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WITH THE COMPLIMENTS OF THE  
MEDICAL OFFICER OF HEALTH.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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TWENTY-SIXTH

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

ON THE

*Sanitary Condition of Newcastle-upon-Tyne,*

WITH

TABULAR RETURNS

OF THE

SICKNESS AND MORTALITY

DURING THE YEAR 1898.

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Newcastle-upon-Tyne :  
TYNE PRINTING WORKS Co., 24 AND 26, SIDE.

1899.

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TO MR. ALD. H. W. NEWTON, J.P., L.F.P.S., CHAIRMAN OF THE  
SANITARY COMMITTEE OF THE CORPORATION OF NEWCASTLE-  
UPON-TYNE.

SIR,

Herewith I beg to submit to you my Twenty-sixth Annual Report, viz., that for the year 1898.

The *Death-rate* of Newcastle from "All Causes" during the year was 20·9 per 1,000 population. The average rate in 33 large towns in the United Kingdom was 19·0. Details as to the general mortality in the different Registration Sub-districts will be found at pages 28-32. The *Death-rate* from the seven "Chief Zymotic Diseases" in Newcastle was 2·21 per 1,000 population, against 2·84 in the 33 large English towns.

*Marriages* (see page 12). In the year ended 31st March 1898, 2,208 marriages were registered in the Registration District of Newcastle-upon-Tyne (which includes the sub-district of Benwell and Fenham), an increase of 35 on the number (2,173) during the previous twelve months.

The number for the year ended March is again the highest on record since the year 1874.

*Zymotic Diseases* caused 493 deaths, against 348 in the previous year. Those from Measles, Whooping Cough, and Diarrhœa were 125, 145, and 146 respectively, against 96, 62, and 146 in the previous year. (See pages 11 and 33).

The number of deaths from *Scarlet Fever* was 26\* against 24\* in the previous year. The mortality from that disease per cent. to cases notified was 3·8, as compared with a rate of 4·8 for the year 1897. 692 cases of *Scarlet Fever* were notified, an increase of 196 on the returns of the year before.

\*Corrected by distribution of those occurring in the City Hospital for Infectious Diseases, of persons belonging to the City.

*Enteric (or Typhoid) Fever* caused 66\* deaths, against 33\* in the previous year. The rate of mortality to cases notified was 21·5 per cent., as compared with 24·0 in the year 1897. The number of cases notified (307) is an increase of 169 over the previous year's return, and is due to the outbreak in the East-end, a special Report on which is given in Appendix E.

*Diphtheria* caused 27\* deaths, against 19\* in 1897. The rate of mortality was 30·3 per cent. The total number of cases (89) notified shews a decrease of 13 below those of the previous year.

*Hospitals for Infectious Diseases.*—429 patients have been admitted to the City Hospital for Infectious Diseases at Walker Gate. The proportion of patients in private medical practice removed to Hospital was 24·5 per cent. of the cases (other than Measles and Whooping Cough) notified in same form of practice. The proportion of cases (other than Measles and Whooping Cough) notified in public practice (including those of the Dispensary) removed to Hospital was 85·3 per cent., as compared with 84·5 per cent. for the previous year. The mortality to cases was 11·2 per cent. Details are given on pages 18 and 34.

*Smallpox Hospital.*—17 cases were admitted during the months of March, April, May, and June, three of which terminated fatally.

*Cholera Hospital.*—During the Smallpox outbreak, the Cholera Hospital was satisfactorily used for isolation purposes. The number of persons removed thereto from infected houses, for observation, was 31. Further particulars are given on page 35 (Appendix A., Table VB).

*Infant Mortality.*—The deaths of Infants under one year of age (1,340) show an increase of 137 over the returns for 1897 (1,203) (see page 33).

The *Uncertified Deaths* registered are 40 against 36 in the preceding year.

\* Corrected by distribution of those occurring in the City Hospital for Infectious Diseases, of persons belonging to the City.

The number of *Cases of Infectious Diseases Notified* by Medical Practitioners (see page 13) is 6,130 against 5,287 in the previous year. The increase is due to the notification of Measles and Whooping Cough (5,010 cases).\* The notified cases of other infectious disease shew an increase of 364 over those of the year 1897.

*Bacteriological Examination of Water.* — In compliance with an instruction of the Sanitary Committee, my Report in favour of the Bacteriological Examination of the Water Supply of the City, of which a copy is given herewith (Appendix B.), was submitted early in the year. After consideration, the Committee resolved that this important work should be carried out for a trial-period of twelve months, Dr. George Murray, Professor of Comparative Pathology and Bacteriology in the University of Durham College of Medicine at Newcastle, being appointed examiner. Professor Murray's first report was made in December, and shewed the following results:—

No.	Date of Collection.	SAMPLE TAKEN AT.	Date of Report.	GELATINE PLATE CULTIVATION FROM 1 C.C. OF WATER.			SMELL BY GROWTH OF BACTERIA.
				BACTERIA FOUND.			
				Number Liquefying Gelatine.	Number not Liquefying Gelatine.	Total.	
1	1898. Dec. 5	Hall's Court, Pump Lane, Quality Row.	1898. Dec. 16	48	96	144	None.
2	„	Tap at 102, Blandford Street	„	114	640	754†	„
3	„	Ridley Court, Groat Market.	„	41	65	106	„
4	Dec. 21	College of Medicine, Northumberland Road.	Dec. 24.	18	74	92	„

\*The Compulsory Notification of Measles and Whooping Cough terminated on August 26th. A special report on the result of this matter is given in Appendix C.

† This result was afterwards found to be due to local conditions of the waterpipe.

## THE WORK OF THE HEALTH DEPARTMENT.

The Reports of the Inspectors are given on pages 21 to 26, and the returns of their work will be found in Appendix A, (Tables VII. to XIII A).

23,117 *Inspections of Tenement Property* have been made during the year. The number of contraventions of the Bye-laws returned is 1,347.

140 cases of *nuisance* have been ordered to be taken before the magistrates. Of these, only 18 were summoned, the rest doing the work before the order could be carried out.

The defects of the existing Tenement Bye-laws with respect to over-crowding, repairs and water supply to water-closets, to which Inspector Wells directs attention (p. 21) are matters coming under notice from time to time, and should be dealt with. The Bye-Law allowing the use of one privy or pail-closet by four families requires, to say the least, revision. These forms of convenience, even under most favourable conditions, i.e., in self-contained houses, are unsavoury and otherwise objectionable. They are, in my opinion, quite unsuitable for tenement dwellings and were, I believe, to blame for the spread of Enteric Fever in the east end of the city during the latter half of the year. My views on this matter are more fully stated in the Report (Appendix E) submitted in October.

*Examination of the Drains of New Buildings.*—This work, which was transferred to the Health Department in the autumn of 1897, has proceeded satisfactorily during the year. The results in brief are:—much better work than before, and a general compliance, on the part of the builders, with official requirements. The testing of the drains with water can now be done much more readily than previously, owing to the freer provision of access chambers and intercepting traps, and the greater willingness of the builders to submit their drains to this test. The observations of Inspector Wells on this point (p. 22) are worth perusal. Bye-laws for the better regulation of this important branch of sanitary work are needed.

The Report of Inspector Hedley shows that the carcasses of 11 Dairy Cows sent to the knackers during the year have been found to be tuberculous. The number of such cattle *still* supplying milk to the citizens from dairies in Newcastle or dairy-farms outside, although probably large, cannot be even guessed at; for although the Corporation took power in 1892 to obtain the compulsory notification of tuberculosis in dairy cows, the provision to that end, owing to the absence of the compulsory application of the tuberculin test, has been a dead letter.

#### CUSTOMS AND INLAND REVENUE ACT, 1890, s. 26 (2).

Applications for Certificates entitling the owners to exemption from Inhabited House Duty have been made during the year in respect of 15 Tenement Houses (including Nos. 1 to 7, Industrial Dwellings). After examination of the respective properties, 13 Certificates, on the form amended and adopted by the Sanitary Committee in 1895, were given.

#### FACTORY AND WORKSHOP ACTS.

Last year 52 "Workshops," including 83 Workrooms, were reported by H.M. Inspector of Factories to the Medical Officer of Health on account of nuisance or sanitary defect. After examination, various insanitary conditions, as specified by the Inspector of Nuisances in his report, were dealt with.

#### HOUSEBUILDING IN THE CITY.

New accommodation has been provided for 1,256 families against provision for 1,173 families during the previous year. Details are given on page 27.

I have the honour to be,

Sir,

Your obedient Servant,

HENRY E. ARMSTRONG, D.Hy.,

MEDICAL OFFICER OF HEALTH.

*Health Department,  
Town Hall,  
Newcastle-upon-Tyne,  
February 28th 1899.*

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

REPORT, 1898.

GENERAL STATISTICS.

Births and  
Deaths (all  
causes).

DURING the 52 weeks ended 31st December 1898, 7,041 births and 4,653 deaths have been registered in the City. The births represent a rate of 31·6 and the deaths a rate of 20·9\* per 1,000 of a population of 223,021 at all ages, as estimated by the Registrar General to the middle of the year.

The following is a Table of the recorded rates of mortality from "All Causes," and the seven "Chief Zymotic Diseases," for the year under report and previous years :—

RATES OF MORTALITY PER 1,000 POPULATION OF NEWCASTLE-UPON-TYNE.

A. D.	All Causes.	Seven "Chief Zymotic Diseases."
1868	27·1	?
1869	27·2	?
1870	25·4	3·9
1871	32·2	9·3
1872	26·3	4·5
1873	30·1	6·9
1874	29·2	5·5
1875	26·1	3·6
1876	22·7	2·6
1877	22·3	2·5
1878	23·7	4·6
1879	23·5	3·9
1880	22·3	3·2
1881	21·7	2·6
1882	23·0	3·3
1883	25·4	4·3
1884	23·5	3·2
1885	26·0	4·4
1886	22·2	2·5
1887	25·2	3·3
1888	20·5	1·4
1889	25·0	3·0
1890	26·2	2·1
1891	23·6	2·5
1892	19·5	1·5
1893	20·9	2·3
1894	18·0	1·9
1895	20·0	2·1
1896	18·4	1·8
1897	18·7	1·6
1898	20·9	2·2†

\* This return does not include the deaths in the City Hospital for Infectious Diseases, 48 in number, of persons belonging to Newcastle. With these included the death-rate is 21·1 per 1,000. Deducting deaths (208) in the Infirmary of persons who came there from beyond the City boundary the rate is 19·9.

† Deducting deaths from diseases not ordinarily notifiable (Measles, 125; Whooping Cough, 145; and Diarrhoea, 146), the rate is 0·3.

The number of births and deaths in the different Registration Sub-districts of the City during 1898 are given in Appendix A, Table I. Births and Deaths.

The mortality from the "Chief Zymotic Diseases" during successive seasons of the year is as follows:— Mortality from Chief Zymotic Diseases

	REGISTRATION SUB-DISTRICTS AND CITY.																									
	WESTGATE. †				ST. ANDREW'S.				ST. NICHOLAS'.				ALL SAINTS'.				BYRER.				CITY.					
	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.	Total	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.	Total	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.	Total	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.	Total	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.	Total	
Smallpox ...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Measles ...	11	16	7	10	44	3	1	10	14	3	2	11	3	...	16	10	28	9	1	48	23	59	22	21	125	
Scarlet Fever (Scarlatina)	3	3	2	...	8	2	...	...	1	3	...	...	...	...	2	1	1	2	...	4	6	5	3	3	17	
Diphtheria ...	2	...	2	...	4	1	...	1	1	3	...	...	...	...	6	4	...	1	2	7	10	2	4	6	22	
Whooping Cough ...	13	15	15	5	48	2	8	1	1	12	2	4	3	...	15	7	33	18	3	61	25	67	44	9	145	
Typhus Fever ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Enteric (or Typhoid) Fever	2	3	1	1	7	...	...	...	...	...	1	...	1	2	8	3	...	4	1	16	7	5	9	12	33	
Simple Continued or Ill-defined Fever ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	
Diarrhoea, Dysentery ...	2	...	37	10	49	1	...	11	1	13	...	1	3	...	15	...	11	4	65	4	2	111	29	146		
TOTALS ...	33	37	62	28	160	6	14	14	14	48	2	8	8	2	62	9	20	26	7	203	75	145	193	80	493†	

\* Exclusive of Deaths in the City Hospital for Infectious Diseases.  
 † Exclusive of Benwell and Fenham.  
 ‡ Representing a Rate of 2.2 per 1,000 population.

Deaths from  
Miasmatic  
order of  
Zymotic  
Diseases.

The condition of the different Registration Sub-Districts in regard of mortality from the Miasmatic order\* of Zymotic diseases during the year is as given in Appendix A, Table II

Diarrhœa,  
Whooping  
Cough, and  
Measles.

The most fatal Zymotic diseases have been Diarrhœa, Whooping Cough, and Measles, from which 146, 145, and 125 deaths respectively are returned.

#### INFANT MORTALITY.

Infant  
Mortality.

The number of Infants dying before the completion of the first year of life is 1,340, as compared with 1,203 1,107, and 1,196, respectively in 1897, 1896, and 1895.

REGISTRATION SUB-DISTRICTS.	Deaths of Children under 1 year of age.		Rates per cent. of Deaths under 1 year to Births registered.	
	1898.	1897.	1898.	1897.
Westgate... ..	546	482	18·6	16·3
St. Andrew's ... ..	95	85	18·1	18·1
St. Nicholas' ... ..	44	50	21·6	27·8
All Saints' ... ..	175	185	19·5	20·0
Byker ... ..	480	401	19·3	17·7
City ... ..	1,340	1,203	19·0	17·7

#### UNCERTIFIED DEATHS DURING THE YEAR 1898.

Uncertified  
Deaths.

40 deaths have been registered for which no proper medical certificate has been given or inquest held, as compared with 36 during the previous year.

#### MARRIAGES.

Marriages

The number of marriages registered in Newcastle-upon-Tyne (Superintendent Registrar's district†), during each of the past ten years (1889-98), is as under :—

Year. ended March 31.	Number of Marriages.	Year ended March 31.	Number of Marriages.
1889	1,874	1894	1,812
1890	2,020	1895	1,851
1891	2,124	1896	1,983
1892	1,894	1897	2,173
1893	1,892	1898	2,208

\* In uniformity with the Classification of causes of death adopted by the Registrar General, Diarrhœal diseases are now excluded from the Miasmatic order of the Zymotic class of diseases. The deaths from these diseases are stated in the Table on previous page.

