; of wet bulb, 45·2. The total rainfall was 1·98in. ·01 inch or more of rain fell on 13 days. The greatest fall in 24 hours, ·40in., occurred on the 3rd.

The deaths during the month were 140; death-rate 20·4 per 1000.

May.—The month of May was somewhat cold during the earlier part. The prevailing winds were N. and N.E. up to the 21st, then S.W. to the end. The mean reading of the barometer was above the average, and was highest on the 29th, at 30·450in., and lowest on the 3rd, at 29·706in.; the average for the month was 30·048in. The mean of the thermometric readings was 57·4°. The highest temperature was on the 20th, when 77·0° were recorded, and lowest on the 1st, when it registered 34·4°. The mean of maximum was 62·8°, of minimum 44·1°. The mean of dry bulb of hygrometer was 53·8, of wet 49·1. The total rainfall was 1·45 inches; the greatest amount of rainfall in 24 hours measured 0·46in. There were 11 wet days.

The total deaths during May were 134, the death-rate 18·9 per 1,000.

June on the whole was cold and disagreeable, only a few days were warm. The prevailing winds to nearly the middle of the month were N.N.E., then S.W., but excepting a few days, the cold continued; afterwards the N. and N.E. winds returned. The readings of the barometer were below the average. The highest was on the 28th, when it stood at 30·205in., and lowest on the 20th, when it was 29·501in.; the mean of the month being 29·870in. The mean temperature of the month was 58·0°. The maximum temperature was on the 18th, when it was 72·1°; the minimum on the 10th, when it was 41·2°. The mean of maximum was 65·4°, of minimum 50·6°. The hygrometer mean reading for dry bulb was 58·8, wet 54·8. The total rainfall was 2·38in.; the greatest rainfall was on the 17th, when it was ·53in. Rain descended on 19 days.

The total deaths were 137, the death-rate 19·9 per 1,000.

July.—The month of July was gloomy and unsettled; thunderstorms were very frequent and S.W. winds prevalent. The mean reading of barometer was below the average. The highest was on the 5th, when it was 30·168in., and lowest on the 26th, at 29·463. The

mean of the month was 29·858in. The mean temperature was 64·7°, the highest registered was 72·3° on the 16th ; the lowest 47·4° on the 31st. The mean of maximum was 68·2°, of minimum 55·1°. The mean of hygrometer dry bulb was 61·7, of wet 58·3. The rainfall was heavy ; the total of month was 6·64in. ; the greatest in 24 hours was ·98in. on the 17th. There were 23 wet days.

The total deaths were 100, the death-rate 14·1 per 100.

AUGUST was hot and dry, S.W. winds prevailed. The mean reading of barometer was below the average to the 8th, then above the average until end of month ; it was at its highest point, 30·288in., on the 10th, and lowest on the 7th, when it was 29·558in.; the mean of month was 29·975. The temperature was high ; the mean of month was 63·2°; it was highest on the 11th, when it registered 78·4°, and lowest on the 10th, when it registered 50·1°. The mean of maximum being 70·0°, of minimum 56·5°. The mean reading of hygrometer dry bulb was 61·3, of wet bulb 58·0. Only ·77in. of rain fell, distributed over seven days ; the greatest fall in 24 hours was on the 2nd, when it measured ·27in.

Deaths 146, death-rate 20·2 per 1,000.

SEPTEMBER was also warm and generally fine, the winds were chiefly S.W. The pressure of the atmosphere was above the average. The barometer was highest on the 28th, then being 30·417in., and lowest, 29·349in., on the 14th. The mean temperature of month was 59·6°. The maximum temperature registered was 81·6° on the 4th, and the minimum, 44·8°, on the 20th. The mean of maximum was 66·1°, of minimum 53·2°. The mean of hygrometer dry bulb was 59·8, of wet bulb 57·3. The rainfall was 3·67in. ; the greatest rainfall in 24 hours, ·77in., on the 17th ; 15 days it measured 0·01in. or more.

Total deaths 161, rate 23·4 per 1,000.

OCTOBER.—This was the coldest October for many years. The prevalent winds E.N.E., with great excess of rain. The barometer oscillated continually and was below the average ; it was highest on the 14th, then standing at 30·329in., and lowest on the 28th, when it was 28·811in. The mean of month 29·849. The mean temperature of month was 46·8° ; the highest point recorded was 63·4°, the lowest on the 31st, then being 28·5°. The mean of maximum was 52·8°, of minimum 40·9°. The thermometer stood at or below 32° on four days. The hygrometer dry bulb indicated 46·0, the wet bulb

43·9. The rainfall was 4·94in.; the greatest rainfall in 24 hours was on the 26th, when it measured 1·45in. There were 15 wet days.

Total deaths 115, death-rate 16·2 per 1,000.

NOVEMBER was a variable month, the prevalent winds N.W. The readings of the barometer were in excess during the beginning, then below, until the last 10 days, when the pressure rose again. It was highest on the 4th, reading 30·438in., and lowest, 29·135, on the 18th. The mean of month being 29·962in. The mean temperature of month was 43·7°. The maximum 57·8° on the 14th. The minimum 28·5° on the 22nd. The mean of the maximum readings was 49·1°, of minimum 38·3°. The thermoneter was at or below 32° on nine days. The total rainfall was 3·67in. The greatest measurement in 24 hours was ·90in. on the 15th. The number of wet days was 14.

Total deaths 133, death rate 19·4 per 1,000.

DECEMBER was particularly mild, the prevailing winds were from N.W. The barometer readings were above average during early part, but below during the middle and end of month. The highest reading was 30·526in. on the 3rd, the lowest, 29·164in., on the 24th; mean of month 29·889in. The average temperature was 43·6°; the highest was 53·8 on the 9th; the minimum 28° on the 26th. The mean of maximum 48·4°, of minimum 39·8°. The thermometer stood at or below 32° on four days. The hygrometric readings were, dry bulb 43·1, wet 42·3.

The total rainfall was heavy, being 6·70 inches. The greatest fall was on the 14th, when it measured 1·09in. There were 20 wet days.

Total deaths 125, death-rate 17·6 per 1000 per annum.

THE DRAINAGE.

The drainage works executed by your Board during the year have been limited to the completion of the sewers in course of construction, and described in my last report. These are, the outfall sewer at Stuart Street, the intercepting sewer at Splotlands, the main sewer at Clive Road, and the sewer at Union Lane, Canton.

Arrangements have been made for the construction of sewers in Wellington and adjoining streets in the sub-district of Canton; a delay has hitherto been experienced owing to the necessity of a completion of plans for laying out streets through which the main sewers would have to pass; these plans have now been completed, and is is desirable that this work should be carried out with as little delay

as possible, owing to the fact that the houses in this locality have cesspools connected with them. The porous nature of the subsoil, and the pressure of the alluvial clay deposit on the southern side, prevent the free escape of water. As a consequence the district is waterlogged, the cesspools frequently fill to overflowing, thereby occasioning nuisances injurious to health unless they are frequently emptied.

When these sewerage works have been completed, cesspools with their concomitant evils will practically cease to exist in the sub-district of Canton.

The following sewers have been constructed by private landowners during the year, but under the inspection of your surveyor, viz :—

Carmarthen Street
Glynne Street
Wyndham Road
Miskin Street
Salisbury Road
Cogan Terrace
Llandough Street
Ruthin Lane
Llanblethian Lane
Glynrhondda Lane
Llantwit Street
Senghennyd Road
Salisbury Place
Cairns Street
Cockburn Street
Tesiger Street
Fitzroy Street
Daniel Street
Robert Street
Florentia Street
Cranbrook Street

and six new Streets at Splotlands, South Side of G.W.R., not named.

I have made a careful inspection as to the condition of certain Streets in the Roath sub-district, where houses have been erected on either side, and have to report the roadways and channeling for carrying off the surface water of the following streets have not been completed :—

Helen Street
Cecil Street
Pearl Street
Bertram Street
Maud Street
Ford Street
Tyler Street
Brook Street
Oakfield Street
Lane back of Broadway
Spring Garden

During wet weather these streets are impassible to the scavengers carts ; the occupiers of houses on either side at such times deposit their refuse and decomposing vegetable matter in the mud and stagnant water in the front of their dwellings, thereby occasioning a state of things dangerous to the public health. From time to time

my attention has been called to this fact by medical men in attendance on cases of Zymotic diseases; this was especially noticeable when some deaths from Diphtheria and Malignant Scarlatina in Helen Street were reported to me, and to this fact I would especially direct your attention.

WATER SUPPLY.

Fourteen samples of water from various parts of the district were submitted to Mr. Thomas, for analysis. Of these several were in a very bad condition, and so serious in their character, your Board directed at my solicitation that steps should be taken to cause the wells to be closed permanently—the only effective remedy against the water being used for drinking. In the table of analysis of water which follows three examples of the well waters of the Borough have been selected, in order to show their unfitness either for drinking or for domestic purposes. The remarks which I have somewhat fully, and frequently expressed in my annual reports, apply with all their force and emphasis to these and do not require re-capitulation, excepting sample No. 1, the constitution of which is different. No. 1 sample, was a water which received the soakage from refuse rejected in the manufacture of caustic soda (Ely Paper Mills) and was chiefly a saturated solution of sulphate of lime. It need scarcely be remarked that such a water is utterly unfit for drinking, although the general freedom from sewage or animal contamination is not denied.