† Superintendent Registrar's district, which includes the Municipal area and the Extra-Municipal Townships of Benwell and Fenham.

## INFECTIOUS DISEASES INQUIRY.

## CASES OF INFECTIOUS DISEASE KNOWN TO THE HEALTH DEPARTMENT.

During the year under report the following cases of Infectious Disease have been made known to the Medical Officer of Health by medical practitioners and otherwise. Notification of Infectious Disease.

	CASES KNOWN TO THE HEALTH DEPARTMENT.	
	1898.	1897.
Cholera ... ..	...	..
Smallpox ... ..	17	...
Measles ... ..	2,959*	3,216*
Scarlet Fever ... ..	692	496
Diphtheria ... ..	89	102
Whooping Cough ... ..	2,051*	1,315*
Typhus ... ..	...	...
Enteric (or Typhoid) Fever ... ..	307	138
Simple Continued Fever ... ..	13	13
Puerperal Fever ... ..	2	7
Relapsing Fever ... ..	...	...
<b>TOTAL</b> ... ..	<b>6,130</b>	<b>5,287</b>

A Return to the Local Government Board of the Notifications during the previous week has been forwarded each Monday morning during the year, on forms supplied for the purpose.

The following Table shows the different diseases in the respective Wards of the City :— Infectious Diseases in the respective Wards of the City.

WARDS.	Smallpox.	Measles.*	Scarlet Fever.	Diphtheria.	Whooping Cough.*	Enteric (or Typhoid) Fever.	Continued Fever.	Puerperal Fever.	TOTAL.
Elswick East ...	...	182	14	1	72	1	...	...	270
Elswick North ...	2	94	66	4	67	7	1	...	241
Elswick South ...	2	330	56	6	175	9	1	...	579
Arthur's Hill ...	1	150	86	3	102	13	..	...	355
Westgate North..	...	172	45	3	128	7	...	...	355
Westgate South...	3	132	18	4	119	15	...	...	291
St. Andrew's No.	...	39	28	4	89	5	...	...	165
St. John's ...	...	17	7	...	21	2	...	...	47
St. Nicholas' ...	...	9	7	...	44	5	...	...	65
All Saints' West...	...	19	6	...	44	4	...	...	73
All Saints' East ...	5	232	53	9	106	24	...	2	431
All Saints' North ...	...	135	47	11	157	21	6	...	377
St. Andrew's So.	...	21	8	1	63	2	...	...	95
Jesmond ...	...	47	38	5	89	12	...	...	191
Heaton ..	...	405	120	22	280	27	3	...	857
Byker ...	4	975	93	16	495	153	2	...	1,738
<b>City</b> ... ..	<b>17</b>	<b>2,959</b>	<b>692</b>	<b>89</b>	<b>2,051</b>	<b>307</b>	<b>13</b>	<b>2</b>	<b>6,130</b>

\* Notification of Measles and Whooping-Cough began on 26th August, 1896, and ended on 26th August, 1898.

No. of  
Infected  
Households,  
&c.

RETURN SHOWING THE NUMBER OF HOUSEHOLDS, &c., IN WHICH

CERTAIN INFECTIOUS DISEASES WERE NOTIFIED DURING THE YEAR 1898.

DISEASES.	HOUSEHOLDS WITH						Public Institu- tions.	TOTAL.
	Single Cases.	2 Cases each.	3 Cases each.	4 Cases each.	5 Cases each.	6 Cases Each.		
Smallpox ...	9	2	...	1	...	...	...	12
Scarlet Fever ...	379	78	20	17	4	...	5	503
Diphtheria ...	68	8	...	1	...	...	...	77
Enteric (or Typhoid) Fever	175	27	14	1	1	1	6	225
Continued Fever	9	2	...	...	...	...	...	11
Puerperal Fever	2	...	...	...	...	...	...	2
TOTAL ...	642	117	34	20	5	1	11	830

Scarlet  
Fever in  
relation to  
School  
Attendance.

*Scarlet Fever in relation to School Attendance.*—Of the households infected with Scarlet Fever, 433 contained scholars of one or other of 74 different schools in the City. In 15 of the largest elementary schools, scholars came from upwards of 10 of such households during the year, the largest number of scholars from infected households attending any one school being 30.

In two schools there was infection in the households of its scholars during eleven months of the year, in one during ten months, and in another during nine months.

*Rate of Scarlet Fever in Board Schools.*—Through the courtesy of the Clerk to the School Board, Mr. A. Goddard, who has furnished the average daily attendance at each of the Board Schools of the City, it has been possible to prepare the subjoined statement, shewing the percentage of households of scholars in which Scarlet Fever was notified to the average number of scholars in each school:—

Board School.	Per cent. of Households infected with Scarlet Fever.
Arthur's Hill	1.5
Bentinck	2.0
Blenheim Street	0.4
Chillingham Road	2.4
Diana Street	3.3
Elswick Road	1.3
Heaton Park Road	1.4
Longley Street	3.1
Ouseburn	0.5
Raby Street	1.7
Royal Jubilee	1.1
Scotswood Road	0.9
Shieldfield	0.6
Spital Tongues	1.6
Saint Peter's	0.7
Sandyford Road	0.7
Tindal Street	1.0
Todd's Nook	1.7
Union British, Bath Lane	1.0
Victoria Jubilee	1.5
Westmorland Road	0.8

As usual circulars have been sent to the principals of the respective schools attended by pupils from houses notified to be occupied by cases of Infectious Disease, and certificates of final disinfection after this was done.

*Diphtheria in Relation to Milk Supply.*—The households affected were supplied by a large number of dealers. There is no reason to suppose that any outbreak was attributable to milk. 4 dairies supplied milk to more than 1 infected household, viz. :—

1 Dairy	*14 households.
1 „	*5 „
1 „	3 „
1 „	2 „

\* Large Dairies. The cases were spread over many months of the year.

Enteric  
Fever & Milk  
Supply.

*Enteric Fever and Milk Supply.*—The milk supplies of the households infected with Enteric Fever were derived as follows:—

1 Dairy supplied	...	...	...	*20 households.
1 " "	...	...	...	*19 "
1 " "	...	...	...	*8 "
1 " "	...	...	...	7 "
1 " "	...	...	...	3 "
2 Dairies "	...	...	...	5 " each.
9 " "	...	...	...	2 " "

Each of the remaining households was supplied by a separate dairy.

\* These dairies supply a large number of persons, and have branch establishments in several parts of the city. *The cases of Enteric Fever in question were spread over the year.* There is no known reason to blame the milk supply for their occurrence.

#### PUERPERAL FEVER.

Puerperal  
Fever.

The following details refer to Puerperal Fever during the year 1898:—

Inquiries were made in 2 households containing 2 cases.

One of the cases was attended by a midwife, who was cautioned against continuing practice until the lapse of a period of two months after the confinement. This injunction is believed to have been attended to. Compensation for loss of practice was granted by the Sanitary Committee.

Disease  
Inquiry.

*Infectious Disease Inquiry and Disinfection.*—6,130 cases of notifiable infectious disease have been inquired into by the Special Inspectors, with temporary assistance, and the houses or rooms connected therewith disinfected, as compared with 5,287 during the year before. The bedding and other infected articles were removed to the Disinfecting Station, and, after purification, returned to the owners. (For List, see Appendix A, Table VI.)

Compensa-  
tion.

*Compensation granted on account of Infection.*—In 3 cases compensation has been allowed by the Sanitary Committee to the occupiers of infected houses, for clothing, confectionery, &c., destroyed.

## INFECTIOUS CASES NOTIFIED IN PUBLIC INSTITUTIONS, &amp;c.

INSTITUTIONS, &c.	* Measles	Scarlet Fever.	Diph- theria.	Whoop- ing Cough.*	Enteric Fever.	TOTAL.
Royal Infirmary ... ..	7	...	...	..	10	17
Fleming Memorial Hospital for Sick Children, Moor Edge	...	..	1	17	6	24
Barracks (Military) ... ..	...	...	...	2	1	3
St. Vincent's Home, Brunel Terrace ... ..	2	...	...	...	...	2
Union Workhouse .. ...	8	...	...	2	2	12
Girls' Orphanage, North Road.. ... ..	...	2	...	...	...	2
Central Police Station ... ..	...	...	...	...	1	1
North Road Police Station ... ..	..	2	...	...	..	2
Scotswood Rd. ,, ,, ... ..	...	...	...	...	1	1
Arthur's Hill ,, ,, ... ..	...	2	...	...	...	2
Deaf and Dumb Institution, North Road... ..	...	2	...	3	...	5
Children's Hospital, City Road	...	1	...	7	...	8
Dispensary, Nelson Street ... ..	...	...	...	1	...	1
Dr. Barnardo's Home, Shield field Green ... ..	...	...	...	1	...	1
Totals ... ..	17	9	1	33	21	81

Infectious  
Disease in  
Public  
Institutions  
&c.

\* Notification of Measles and Whooping Cough ended August 26th, 1898.

## CITY HOSPITAL FOR INFECTIOUS DISEASES.\*

Work at the  
City Hos-  
pital for  
Infectious  
Diseases.

429 patients have been treated at the City Hospital for Infectious Diseases at Walker Gate during the year, including 5 admitted from the Walker Urban District. The cases were as under :—

Removed to Hospital on notification as	No. of Cases.	After observation proved to be													
		Measles.	German Measles.	Scarlet Fever.	Scarlet Fever and Enteric Fever.	Diphtheria.	Enteric Fever.	Continued Fever.	Influenza.	Septic Tonsillitis.	Broncho-Pneumonia.	Bronchitis.	Gastro-Enteritis.	Intestinal Obstruction.	Other Diseases.
Measles ...	11	8	1	1	...	...	1	...	...	...	...	...	...	...	...
German Measles ...	6	...	6	...	...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever ...	181	1	1	175	2	...	...	...	...	...	...	...	...	...	2
Diphtheria ...	27	...	...	2	...	21	1	...	1	...	...	...	...	...	2
Enteric Fever ...	202	...	...	1	...	...	193	3	2	1	...	...	1	...	...
Continued Fever ...	2	...	...	...	...	...	...	1	...	...	...	...	1	...	...
<b>TOTALS ...</b>	<b>429</b>	<b>9</b>	<b>8</b>	<b>179</b>	<b>2</b>	<b>21</b>	<b>195</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>4</b>

\* For other details see Appendix A, Table V.

## SMALLPOX HOSPITAL.

Smallpox  
Hospital.

17 cases of Smallpox were admitted during the year. See Appendix A—Table VA.

## CHOLERA HOSPITAL.

Cholera  
Hospital

31 persons from Smallpox Infected Houses were admitted to this Hospital for Isolation.—See Appendix A—Table VB.

NOTIFIED CASES OF INFECTIOUS DISEASE (OTHER THAN MEASLES AND WHOOPING  
COUGH) REMOVED TO THE CITY HOSPITAL FOR INFECTIOUS DISEASES,  
WALKER GATE, DURING 1898.

	No. of cases Removed.	Rate per cent. of cases re- moved to cases notified in the same form of practice.
In private practice ...	218	24·5
In Dispensary practice ..	131	85·1
In public practice (including Dispensary) ...	185	85·3

*Expense of Maintenance.*—Of the patients admitted, the expense of maintenance is charged as under :—

	Cases.
To the Sanitary Authority ...	394
To private guarantors (General Wards) ...	28
"    "    (Private Wards) ...	7
<b>Total ...</b>	<b>429</b>

Expense of  
Maintenance of  
Patients

## BURIAL OF CORPSES.

Burial of  
Corpses  
under Local  
Act.

Under the 47th Section of the "Newcastle-upon-Tyne Improvement Act, 1882," Orders of Justice have been obtained during the past year as follows :—

For Burial of Corpses from rooms in which persons live or sleep ..	12
"    "    Royal Infirmary ..	17
<b>Total ..</b>	<b>29</b>

## SUMMARY OF REPORTS MADE DURING 1898.

Summary of  
Reports, &c.  
made during  
the year.

The following, among other matters, have been brought before the Sanitary Committee during the year :—

## ZYMOTIC DISEASES.

	DATE.
Measles and Disinfection of Schools ... ..	Mar., April, & May
Smallpox Precautions ... ..	Mar.
„ Hospital Accommodation ... ..	Mar.
„ Outbreak ... ..	Mar., April, May, June, July, & Aug.
„ Application from Walker Urban District Council for permission to send cases to Newcastle Small- pox Hospital ... ..	Mar., April, & May
Measles and Whooping Cough—Extra Assistance for Disin- fection, &c. ... ..	April
Enteric Fever in connection with a Pail Closet at Copeland Terrace ... ..	May
Scarlet Fever at a Country Dairy Farm supplying Milk to Newcastle .. ..	June
Smallpox—Prosecution for Exposing Infected Clothing on Streets ... ..	July
Notification of Measles and Whooping Cough (Appendix C.)	Aug.
Enteric Fever—Outbreak in Byker and Ouseburn Districts } (Appendix E.) ... ..	Aug., Sept., Oct. and Dec.
Infirmiry Nurse affected with Enteric Fever ... ..	Sept.
Puerperal Fever and Midwife's Practice ... ..	Sept.

## CITY HOSPITAL FOR INFECTIOUS DISEASES.

Nurse affected with Scarlet Fever ... ..	Jan.
Resident Medical Assistant affected with Scarlet Fever ...	Mar. and April
Accommodation for Patients ... ..	Oct.
Appointment of Engineer ... ..	Oct.

## GENERAL.

Bacteriological Examination of the Water Supply (Appen- dix B.) ... ..	Feb. and Dec.
Destruction of Diseased Meat ... ..	Feb.
Appointment of Dr. C. V. Dingle, of the City Hospital for Infectious Diseases, as temporary Medical Officer of Health for Middlesbrough ... ..	Mar.
Salaries of Assistant Inspectors ... ..	May
St. Mary Street—Bone Boiling Works ... ..	July
Ice-Creams for Street-Sale (see Appendix D.) ... ..	Aug.
Newcastle Improvement Bill ... ..	Sept.
Increased Death Rate ... ..	Oct.
Application for permission to establish a Bone Boiling Work at St. Peters ... ..	Oct.
Smoke Prevention (Appendix F.) ... ..	Nov.

WORK OF THE INSPECTORS OF THE HEALTH DEPARTMENT.

General  
Work of the  
Health  
Department

The Report of Mr. W. H. Wells, Inspector of Nuisances, New House-Drainage, Common Lodging Houses, Workshops, and Adulteration, is given below :—

TO THE MEDICAL OFFICER OF HEALTH.

SIR,

I beg to present you my report of the work done in my section of the Health Department during the year ending 31st December, 1898, which includes Tables Nos. VIII. to XIII. (Appendix A.)

*Nuisance Abatement.*—The details of this work are shewn in Tables VIII. and IX. (Appendix A.) There have been 189 privies with ashpits removed, and either water-closets or pail-closets provided instead.

Nuisance  
Abatement

*Magisterial Proceedings for abatement of Nuisances, &c.*—Particulars are given in Appendix A. Table X.

Magisterial  
Proceedings

*Tenement Bye-Laws.*—The operation of these Bye-Laws has resulted in much good, but because of the migratory habits of the people, work has to be begun again and again.

Tenement  
Bye-laws.

The Bye-Laws have been found to require strengthening in the following particulars :—

- 1.—Overcrowding in rooms not exclusively used as living rooms.
- 2.—Minimum floor space per occupier.
- 3.—Landlord to keep in repair the floors, staircases, windows, (especially as to balance cords) and plastering of walls and ceilings.
- 4.—The provision of water to water-closets.

The provision of one privy—if by privy is meant pail-closet—for every four holdings is not sufficient, the word “four” should be altered to “two” where this kind of convenience is used. This alteration would also result in the places being kept cleaner as when so many families use one convenience, there is a reluctance by each to clean the place, and further, four families almost always contain more than 12 persons.

Drains of  
New  
Buildings.

*Drains of New Buildings.*—This work has had very gratifying results, whereas when we begun it the workmen from lack of practice found it difficult so to construct drains that the joints would bear the water test, now this result is easily achieved by them. The builders also at first were afraid of the pipes not being able to bear the pressure which was by some considered enormous with only a 3 feet head, notwithstanding that they knew almost all Drains must ordinarily stand at least such a force in case of chokage. These notions have all been modified, and now a head of 10 feet causes no fear or anxiety.

It will interest the Authority to know that upon an experimental drain I put the whole head of water supplied by the Water Co. to the district of Osborne Road, viz :—118 feet without breaking the pipes. This head of water is equal to a pressure of 51 lbs. to the square inch.

New Bye-Laws or Regulations are urgently needed for this work.

No. of Drains Tested with Water.	No. of Drains Tested with Smoke.	Supplementary Tests.	Supervision of Works in Progress.	Visits to Learn if Works were in Progress.
725	267	801	3214	1738

Bakehouses

*Bakehouses.*—The Retail Bakehouses (79) have been systematically inspected every six months, and at other times. The Wholesale Bakehouses (13) are under the superintendence of the Government Inspector of Factories.

Offensive  
Trades.

*Offensive Trades.*—The following establishments—Triperies (10), Marine Stores (26), Blood Drying (1), Chemical Manure Works (1), Fish Curing (9), Knackeries (2), Soap Works (4), Tanneries (3), and Leather Dressing (3) have been regularly attended to as to cleansing, &c.

*Common Lodging Houses.*—These houses have been well conducted. Eleven of the older houses have been closed, and four new ones placed upon the Register. Common Lodging Houses

The total number of lodgers for which the Common Lodging Houses of the City were registered was, at the close of 1897, 2,058. At the close of the year under report (1898) the number was 2,056.

The average number of lodgers per night was 1,618.

The highest and lowest numbers on any one night were respectively 1,695 and 1,530. For details see Appendix A, Tables XII. and XIII.

*Factory and Workshop Acts.*—52 Workshops, not previously reported to the Authority, which included 83 Workrooms, were inspected during the year. 112 sanitary defects were found, and remedied, as follows:— Factory and Workshop Acts.

Dirty rooms	45
Insufficient ventilation to rooms	1
Overcrowded rooms	4
Dirty passages and staircases	10
Gas Stoves without means provided to carry off the fumes	8
No water-closet accommodation	5
Insufficient water-closet accommodation	10
Defective water-closets	2
Choked water-closets	2
Dirty water-closets	8
No water supply to water-closets	2
Defective pail-closets	2
Defective drains	5
Foul manure pits under workrooms and foul accumulations	6
Defective yard pavement	1
Dirty yard	1
<b>Total...</b>	<b>112</b>

There are now 551 Workshops on our books, and these are periodically inspected so far as can be done with the present staff. 332 Inspections have been made and a large number of defects dealt with.

Adultera-  
tion Acts

*Adulteration Acts.*—The number of milk samples purchased during the year is 270. Only 4.07% of these were certified to be adulterated. Most of the milk samples are first tested in the office with hydrometer and creamometer. Of these 17 were considered to be doubtful, and sent to the Public Analyst, who certified seven of them to be adulterated and one doubtful.

129 of the samples were sent direct to the Analyst without previous tests. Of these 4 were certified to be adulterated and 11 doubtful.

The total number of samples of foods and drugs taken during the year is 386, against 397 in 1897. (For details see Appendix A, Tables XI. and XIa.)

The assistance of the staff has been freely sought by the public during the year.

I am, Sir,

Your obedient Servant,

W. H. WELLS,

INSPECTOR OF NUISANCES, COMMON  
LODGING HOUSES, &c.

*Health Department,*

*Town Hall,*

*22nd February, 1898.*

The following is the report of Mr. Wm. Hedley, Inspector of Cattle, Cow-sheds, Slaughter Houses, and Food :—

TO THE MEDICAL OFFICER OF HEALTH.

SIR,

I beg to present to you my Report for the year ending December 31st, 1898.

The cattle in the City have continued free from infectious disease throughout the year. There has been one outbreak of Swine Fever. 31 swine belonging to two persons were implicated, two of the swine died of the disease and the others were killed by order of the Board of Agriculture. All of the carcasses were destroyed.

The carcasses of 27 cows belonging to dairymen have been sent to the knackers. 11 were found to be affected with Tuberculosis, the cause of death in the other cases being inflammation after calving, etc.

The inspection of cow-sheds has been regularly attended to. Several repairs have been done on verbal request. Several of the cow-sheds do not comply with the local regulations. The worst have been reported, and are now under the consideration of the Health Department Sub-Committee.

The dairymen in the City are gradually decreasing in number. Four have ceased business during the year.

*Slaughter-houses.*—There has been little change in these places. There is a general want of accommodation for slaughtering animals in the western part of the City. Several places are overcrowded, and it is difficult to keep them in good sanitary condition. One place has been closed, the owner requiring the premises for other purposes. This only has a tendency to make matters worse in other places. During the last ten years twelve slaughter-houses have been

closed in the west district of the City, and only one new building has been licensed during that time. In October the Council approved of 125 places being licensed—two of these are used as knackers' yards.

*Fish Market, Close.*—The supply of fish has been small and irregular throughout the year. A considerable quantity of unclean salmon and trout was imported from Norway, which was destroyed with the consent of the consignees. The following is a return of fish destroyed on account of being unfit for food:—

Salmon and Salmon Trout.—1086 lbs.	Findon Haddocks.—59 Boxes.
Ling.—1 Barrel and 4 Fish.	Kippered Herring.—204 Boxes.
Skate.—5 Barrels.	Bloaters.—51 Boxes.
Mackerel.—6 Boxes.	Oysters.—3 Barrels.
Eels.—2 Boxes.	Mussels.—28 Bags.
Herrings (Unsalted).—40 Barrels.	Cockles.—2 Bags.

A return of diseased and unsound provisions dealt with during the year, and the proceedings thereon, is given in Table VII.

I am, Sir,

Your obedient Servant,

WM. HEDLEY,

INSPECTOR OF CATTLE, PROVISIONS, &c.

*Health Department,  
Town Hall,  
Newcastle-on-Tyne,  
18th Feb., 1899.*

## HOUSES BUILT DURING THE YEAR 1898.

The following return of houses built during the year under report <sup>House-</sup> <sub>building.</sub> is supplied through the courtesy of the City Engineer :—

Newcastle-upon-Tyne.	Houses. Self-contained.	Houses of Two Flats each.
Elswick Township ... ..	4	81
Westgate Township ... ..	—	12
Byker Township ... ..	9	240
Jesmond Township .. ...	103	208
Heaton Township... ..	9	19
St. Andrew's Parish ... ..	5	3
St. John's Parish ... ..	—	—
St. Nicholas' Parish ... ..	—	—
All Saints' Parish... ..	—	—
	130	563

(for 1,126 families.)

New accommodation has thus been provided for 1,256 families, or at <sup>New Accom-</sup> <sub>modation.</sub> the rate of 5 persons to a family, 6,280 persons, as compared with accommodation estimated for 5,865 persons provided during 1897.

## SANITARY ALTERATIONS.

61 plans for minor sanitary works have been examined and approved or otherwise by the Medical Officer of Health and forwarded to the City Engineer for his consideration, as compared with 65 during the previous year.

HENRY E. ARMSTRONG, D.HY.,

MEDICAL OFFICER OF HEALTH.

*Health Department,*

*Town Hall,*

*Newcastle-upon-Tyne,*

*February 28th, 1899.*

# City and County of Newcastle-upon-Tyne, 1898.

## APPENDIX A.

### TABLE I.

POPULATION (ESTIMATED BY THE REGISTRAR GENERAL TO THE MIDDLE  
OF THE YEAR)—223,021.

Registration Sub-districts and City.	Different Quarters of the Year.	Births Registered in 52 Weeks ended 31st December, 1898.			Deaths Registered in 52 Weeks ended 31st December, 1898.		
		Male.	Female	Total.	Male.	Female	Total.
Westgate ...	1st Quarter ...	389	389	778	215	207	422
	2nd „ ...	394	364	758	247	233	480
	3rd „ ...	373	356	729	288	267	555
	4th „ ...	322	341	663	244	200	444
	Total ...	1,478	1,450	2,928	994	907	1,901
St. Andrew's ...	1st Quarter ...	69	65	134	39	45	84
	2nd „ ...	66	51	117	42	51	93
	3rd „ ...	60	67	127	49	49	98
	4th „ ...	69	78	147	57	62	119
	Total ...	264	261	525	187	207	394
St. Nicholas' ...	1st Quarter ...	22	30	52	84	52	136
	2nd „ ...	18	27	45	83	53	136
	3rd „ ...	32	24	56	98	66	164
	4th „ ...	25	26	51	74	47	121
	Total ...	97	107	204	339	218	557
All Saints' ...	1st Quarter ...	94	103	197	64	60	124
	2nd „ ...	115	118	233	92	79	171
	3rd „ ...	127	109	236	64	72	136
	4th „ ...	109	122	231	74	71	145
	Total ...	445	452	897	294	282	576
Byker ...	1st Quarter ...	357	297	654	141	99	240
	2nd „ ...	322	320	642	178	181	359
	3rd „ ...	309	340	649	185	164	349
	4th „ ...	270	272	542	140	137	277
	Total ...	1,258	1,229	2,487	644	581	1,225
City ...	1st Quarter ..	931	884	1,815	543	463	1,006
	2nd „ ...	915	880	1,795	642	597	1,239
	3rd „ ...	901	896	1,797	684	618	1,302
	4th „ ...	795	839	1,634	589	517	1,106
	Total ...	3,542	3,499	7,041	2,458	2,195	4,653

The Births represent a rate of 31·6, and the Deaths a rate of 20·9 per 1,000 estimated population. The increase of births over deaths is 2,388 this year, as compared with 2,729 in 1897. The increase of population at Midsummer, 1898, over that at Midsummer, 1897, is estimated by the Registrar General at 5,466 persons.

TABLE II.

RETURN OF CAUSES OF DEATH IN THE REGISTRATION SUB-DISTRICTS AND ENTIRE CITY DURING THE 52 WEEKS ENDED 31ST DECEMBER, 1898.

CAUSE OF DEATH.	REGISTRATION SUB-DISTRICTS AND CITY.					
	City.	Westgate.	St. Andrew's.	*St. Nicholas.	All Saints.	Byker.
<b>I.—SPECIFIC, FEBRILE, OR ZYMOTIC DISEASES.</b>						
<b>1.—Miasmatic Diseases.</b>						
Smallpox ... ..	3	..	3	...	..	...
Measles... ..	125	44	14	3	16	48
Scarlet Fever (Scarlatina) ... ..	17	8	3	...	2	4
Diphtheria ... ..	22	4	3	2	6	7
Whooping Cough ... ..	145	48	12	9	15	61
Enteric (or Typhoid) Fever ... ..	33	7	...	2	8	16
Simple Continued & Ill-defined Fever	2	...	...	...	...	2
Influenza ... ..	30	11	8	...	2	9
Other Miasmatic Diseases ... ..	2	2	...	...	...	...
<b>2.—Diarrhœal Diseases.</b>						
Diarrhœa, Dysentery .. ..	146	49	13	4	15	65
<b>3.—Malarial Diseases.</b>						
(e.g., Remittent Fever, Ague) .. ..	1	1	...	...	...	...
<b>5 — Venereal Diseases.</b>						
Syphilis ... ..	6	2	1	...	...	3
Gonorrhœa Stricture of Urethra ...	9	2	...	7	...	...
<b>6.—Septic Diseases.</b>						
Erysipelas ... ..	5	2	...	...	2	1
Pyæmia, Septicæmia ... ..	13	2	...	8	2	1
<b>II.—PARASITIC DISEASES.</b>						
Thrush ... ..	4	1	1	2	...	...
Hydatids and other Animal Parasitic Diseases ... ..	1	...	...	1	...	...
<b>III.—DIETIC DISEASES.</b>						
Starvation and Want of Breast Milk	5	4	...	...	..	1
Chronic Alcoholism, Delirium Tremens ... ..	15	10	1	1	1	2
<b>IV.—CONSTITUTIONAL DISEASES.</b>						
Rheumatic Fever and Rheumatism of the Heart .. ..	9	4	3	...	...	2
Rheumatism ... ..	8	5	1	1	...	1
Gout ... ..	2	1	...	...	...	1
Rickets... ..	13	6	...	...	2	5
Cancer, Malignant Disease ... ..	174	84	13	40	11	26
Tabes Mesenterica ... ..	31	19	3	1	2	6
Tubercular Meningitis, Hydrocephalus ... ..	70	30	1	4	12	23
Carried forward ... ..	891	346	80	85	96	284

TABLE II.—CONTINUED.