ANALYSES OF WATER IN PARTS, PER 100,000.

	No. 1.	No. 2.	No. 3.
Total Solid Matter	317·2	104·5	83·0
Albumenoid Ammonia	·012	·006	·008
Free Ammonia	·0015	·0013	·004
Nitrogen as Nitrates and Nitrites...	——	6·589	3·846
Total Nitrogen found	·011	6·595	3·856
Previous Sewage or Animal Contamination	——	65,570	38,140
Chlorine	1·05	11·00	6·50
Magnesia Salts	excessive	excessive	excessive
Hardness { Temporary ...	13·2	7·1	13·8
Hardness { Permanent ...	148·2	51·8	30·8
Total	161·4	58·9	44·6
Remarks	nearly clear	nearly clear	clear

The public water supply of the Borough of Cardiff has occupied a considerable space in the successive annual reports previously made to your Board. The sources and character of the water have been described, and I have referred to the great importance which I attach to the sanitary bearing of this question upon the public health. I should not, therefore, have considered it necessary to make

but a passing allusion to it, if any, on the present occasion had not exceptional circumstances arisen during the past season. The quality of the waters I have always considered satisfactory as being the best obtainable within the limits of your District, but a serious defect—the nature of which I fore-shadowed and pointed out in my previous reports has been realised—the inadequacy of the supply. This insufficiency has occurred partly from the drought prevalent during the summer and autumnal months of the past year, but must be attributed chiefly to the rapid growth of the population. This question necessitates your serious consideration in order that a comprehensive scheme be provided calculated to deal not only with existing wants, but capable of affording means to cover the requirements of some years to come. I shall now recur to the two sources from which the water is obtained, and point out very briefly the extent to which these may be made available to cope with existing and future demands. These may be described as follows :—The gathering grounds at Lisvane and Llanishen form the chief source. The water is received into the reservoir at Llanishen which has a storeage capacity of 80,000,000 gallons. The gathering grounds are said to embrace an area of about 2,600 acres, consisting of mountain, arable, and pasture land, not very highly cultivated and consequently free from excess of manurial pollution, although such vegetable or animal contamination will be regulated, naturally, by the condition of the agricultural holdings.

The other source is obtained from the Pumping Station at Ely—a water derived chiefly, if not almost exclusively, from the magnesian-limestone formation into which subterranean channels or headings have been driven for the purpose of collecting the water. These land springs and percolation are the results of rainfall upon highly manured and cultivated ground, and this fact together with the soluble nature of the constituents of the geological formation determine that the water shall contain a considerable quantity of solid matter of such a composition as to afford evidence of animal contamination. The total supply from both of the foregoing sources falls short of 2,000,000 gallons per day, and under present conditions apart from any considerations as to the season of the year or to wet or dry weather 2,000,000 gallons may be set down as the maximum quantity available for Cardiff, Penarth and Llandaff. The population of the Urban Sanitary District of Cardiff is computed at 83,389, but to these figures the population of Penarth must be added (above 5,000 and rapidly increasing) and an allowance made for the water used in Llandaff.

It may be assumed, therefore, with safety that 90,000 persons are dependent upon the foregoing provision (2,000,000 gallons) for the

water required for drinking and domestic purposes as well as that necessary for the sanitary uses of the districts embraced in the supply. The estimated minimum supply by competent authorities is 25 gallons per head of population. With a population of 90,000 and 2,000,000 gallons of water 22 gallons per head are available—hence there is a deficiency of nearly 300,000 gallons per day below the minimum quantity which should be supplied. It may not be out of place to point out here that the quantity of water per head of population has been steadily on the increase especially in those towns which have become wealthy from commercial enterprise. The points to which I refer have no bearing upon the consumption of water by factories, but upon sanitary grounds only. In the construction of modern dwellings of a type which have no pretensions either to villas or palatial residences, waterclosets are becoming general, and bath-rooms with direct water connection are considered essential. The abolition of cesspools and the vastly increased necessity of more water for sanitary purposes, during the dry and hot months of the year are all considerations which have a weighty bearing upon the future water supply of the district.

Leaving aside the question of any permanent supply being drawn from the Ely station, it may not be inopportune to glance briefly at the capabilities of the Llanishen water-shed. This is drained by no less than six brooks; four of which are taken in the parish of Lisvane and conducted through the greater portion of the distance to the reservoir by a brick drain. These brooks traverse a hilly district, and are consequently very rapid in their discharge of storm water. The stream to the extreme north-east of the water-shed runs through much peaty ground, and at the best of weather is of a dark colour and loaded with organic matter. It is an unfortunate circumstance that this brook was ever incorporated in the supply as it confers a peaty character upon the whole, and might if possible be discarded with advantage, especially as a very small proportion only of the water can be obtained in a condition sufficiently free from suspended matters to be run into the reservoir.

In moderately dry winter weather the four streams referred to yield about 1,500,000 gallons of water per day. Two other streams the Llanishen and Nant Mawr brooks, form the remaining supply channels from the gathering ground. It is extremely difficult to arrive at an estimate of the quantity which can be obtained from these—especially from the latter, as after a very moderate storm it becomes loaded with brick red suspended matter, and it is not an unfrequent occurrence that during a rainy month the water of the brook is not available for a single day. If for the reasons stated the

peaty brook was rejected—and the reasons given are not without considerable weight—and due regard was paid to the intermittent character of the supply derived during the best of weather from the Nant Mawr stream, the actual area of the gathering grounds, which in the aggregate are nearer 2,300 than 2,600 would be reduced below 2,000 acres.

A very important consideration which bears further upon the question is the distribution of the rainfall, and the nature of the land whereon it falls. By far the greater portion of water descends upon hilly ground, and as a consequence the flow of the water is extremely rapid. Moreover, a considerable area of the gathering ground consists of arable land, which, although it be not highly cultivated, forms, nevertheless, a most undesirable base for rain water to fall upon, as it facilitates in so great a degree the carrying away of matters in suspension which render the water utterly unfit for storage purposes. It is by no means an unfrequent occurrence that from one to two inches of rainfall is obtained within 24 hours and as an instance of this I may state that in 1878 the average of the four days during which the greatest quantity of rain descended was no less than 1·91 inches. Practically the whole of this rainfall should be disregarded as it would be in a most unfit condition for admission into a reservoir. At the present time the clearest portion of the supply from all the brooks is used, and since they run more than is wanted under the now inadequate distribution, the quality of the water is good. If the works are extended and a large portion of the storm water is to be intercepted the peaty and other matters will find their way into the reservoirs in large quantity and give rise, as a consequence, to much contamination. It does not seem possible to keep up the existing standard of purity, if the distribution is increased to the extent of 1,000,000 gallons per day in consequence of the bad condition of the brooks during heavy storms, and furthermore, the number of inches of rainfall which must be lost inevitably is very considerable for the reason stated.

As an instance of the limited supply yielded by the gathering grounds of Lisvane and Llanishen, the fact that 4-5ths of the capacity of the present reservoir 64,000,000 gallons required a month to fill when $1\frac{1}{4}$ million gallons only were distributed, and this during winter weather shows that the conclusion which follow appear perfectly tenable.

Within the next two years the population of Cardiff and Penarth will reach a total of 100,000 persons. By using an adequate supply during the summer and autumn months for sanitary purposes, and

affording the same to the inhabitants, 30 gallons per head would be consumed, and this quantity will leave the town unprovided for future extension.

THE FOOD SUPPLY.

The food supply, will in the future engross considerable attention, not simply from the dangers to be apprehended by the consumption of food derived from animals slaughtered when suffering from diseases endemic to this country, but also to the fact that the increasing facilities afforded for the importation of live and dead stock from foreign parts, may be the means of introducing others, hitherto unknown in this kingdom, such as Texas fever, Trichina, and certain epizootic diseases of animals.

The following diseases of animals are recognized as communicable to man when the flesh of animals suffering from such is used as an article of food:—The foot and mouth disease, and Tuberculosis (analogous to Phthisis) when the milk of cows suffering from this disease is used; Epidemic Pleuro-pneumonia; Cattle plague (Typhus contagiousus, Steppe disease, Rinderpest); Anthrax (Malignant pustule, Carbuncular fever; Splenic Apoplexy); Black quarter (Erysipelas carbunculosum); the rot in sheep (Fluke disease due to the presence of the parasite, Distoma hepaticum in the liver); Swine fever; Pig measles, occasioned by the presence of the parasite cysticercus cellulosòe in the flesh or muscles of the animals giving rise to Tòenia solium (Tape worm) of man; Trichina, also found in pig flesh, these two diseases are especially likely to affect man when pork is consumed in an underdone state. It is to due this circumstance that Trichina is very prevalent at the present time in Germany; and lastly Texas fever, a specific form of Splenic apoplexy.

The animal diseases coming under my notice during the year have been Swine fever, Anthrax fever, Rot in Sheep, and Texas fever.

I may here state that whenever my attention has been called to the quality of meat, I have considered that when the disease has so far advanced as to materially alter the character of the flesh and fat it indicates serious general and constitutional disturbances previous to being slaughtered, and that the blood of such animals has been abnormal and may contain organisms or germs capable of communicating the specific disease to man. I have always considered such food dangerously unfit for human consumption, and have directed proceedings to be taken to get it destroyed.