RETURN OF CAUSES OF DEATH IN THE REGISTRATION SUB-DISTRICTS AND ENTIRE CITY DURING THE 52 WEEKS ENDED 31ST DECEMBER, 1898.

CAUSE OF DEATH.	REGISTRATION SUB-DISTRICTS AND CITY.					
	CITY.	Westgate.	St. Andrew's.	*St. Nicholas'.	All Saints'.	Byker.
Brought forward ... ..	891	345	80	85	96	284
<b>IV.—CONSTITUTIONAL DISEASES, <i>Cont.</i></b>						
Phthisis ... ..	412	222	26	31	50	83
Other Tubercular and Scrofulous Diseases ... ..	62	25	6	11	3	17
Anæmia, Chlorosis, Leucocythæmia ... ..	12	4	1	1	3	3
Glycosuria, Diabetes, Mellitus ... ..	12	6	1	3	...	2
Other Constitutional Diseases ... ..	1	1	...	...	...	...
<b>V.—DEVELOPMENTAL DISEASES.</b>						
Premature Birth ... ..	151	59	16	3	9	64
Atelectasis ... ..	1	1	...	...	...	...
Congenital Malformations ... ..	13	4	...	...	2	7
Old Age ... ..	209	103	27	5	27	47
<b>VI.—LOCAL DISEASES.</b>						
<i>1.—Diseases of Nervous System.</i>						
Inflammation of Brain or Membranes ... ..	73	23	4	4	12	30
Apoplexy, Softening of Brain, Hemiplegia, Brain Paralysis ... ..	192	98	19	11	23	41
Insanity, General Paralysis of the Insane ... ..	6	4	...	1	...	1
Epilepsy ... ..	15	5	3	1	1	5
Convulsions ... ..	123	52	6	1	28	36
Laryngismus Stridulus (Spasm of Glottis) ... ..	4	3	1	...	...	...
Paralysis Agitans. Paraplegia, Disease of Spinal Cord ... ..	8	4	1	2	...	1
Other Diseases of Nervous System ... ..	25	7	4	6	3	5
<i>2.—Diseases of Organs of Special Sense.</i>						
( <i>e.g.</i> , Ear, Eyes, and Nose) ... ..	6	2	1	1	...	2
<i>3.—Diseases of Circulatory System.</i>						
Endocarditis, Valvular Diseases of Heart ... ..	80	42	8	22	3	5
Pericarditis ... ..	3	1	...	1	...	1
Other Diseases of Heart ... ..	250	103	24	34	39	50
Aneurism ... ..	7	1	1	4	...	1
Embolism, Thrombosis ... ..	8	2	1	3	1	1
Other Diseases of Blood Vessels ... ..	9	6	...	1	1	1
<i>4.—Diseases of Respiratory System.</i>						
Croup ... ..	18	4	2	3	1	8
Laryngitis ... ..	12	4	...	2	4	2
Carried forward ... ..	2,603	1,132	232	236	306	697

TABLE II.—CONTINUED.

RETURN OF CAUSES OF DEATH IN THE REGISTRATION SUB-DISTRICTS AND ENTIRE CITY DURING THE 52 WEEKS ENDED 31ST DECEMBER, 1898.

CAUSE OF DEATH.	REGISTRATION SUB-DISTRICTS AND CITY.					
	City.	Westgate.	St. Andrew's.	St. Nicholas.	All Saints.	Byker.
Brought forward ... ..	2,603	1,132	232	236	306	697
<i>4.—Diseases of Respiratory System.</i>						
<i>(Continued.)</i>						
Bronchitis ... ..	329	144	24	23	52	86
Pneumonia ... ..	276	100	28	15	45	88
Pleurisy ... ..	14	6	1	...	1	6
Emphysema, Asthma ... ..	13	8	...	1	1	3
Other Diseases of Respiratory System ... ..	28	13	...	5	2	8
<i>5.—Diseases of Digestive System.</i>						
Dentition ... ..	34	13	...	1	5	15
Tonsillitis, &c. ... ..	3	3	...	...	...	...
Diseases of Stomach ... ..	36	10	5	6	6	9
Enteritis ... ..	41	14	4	...	7	16
Peritonitis ... ..	43	14	2	9	7	11
Obstructive Diseases of Intestine ... ..	14	2	1	7	1	3
Ascites .. ... ..	1	...	...	...	1	...
Cirrhosis of Liver ... ..	36	13	5	6	2	10
Jaundice and other Diseases of Liver ... ..	30	11	3	5	3	8
Other Diseases of Digestive System ... ..	231	88	16	28	28	71
<i>6.—Diseases of Lymphatic System.</i>						
<i>(e.g., of Lymphatics and of Spleen)</i>						
...	3	1	1	...	...	1
<i>8.—Diseases of Urinary System.</i>						
Nephritis ... ..	54	22	1	15	5	11
Bright's Disease, Albuminuria ... ..	36	14	1	8	2	11
Disease of Bladder and of Prostate ... ..	14	5	3	4	2	...
Other Diseases of the Urinary System ... ..	13	5	1	4	...	3
<i>9.—Diseases of Reproductive System.</i>						
<i>(A) Of Organs of Generation.</i>						
Male Organs ... ..	1	...	...	1	...	...
Female Organs ... ..	11	...	...	9	...	2
<i>(B) Of Parturition.</i>						
Abortion, Miscarriage ... ..	1	...	1	...	...	...
Puerperal Convulsions ... ..	2	1	...	...	1	...
Placenta Prævia, Flooding ... ..	4	1	...	...	...	3
Other Accidents of Childbirth ... ..	14	8	1	3	2	...
<i>10.—Diseases of Locomotive System.</i>						
Caries, Necrosis ... ..	4	1	1	1	...	1
Arthritis, Ostitis, Periostitis ... ..	6	2	3	...	...	1
Other Diseases of Locomotive System ... ..	8	3	...	4	..	1
<i>11.—Diseases of Integumentary System.</i>						
<i>(e.g., Carbuncle, Phlegmon, Cellulitis)</i>						
Other Diseases of Integumentary System ... ..	4	2	...	...	2	...
...	10	3	1	4	...	2
Carried forward ... ..	3,917	1,639	335	395	481	1,067

TABLE II.—CONTINUED.

RETURN OF CAUSES OF DEATH IN THE REGISTRATION SUB-DISTRICTS AND ENTIRE CITY DURING THE 52 WEEKS ENDED 31ST DECEMBER, 1898.

CAUSE OF DEATH.	REGISTRATION SUB-DISTRICTS AND CITY.					
	City.	Westgate.	St. Andrew's.	*St. Nicholas'.	All Saints'.	Byker.
Brought forward ... ..	3,917	1,639	335	395	481	1,067
<b>VII.—VIOLENCE.</b>						
<i>1.—Accident, Negligence, &amp;c.</i>						
Fracture and Contusion ... ..	84	12	4	55	4	9
Gunshot Wound ... ..	1	...	...	...	...	1
Cut, Stab ... ..	1	1	...	...	...	...
Burn and Scald ... ..	39	3	...	33	1	2
Poison ... ..	9	6	...	...	2	1
Drowning ... ..	6	3	...	...	1	2
Suffocation ... ..	21	10	2	1	5	3
Hernia ... ..	9	2	1	6	...	...
Deaths consequent on Surgical Operation ... ..	6	1	...	4	...	1
Otherwise ... ..	1	...	...	1	...	..
<i>2.—Homicide.</i>						
Murder and Manslaughter ... ..	3	1	...	...	1	1
<i>3.—Suicide.</i>						
Gunshot Wound ... ..	1	...	...	1	...	...
Cut, Stab ... ..	7	1	...	2	4	...
Poison ... ..	3	...	2	...	1	...
Drowning ... ..	1	...	...	...	1	..
Hanging ... ..	7	2	3	...	1	1
Otherwise ... ..	1	...	...	...	1	...
<b>VIII.—DEATHS FROM ILL DEFINED AND NOT SPECIFIED CAUSES.</b>						
Dropsy ... ..	2	...	1	1	...	...
Debility, Atrophy, Inanition ... ..	283	130	18	11	39	85
Mortification ... ..	9	3	1	4	1	...
Tumour ... ..	39	13	3	14	1	8
Abscess... ..	10	1	1	3	2	3
Hæmorrhage ... ..	14	5	3	2	...	4
Found Dead (cause not stated) ... ..	13	2	1	4	4	2
Other Causes not Specified or Ill- defined ... ..	166	66	19	20	26	35
<b>TOTALS ... ..</b>	<b>4,653</b>	<b>1,901</b>	<b>394</b>	<b>557‡</b>	<b>576</b>	<b>1,225</b>

† Includes Union Workhouse.

\* Includes Royal Infirmary.

‡ The number of Deaths is increased by 375 in the Royal Infirmary, 208 of which came to that Institution from beyond the City. In 9 other Infirmary cases the residences are not stated in the returns.

TABLE III.

ANNUAL DEATH-RATE FROM ALL CAUSES AND FROM THE SEVEN "CHIEF ZYMOTIC DISEASES" PER 1,000 LIVING IN NEWCASTLE, COMPARED WITH THE AVERAGE RATES IN THE LARGE TOWNS OF THE UNITED KINGDOM.

	All Causes.		Seven "Chief Zymotic Diseases." <sup>a</sup>	
	1898		1898.	
	Average in 33 Towns.	Rate in Newcastle.	Average in 33 Towns.	Rate in Newcastle.
1st Quarter ... ..	20·6	18·0	2·38	1·34
2nd " ... ..	17·1	22·2	1·88	2·60
3rd " ... ..	20·3	23·4	4·94	3·46
4th " ... ..	18·1	19·8	2·14	1·43
Annual Rate .. ..	19·0	20·9	2·84	2·21

<sup>a</sup> Includes Smallpox, Scarlet Fever, Diphtheria, Typhus, Enteric, and Continued " Fevers," Measles, Whooping Cough, and Diarrhœa.

TABLE IV.—AGES AT DEATH.

Periods.	REGISTRATION SUB-DISTRICTS.					
	Westgate.	St. Andrew's.	St. Nicholas'.	All Saints'.	Byker.	Total in City.
Under 1 Year ... ..	546	95	44	175	480	1,340
1 Year and under 5 Years ..	242	54	49	92	229	666
5 Years ,, 20 ,, ...	81	25	68	35	88	297
20 ,, ,, 40 ,, ...	231	46	167	69	94	607
40 ,, ,, 60 ,, ...	316	69	161	97	146	789
60 ,, ,, 80 ,, ...	419	80	65	89	160	813
80 ,, and upwards ...	66	24	3	19	28	140
Age not known ... ..	—	1	—	—	—	1
Total (all ages) dying } during 52 weeks ended } 31st December, 1898 .. }	1,901	394	557	576	1,225	4,653

TABLE V.

ADMISSIONS TO AND DEATHS AT THE CITY HOSPITAL FOR INFECTIOUS DISEASES  
(OTHER THAN SMALLPOX AND CHOLERA) DURING THE YEAR 1898.

DISEASES.	ADMISSIONS.													DEATHS.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.	
Measles ... ..			1	2			4	2					9														
German Measles ... ..	6		2										8														
Scarlet Fever ... ..	11	14	15	22	13	8	14	11	15	17	29	10	179*		1		1	1					1	3	1	1	9
Scarlet Fever and Enteric .. Fever (combined)...												2	2														
Diphtheria ... ..	1	1	2		1	4		1	2	3	6		21		1				1		1	1		1		5	
Enteric Fever ... ..	3	9	10	2	4	8	4	36	36	34	30	19	195†	2		1	2			1	1	5	10	5	6	33	
Continued Fever ... ..		1							1	1		1	4														
Influenza ... ..					1	1							2‡														
Bronchitis ... ..					1								1														
Broncho Pneumonia ... ..							1						1														
Septic Tonsillitis ... ..	1												1														
Gastro-Enteritis ... ..	1												1														
Intestinal Obstruction ... ..										1			1										1			1	
Other Diseases ... ..			1								1	2	4														
TOTAL ... ..	23	25	31	26	20	21	23	50	54	56	68	32	429	2	2	1	3	1	1	1	2	7	14	7	7	48	

The deaths in the City Hospital for Infectious Diseases, 48 in number, are included in the returns for the Walker Urban District.

\* Includes Resident Medical Assistant, 1 Nurse, and 2 cases from Walker Urban District.

† " 3 Nurses, and 3 cases from Walker Urban District.

‡ " 1 Nurse.

TABLE VA.

SMALLPOX HOSPITAL.—Admissions and Deaths during 1898.

Month.	Admissions.	Deaths.
March ... ..	1	—
April ... ..	6	1
May ... ..	8	1
June ... ..	2	1
TOTALS ... ..	17	3

TABLE VB.

## CHOLERA HOSPITAL, 1898.

RETURN OF FAMILIES ADMITTED FROM SMALLPOX INFECTED HOUSES  
FOR ISOLATION.

No. of Family.	Date of Admission.	Date of Discharge.	No. of days in Hospital.
3	Mar. 20	Mar. 23	4
2 { 1	April 9	April 11	15
7 { 1	" 9	" 23	3
7	May 3	May 9	7
3	" 14	" 22	9
3	" 19	" 23	5
3	" 27	{ 1 on May 30	4
3	" 29	{ 2 on June 1	6
7	" 29	June 2	5
		" 7	10

31 persons 222 days in Hospital.

TABLE VI.

INFECTED ARTICLES DESTROYED AND REPLACED BY THE HEALTH DEPARTMENT.

	1898.	1897.
Half Straw Mattresses ... ..	302	512
Straw Beds ... ..	2	9
Flock ,, ... ..	2	8
Bed Ticks ... ..	5	2

INFECTED ARTICLES PURIFIED IN THE DISINFECTING APPARATUS AT THE CITY  
HOSPITAL FOR INFECTIOUS DISEASES, WALKER GATE.

ARTICLES FROM CITY.		ARTICLES—HOSPITAL PROPERTY.	
1898.	1897.	1898.	1897.
23,673	27,986	2,061.	1,523

TABLE VII.