During the year 1790 lbs. of meat have been destroyed by order of he magistrates; and when such meat has been dressed to expose it for

sale,further proceedings have been taken against the owners, and seven penalties varying in sums from 5s.to £10 with costs have been inflicted.

I may here make a few remarks on Texas fever, as this disease for the first time came under my observation on the 1st September,when the s.s. Rhewinda arrived in this port from New York with a cargo of live cattle. When inspected by Mr. Moir, the Veterinary Surgeon acting under your Board, he ascertained that some of the herd died during the passage, and had been thrown overboard ; he found at the time of his visit that one or two of the cattle were sick, one was slaughtered, and at his reqnest I inspected the carcase ; its appearance indicated that previous to being slanghtered the animal was suffering from some form of fever, one of the marked symptoms of which was frequent and copious purging, the excreta containing much pus and blood. Mr. Moir had made a most careful post-mortem examination, and among other morbid appearances he found the whole of the carcase was very dark ; the fat yellow, and throughout patches of different colour existed in several parts of the surface, more especially in the sub-lumbar region, the internal coats of the first, second, and third stomachs were inflamed, and the coats of the fourth stomach were much thickened and highly congested, with patches of small and irregularly shaped ulcerations. The intestines were highly inflamed and thickened throughout, especially in the rectum, the bladder was inflamed, and had a granular appearance internally, the spleen was very much enlarged, and the kidneys were black in colour and highly congested. These morbid appearances raised in his mind an opinion that the disease was Texas fever, and he communicated that fact to Mr. May, of Bristol, the Cattle Inspector acting under the Authority of the Privy Council for this district. He confirmed the opinion of Mr. Moir, and reported the circumstance to his Board ; a further enquiry was instituted, which left little doubt as to the nature of the disease.

My attention was afterwards called to a case of fever on board the Rhwinda, the sick man had been removed to the Hamadryad Hospital. On visiting the ship I found that the cabin occupied by this seaman was closely adjacent to the compartments in which the animals had been confined. After the cattle had been removed these compartments had been cleansed ; but when I directed the temporary flooring on the deck to be raised I found beneath a large accumulation of mannrial matter, the excreta of the animals; this I ordered to be burnt or taken out to sea. Veterinary Authorities express a strong opinion that the disease is very infectious, and that cattle feeding on pastures, where animals suffering from the disease have previously grazed, have succumbed to it. It is therefore highly important that

care should be taken that none of these excreta should be mixed with any manure intended to be used for agricultural or grazing purposes, as considerable danger of introducing the disease into the district might otherwise be incurred.

I afterwards caused the cabin occupied by the sick sailor, and the animal compartments, to be freely exposed to the fumes of sulphurous acid gas.

DWELLINGS OF THE WORKING CLASSES.

A considerable improvement has taken place in these dwellings, attributable to constant supervision, the result being a marked diminution in overcrowding. Greater cleanliness is noticeable and more regard paid to proper ventilation. When cases of overcrowding or other evils have been observed, notices were served on the occupiers to remedy these. They have as a rule been complied with, and only in seven instances it was found necessary to summon offenders; in these cases penalties from 5s. to £5 with costs were inflicted.

THE POPULATION.

The estimated population of the Urban Sanitary District of Cardiff for the year 1880 is 83,389. This estimate is based on the average number of inmates allowed for each occupied house, as was found to be the case at the census of 1861 and 1871, and is in accordance with the principle recognized by the Registrar General as applicable to large commercial towns where the area of the labour field is constantly increasing, thus affording attraction to immigration. The two censuses, 1861 and 1871, showed an average number of 6·5 inmates occupying each house. This year I calculate 6·25, as I consider the increase in the number of dwelling houses affording accommodation to the working classes has somewhat reduced the average number to each house. The average number of seamen estimated to be constantly in port is calculated by allowing the same proportionate rate to the total tonnage of the year as obtained in 1861 and 1871; this is an approximate calculation, for the number of seamen in the port on that particular night (March 31st) would be greater or less according to the prevalent wind, thus a westerly wind would probably occasion a larger, an easterly wind a less number of vessels in the port. According to these calculations the following represents the average population of the three sub-districts:—

Sub-district of Cardiff, inhabitants (proper)...	39,500
Average number of Seamen in the port	7,000
Sub-district of Roath	22,527
„ „ „ Canton...	14,362
Total	83,389

THE MARRIAGES.

The marriages during the year 1880 were as follows:—

Church of England	232
Nonconformist Chapels	134
Catholic Chapels	71
Registrar's Office	385
Total	822

The yearly returns of marriages for the six years ending December, 1880, were:—

1875	841
1876	746
1877	811
1878	721
1879	836
1880	822

This returns shews that since the year 1875 the yearly number of marriages has been less than in that year, and is in accordance with the remarks applicable to the whole kingdom, as made by the Registrar General. He, however, attributes this diminished number to the depressing influence of trade and commerce; but this interpretation is hardly to be considered the cause in Cardiff, where its commercial interests are associated with the exportation of the staple articles of coal and iron; these exports largely increasing every year, as is shown in another table.

THE BIRTHS.

	Cardiff.	Roath.	Canton.	Total.
Quarter ending March ...	393	253	142	788
„ „ June	368	237	135	740
„ „ September ...	344	222	137	703
„ „ December ...	326	198	138	662
	1431	910	552	2893

The birth-rate of the whole of district has been 34·6 per 1,000 inhabitants, but the calculation includes in the estimated population of the town 7,000 seamen, whose families reside elsewhere, and therefore do not contribute to the births. Had the proportionate rate been taken on the population proper, excluding seamen, the birth-rate would have been 37·8. The birth-rate of the kingdom in 1880 was 34·6 per 1,000, the average of the latter being less than the mean average of the previous ten years, which was 35·7, and is in accordance with the diminshed rate observed in Cardiff in 1880.

THE DEATHS.

The deaths in the Urban Sanitary district of Cardiff, during the year 1880, were 785 males, and 849 females, making a total of 1634. The deaths were distributed over the sub-districts as under :—

	Cardiff.	Roath.	Canton.	Total.
Quarter ending March	259	103	81	443
„ June	240	100	71	411
„ September ...	238	90	79	407
„ December ...	214	100	59	373
Total ...	951	393	290	1634

The death-rate was 19·59 per 1,000 inhabitants.

The following table illustrates the total births and deaths, the relative proportion of births and deaths, and the death-rate per 1,000 inhabitants from the year 1848 to 1880 :—

Years.	Births.	Deaths.	Excess of Deaths over Births.	Excess of Births over Deaths.	Death-rate per 1000 Population.	
1848	428	579	151	...	35·3	
1849	466	864	398	...	54·0	
1850	504	485	...	19	28·6...	Sanitary Inspectn. Lodging-houses
1851	575	525	...	50	28·6	
1852	696	620	...	76	28·6	
1853	865	644	...	221	26·8	
1854	950	925	...	25	34·9	
1855	1079	641	...	438	21·7...	1855, first portion of present system drainage used.
1856	1227	772	...	455	22·1	
1857	1367	883	...	484	23·2...	1857, first main of present water supply used.
1858	1356	753	...	603	20·3	
1859	1336	826	...	510	22·3	
1860	1246	662	...	584	18·9	
1861	1223	837	...	386	23·9	
1862	1268	695	...	573	19·4	
1863	1302	862	...	440	23·9	
1864	1399	932	...	467	25·5	
1865	1382	867	...	515	23·4	
1866	1331	882	...	449	23·5	
1867	1397	873	...	524	23·5	
1868	1387	843	...	544	22·5	
1869	1414	1005	...	409	26·2	
1870	1406	903	...	503	23·2	
1871	1391	891	...	500	22·5	
1872	1358	916	...	442	22·6	
1873	1430	995	...	435	21·3	
1874	1550	885	...	665	23·5	
1875	2716	1547	...	1169	21·2	
1876	2707	1455	...	1252	19·1	
1877	2772	1475	...	1297	19·1	
1878	2795	1468	...	1327	18·5	
1879	2969	1428	...	1541	17·5	
1880	2893	1634	...	1259	19·5	

* In 1849 the town was visited th a severe epidemic of cholera, and again in 1854.

The death-rate of the Urban Sanitary District of Cardiff in 1880, as compared with the death-rate of the 39 districts and sub-districts comprising the chief towns of the kingdom; the remaining districts and sub-districts comprising chiefly small towns and country parishes; and the average death-rate of the kingdom generally is as under:—

	Quarters ending:—				
	March	June	Sept.	Dec.	
Cardiff	21·6	19·7	19·2	17·7	19·5
134 districts and 57 sub-districts comprising chief towns	24·2	20·7	22·6	21·0	22·1
The remaining districts and sub-districts, comprising chiefly small towns and country parishes.....	21·0	18·2	17·2	17·6	18·5
Average death-rate of the whole kingdom	22·9	19·7	20·4	19·6	20.7

From the above table it will be seen that the rate of mortality of the Urban Sanitary District of Cardiff was 2·6 per 1,000 less than that of the chief towns; 1 per 1,000 more than the small towns and country parishes, and 1·2 per 1,000 less than that of the mean death-rate of the kingdom.