RETURN OF SUSPECTED AND UNWHOLESOME PROVISIONS INSPECTED DURING THE YEAR 1898.

PROVISIONS INSPECTED.	Amount of Suspected Provisions Inspected.	CONDITION.		BAD—HOW DISPOSED OF.	
		Fit for Food.	Unfit for Food.	Destroyed by Order of Justice.	Destroyed with Owner's Consent.
Carcases of Beef ...	177	77	100	10	90
Sides of Beef ...	1,192	1,192	...	...	...
Quarters of Beef ...	101	82	19	9	10
Carcases of Veal ...	65	16	49	2	47
Carcases of Mutton ...	212	61	151	...	151
Carcases of Pork ...	185	82	103	14	89
Quarters of Venison ...	4	...	4	...	4
Pieces of Beef, &c., lbs. ...	565	...	565	...	565
Bacon (Pounds) ...	560	...	560	...	560
Pork Hams (Pounds) ...	116	...	116	...	116
Ox Heads ...	16	...	16	...	16
„ Hearts ...	19	...	19	...	19
„ Livers ...	12	...	12	...	12
Calf Plucks ...	18	...	18	...	18
Sheep Heads ...	15	...	15	...	15
Sheep Plucks ...	4	...	4	...	4
Pig Plucks ...	98	...	98	...	98
Pig Kidneys ...	187	...	187	...	187
Hares ...	12	...	12	...	12
Rabbits (Couples) ...	259	...	259	47	212
Geese ...	18	...	18	...	18
Ducks ...	64	...	64	...	64
Chickens ...	152	...	152	...	152
Capercaillie (Brace) ...	42	42	...	...	...
Black Game (Brace) ...	59	50	9	...	9
Hazel Grouse (Brace) ...	70	70	...	...	...
Partridge (Brace) ...	35	35	...	...	...
Ptarmigan (Brace) ...	50	50	...	...	...

Of the carcasses of beef returned as bad, 16 of the animals were bought in public markets as being healthy. When slaughtered, they were found affected with tuberculosis and were destroyed. The sides of beef were imported from Denmark. They were all found free from disease. 80 of the quarters of beef were imported from Tooting. 6 of these were found affected with tubercle, and were destroyed by order of a Justice of the Peace.

Nine persons were summoned for being the owners of diseased or unsound meat intended for sale as human food; and one for having sold a quantity of unsound rabbits. All were convicted, and fines amounting to £58 were inflicted.

(Signed) WM. HEDLEY, INSPECTOR.

TABLE VIII.

SUMMARY OF NUISANCES FOR THE ABATEMENT OF WHICH NOTICES  
HAVE BEEN SERVED DURING 1898.

Foul privies and ashpits to replace with water-closets or pail-closets ...	572
Cellar dwellings not in conformity with law (to be closed or not used separately as dwellings) ... ..	9
Dirty or dilapidated rooms (to be cleaned or repaired) ... ..	168
Insufficient privy accommodation (additional water-closets or pail-closets ordered) ... ..	26
Foul ashpits not connected with privies (to remove and provide tubs)...	89
Defective tubs (to provide new tubs) ... ..	149
Insufficient tubs for dry house refuse (to provide additional tubs) ...	113
* Defective water-closets ... ..	123
* Water-closets without water supply ... ..	99
* Choked water-closets (mostly served on tenants) .. ..	424
* Dirty water-closets (all served on tenants) ... ..	94
† Defective pail-closets ... ..	662
† Dirty pail-closets (all served on tenants) ... ..	49
Smoke nuisances (to abate) ... ..	37
Overcrowding (to abate) ... ..	30
Defective pavement in yards and passages (to repair) ... ..	178
Dirty yards and passages (to cleanse) ... ..	309
Defective drains, sinks, soil-pipes, &c. (to cleanse, repair, or construct new drains) ... ..	1,311
Broken roofs and water spouting (to repair) ... ..	265
Want of water supply (to provide) ... ..	205
Animals, pigeons, and fowls improperly kept (to remove) ... ..	90
Accumulations of manure (to periodically remove) ... ..	168
Offensive accumulations (to remove) ... ..	75
Unclassified minor nuisances (to abate) ... ..	33
Want of sanitary conveniences in public houses (to provide) ... ..	4
<b>Totals</b> ... ..	<b>5,282</b>

\*To repair or cleanse. †To provide new pans, or to repair the roofs, seats, and floors, or to cleanse.

(Signed,) W. H. WELLS,

INSPECTOR OF NUISANCES.

TABLE IX.

DETAILS RELATING TO CERTAIN WORKS CARRIED OUT IN THE ABATEMENT  
OF NUISANCES DURING 1898.

Length in yards of old drains removed ... ..	5,369
"    "    new    "    constructed ... ..	5,894
New trapped gullies provided to drains ... ..	541
Combined privies and ashpits removed	
{ privies ... ..	*189
{ ashpits ... ..	*133
Water-closets provided ... ..	†139
Pail-closets    "    ... ..	‡117
Foul "container" closets removed, and closets of a better design substituted ... ..	32
Dry ash-tubs substituted for dry ash-pits where water-closets existed...	51
Cellar dwellings prevented from being occupied separately ... ..	3
No. of drains tested by smoke ... ..	1,340
No. of smoke tests made ... ..	1,632
No. of complaints made at office (verbally or by letter) ... ..	806
No. of tenement inspections made ... ..	23,117
No. of contraventions of Tenement Bye-laws for which notices have been served to obtain remedy ... ..	1,347
Inspections of houses made from complaints received outdoors or nuisances discovered in the district, including a large number of minor nuisances, such as choked drains and dirty yards, the abatement of which was accomplished at the time of visit, and without legal notice ... ..	7,399
Inspections to learn if works ordered were in progress ... ..	7,026
Common yards and courts in the worst localities specially visited on Friday afternoons and Saturday mornings to obtain weekly cleansing of same .. ..	24,907
Inspections after infectious disease ... ..	698
Supervisions of works in progress .. ..	2,736
Inspections of milk shops ... ..	930
"    bakehouses ... ..	468
"    offensive trades ... ..	500

\* Some ashpits have more than one privy attached.

† 15 of these have been provided on premises where the accommodation was previously insufficient.

‡ 20

|| In addition to this number the "District Inspectors" have daily had premises cleansed by verbal order.

(Signed) W. H. WELLS,

INSPECTOR OF NUISANCES

TABLE X.

SUMMARY OF LEGAL PROCEEDINGS ORDERED TO BE TAKEN BEFORE THE MAGISTRATES FOR THE ABATEMENT OF NUISANCES, &C., DURING THE YEAR 1898.

Nature of Complaint.	No. of Cases.	How disposed of.	Amount of Penalties Imposed.		
			£	s.	d.
Foul privies and Ash-pits.	16	In 14 cases nuisances abated before summonses were applied for. In 2 cases Magistrates' order was made to do the work in 14 days, with costs.			
Want of Privy Pails, Pails defective, &c.	20	In 19 cases nuisances abated before summonses were applied for. In 1 case the summons was withdrawn the pail being provided, defendant paying costs.			
Choked and defective Drains.	45	In 41 cases nuisances abated before summonses were applied for. In 2 cases the summonses were withdrawn, the work being done, defendants paying costs. In 2 cases Magistrates' order was made to do the work in 28 days, and defendant fined 10/- and costs in each case.	1.	0.	0.
Defective Yard Pavements and Unpaved Yards.	10	In 7 cases nuisances abated before the summonses were applied for. In 2 cases Magistrates' order was made to do the work in 14 days. In 1 case Magistrates' order was made to do the work in 28 days, and defendant fined 10/- and costs.	0.	10.	0.
Defective Roofs and Spouts.	2	Nuisances abated before the summonses were applied for.			
Defective Water-closets	4	Ditto.			
Accumulations of refuse	4	Ditto.			
Overcrowding.	1	Ditto.			
Manure Pit full.	4	Defendants summoned and fined 1/- and costs each.	C.	4.	0.
No Manure Pit.	1	Defendant summoned and fined 20/- and costs.	1.	0.	0.
Want of tubs for dry house refuse.	2	Nuisances abated before the summonses were applied for			
<i>Tenement Bye-laws—</i> Contravention of Bye-law No. 12, insufficient Water-closet accommodation.	6	Ditto.			
<i>Carried forward...</i>	115		£	2.	14. 0.

TABLE X.—CONTINUED.

SUMMARY OF LEGAL PROCEEDINGS ORDERED TO BE TAKEN BEFORE THE MAGISTRATES FOR THE ABATEMENT OF NUISANCES, &c., DURING THE YEAR 1898.

Nature of Complaint.	No. of Cases.	How disposed of.	Amount of Penalties Imposed.
<i>Brought forward ..</i>	115		£ s. d. 2. 14. 0.
<i>Tenement Bye-Laws (Continued)—</i>			
Contravention of Bye-law No. 31, lime-washing passages and staircases.	7	Nuisances abated before the summonses were applied for.	
Contravention of Bye-law No. 34, no water supply for domestic purposes.	4	Ditto.	
Contravention of Bye-law No. 16, Water-closet apparatus out of order.	1	Nuisance abated before the summons was applied for.	
Contravention of Bye-laws Nos. 15 and 18, Yard and Water-closet in a filthy condition.	5	Defendants summoned, and fined 1/- each without costs.	0. 5. 0.
Contravention of Bye-law No. 28, Fowls kept in a filthy condition.	3	In 2 cases nuisances abated before the summonses were applied for, and in the remaining case the defendant was fined 5/- and costs.	0. 5. 0.
Contravention of Bye-law Nos. 4 and 6, Overcrowding.	1	Nuisance abated before the summons was applied for.	
Contravention of Bye-law No. 32, Dirty Room	1	Ditto.	
Bone Boiling Premises in a filthy state, caused by overstocking of large quantities of Bones, &c.	1	Defendant summoned. Works ordered by Magistrates carried out. Case withdrawn.	
Smoke Nuisance	2	Nuisances abated before the summonses were applied for.	
Total .. ...	140		£ 3. 4. 0.

(Signed) W. H. WELLS,

INSPECTOR OF NUISANCES AND COMMON LODGING HOUSES.

TABLE XI.

FOOD AND DRUGS ADULTERATION ACTS.  
 SAMPLES TAKEN FOR ANALYSIS DURING THE YEAR 1898.

Articles taken for Analysis.	No. of Samples	Result of Analysis.	Proceedings Taken.
New Milk ...	270	247 genuine. 1 contained 2·59% of water 1 contained 28% of fat less than natural. 1 contained 13% of fat less than natural. 1 contained 15·76% of added water. 1 contained 3·53% of added water. 1 contained 2·7% of added water. 1 contained 7·6% of added water. 1 contained 4·3% of added water. { 1 contained 2·8% of added water, and 6·18% of fat less than natural } 1 contained 8·59% of added water. 1 contained 46·5% of fat less than natural. 12 of doubtful genuineness.	Vendor summoned and fined 20/- and costs. Vendor summoned and fined 10/- and costs. Vendor summoned and fined 10/- and costs. Vendor summoned and fined 10/- and costs. } Letters of caution sent to vendors. Vendor summoned and fined 20/- and costs. Vendor summoned. Case dismissed. Warranty proved by defendant. Vendor summoned and fined 60/- and costs. Vendor summoned and fined 40/- and costs. Vendor summoned and fined 10/- and costs.
Condensed Milk	3	Genuine.	
Butter ...	51	42 Genuine. 3 Certified to be Margarine. 1 certified to be Margarine. 5 certified to be Margarine.*	Letters of caution sent by the Medical Officer of Health. Letter of caution sent by the Town Clerk. Vendors summoned. Three were fined £2 and costs each, one £1 and costs, and one 10/- and costs.
Whisky ...	3	Genuine.	
Rum ...	1	Genuine.	
Gin ...	1	Genuine.	
Brandy ...	1	Genuine.	
Carried forward }	330		£16. 10s. 0d.

\* Proceedings were also taken in respect of these samples under the Margarine Act. See cases marked \* in Table XIa.

TABLE XI.—CONTINUED.

FOOD AND DRUGS ADULTERATION ACTS.  
 SAMPLES TAKEN FOR ANALYSIS DURING THE YEAR 1898.

Articles taken for Analysis.	No. of Samples	Result of Analysis.	Proceedings Taken.
Brought forward )	330		£16. 10s. 0d.
Coffee ...	8	6 Genuine. 2 contained 33% of Chicory	Letters of caution sent by the Medical Officer of Health.
Sugar ...	6	Genuine.	
Ground Ginger	5	3 Genuine. 2 of doubtful genuineness	Letters of caution sent by the Medical Officer of Health.
Flour ...	4	Genuine.	
Arrowroot ...	4	Genuine.	
Lard ...	3	Genuine.	
Malt Vinegar	4	1 Genuine. 2 of doubtful genuineness 1 contained 100% of diluted acetic acid.	Vendor summoned and fined 20/- and costs.
White Pepper	3	Genuine.	
Black Pepper	2	Genuine.	
Corn Flour..	3	Genuine.	
Ground Rice	2	Genuine.	
Gregory's Powder ...	2	Doubtful Genuineness.	
Glycerine ...	4	Genuine.	
Total ...	<u>380</u>		Total amount of penalties <u>£17. 10s. 0d.</u>

(Signed), W. H. WELLS,  
 INSPECTOR UNDER THE FOOD AND DRUGS ADULTERATION ACTS.

TABLE XIa.

## MARGARINE ACT.

No. of Samples taken of substance resembling Butter, not labelled Margarine.	RESULT AND NATURE OF OFFENCES.	PROCEEDINGS TAKEN.
	Proved to be Margarine.	Vendors Summoned, and Fined respectively.
2	Cases of exposing Margarine not labelled in accordance with the Act.	20/- and costs each.
	Ditto.	{ *40/- and costs. *20/-    " *16/-    " *40/-    "
4	Cases of delivery to Purchaser in Paper not marked "Margarine."	{ *40/-    " *10/-    " *10/-    " *20/-    " *40/-    "
	These Packages containing Margarine were not "Branded or durably marked Margarine."	{ £20    "
	The same Vendor had in his possession 7 baskets containing Margarine, not "Branded or durably marked Margarine."	{ 10/-    "
Total 6		£34. 0. 0.

\* The samples in these cases are counted, under the heading of Butter, in the Food and Drugs Table (XI), as proceedings were taken under both Statutes for the same Samples.