The deaths at age were:—

Under one year	478
One year and under five years	339
Five years and under fifteen years ...	71
Fifteen years and under twenty-five years	94
Twenty-five years and under sixty years	435
Sixty upwards	217
	1,634

The deaths under one year of age were at the rate of 165 per 1,000 births. This rate is considerably in excess of the previous year, a circumstance due to the prevalence of infantile epidemics, as will be shewn when speaking of Zymotic mortality.

The comparative rate of mortality, under one year of age, to 1,000 births is as under :—

	The Kingdom.	The Large Towns.	Cardiff.
Quarter ending March	152	158	162
„ „ June	122	137	164
„ „ Sept.	195	238	194
„ „ Dec.	144	152	123
The Year	153	171	165

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

	CARDIFF.		ROATH.		CANTON.	
	Deaths.	Deaths per 1,000 Inhabitants.	Deaths.	Deaths per 1,000 Inhabitants.	Deaths.	Deaths per 1,000 Inhabitants.
Zymotic Disease	159	3·4	106	4·7	81	5·6
Constitutional „	191	4·1	66	2 9	46	3·2
Local „	397	8·7	167	7·4	116	8·
Developmental „	119	2·5	45	1·9	37	2·5
Violent „	85	1·8	9	0·3	10	0·6
Total.....	951	20·4	393	17·4	290	20·1

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 1880, as compared with the average death-rate of the Kingdom extending over 25 years. In accordance with instructions from the Local Government Board, I have compiled two other tables. Table A, deaths during the year 1880, 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. Table 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 is in many cases produced, and in all aggravated, by defective sanitary arrangements.

The deaths from the seven chief Zymotic diseases occured in the following streets and institutions :—

CARDIFF.

Name of Street.	S. Pox.	Measles.	Scarlatina	Dip'theria	W. Cough	Fever.	Diarrhœa
AugustaStreet.....	...	...	...	2	1	...	...
Alice Street.....	...	...	...	...	1	...	...
Buzzard Street.....	...	...	2	...	...	...	...
Bedford Street.....	...	...	...	...	2	...	1
Brook Street	...	...	...	...	1	...	...
Barracks The	...	...	...	...	...	3	...
Bute Terrace	...	...	...	...	...	...	1
Bute Street	...	...	...	...	...	...	1
Bute Road	...	...	1	...	...	...	1
Crockherbtown	...	1	...	...	...	...	...
Castle Road.....	...	1	...	...	...	...	...
Cathays Terrace	...	1	...	...	...	...	2
Canal Street..	...	...	...	...	1	...	...
Catherine Street	...	...	...	...	1	...	...
Church Street S	...	...	...	...	...	...	1
East Terrace	...	3	...	...	...	...	...
Evans Court.....	...	1	...	...	...	...	...
East Street	...	1	...	...	...	...	...
Ellen Street.....	...	...	...	...	...	1	...
Evelyn Street	...	...	...	...	...	...	1
Frederick Street	...	1	...	...	...	...	1
Francis Street.....	...	...	1	...	...	...	1
George Street U	...	1	...	...	...	...	1
Garth Street.....	...	...	...	...	1	...	...
Green Street.....	...	...	...	...	2	...	...
Gough Street	...	1	...	...	...	...	3
Gainors Court	...	...	...	...	...	...	1
Hills Terrace	...	2	...	...	...	...	...
Herbert Street.....	...	1	...	...	1	...	3
Havelock Street	...	...	...	...	...	...	1
High Street	...	...	...	...	...	...	1
Hill Street	...	...	...	...	...	...	1
Ivor Street	...	...	...	...	1	...	...
James Street	...	...	1	...	...	...	...
Kite Street	...	1	...	...	...	...	...
Luton Place N.....	...	2	...	...	...	...	...
Louisa Street	...	1	...	...	...	...	...
Loudon Square	...	1	...	...	...	...	...
Luton Place W.....	...	...	...	...	2	...	1
Luton Place S.....	...	...	...	...	...	1	...
Margaret Street	...	...	3	...	...	..	...
MariaStreet.....	...	1	...	3	...	...	...
Mary Ann Street.....	...	...	...	...	1	..	...
Mark Street.....	...	...	...	...	1	...	...
Moira Street.....	...	...	...	...	1	...	...
Millicent Street	...	...	...	...	...	...	2

CARDIFF.

Name of Street.	S. Pox.	Measles.	Scarlatina	Dip'theria	W. Cough	Fever.	Diarrhœa.
Plymouth Street	...	...	...	...	...	...	1
Peel Street	...	...	...	...	...	...	1
Penarth Road	...	...	...	...	2	...	...
Richmond Road	...	1	1	...	1	...	...
Ruperra Street	...	...	...	...	...	1	...
Rising Sun Court	...	...	...	...	...	...	1
Sophia Street	...	1	...	...	...	...	...
Stanley Street	...	...	...	...	1	...	...
Scott Street	...	...	...	...	1	...	1
Stuart Street	...	...	...	...	...	...	1
Tyndall Street	...	...	...	...	2	...	...
Thomas Street	..	...	...	...	1	...	...
Tredegar Street	..	...	...	...	1	...	...
Union Street	...	...	...	...	...	...	1
William Street S	...	...	1	...	...	1	...
William Street N	...	...	...	...	1	...	1
Wood Street	..	...	...	...	...	...	2
Westgate Street	...	...	...	...	1	...	...

INSTITUTIONS.

Infirmary	...	...	...	...	...	...	...
Hamadryad	1	...	...	...	...	...	1
Union	...	9	...	...	...	2	8
Gaol	...	...	...	1	...	...	...

ROATH.

Asgay Street	...	1	...	...	...	...	...
Broadway	...	1	...	...	3	...	...
Bertram Street	...	...	...	...	1	...	...
Croft Street	...	2	...	...	...	...	...
Clifton Street	...	...	1	...	...	...	1
Clive Street	...	...	1	...	...	...	...
Cecil Street	...	...	...	...	2	...	...
Constellation Street	...	...	...	...	1	...	...
Charles Street	...	...	...	...	...	1	1
Comet Street	...	...	...	...	...	1	1
Clive Road	...	...	...	...	...	...	1
Dimond Street	...	1	...	...	1	...	1
Eclipse Street	...	1	...	...	...	...	...
Emerald Street	...	...	1	...	2	...	1
Elm Street	...	...	1	...	...	...	1
Fox Street	...	...	1	...	...	...	...
Glyde Street	...	...	...	...	...	1	...
Grouse Street	...	...	...	...	3	...	...
Grenville Terrace	...	...	1	...	...	...	...
Gallstone Street	...	1	...	...	...	...	...

ROATH.

Name of Street.	S. Pox.	Measles.	Scarlatina	Dip'theria	W. Cough	Fever.	Diarrhœa.
Hellen Street	...	1	2	2	...	...	1
Zinc Street	...	1	...	...	2	1	...
John Street.....	...	3	...	...	1	...	3
James Street	...	...	...	...	...	...	1
Kinggarth Street.....	...	...	...	...	...	...	1
Kerrycroy Street.....	...	...	...	...	...	1	...
Longcross Street	...	1	...	...	...	...	...
Lead Street	...	...	...	...	1	...	...
Milton Street	...	...	...	...	...	..	2
Metal Street.....	...	2	1	...	...	...	2
MargretTerrace(Lady)	...	...	1	...	...	...	...
Newport Road..... ...	...	...	...	...	...	...	1
Orbit Street.....	...	...	1	...	...	...	...
Oxford Street	...	...	...	...	...	1	1
Planet Street	...	1	...	...	...	...	4
Pearl Street.....	...	...	...	...	...	...	1
Partridge Road	...	...	...	...	...	...	1
Ruby Street.....	...	1	...	...	...	...	2
Rose Street	...	...	...	...	...	...	1
Richards Terrace.....	..	1	...	...	...	...	...
Silver Street	...	1	...	...	1	...	...
Snipe Street.....	...	1	...	...	1	...	...
Shakespere Street ...	...	1	...	...	1	...	2
System Street	...	...	...	...	1	...	...
Stacey Road.....	...	...	...	1	...	...	2
Splotland Terrace ...	...	...	...	..	...	...	1
Sapphire Street	...	...	...	...	...	...	1
Topaz Street	...	...	...	...	2	...	...
Talworth House Lodge	...	...	...	...	1	...	...
Tin Street	...	...	...	...	...	...	1
Theodora Street	...	...	...	...	...	...	1

CANTON AND GRANGETOWN.

Amherst Street	...	...	...	...	...	1	2
Bradford Street	...	1	...	...	...	...	...
Broomfield Street	...	...	...	...	1	...	...
Cowbridge Road	...	..	2	...	...	...	...
Devonshire Place.....	...	...	...	. .	1	...	...
Edward Street.....	...	...	1	...	...	...	...
Ely Road.....	...	...	...	...	1	...	...
East Street	...	...	...	...	...	1	...
Grange..... ...	...	1	...	...	...	...	...
Elyn Street	...	...	...	...	1	...	...
Glamorgan Street. ...	...	...	...	...	...	...	1
Halket Street.....	...	...	1	...	...	...	1
Hewell Street	...	...	...	...	...	...	1
Havelock Street	...	2	...	...	...	...	...

CANTON AND GRANGETOWN.

Name of Street.	S. Pox.	Measles.	Scarlatina	Dip'theria	W. Cough	Fever.	Diarrhœa.
Homsdale Street.....	...	2	...	...	1	...	1
Harris Terrace.....	...	...	...	1	...	...	...
Harvey Street...	..	...	...	....	2	...	...
Insole Terrace.....	...	...	...	...	1	...	...
Knole Street	...	...	...	...	2	...	1
Kent Street.....	...	...	...	...	. .	...	2
Ludlow Street.....	...	1	...	...	...	...	...
Leckwith Road.....	...	...	1	...	1	1	1
Llandaff Road.....	...	...	...	...	2	...	2
Lewis Street	...	...	...	...	1	...	...
Market Street.....	...	...	...	...	...	...	1
Oakley Street	...	4	...	...	...	3	...
Penarth Road	...	1	...	...	...	...	1
Picton Place	...	...	1	...	2	...	2
Pontcanna	...	...	...	...	...	...	1
Romilly Crescent.....	...	...	...	...	1	...	...
Railway Terrace	...	...	...	...	...	...	1
Stag Terrace	...	...	1	...	...	...	...
Severn Road	...	...	...	...	1	1	2
Seven Oak Street.....	...	...	...	...	1	...	...
Thomas Street.....	...	1	...	...	...	...	...
Union Street	...	...	...	...	...	...	1
Wellington Street	...	...	1	...	2	...	1
Wyndham Street.....	...	...	...	...	1	...	...
Windsor Terrace.....	...	...	...	...	...	...	1

To these diseases I will now direct your attention.

Small Pox.—One death was registered from Small Pox ; this was a seaman in the Hamadryad Hospital, who arrived in this port on board the Italian Ship "Pertino." On visiting the vessel I found that it had left Antwerp on the 18th July, and the crew were healthy on the 23rd. Subsequently Small Pox manifested itself and I caused the sick man to be immediately removed in a boat to the Hospital, where he died on the 3rd day of August. Two other cases of sickness from Small Pox were reported to me ; the first was a seaman on board the S.S. "Lisbon," which arrived in the port in the early morning ; the sufferer was immediately removed to the Hamadryad Seaman's Hospital ; it was a severe case of confluent Small Pox; but the patient ultimately recovered.

The second case was reported to me on the 17th April, on board the ship "Penleuch," which vessel had arrived here that morning from the port of London. This case was also removed to the

Hamadryad Hospital; it proved to be a severe case of the confluent form of the disease; this patient recovered. The action I take on receiving notice of infectious disease on board ship, is to visit and examine the whole of the crew, also the log books; I afterwards cause the cabins occupied by the sick to be fumigated with sulphurous acid gas, and the ship generally disinfected, the bedding and clothes used by the sick are usually destroyed, and recommend the crew in each case to be revaccinated; they are afterwards kept under constant supervision. The vessels are isolated from all others in the port; none of the crew are permitted to visit the shore, and no one allowed on board except such as are absolutely necessary for carrying on the business of the ship. It is satisfactory to state that no fresh cases occurred on board either of these vessels, nor did the disease spread in the district. As this port is constantly exposed to the danger of the introduction of Small Pox, whenever such an occurrence takes place, I give notice to the Vaccination Officer to enquire into and satisfy himself of the efficiency of vaccination throughout the district nearest to that institution, where the cases have been removed.

I have obtained the following tabular statements of vaccination in the Urban Sanitary District of Cardiff, for the 12 months ending December, 1879, and the 6 months ending June 30th, 1880.

		12 Months ending Dec., 1879.	6 Months ending June, 1880.
1.	Number of births returned in the "Birth List Sheets"	3320	1765
2.	Successfully Vaccinated	2773	1326
3.	Insusceptible of Vaccination	2	...
4.	Had Small Pox	1	...
5.	Dead Unvaccinated	305	225
6.	Postponement by Medical Certificate	4	64
7.	Removed to districts the Vaccination Officer of which has been duly apprized	42	15
8.	Removal to places unknown or which cannot be reached; and cases not having been found	157	65
9.	Number of these births remaining on the 31st January, 1881, neither duly entered in the "Vaccination Register," nor temporarily accounted in the Report Book	36	70

In column 5 of each report the numbers 305 in 1879, and 225 in 1880, as died unvaccinated, seems to show that vaccination is unduly deferred.

In column 8 the report for 1880 is more favourable than in 1879, but it would be still more so, if enquiries were made as soon as the time allowed for vaccination by law had expired, and compliance enforced.

As regards column 9, probably some have been vaccinated, and certificates lost, others may be cases of unfitness for which postponement certificates have either not been obtained or failed to be received.

The Vaccination Committee of Board of Guardians have ordered particulars of the 36 to be supplied to them, with a view to take proceedings against the parents who have neglected to comply with the notices issued by the Vaccination Officer.

The Vaccination Committee are also issuing instructions to the Vaccination Officer, that he should furnish the Committee with a detailed statement of all cases unvaccinated after the period required by law has expired, and any action he may have taken thereon, for the purpose of receiving any directions the Committee may desire to give him.

Measles—Measles has been fatal in 67 cases; these occured chiefly in the early months of the year, and were probably a continuation of epidemic which broke out towards the end of the year 1879, and prevailed until the month of May, whilst after this it practically ceased, only isolated cases being reported after that month. The death rate was 0·803, that of the kingdom for the yearly average of 25 years being 0·428.

Scarlatina.—Scarlatina had a mortality of 29; this was much below the average of the kingdom, (25 years 0·925,) and was considerably less than the average of Cardiff for some time. When cases of scarlatina have been reported to me I have recommended isolation as far as practicable, visitors to the infected house forbidden, and notice given to the head of the family that no children are to be permitted to attend day school, a notice to that effect is also served on the School Master; disinfection of clothes and bedding, by means of the heated chamber, enforced, and the house fumigated with sulphourous acid gas.

Diptheria.—There were ten deaths from diptheria; the death-rate from this disease being 0·119, against the yearly average of the kingdom, 0·264. On enquiry into the possible existent cause of this disease, the opinion I have before expressed to your board that the

escape of sewer gas was an important factor in its causation, has been confirmed; and I would especially press upon occupiers of houses that the sewer arrangements of the house should be maintained in a perfect and efficient state, that in all cases, where possible, a ventilation shaft external to the house should be connected with the soil pipe, so that no pressure from the main sewer might force an escape into the house, and that in every case where there is an offensive smell of sewer gas, however slight, the attention of the Sanitary Inspector should be directed to the fact.

Whooping-Cough extensively prevailed throughout the district; it was confined chiefly to Cardiff to the end of April; after this time it spread throughout Roath and Canton; in these sub-districts it continued until the end of the year, and was especially fatal during the months of October and November. This is an epidemic incidental to infancy, and from time to time breaks out with more or less severity in large urban populations; sanitary provisions can little control it, isolation is practicably impossible, inasmuch as the illness of the individual attacked lasts some months; the disease is more or less fatal, according to temperature influences.

Fever had a mortality of 23; of these, one was registered as typhus, fourteen as typhoid, and eight as simple continued fever; three of the latter were registered as the remittent form of childhood. The death-rate from fever was 0·273, that of the kingdom being 0·656. It is highly satisfactory to find that there has been a gradual decreasing mortality from fever in this town for some years, and that its present death-rate from that cause is considerably less than one half of the average mortality of the kingdom.

In a report made to the General Board of Health in 1848, Mr. Ramnull, the Government Inspector sent down to enquire into the sanitary state of Cardiff, stated that certain streets in Cardiff, such as Mary Ann Street, Stanley Street, Love Lane, and the streets occupied by the Irish in the Newtown district, were never free from fever, and attributed this circumstance to the absence of sanitary arrangements. Since the sanitary improvements have been carried out by your board fever is rarely met with in these streets, or a death from fever registered; when this does occur I have invariably found it sporadic, that is, due to individual and not epidemic causes.

Diarrhœa.—The deaths from this disease were very numerous, and contributed largely to the mortality ascribed to the seven chief Zymotic diseases.

Diarrhœa varies greatly in its character and causation. It may be epidemic or endemic, as it extends over large areas, or is confined to limited localities. Its marked predisposing and excitant causes are

climate, temperature, and miasmata; while the degree of sanitary arrangements appertaining to a district modifies or intensifies its prevalence and severity. It is very infectious, and may attack any person exposed to its influence, without regard to age. A typical illustration of this form has been observed on all occasions when the country has been visited by epidemic cholera, and in consequence of of this the disease was designated "Choleraic diarrhœa." It may be sporadic, when it is confined to individuals, and then supervenes on an abnormal condition of health produced by dentition or some constitutional derangement as struma, tabes mesenterica, or such like diseases; or it may be dietetic, as when it has been occasioned by eating certain kinds of fruit (plums, &c.), or indigestible vegetables (cucumbers, &c.), or by the adminstration of food improper in character, or altered in quality, to young infants.

I have endeavoured to make these distinctions sufficiently clear to enable you to recognise the essential nature of the disease, which has this year produced an unusually large mortality.