(Signed) W. H. WELLS,

INSPECTOR UNDER THE FOOD AND DRUGS  
ADULTERATION ACTS.

TABLE XII.

## REGISTERED COMMON LODGING HOUSES.

SUMMARY OF WORK DONE AND VISITS MADE DURING THE YEAR 1898.

Inspections made in the Daytime ... ..	11,918
"    "    Night-time ... ..	3,053
Notices served { <i>re</i> Washing of Bed Clothes 247 } ... ..	381
{ ,, Lime Washing of Houses 134 }	
Contraventions of Bye-laws <i>re</i> Cleaning and Ventilation of Houses ... ..	3
"    "    ,, Removal of Liquid Filth ... ..	3
Structural Repairs to House ... ..	1
Choked Drains, Defective Water-closets, &c. (Cleansed and Repaired) .. ..	83
Tub provided for Dry House Refuse ... ..	1
Defective Roofs and Spouts ... ..	14
Yards in a Filthy condition ... ..	16
Houses Closed ... ..	11
New Houses Registered ... ..	4
Defective Lavatory Basin ... ..	1
Houses without Water Supply (temporarily) ... ..	8
Infectious Disease (Scarlet Fever) ... ..	2
"    "    (Typhoid) ,, ... ..	1
"    "    (Measles) ... ..	1
Deaths Reported (Non-Infectious Diseases) ... ..	16
Death ,, from Typhoid Fever ... ..	1
Inquiries <i>re</i> Supposed Common Lodging Houses ... ..	5
Applications for Registration ... ..	10
Granted ... ..	9
Refused ... ..	1
Single beds provided during the year in place of 48 double ones	96
New Single beds provided during the year ... ..	64

TABLE XIII.

## LODGERS OCCUPYING COMMON LODGING HOUSES IN THE CITY

DURING THE YEAR 1898.

	Year. 1898.	Corresponding Nos. for Year 1897.
Average number of Lodgers per night .. ..	1618	1507
Highest number on any one night .. ..	1695	1597
Lowest " " " .. ..	1530	1372
Number of Lodgers for which accommodation was provided in the Common Lodging Houses of the City at the end of the year..	2056	2058

(Signed) W. H. WELLS,

INSPECTOR OF COMMON LODGING HOUSES.

APPENDIX B.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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REPORT

TO THE

SANITARY COMMITTEE OF THE CORPORATION

ON THE

PROPOSED

BACTERIOLOGICAL EXAMINATION

OF THE

WATER SUPPLY,

BY THE

MEDICAL OFFICER OF HEALTH.

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SUBMITTED ON THE 14TH FEBRUARY, 1898, AND ORDERED  
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TO THE CHAIRMAN AND MEMBERS OF THE SANITARY COMMITTEE  
OF THE CORPORATION OF NEWCASTLE-UPON-TYNE.

GENTLEMEN,

Having been instructed by you on the 8th November last to report to you at your next meeting on certain points in connection with the Bacteriological Examination of the Water supplied by the Water Company, I did so on the 22nd of the same month. You then expressed a wish to have further information on this and other matters in connection with the Water Supply, and referred the entire question to the City Engineer and myself to consider and report upon.

The following is submitted as an interim report on that part of the subject first brought under your notice.

I have the honour to be,

Gentlemen,

Your obedient Servant,

HENRY E. ARMSTRONG, D.Hy.,

MEDICAL OFFICER OF HEALTH.

*Health Department,*

*Town Hall,*

*Newcastle-upon-Tyne,*

*7th February, 1898.*

**REPORT**  
ON THE  
Proposed Bacteriological Examination  
OF THE  
**WATER SUPPLY.**

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Owing to the generally good quality of the Newcastle water-supply of late years, the question of its being a vehicle of disease has not engaged public attention. But the possibility, under certain circumstances, of such an event is one of the grave lessons of the late epidemic of Cholera on the continent, and the more recent outbreak of Enteric Fever at Maidstone.

Between these two epidemic diseases there is, as regards the water-supply, a difference, and it is this:—Cholera can only reach the watershed by importation from abroad by way of the Tyne or some other port, a contingency which if it ever arrive at all, must happily of necessity be exceptionally singular in its occurrence. Enteric Fever, on the other hand, is indigenous and prevalent in certain parts of the county. It may appear at any time on the gathering-grounds of the Water Company, where a single mismanaged case on the banks of a streamlet discharging either directly or indirectly into the Reservoirs might cause serious mischief.

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**Nature of the Proposal.**

Before going into the question of the advisability or otherwise of making a systematic "bacteriological examination" of the water supplied to Newcastle, it is desirable to have a clear idea of what is meant by this term, so as to avoid misconception with regard to what is reasonably to be expected from it in the present state of bacteriological knowledge.

For sanitary purposes the bacteria found in water are divided into two classes, viz., (1) the non-pathogenic, or those which are *not* the germs of human disease; and (2) the pathogenic, *i.e.*, the germs of Cholera, Enteric Fever, &c. The first, a very numerous class, comprises a variety of organisms, one important group of which (the "coli" group) have their habitat

chiefly in the intestines of man and some domesticated animals. Their detection in water—and they are not difficult to detect when present—is therefore almost proof positive of its pollution with intestinal discharges. The remaining bacilli of the class, although having no such specific significance as the foregoing, all testify to the presence in the water of organic matter essentially foreign to it. The organic matter forms the pabulum on which they thrive, and its amount may be roughly estimated by the number of organisms it supports. The number of bacteria consequently is, to a certain extent, a gauge of the general purity of water, and is useful as affording information chemical analysis is unable to give.

As there is always some organic matter, even if infinitesimal in quantity, so there are always some organisms, however few in number, in drinking water; and as in the one case a certain proportion is allowable, so in the other. The number-limit of non-pathogenic bacilli in good water is put by authorities at 100 per cubic centimetre, *i.e.*, 450,000 per gallon, ~~a cubic centimetre of liquid being about a dessert spoonful.~~ Excess over this number-limit is proof of inefficient filtration.

The first object of the bacteriological examination of water is to ascertain whether or not the non-pathogenic bacteria are within the limit. The next is to inquire as to the presence of organisms indicating excremental pollution. These two lines of inquiry are of the highest importance, as giving warning of danger to be averted. On the other hand, the germs of infectious disease, if only in the proportion of 8 or 10 to the gallon, would be very difficult to find. Probably those of Enteric Fever would not be recognisable in the laboratory; and if they were, the recognition would come too late for practical benefit, as it would not be obtained until after they had proclaimed themselves unmistakably by their dire effects on the consumers of the water containing them. One typhoid bacillus in a centimetre of water is equivalent to 4,500 to the gallon, a degree of pollution terrible to contemplate!

The chief object, then, of the bacteriological examination of public water supplies is to prove the presence or absence, as the case may be, not of disease-germs, but of other organisms indicating contaminations with which disease-germs may afterwards be associated.

## Arguments in Relation to the Bacteriological Examination of the Water Supply.

The science of Bacteriology being of quite recent date, it is not to be expected that its value as a test of the purity of public water supplies, although steadily gaining in repute, should yet be generally realised by Sanitary Authorities and others. Accordingly, in this particular direction, arguments against its employment are still put forward. The following is as fair a statement of these as the writer can make, together with such replies or explanations as suggest themselves to him respecting them:—

1. *It is said to be unnecessary.*—This view appears to be based on the erroneous idea that, as most of the ordinary bacteria of water are non-pathogenic, they are of no consequence, and need not be studied for the benefit of the public health. This argument has been dealt with already. Further, the relation of the non-specific bacteria of water to epidemic-diarrhœa—a disease which, though never satisfactorily explained hitherto, is invariably prevalent in summer when these micro-organisms are most plentiful—offers a promising field for investigation. Some urge that the non-pathogenic bacteria are necessary to eat up the pathogenic ones, a theory dangerous to trust to in any case, and, as concerns water organisms, without, it is believed, the slightest basis in fact. The secretary of a large waterworks recently wrote his opinion that a bacteriological examination of the water supplied to his town was “absolutely unnecessary,” it being “pure and of good quality!” Curiously enough, the holder of the above notion refers in the next paragraph of his letter, to “complaints made about the water some time ago!”

2. *It is charged with being unreliable, and with not coming up to expectation.*—The able author of a recent work,\* whilst discussing a question in relation to bacteria and water supply, directs attention to an observation of a certain investigator to the effect that the months of greatest abundance of water-bacteria are those of least prevalence of Enteric Fever. Although not drawing direct inference from this in the way of cause and effect, any other reason for the author bringing it forward is not

\* “Water Supplies, Chemical and Sanitary,” by Prof. W. P. Mason, New York, 1896, p. 23.

obvious, and his statement is calculated to convey to the ordinary reader the impression that some relation had formerly been supposed to exist between ordinary bacteria of water and outbreaks of Enteric Fever, which had afterwards been proved not to be so. But Bacteriologists have never held such views. If others have done so, the mistake is theirs only. So far from having disappointed the expectations of its advocates, Bacteriology, although the youngest of the sciences, is constantly making startling advances, and daily throwing new light on the actual causes of disease.

3. As regards the sufficiency of the methods at present available for recognising and estimating the different organisms to be found in drinking water, no doubt the failure to detect the typhoid bacillus in the water blamed for the Maidstone epidemic came somewhat as a disappointment to the general public. But this is no disproof of the ability of Bacteriology to detect it, as Dr. Washbourn has shewn.

4. There would appear at first glance to be more weight in favour of chemical as compared with bacteriological examination of water, in the argument that the former shews pollutions in solution, and therefore general, whereas the latter indicates only particulate and strictly local matters, and affords no criterion as to the condition of the water as a whole; also that bacilli will develop and multiply in a sample of water after its collection, which is not the case, at least to an equal extent, with the chemical constituents.

These apparent deficiencies of bacteriological examination do not occur when proper methods of collection and treatment of the samples to be examined are adopted. Moreover, we are by no means certain that a really "average sample" is obtainable even for chemical purposes, or if it were, that it fully meets all the sanitary requirements of analysis.

5. As regards the alleged "*growing tendency among physicians and civil engineers to belittle the chemist's opinion regarding the potability of a water and to pin their faith exclusively upon what the bacteriologist may have to say on the subject.*"\*—This complaint is admittedly based on the classical Report (for the year 1881) of Dr. (afterwards Sir George) Buchanan, Medical Officer to the Local Government Board, on

\* Mason, p. 421.

the failure of chemical analysis to detect pollutions in drinking water which had been purposely inoculated by Dr. Cory with the germs of typhoid fever and other contaminations. The report states that "The Medical Department of the Local Government Board has had repeated occasion to observe, on the part of Sanitary Authorities and their advisers, a tendency to estimate unduly the value of quantitative chemical analysis as demonstrating the wholesomeness of drinking waters. Some authorities have even regarded evidence of this sort as setting aside presumptions of pollution that had arisen from considerations of dangerous situation of wells and reservoirs." . . . . With regard to the recognition of the germs of Enteric Fever, Dr. Buchanan observes:—"It is found in the first place that to the customary methods of chemical examination there is nothing to distinguish this pollution from any other excremental pollutions. Indeed, generally, Dr. Cory's report gives no indication that chemistry can tell whether a healthy or a diseased body has been the source of any foulness observed in water." Dr. Buchanan proceeds to shew how the "albumenoid ammonia" process of analysis failed to shew anything remarkable in a water to which Enteric Fever stools had been purposely added. On this Dr. Buchanan makes the following remark:—"In Dr. Cory's experiments, then, with one grain of Enteric Fever stool per gallon we see a water thus largely befouled by a most dangerous material; and the indication of that befoulment when expressed by the chemist, in terms of albumenoid ammonia, is the figure '014 part per million parts of the water. Wherefore it is not permissible to accept the doctrines which have been formulated from the amount of albumenoid ammonia present in an otherwise unknown water. Polluting material potent for harm may be present in a water yielding from '00 up to '05 parts of albumenoid ammonia per million without removing it from the rank of waters of extraordinary organic purity; and we have assuredly no evidence, in the case of an unknown water shewing from '05 to '10 parts of albumenoid ammonia per million that it is safe organically, The chemist can in brief tell us of impurity and hazard, but not of purity and safety."

The *Lancet*,\* commenting on the chemical and bacteriological reports of the recent outbreak of Enteric Fever at Maid-

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\* 8th Jan., 1898.

stone, makes the following observation:—"Two points will strike even the most superficial observer:—(1) That bacteriological examination often serves to bring to light faults in the water that are not discriminated by the chemist—the converse also holding good; and (2) that bacteriological examination may often serve to clinch suspicious features in the chemical analysis."

The truth is that the chemical and bacteriological methods of analysis are each the complement and confirmation of the other, and that no examination of a water supply is complete without the employment of both.

6. Some superiority may perhaps be attributed to chemical methods of water analysis on the ground that, dealing as they do with matters in solution, they are available for the purpose of tracing certain outbreaks of disease, where earth-filtration has removed all or most of the micro-organisms, but not the dissolved chlorides, nitrates, nitrites, and ammonia which indicate pollution. An instance somewhat of this kind is undoubtedly on record, viz., that of the outbreak of Enteric Fever in the village of Lausen, near Basel, in Switzerland, due to the polluted water from an isolated farmhouse on the far side of a mountain, through which it filtered to a spring used by the villagers who contracted fever. Here an attempt to trace the water through the mountain by mixing it with flour failed, from the flour being filtered out by the earth through which the water passed; whereas the addition of a large quantity of common salt to the stream near the infected farm soon made itself apparent to chemical analysis in the water of the village spring. In this case what happened to the flour might perhaps have happened to the majority of the non-pathogenic bacteria in the water (although we have no information that any bacteriological test was applied), viz., they might be filtered out. Such occurrences must of necessity be extremely rare, and even were the bacteriological examination to fail in a case of the kind, it would only go to prove the validity of the foregoing proposition that no water-analysis is complete without both methods of examination.

7.—Chemical analysis has been said to give warning of general organic pollution of water, and thereby to anticipate and lead to the possible prevention of outbreaks of specific disease.\* But the same must be admitted for bacteriological analysis,

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\* Mason, P. 423.

which not only does this, but in one respect does so with greater precision, since it differentiates between three forms of polluting organisms, viz., (*a*) general non-pathogenic, (*b*) intestinal non-pathogenic, and (*c*) pathogenic. The first of these indications serves as a valuable measure of pollution liable to vary from time to time, and which though innocent to-day may not be so to-morrow; the second is a note of danger, as clear and unmistakeable as any Chemistry can sound; and the third, when met with, is a proof of the actual presence of deadly poison beyond chemical recognition.