The subjoined table (A) shews the registered ages of deaths from diarrhœa in 1880:—

A

MONTH.	AGE.							TOTAL.
	0	1	2	5	15	25	60	
January	1							1
February	1							1
March.....	4	1						5
April	3							3
May	2							2
June	1	1				1		3
July	3	1						4
August	21	8	2				2	33
September	23	6	2		2			33
October	6	1						7
November	1		2		2		1	4
December	1	1				1		3
TOTAL	67	19	6		4	2	3	99

This table indicates that out of 99 deaths, 67·6 per cent. occurred under one year; 19·1 per cent. at the age of one year; 6 per cent. between two and five years, and only 8 per cent. above the latter age.

Nearly the same proportionate percentage of deaths at age is found in the annual mortality from diarrhœa, in the preceding four years. Thus, as is seen from table B:—

B

	0	1	2	5	15	25	60	Total.	Per centage of deaths in one year, and under, of total deaths.
1876	52	4	1	1		5	6	69	81
1877	14	2	2				1	19	81
1878	47	16	4			4	2	73	86
1879	26	3	2		1	1		33	87
1880	67	19	6		2	2	3	99	86

Table A also shews that a considerable excess in the mortality from diarrhœa takes place during the summer months of July, August and September. Thus, out of a total of 99 deaths from this disease, 70·7 per cent. were registered in these three months. A very proximate rate also ruled the four preceding years, with the exception of 1879, when the mortality was kept down by the unusually low temperature ruling the whole period, the relative annual percentage being as under:—(table C):—

C

DEATHS FROM DIARRHŒA.

	Deaths registered in July, Aug., and Sep.	Total deaths of year.	Per centage of deaths in the three months of total deaths.
1876	50	69	72·4
1877	13	19	68·4
1878	54	73	73·9
1879	9	33	27·3
1880	70	99	70·7

Table D is intended to illustrate the influence of temperature and rainfall, in reference to deaths from Diarrhœa.

D

	Highest Temp.	Mean Temp.	Rainfall in inches	Wet Days.	Deaths from Diarrhœa.	Remarks on Weather.
			JULY.			
1876	89·5°	66·2°	1·24	10	12	Hot, dry, few wet days.
1877	75·0°	58·7°	4·94	18	3	Cool, wet, many wet days.
1878	84·6°	64·2°	2·01	9	18	Hot, dry, few wet days.
1879	78·2°	59·2°	4·00	21	4	Cool, wet, many wet days.
1880	72·3°	61·6°	6·64	23	4	Somewhat cool, very wet, many wet days.
Means & Totals		62·0°	18·83	81	41	
			AUGUST.			
1876	88·0°	63·5°	6·06	11	31	Hot, heavy rain & few wet days
1877	80·0°	61·2°	5·70	21	8	Rather cool, wet, many wet dys.
1878	75·4°	63·0°	10·82	24	29	Hot, thunder storms, „
1879	72·4°	68·1°	8·12	22	3	Cool, very wet, „
1880	78·4°	63·2°	0·77	7	33	Hot, very dry, few wet days.
Means & Totals		62·2°	31·47	85	104	
			SEPTEMBER.			
1876	71·0°	57·6°	7·08	19	7	Warm, wet, many wet days
1877	72·0°	54·4°	3·25	8	2	Cold, rather dry, few wet days
1878	74·3°	58·1°	3·21	9	7	Warm, not many wet days
1879	67·0°	55·8°	4·85	17	2	Cool, wet, many wet days
1880	81°·6	59·6°.	3·67	15	33	Unusually hot, not very wet
Means & Totals		57·1°	22·06	68	51	

In this table the highest temperature of the month is given in the first column; the second shows the mean temperature. At the bottom of this column the mean of the five years is set forth, so that it can be seen at a glance whether the mean heat of any month is above or below the average of the five years. The next three columns exhibit the rainfall in inches, the number of wet days, and deaths from diarrhœa respectively. In the remarks column these various factors are summarised in a few words. From this synopsis the broad and interesting fact appears that deaths from diarrhœa in the summer quarter show a steady increase from July to August, and then a gradual decline in September. Thus the total deaths from this cause in July for the five years, 1876—80, were 41, August 104, and

September 51. This shows, speaking generally, a prevalence of diarrhœa more or less in proportion to temperature, and somewhat modified by the rainfall and the number of wet days. The *duration* of hot weather has a significant bearing in this connexion. August need not be warmer than July, and yet the prevalence of diarrhœa may be much greater and the disease more fatal, because the effect of a continued high temperature is cumulative, and morbid conditions set up in July will culminate in August, and further many of the cases commencing in July may not arrive at their fatal termination until the following month. Similarly September may have a mortality in excess of that due to its own temperature. If we take the months in detail the same tendency is exhibited more clearly. It may be noted from a comparison of the figures that when the weather is hot and also dry, the largest number of deaths from diarrhœa occur. On the other hand when it is cold and wet the smallest mortality prevails. A glance at the table shows this more clearly.

Upon an examination of the register of mortality, I find that the diarrhœa was not epidemic or endemic, as no second case occurred in the houses in which it appeared, showing the absence of infection; and again the disease was confined to infants of one year old and under. Some of the cases were sporadic, and due to dentition, mesenteric disease, &c.; but the largest proportion must be referred to dietetic causes. Now it is important to ascertain if possible the particular article of diet that excited the disease. Infants do not eat plums, cucumbers, &c., which are prone to induce diarrhœa in grown-up people. Circumstances led me to suspect that the milk supply was an active factor in the causation, and this suspicion seemed to be strengthened by the fact that the disease was less prevalent amongst the Irish inhabitants than the rest of the population. Out of 99 deaths from diarrhœa only nine were Irish, and there are 13,000 Irish in Cardiff, so that the proportion was 0·69 per 1000, whereas the death-rate amongst the remainder of the inhabitants was 1·28 per 1000. This is accounted for by the small extent to which cows' milk enters into the dietary of the infants of the Irish poor—a population that is always largely attacked by diarrhœa of an epidemic character. This view is further corroborated by the fact that when I ordered the cows' milk supply to be discontinued in cases of diarrhœa, and condensed milk substituted, the disease ceased.

It might be objected that on this ground diarrhœa ought to be as prevalent in the country as the town, if not more so; but the answer is readily found in the curious fact that cows' milk is generally most difficult to procure in country places, but always obtainable in the town.

Now apart from the milk of diseased cows, which the authorities are unremitting in their exertions to exclude from the town supply, and to which I need not refer, I may remark that cows' milk may be productive of diarrhœa in two principal ways. The calf is sometimes weaned when a few days old, and the cow's milk sold in the usual way. Now the milk at this early period is rich in a principle termed colostrum, which is the natural aperient for the calf, but is, of course, much too powerful for an infant, more particularly when there is already a tendency to intestinal irritation from hot weather. Thus it happens that milk which might have produced only a moderate aperient effect in the cool weather of the spring months, may occasion fatal diarrhœa when combined with the high temperature of summer. Sometimes when I have suggested to a mother that milk might be the source of her infant's trouble, I have been met with the confident reply—"Oh! that cannot be, as the cow only calved so many days since," but I need hardly say that the answer only confirmed my suspicion. The reason why milk is thus purveyed prematurely, seems to be that it is much more profitable to sell the milk than to feed the calf with it; and both infant and calf suffer in consequence.

The other mode in which milk excites diarrhœa, is by its instability in hot weather—the tendency to turn sour, as it is popularly termed. Sour milk is generally considered by the public a sufficient cause for the production of diarrhœa, and other ailments in infants, but it is not commonly known that milk in hot weather is liable to sudden and almost spontaneous changes, and that it exerts an injurious influence on the delicate organisation of the very young before it is much altered in appearance, taste, or smell. There is a tendency in this direction even with care in summer heat, but it generally acquires its marked development from a want of cleanliness in utensils,—feeding-bottles, &c., which are permitted to become sour; and sometimes from mixing stale milk with the fresh supply.

I brought this question under the notice of Mr. Thomas, the Borough Analyst, and also sent him samples of milk, and in reply received from him, under date December 6th, 1880, a report of his examination of milk, which is corroborative of my views. He says:—"I carefully noted that your remarks with regard to the unstable character of milk during the autumn season have been peculiarly verified by me this year. The samples have shown a great tendency to premature decomposition, *i.e.*, turning acid very quickly, and becoming curdled soon after milking. A microscopical examination of these milks revealed an abnormal condition of the corpuscles, and in some instances sufficient colostrum was present to account for diarrhœa in children fed with such milk."

I think I have said enough to indicate the important influence exerted by milk of unsatisfactory quality in hot weather upon the prevalence of, and mortality due to diarrhœa. I do not wish to be understood to depreciate the great value of good milk as an important article of diet, but to inculcate caution in the management and sale of it. I would also suggest the desirability of substituting condensed milk, or some other suitable article for it, if diarrhœa occurs when using cow's milk, although it may not appear to be inferior or altered in quality.

Constitutional Diseases.—The deaths from constitutional diseases were less than the annual average of the kingdom. I am enabled to report that the progressive improvement that has taken place during late years in the mortality caused by phthisis has been maintained ; this is doubtless due to the efficient drainage of the low levels in and about this district, and fully corroborates the views taken by Dr. Buchanan, the Medical Officer of the Privy Council, on this subject.

Local Diseases.—The mortality from this class of disease approximates very closely to the general average of the kingdom as is to be expected when it is recognised that a large proportion of the deaths registered under this head are comprised of acute inflammatory diseases of the internal viscera due to weather and atmospheric influences, as I have from time to time alluded to in the monthly reports furnished to your board.

Developmental Diseases contrast with that of the kingdom, and may possibly be ascribed to the fact that the labouring classes have fair and remunerative employment, enabling them to procure the necessaries of life, while their habitations are commodious and well-ventilated ; these circumstances operate very favourably in developing the constitutional powers of early and adult life.

Violent Deaths are somewhat in excess, as is to be expected from the circumstance that a large proportion of the working classes of this town are engaged in occupations exposing them to the chance of accidents in connection with the shipping at the docks, the large manufactories, and the three important railways in the immediate neighbourhood.

The following is a summary of the sanitary duties discharged during the year :—

9,897 day and 2,111 night visits were made by the Inspectors of lodging-houses, and the condition duly reported to your Medical Officer of Health.

86 houses were reported as being overcrowded ; this is a marked decrease as compared with the last year when the number was 409.

It is also satisfactory to find that the whole of the occupiers of these 86 houses overcrowded complied with the instructions given them to reduce the number of inmates, except seven; in these cases proceedings were taken before the magistrates, and penalties varying from 5s. to £5 with costs inflicted.

497 houses were found in a condition requiring to be cleansed and limewashed. The occupiers of these houses were furnished on loan with lime brushes and other necessaries for cleansing and purifying them.

71 houses were fumigated with sulphurous acid and chlorine gases after fever and other zymotic diseases; in all these cases the bedding and clothes belonging to the sick were exposed to the action of dry air heated to a temperature exceeding 240 degrees Fahr.

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

54 cesspools were emptied in accordance with Bye-Laws.

Three cesspools were emptied by owners contrary to the requirements of your Bye-Laws; proceedings were taken against the offenders, but the cases were dismissed with a caution.

49 animals ascertained to be kept in an improper state, notices were served on owners to abate this nuisance.

331 accumulations of house and refuse matter near dwellings were ordered to be removed.

Five wells were peremptorily closed by order of magistrates, the water being polluted and unfit for dietetic or domestic purposes.

The owners of eleven houses without proper water supply were ordered to obtain the same from the Public Water Works.

Eight carcasses of mutton and two of beef with other pieces of meat were seized, as being unfit for food, in all amounting to 1,790lbs., and destroyed by order of magistrates.

Proceedings were afterwards taken, and seven penalties, varying in sums from 5s. to £10 with costs, inflicted.

809lbs. of fish in a semi-putrified condition were destroyed.

PORT SANITARY AUTHORITY.

In directing your attention to the Port Sanitary duties appertaining to my office, I may state that many of these are detailed in the general body of this report, when alluding to the cases of infectious diseases imported into this district by the shipping. I have now to describe the means adopted to detect disease, when it occurs on board vessels arriving at this port. As explained in a former report, difficulties stand in the way of carrying out a complete and thorough supervision of the shipping, from the

circumstance that there is no convenient spot for vessels to be moored, applicable for quarantine purposes, and a large number arrive in the roads with every tide rendering any inspection impracticable. Under these circumstances such information is obtained through the pilots, whose duty it is, immediately on boarding a vessel, to put certain questions to the officer in charge, with the view of eliciting whether any death or sickness has occurred during the voyage, or whether any of the crew are suffering from disease. The replies are signed and transmitted to the Customs' officials, and if disease is prevalent my attention is called to the fact, and it is my duty to visit the ship as early as possible, and communicate the result to the Custom-house Authority; whilst it is left in my power to take any steps I may deem necessary for the protection of the public health, and that of the crew of the ship. A similar duty also devolves on the rummaging officer, so that little possibility exists of disease on board foreign vessels escaping detection; and it is from these vessels that the importation of infectious diseases of a serious character is to be apprehended. As regards coasting vessels this machinery is not available; but connected with this port an institution has been established called, "The Hamadryad Seamen's Hospital," open to all seamen; and practically all cases of sickness among seamen are treated there. Arrangements are made with the resident Medical Officer, who immediately reports to me any special case requiring to be brought under my notice, with the name of the vessel to which the sick seaman belongs. It is therefore scarcely possible for any serious case of infectious disease to escape my observation.

The subjoined table shows the number of vessels coastwise and foreign, yearly entering this Port, with their registered tonnage, from 1871 to 1880 inclusive :—

Year.	No. of Vessels Inwards.		Total No. of Vessels Foreign and Coastwise.	Tonnage.		Total Tonnage Foreign and Coastwise Inwards.
	Foreign.	Coastwise.		Foreign.	Coastwise.	
1871	4,234	6,919	11,133	1,637,725	588,011	2,225,736
1872	4,942	6,994	11,836	1,957,897	600,805	2,552,702
1873	4,694	6,674	11,368	1,920,410	640,089	2,560,499
1874	4,966	6,213	11,176	2,113,987	545,692	2,659,679
1875	4,645	5,541	10,186	1,947,265	493 818	2,441,083
1876	5,511	6,957	12,468	2,367,307	601,240	2,963,547
1877	5,625	6,661	12,286	2,542,210	586,773	3,128,983
1878	5,867	7,138	13,005	2,821,409	613,845	3,335,254
1879	5,761	6,958	12,719	2,944,565	635,613	3,580,178
1880	6,609	7,117	13,726	3,664,567	667,696	4,332,263

I have obtained a statement of indoor cases of sickness removed from vessels into the seamen's hospital, which gives the following results :—

Diseases.	Cases.	Deaths.
Small-pox ...	3	1
Fever-Typhoid ...	15	0
„ Doubtful ...	6	0
Diarrhœa and Dysentery	10	1
Ague ...	17	0
Acute Rheumatism ...	37	0
Phthisis ...	2	2
Bronchitis ...	48	0
Pleurisy ...		
Pneumonia ...		
Heart Disease ...	1	1
Injuries ...	67	2
Other Diseases ...	165	3
	371	10

It is satisfactory to find that no fatal case of fever occurred in this institution. The vessels from which the cases of typhoid fever were received were visited by me, and I have every reason to believe they were simply sporadic, no second case occurring in the same ship. A similar remark applies to diarrhœa ; the one fatal case was associated with dysentery, and was probably due to the influences of a tropical climate. The above cases practically represent the extent of sickness on board vessels at the time of entering the port as well as those occurring afterwards. Allowing one seaman for every 35 tons, and dividing the total tonnage of the year, 4,332,263, by that number, the result shows the total number of seamen arriving here during the year to be 123,779. The total cases of sickness sufficiently serious to be admitted into the seamen's hospital were 371, and of these 10 only terminated fatally. It must be considered that the proportionate rate of sickness among sailors has been satisfactorily limited.

I have now to state the action taken by me on all occasions when sickness has been reported to me. Without loss of time, the vessel is visited and full inquiries made respecting the condition of those on board. If not already been done, and it is considered necessary, I direct the patient to be removed into the Seamen's Hospital. I then examine the whole of the crew, as also the log book ; and should the case be of a serious character like measures are adopted to those enumerated in my general report when speaking of small-pox.

During the year 97 vessels reported to have sickness on board were visited by me and dealt with; 13 others were in a condition requiring the adoption of sanitary measures, such as cleansing, or improved ventilation; 17 chests of clothes, and 10 bags were removed from the Customs' officials, belonging to seamen who had died during voyage, for the purpose of disinfection; this was effectively done by your Inspector, and returned to the proper authorities.

In concluding this report, I can but again refer, as I have on all previous occasions, to the very efficient manner in which Messrs. James and Gover, your Sanitary Inspectors, have discharged their several duties.

I have the honour to be, Gentlemen,

Your obedient servant,

H. J. PAINE, M.D.,

Medical Officer of Health, Cardiff Urban District and Port Sanitary Authority.

APPENDIX.

CARDIFF URBAN SANITARY DISTRICT.

Deaths registered at several groups of ages from differen causes during the year 1880.