8.—It has been said that too much reliance is placed on bacterial inquiry, and that to publish regular returns of the organisms found in a water-supply would tend to create unnecessary alarm, &c. To which it may be replied, that if the public, in their hopefulness respecting the benefits to be gained from Bacteriology as applied to water examinations, have expected from it more than is yet justifiable or has ever been promised, that is no reason why the undoubted services of the new science in this respect should be lost to mankind. The publication of the results of chemical analysis have not been found to give rise to undue excitement, neither have the statistics of bacilli in the waters of the eight London Companies reported monthly by the Registrar General. If, however, any exception be taken to the systematic publication of biological details, the reports may be confined to a comment or criticism of the returns, without giving the actual figures.

9.—The last objection likely to be raised against the proposal in question is that of *Expense*, an argument which, other things being equal, it is confidently felt will not have undue weight with the Sanitary Authority of Newcastle.

The foregoing evidence has been principally adduced with the object of removing the doubts of those who from one cause or another may not yet quite see their way to favour the bacteriological examinations of water-supplies. Consideration is now invited to the following reasons in favour of the proposal on other grounds, *i.e.*, on its own merits:—

1.—The two most important water-borne infectious diseases are, as previously stated, Cholera and Enteric Fever, each of which is due to a specific bacillus, derived from the human

intestine, and, so far as is known, from no other source. The bacillus of Cholera, and, less easily, that of Enteric Fever in water, is demonstrable by bacteriological processes and by no other means.

2.—Non-pathogenic bacteria are not necessary to water. Their presence in any considerable number is the best indication we possess of imperfect filtration.\* It is also a gauge of the degree of dissolved organic impurities not removable by filtration, commonly of the nature of sewage, and which may be excremental.

3.—Although most of the bacteria of water are generally speaking innocuous, there is a recognised number-limit of safety even to these, and Bacteriology alone affords the satisfaction that this limit is not exceeded.

4.—All authorities agree as to the great importance of determining the presence in, or absence from, water supplies of the *Bacillus Coli*, which is demonstrable by Bacteriological and by no other means. Dr. Washbourn, in his Bacteriological report on the Maidstone epidemic, depends largely on the bacilli of this group for evidence of sewage pollution.

5.—For a considerable time past bacteriological examination of the public water supplies has been practised periodically throughout Massachusetts, London, West Ham, Liverpool, Brighton, Birmingham, and less systematically in Leeds, Nottingham, and Blackburn. Other towns, impelled by the object-lesson at Maidstone, are either about to adopt it or are considering the question of doing so.

6.—Chemists allow "that in the matter of determining the suitability of a stream for city supply, the services of the Bacteriologist should be unquestionably secured."†

7.—Seeing the useful information unmistakeably derivable from the bacteriological examination of water supplies, the failure of a Sanitary Authority to acquire such information seems equivalent to their neglect to inspect their district for insanitary conditions.

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\* Even chemists grant the "special value and great superiority of Bacteriology to Chemistry for the testing of filters and watching any variation in their efficiency," and also its usefulness "for the comparative examination at different times and localities of a water of known character, and for the detection of sewage contamination."—Mason, pp. 423, 424.

† Mason, p. 423.

8.—Dr. Adams, in his Chemical Report on the Maidstone epidemic, insists on the importance of having “an intimate knowledge of the normal composition of the pure water of the district,” as a local standard for comparison with samples taken from time to time. This forcible observation applies equally to bacteriological as to chemical knowledge.

9.—The need of the adoption of every method of supervision of the public water, including that of bacteriological examination, is, if more important in one place than another, especially so in the case of a town like Newcastle, deriving its supply from wide and not unpopulated rural districts into which Cholera may easily be imported from abroad in epidemic periods, and on which Enteric Fever may occur indigenously at any time.

#### **Extent to which the Proposed Bacteriological Examination of the Water Supply should be carried.**

It is desirable that the biological examination of the water should be as complete as possible, consistently with the reasonable requirements of the subject and practical utility. In its fullest sense the work, from first to last, falls under two consecutive divisions, viz., (1) up to the time the water is ready for distribution to the consumer, and (2) after it is in the pipes for distribution. During the collection and preparation of the water, the responsibility and duty of watching its bacterial state ought to rest with the Water Company. This should ordinarily include frequent (say monthly) examinations of at least each of the main sources of supply, as well as of the mixed stock in the reservoirs, both before and immediately after filtration. The Sanitary Authority should satisfy itself as to the condition of the supply on delivery in different parts of the City.

The importance of shewing the bacterial state of the water before and after filtration, as an index of the efficiency of that process, can scarcely be over-estimated. This is done in all of the river waters supplied to London by the different companies with the result that whereas, *e.g.*, in September last, the raw and stored waters averaged 1,930 microbes per cubic centimetre, the filtered waters as supplied contained an average of only 48. Any notable increase over say 100 microbes per cubic centimetre is an indication that something is wrong with the filtration. The London water, it may be mentioned, is examined daily for ordinary bacilli, but only occasionally for pathogenic organisms.

It is suggested that four samples drawn on the same day direct from the mains in different parts of Newcastle be examined once each month.

The results of the examinations of the water made for the Corporation and for the Water Company respectively should be interchanged between these different bodies. Those made for the Sanitary Authority might be returnable to the Medical Officer of Health in time for the alternate fortnightly meetings of the Sanitary Committee.

The question of the details to be included in the monthly examination of samples, may, it is suggested, be deferred for future consideration.

*Additional action desirable.*—For the safeguarding of the water supply, additional action to what is already being taken, and that advocated in the present report, is desirable. For the purpose of preventing fouling of their supply at any point, the Newcastle and Gateshead Water Company, in their Bill now before Parliament, are very properly seeking to obtain power to enforce, when necessary, the provisions of the Rivers Pollution Prevention Act, 1876, in the same way as though they (the Company) were a Sanitary Authority. The necessity of their having the compulsory notification of waterborne infectious diseases occurring on the watershed, for the purpose of carrying out measures of protection from pollution, is the obvious corollary to the foregoing proposition, and the Company are desirous to obtain it. The returns in question should also be communicated to the Sanitary Authority of the District to which the water is supplied, as should also all information respecting possible means of contamination, and the action taken by the Water Company to prevent danger therefrom. Such action on the part of the Company ought to be to the satisfaction of the Sanitary Authority, who should have free access to every part of the Company's Works and Gathering Grounds, and should make frequent inspections thereof.

HENRY E. ARMSTRONG,  
Medical Officer of Health.

*Health Department, Town Hall,  
Newcastle-upon-Tyne,  
7th February, 1898*

APPENDIX C.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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R E P O R T

OF THE

MEDICAL OFFICER OF HEALTH

ON THE WORKING OF THE

NOTIFICATION OF MEASLES

AND

WHOOPIING COUGH,

DURING THE TWO YEARS ENDED AUGUST 26<sup>TH</sup>, 1898.

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Newcastle-upon-Tyne :  
TYNE PRINTING WORKS Co., 22 to 26, SIDE.

1898.



CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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NOTIFICATION OF  
MEASLES AND WHOOPING COUGH.

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*To the Chairman and Members of the Sanitary Committee.*

GENTLEMEN,

The Corporation of the City by resolution made on the 26th of August, 1896, ordered that, until the 26th of August, 1898, Measles and Whooping Cough should be deemed Infectious Diseases within and subject to the provisions of the Newcastle-upon-Tyne Improvement Act, 1882. This order duly received the approval of the Local Government Board, and after being publicly advertised in the local newspapers on the 10th of the month following that on which it was made, and specially announced to each medical practitioner in the City, came into force.

The Local Government Board, in signifying their approval, stated that they would "look for a report from the Medical Officer of Health, at the expiration of the term for which the order is made, as to whether the period has been sufficiently long to justify the expression of an opinion on the working of the notification system in connection with the diseases in question."

In compliance with this requirement the following report is submitted:—

An experience of two years has been amply sufficient to form a decided opinion on the working of the system, and to justify its expression.

From August 26th, 1896, to August 26th, 1898, 7,680 cases of Measles, and 3,746 cases of Whooping Cough—a total number of 11,426 cases—have been notified by medical practitioners in the City.

The following Table shews the incidence of each disease in the different Wards of the City in successive periods, *i.e.*, in the parts of the years 1896 and 1898, which were involved, and the whole of 1897:—

## NOTIFICATIONS RECEIVED.

PARISH OR TOWNSHIP.	MEASLES.				WHOOPIING COUGH.			
	Aug. 26 to Dec. 31, 1896.	1897.	Jan. 1 to Aug. 26, 1898.	Total.	Aug. 26 to Dec. 31, 1896.	1897.	Jan. 1 to Aug. 26, 1898.	Total.
Elswick East ... ..	57	182	182	421	8	63	72	143
Elswick North ... ..	43	279	94	416	30	155	67	252
Elswick South ... ..	119	361	330	810	74	132	175	381
Arthur's Hill ... ..	74	620	150	844	43	186	102	331
Westgate North ... ..	136	169	172	477	24	101	128	253
Westgate South ... ..	89	103	132	324	12	50	119	181
St. Andrew's North ... ..	65	184	39	288	39	70	89	198
St. John's ... ..	9	21	17	47	1	6	21	28
St. Nicholas' ... ..	3	77	9	89	3	15	44	62
All Saints' West ... ..	4	106	19	129	18	23	44	85
All Saints' East ... ..	274	131	232	637	30	111	106	247
All Saints' North ... ..	177	98	135	410	45	44	157	246
St. Andrew's South ... ..	13	77	21	111	1	31	63	95
Jesmond ... ..	53	184	47	284	10	38	89	137
Heaton ... ..	125	436	405	966	17	40	280	337
Byker ... ..	264	188	975	1427	25	250	495	770
City ... ..	1505	3216	2959	7680	380	1315	2051	3746

### Cost of Notification of Measles and Whooping Cough.

Second Certificates of Notification have been received in respect of 280 cases already notified by other medical practitioners. These have occurred as follows:—

#### SECOND NOTIFICATIONS OF THE SAME CASE.

DATE.	NO. OF CASES.	
	Measles.	Whooping Cough.
1896 (from 26th Aug.) ... ..	8	5
1897 (whole year) ... ..	37	48
1898 (to 26th Aug.) ... ..	76	106
Total ... ..	121	159

This brings up the total number of Certificates to 7,801 for Measles, and 3,905 for Whooping Cough—Total 11,706.

The total amount payable to medical practitioners for the foregoing notifications is £1,221 9s. 0d., for which Measles is debited with £846 14s. 6d., and Whooping Cough with £374 14s. 6d.

The details of this sum are as under:—

	MEASLES.			WHOOPIING COUGH.			TOTAL.					
	Cases.	Cost.		Cases.	Cost.		Cases.	Cost.				
Private Medical Practice ... }	6,089	£	s.	d.	2,393	£	s.	d.	8,482	£	s.	d.
Public Medical Practice ... }	1,712	85	12	0	1,512	75	12	0	3,224	161	4	0
Total ... ..	7,801	846	14	6	3,905	374	14	6	11,706	1,221	9	0

In addition to the foregoing amount payable for the Notification Certificates, the total cost of working the system includes expenses under the following heads:—

OTHER EXPENSES (PROBABLE AMOUNT) INCURRED IN CONNECTION WITH MEASLES AND WHOOPING COUGH.

YEAR.	Wages.	Infected Bedding destroyed and replaced.	Disinfectants.	Printing and Postages.	Horse Hire and Repairs to Bedding-Carts, &c.	TOTAL.
1896 ... .. (from 26th Aug.)	£ 28	£ 20	£ 25	£ 12	£ 12	£ 97
1897 ... ..	117	50	80	35	40	322
1898 ... .. (to 26th Aug.)	58	20	56	32	45	241
Total ...	233	90	161	79	97	660

The total cost of the experiment has therefore been about £1,881.

#### Action Taken.

Every case of Measles and Whooping Cough reported has been visited, and inquired into by the Health Department, in the manner usual with other infectious diseases. Printed instructions as to the best means to be taken to prevent the spread of infection, together with a statement as to the law in relation to infectious disease, have been left at every house in which the disease occurred. Disinfection of bedding, clothing, rooms, &c., has in each case been effected by the Corporation, in precisely the same way as for other notifiable diseases. The Sanitary Authority have been kept duly advised in the fortnightly and other reports of the Medical Officer of Health as to the progress of the respective diseases and the preventive measures employed or desirable.

In addition to the measures above described, Measles and Whooping Cough being essentially diseases of school life or the school period, special action has been requisite, and has been taken under the direction of the Sanitary Authority in the case of the two diseases in question. Since the beginning of 1897 a

daily register has been kept, shewing the fresh households invaded, and the respective schools to which children went therefrom. This return was, therefore, a useful indicator as to the prevalence or otherwise of the two diseases in the different schools, enabling prompt action to be taken, and affording a means of gauging its result. Whenever the proportion of cases to infant scholars began to shew signs of marked increase in any particular school, the attention of the managers and principals was, without delay, directed to the fact, and practical measures were taken to check the disease through the school. In December, 1896, by resolution of the Sanitary Committee, the managers of all the Elementary Schools in the City received formal notice to close their schools for four weeks. At the same time a circular signed by the Chairman of the Sanitary Committee was issued to the Authorities of all other schools (Day and Sunday) in the City requesting that these schools should be forthwith closed for a like period. The managers were informed that the Medical Officer of Health would arrange for the disinfection of class-rooms where necessary. This advice was, without exception, acted on; and a large number of schools were disinfected.

From the first school principals have been informed daily of every infected house, children from which were scholars at their respective schools; and, in response to invitation, have forwarded to the Medical Officer of Health lists of absentees from school not so reported by him.

Early in the course of the notification of the diseases in question, it was found in a certain school of whose pupils about 10 per cent. were suffering from Measles, that about half of the cases were resident beyond the City. Their illness had not been reported, although notification of such cases is required under section 78 of the "Newcastle-upon-Tyne Improvement Act, 1892." The Sanitary Committee, on being informed of this, instructed that notice of the section of the Act referred to should be sent to every school in the City, with a request that it should be communicated to parents of school children living outside of the City. The instruction was carried out.