CAUSE OF DEATH.	AGES.						Total.	Death Rate in Cardiff per 1000 Inhabitants, 1880.	Aver Rate Inha Kin 2	Death 1000 ants of m, for cars.
	Under 1 year.	1 and under 5.	5 and under 15	15 and under 25	25 and under 60	60 and upwards.				
CLASSES.										
I. Zymotic Diseases	133	153	25	12	19	4	346	4·14		·038
II. Constitutional	31	61	20	44	126	21	303	3·63		·205
III. Local Diseases	195	95	17	25	224	124	680	8·15		·499
IV. Developmental Diseases ...	105	27	1	4	11	59	201	2·41		·551
V. Violent Deaths	14	9	3	9	55	9	104	1·24		·761
Total	478	339	71	94	435	217	1634	19·59		22·282
CLASS.										
I. ZYMOTIC DISEASES										
ORDER 1.—MIASMATIC										
1. Smallpox				1			1	0·011		0·250
2. Measles	17	47	3				67	0·803		0·428
3. Scarlet Fever (Scarlatina) ...	3	20	6				29	0·347		0·925
4. Diptheria		7	3				10	0·119		0·264
5. Quinsy	1				1		2	0·023		0·016
6. Croup	3	6	4				13	0·155		0·240
7. Whooping Cough	30	44	2		1		77	0·923		0·514
Typhus Fever				1			1	0·011		0·099
8. Enteric or Typhoid Fever ...	1	1	5	3	4		14	0·167		0·381
Simple continued Fever ...	1	3	1	3			8	0·095		0·176
9. Erysipelas				1	3	1	5	0·059		0·097
10. Puerperal Fever (Metria) ...					1		1	0·011		0·059
11. Dysentry	1				2		3	0·035		0·067
12. Diarrhœa	67	25		2	2	3	99	1·187		0·890
13. Cholera					1		1	0·011		0·119
14. Rheumatism				1			1	0·011		0·109
15. Other Zymotic Diseases ...					1		1	0·011		0·005
ORDER 2.—ENTHETIC.										
1 Syphilis	6						6	0·071		0·063
ORDER 3.—DIETIC.										
1. Purpura and Scurvy ...			1				1	0·011		0·018
2. Alcoholism { a. Del. Tremens ..					2		2	0·023		0·023
{ b. Intemperance ..					1		1	0·011		0·017
ORDER 4.—PARASITIC.										
1. Thrush	3						3	0·035		0·055
Totals	133	153	25	12	19	4	346	4·14		5·038
CLASS.										
II CONSTITUTIONAL DISEASES										
ORDER 1. DIATHETIC.										
1. Dropsy					1	1	2	0·023		0·385
2. Cancer				1	20	14	35	0·419		0·369
ORDER 2.—TUBERCULAR.										
1. Scrofula	8	14	5	2	2		31	0·371		0·142
2. Tabes Mesenterica	13	6	1				20	0·239		0·232
3. Phthisis	3	16	8	41	103	6	177	2·122		2·567
4. Hydrocephalus	7	25	6				38	0·455		0·370
Totals	31	61	20	44	126	21	303	3·63		4·205
CLASS.										
III. LOCAL DISEASES.										
ORDER 1.—DISEASES OF NERVOUS SYSTEM.										
1. Cephalitis	4	8	3	1	5		21	0·251		1·98
2. Apoplexy					11	11	22	0·263		4·77
3. Paralysis					14	15	29	0·347		0·486
4. Epilepsy	1	2		2	5	1	11	0·130		0·114
5. Convulsions	79	17	2				98	1·175		1·265
6. Brain Disease, &c.	2	2	1	1	11	5	22	0·263		0·231
ORDER 2.—DISEASES OF CIRCULATION										
1. Aneurism					7	1	8	0·095		0·021
2. Heart Disease			1	3	49	27	80	0·959		0·899
ORDER 3.—DISEASES OF RESPIRATORY ORGANS										
1. Laryngitis	1	3			2		6	0·071		0·068
2. Bronchitis	84	25	2		28	36	175	2·098		1·596
3. Pleurisy					3		3	0·035		0·46
4. Pneumonia	16	32	3	7	25	7	90	1·079		1·163
5. Asthma					2		2	0·023		0·203
6. Lung Disease	2	2			4	2	10	0·119		0·195
ORDER 4.—DISEASES OF DIGESTIVE ORGANS.										
1. Gastritis		1				1	2	0·023		0·038
2. Enteritis	2						2	0·023		0·162
3. Peritonitis		1	2		3	1	7	0·083		0·077
4. Ascites					3	1	4	0·047		0·035
5. Hernia					1	3	4	0·047		0·042
6. Ileus					2		2	0·023		0·059
7. Stricture of Intestines ...				1	1		2	0·023		0·013
8. Stomach Disease, &c. ...	1				1		2	0·023		0·128
9. Hepatitis				1	2		3	0·035		0·069
10. Jaundice	2				3		5	0·059		0·069
11. Liver Disease, &c.				1	8	5	14	0·167		0·238
12. Spleen Disease, &c.					1		1	0·011		0·003
ORDER 5.—DISEASES OF URINARY ORGANS.										
1. Bright's Disease (Nephria) ...	1			6	22	3	32	0·383		0·078
2. Diabetes				1			1	0·011		0·028
3. Calculus (Stone)			2		1		3	0·035		0·010
4. Cystitis					2	2	4	0·047		0·016
5. Kidney Disease		1	1	1	6	2	11	0·130		0·114
ORDER 6.—DISEASES OF ORGANS OF GENERATION.										
1. Ovarian Dropsy					1		1	0·011		0·011
ORDER 8.—DISEASES OF INTEGUMENTARY ORGANS.										
1. Phlegmon		1			1	1	3	0·035		0·023
Totals	195	95	17	25	224	124	680	8·15		8·499
CLASS.										
V. VIOLENT DEATHS.										
ORDER 1.										
1. Fractures and Contusions ...		4	4	3	30	4	45	0·539		0·235
2. Burns and Scalds		2				3	5	0·059		0·146
3. Poison	1		1		1		3	0·035		0·013
4. Drowning	2	1	1	6	15		25	0·299		0·121
5. Suffocation	1				2		3	0·035		0·056
ORDER 2.— ACCIDENTS OR NEGLIGENCE.										
1. Homicide										
2. Murder and Manslaughter ...					1		1	0·011		0·019
ORDER 3.—SUICIDE.					1		1			
1. Hanging						1	1	0·022		0·029
Total	4	7	6	9	50	8	84	1·007		
ORDER 4.										
1. Not classed	10	2	2		5	1	20	0·239		0·165
Totals	14	9	8	9	55	9	104	1·24		0·761

Table of Deaths during the year 1880, in the Urban Sanitary District of Cardiff.

(A)

CLASSIFIED ACCORDING TO DISEASES, AGES, AND LOCALITIES, AND SHOWING ALSO THE POPULATION OF SUCH LOCALITIES, AND THE BIRTHS THEREIN DURING THE YEAR.

Area of District, 7,374 Acres.

(1.) Names of Localities (being Parishes, Groups of Parishes, Townships, Wards, or other areas into which the local area adopted for the purposes of these Statistics) public institutions being excluded.	Population at all Ages.		Registered Births.	Mortality from all causes, at subjoined Ages.							Mortality from subjoined causes, distinguishing Deaths of Children under Five Years of Age.																				
	Census 1871.	Estimated to middle of 1880		At all ages.	Under 1 year.	1 and under 5	5 and under 15	15 and under 25	25 and under 60.	60 and upwards.		Smallpox.	Measles.	Scarlatina.	Diphtheria.	Croup (not spasmodic).	Whooping Cough.	Continued Fevers.			Cholera.	Rheumatic Fever.	Erysipelas	Pyæmia.	Puerperal Fever.	Ague.	Phthisis.	Bronchitis, Pneumonia, Pleurisy, &c.	Heart Disease.	Injuries.	Other Diseases.
																		Typhus.	Enteric or Typhoid.	Other Continued and Dysentery.											
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.
District of Cardiff.....		33,389	2,293	1461	466	324	63	74	356	178	Under 5		55	23	7	9	74		2	4	86						19	157		9	345
											5 upwds.		3	6	2	4	3	1	9	4	7	1	1	5	3	1	136	93	72	48	27
Public Institutions. Infirmary	Unknown present Districts not formed.			43		3	6	7	24	3	Under 5								1								4	3		2	1
											5 upwds.													1						18	13
Hamadryad				10				1	8	1	Under 5	1															2		1	2	3
											5 upwds.																				
Union				118	12	12	1	12	46	35	Under 5		9						2								16	15	7	5	8
											5 upwds.																				48
Gaol.....				2			1		1		Under 5				1																1
											5 upwds.																				
Totals.....		33,389	2,293	1634	478	339	71	94	435	217	Under 5		64	23	7	9	74		2	4	93						19	157		11	354
											5 upwds.	1	3	6	3	4	3	1	12	4	8	1	1	5	4	1	158	111	80	73	337
Deaths occurring inside the division or district among persons not belonging thereto.											Under 5		3								3										3
				29	3	5	3	1	12	5	5 upwds.														1		2	1		5	12

The estimated population of Urban District of Cardiff is based on total number of inhabited houses, and average number of inmates found to exist in each house at census 1861 and 1871.

Table of New Cases of Sickness of a special character which occurred in Public Institutions during the year 1880, in the Urban Sanitary District of Cardiff.

(B)

CLASSIFIED ACCORDING TO LOCALITIES AND DISEASES.

NAMES OF LOCALITIES.	New Cases of Sickness, in Persons belonging to the District, distinguishing those in Children under Five Years of Age.																	
		Smallpox.	Measles.	Scarlatina.	Diphtheria.	Croup (not spasmodic).	Whooping Cough.	Continued Fevers.			Diarrhœa and Dysentery.	Cholera.	Rheumatic Fever.	Erysipelas.	Pyæmia.	Puerperal Fever.	Ague.
								Typhus.	Enteric or Typhoid.	Other Continued.							
1.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.
Workhouse, In	Under 5.		20						2		15		17	5			1
	5 upwards.										3						
„ Out	Under 5.		56	8		4	21				65		28	37			13
	5 upwards.		48	5			4	4	21	29	120						
Infirmary, In..	Under 5.								1		4	1	24	4			
	5 upwards.																
„ Out	Under 5.		54	10			178			59	187						
	5 upwards.		32	69			256		23	76	226		46	20			12
Seamen's Hospital, In	Under 5.	3							15	6	10		27		1		17
	5 upwards.																
Gaol..	Under 5.				1						19						
	5 upwards.																
Totals		3	260	101	1	4	458	4	62	170	654	1	142	66	1		43