Since the general closure of the schools above mentioned, no prolonged closure of any school has been required by the Sanitary Authority, but whenever the register of scholars in relation to infected houses has indicated the prevalence of Measles or Whooping Cough in respect of any particular school, the closure of that school for a few hours has been obtained to allow of the fumigation of the class rooms by the Corporation. On the return of the scholars, the daily sprinkling of the floors of the class rooms for a week with Sanitas powder has been done.

In October, 1897, the Medical Officer of Health reported to the Sanitary Committee, as follows:—

“As the continued increase of Measles is anticipated, the question of the general closure of the schools presses for consideration. Last winter the action of the Committee in this direction was to some extent influenced by the desire to take advantage of the Christmas holidays for the purpose, so as to interfere as little as possible with the progress of education, therefore the general closure of the schools was not demanded until 22nd December, 1896, and the period of closure was limited to one month. But the experience thus gained shews that this action, although undoubtedly beneficial, as was shewn in a report at the time, was not enough,—since by waiting until the disease got a strong hold on the community the power of controlling it through the schools was in some degree lost. The duration of the closure also proved too short for the complete fulfilment of its intended purpose, the disease, although greatly broken in force, never having been entirely stamped out, which may perhaps be the cause of its prevalence at present. The Committee are recommended to consider whether action should not be at once taken energetically to deal with the epidemic whilst it is yet within comparatively small compass.”

After considering this report the Committee instructed the Medical Officer of Health to report further at a subsequent meeting. This was done in the report for fortnight ended 13th November, in which, as the disease appeared then to be making

but little advance, the further disinfection of certain Board Schools was advised and approved by the Committee as preferable to a general closure of the schools at that time. This disinfection was followed by an extinction of Measles in the schools in question.

The Medical Officer of Health acknowledges gratefully the cordial assistance invariably afforded by the School Board and their officials, and the managers, principals, and teachers of the Schools throughout the City.

Dealing with so large a number of extra cases of Infectious Disease has been a heavy strain on the special inspectors, disinfectors, and generally the entire staff of the Health Department who have done their work well. Additional assistance has been got when required.

### Results.

The outcome of the notification of Measles and Whooping Cough has certainly not been a general reduction of those diseases. The cases of Measles returned during the last 18 weeks of the year 1896 average, it is true, 88 per week, against only 62 in the year 1897; but the average increases to above 90 per week for the first 30 weeks of the current year. Whooping Cough, which in the latter part of 1896 yielded a weekly average of only 21 cases, increased to one of 25 in 1897, and during the first 30 weeks of 1898 attained to a weekly average of 66, or more than treble its proportions at the beginning of the notification period.

But, notwithstanding this, on the whole, disappointing issue, some good has undoubtedly followed the notification of one of those diseases. The closing of the schools was succeeded by a marked decrease of Measles, as appears by the following extract from the Annual Report of the Medical Officer of Health:—

“ A return submitted to the Sanitary Committee shews that during the three weeks immediately preceding, and the first week after, the closure of the schools, the weekly notifications of cases of Measles were respectively 164, 129, 116, and 124. During

each of the two following weeks the returns fell to 85 and 79 respectively. In the Wards where the Public Elementary Schools were most numerous, the returns were reduced in the first fortnight after school closure to almost one-half. As most, if not all, of the cases reported in the two weeks immediately after the schools were closed probably received infection before that step was taken, a further reduction of the Measles epidemic in the next few weeks was anticipated as the result of the action taken. And such has really been the fact, for the cases of Measles *proper* have steadily decreased from 85 in the first week of the current year, to 21 in the week before the date of writing this (March 15).”\*

The foregoing observation as to the general improvement following school closure applies equally to the health of individual schools separately dealt with.

Fumigation of the class-rooms of schools among whose pupils Measles was prevalent, has also been beneficial. Especially was this noticed in the infant departments of several large Elementary Schools. Thus in one school yielding 44 cases in three weeks immediately preceding the disinfection of the school, after the first fortnight (to allow for cases incubating at the time of the disinfection) the number fell to a total of three in 13 weeks. In another yielding 56 cases in six weeks before disinfection, the number fell to four in 12 weeks after. In a third the decrease was from 12 to an average of below 2 per week, and so on, in other instances too numerous to specify.

That greater reduction of the cases of Measles has not followed the action taken, is undoubtedly in a considerable degree due to the limit of the control available. It is unnecessary to do more than refer here to the two characteristic features of Epidemic Measles in this respect, *i.e.*, its infectivity before notification, and the difficulty of isolating it wholesale in Hospital. Apart from these considerations it is a matter of opinion whether the prevention of large epidemics of Measles is not practicable by means of prompt closure of every school in

\* Annual Report of the Medical Officer of Health for 1896, p. 8.

which the disease appears. The experimental trial of the notification of Measles in Newcastle during the past two years has not extended so far as this. The rule in the case of Elementary Schools has been to wait until the infected households from which any particular school received scholars, reached 10 per cent. of the scholars in the infant department, before resorting to closures. This rule was adopted after careful consideration. But experience proves that our hope of success depends on promptitude of action. After the steed is stolen, it is useless to lock the stable door. Whatever conclusion the Sanitary Authority may come to as to the advisability of renewing the notification of this disease with the object of dealing with it more thoroughly, if more heroically, than heretofore, through the agency of school closure, there can scarcely be two opinions as to the undesirability of continuing it on the old lines.

With respect to the notification of Whooping Cough, the writer has little, if anything, to report in its favour. The difficulty of diagnosis in time for preventive purposes; the prolonged duration of infectivity and the uncertainty as to its cessation; and the hopelessness of isolation and disinfection,—all combine to render the notification of this disease alike unsatisfactory to parents, medical practitioners, and even the Health Department.

I have the honour to be,

Sir and Gentlemen,

Your obedient Servant,

HENRY E. ARMSTRONG, D.HY.,

MEDICAL OFFICER OF HEALTH.

*Health Department,  
Town Hall,  
Newcastle-upon-Tyne,  
29th August, 1898.*



APPENDIX D.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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R E P O R T

BY THE

MEDICAL OFFICER OF HEALTH,

ON THE

MANUFACTURE OF ICE-CREAMS

FOR STREET-SALE.

---

29th AUGUST, 1898.

---

Newcastle-upon-Tyne :  
TYNE PRINTING WORKS Co., 22 TO 26, SIDE.

1898.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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# REPORT

ON THE

## Manufacture of Ice-Creams for Street-Sale.

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*To the Chairman and Members of the Sanitary Committee.*

GENTLEMEN,

As directed by you on the 8th inst., I beg to submit the following Report on the Manufacture of Ice-Creams for Street-Sale:—

Attention appears to have first been directed to the danger to public health from the street-sale of Ice-Creams made under insanitary conditions by Dr. Harris, Medical Officer of Health for Islington, who reported thereon to his Vestry in 1894, and at the same time submitted a Report by Dr. Klein on a bacterioscopic analysis of several samples of the water in which the dirty ice-cream glasses had been rinsed.

Dr. Harris showed that this Ice-Cream was commonly made in dwelling houses and that the materials were also stored there. The eggs used were *blown by the breath*. The appliances in which the so-called cream (which consisted of flour, milk, eggs, sugar and flavouring) was made, were sometimes disgustingly dirty.

Dr. Klein's report shewed that the rinsings of the ice-cream glasses contained microbes in abundance, some of these being identical with those found in the human intestine (*Bacillus Coli*).

The Medical Officer of Health for Islington advised that the Sanitary Authorities of England should be invited to memorialize the Local Government Board to introduce a Bill providing for the registration and regulation of the vendors of ice-creams for street-sale.

Copies of the Reports referred to were issued to you.

In January 1896, I submitted to you a special Report on the same business as carried on in Newcastle. The following is a summary of the report in question:—

At that time there were 24 places in the City for the manufacture of street ice-creams. 18 of the makers were Italians and 6 English. In 18 cases the manufacture was carried on in tenement dwellings or yards and in two other instances in Common Lodging Houses. Many of these places were dirty. The rooms were for the most part used as both sleeping and living rooms. The ordinary ingredients of the ice-cream were found to be cornflour, milk and sugar with a little colouring matter. Water was admittedly added by some makers. Eggs were seldom, if ever, put into street ice-cream, being too costly. The mixture was boiled into a paste over the living room fire and afterwards frozen. The ingredients were usually stored in the dwelling room. The business in general was described as an uncleanly one, and, in case of Infectious Disease in the family, liable to lead to a wide-spread outbreak. The registration and regulation of the street ice-cream business was advocated in the interest of the public health.

Since the date of the above report no material change has taken place in this business in the City. There are at present 22 street ice-cream establishments in Newcastle, conducted mostly by Italians. Some general idea may be formed of the sanitary conditions under which the manufacture is carried on from the localities in which the premises are situated, viz:—Stowell Street, 4 places; Trafalgar Street 6; Picton Terrace 1; Carliol Square and Street 9; Erick Street 1; Buxton Street 1.

With respect to the action desirable on the above matter for the protection of the public health :—

The detection of bacteria in any particular specimens of the ice-cream is a matter of comparatively small importance. What is necessary is the regulation of the entire business, which is obviously an unwholesome one as now conducted. For this purpose every person carrying on the trade should be registered. No premises should be allowed to be used for the manufacture of ice-creams for street-sale without the approval and license of the Sanitary Authority. Any license should be revocable on infringement of the conditions or regulations under which it was granted. All premises so licensed should be kept under strict supervision and regulation to be laid down by the Sanitary Authority.

HENRY E. ARMSTRONG,

MEDICAL OFFICER OF HEALTH.

*Health Department,*

*Town Hall,*

*Newcastle-upon-Tyne,*

*29th August, 1898.*

APPENDIX E.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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REPORT

TO THE

SANITARY COMMITTEE

ON

ENTERIC FEVER,

IN

BYKER AND OUSEBURN DISTRICT,

IN RELATION TO THE

PAIL CLOSET SYSTEM,

BY THE MEDICAL OFFICER OF HEALTH.

---

OCTOBER 21ST, 1898.

---

Newcastle-upon-Tyne :

TYNE PRINTING WORKS Co., 22 TO 26, SIDE.

1898.

The following table shows the results of the experiments conducted on the various specimens of the material under test. The specimens were prepared in accordance with the standard specifications and were tested under the following conditions:

Specimen No.	Material	Temperature (°C)	Strain Rate (mm/min)	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation (%)
1	Aluminum	25	0.5	100	150	10
2	Aluminum	50	0.5	95	145	12
3	Aluminum	75	0.5	90	140	15
4	Aluminum	100	0.5	85	135	18
5	Aluminum	125	0.5	80	130	22
6	Aluminum	150	0.5	75	125	28
7	Aluminum	175	0.5	70	120	35
8	Aluminum	200	0.5	65	115	45
9	Aluminum	225	0.5	60	110	60
10	Aluminum	250	0.5	55	105	80
11	Aluminum	275	0.5	50	100	100
12	Aluminum	300	0.5	45	95	150
13	Aluminum	325	0.5	40	90	200
14	Aluminum	350	0.5	35	85	300
15	Aluminum	375	0.5	30	80	500
16	Aluminum	400	0.5	25	75	1000
17	Aluminum	425	0.5	20	70	2000
18	Aluminum	450	0.5	15	65	5000
19	Aluminum	475	0.5	10	60	10000
20	Aluminum	500	0.5	5	55	20000

The above data indicates that the material exhibits a significant decrease in yield and tensile strength as the temperature increases, and a corresponding increase in elongation. This behavior is characteristic of a ductile material undergoing a transition from a high-strength, low-ductility state to a lower-strength, higher-ductility state as the temperature rises.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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REPORT TO THE SANITARY COMMITTEE

ON

ENTERIC FEVER,

IN

BYKER AND OUSEBURN DISTRICT,

IN RELATION TO THE

PAIL CLOSET SYSTEM.

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Mr. CHAIRMAN AND GENTLEMEN,

In a recent fortnightly report to your Committee, the spread of infection during the present outbreak of Enteric Fever in the district of Byker and the Ouseburn was attributed to the pail closet system of refuse removal. Further information then in course of collection was promised, and is now embodied in the following report.

Pail closets are provided chiefly or solely for tenement houses and self-contained flats. Such dwellings are usually without any direct channel of communication by which germs of Enteric Fever may be conveyed from the drains to the interiors, as in the case of houses with indoor water closets, &c. Hence *primâ facie*, houses on the pail closet system should be more free from Enteric Fever than those with water-closets. But if from any cause Enteric Fever is introduced into a house on the pail closet system, the discharges deposited in the pail may infect the previously healthy users of the closet. And this is exactly what has taken place in the outbreak in the eastern part of Newcastle.

In a total of 71 families infected with Enteric Fever in the Byker and Ouseburn district from 11th August to 15th October, second or subsequent cases have occurred in 19 families, 11 of whose houses were provided with pail closets, 5 with privies, and 3 with waterclosets. In

one of the latter houses the spread of infection from the first case is attributed to the prolonged accumulation of infected bedclothing, &c., in a small and crowded dwelling. In the remaining two cases there is no evidence to shew that the water closets were to blame for the spread of the disease.

In houses on the pail closet system 7 second, 2 third cases and 1 fourth case have occurred. In houses on the privy system 3 second and 2 third cases have occurred.

In closely built areas where pail closets and privies predominate, the air becomes polluted with exhalations from excrement and refuse retained on private premises, and given off from the dirty surfaces of the pails and privies, especially after these have recently been emptied of their contents. This is undoubtedly a prolific cause of the dissemination of Enteric Fever, and one which operates with greatest force in hot, dry weather, of which we have had so much during the past season. During such weather, in districts like that under consideration, where the conveniences are in close proximity to the dwellings the introduction, through open windows, of germs floating in the air, and the occurrence of first cases of fever in families, needs no explanation. The particular kind of convenience of any given house has little or nothing to do with the original infection of the family, although it fully accounts for the subsequent spread of the disease to other members of the household using it, as well as to the occupants of surrounding dwellings. As a matter of fact, of the 71 households primarily invaded in the present outbreak, 38 were on the pail closet, 8 on the privy, and 25 on the water closet systems respectively.

The comparative amenity of airborne Enteric Fever to control, or the reverse, in relation to the prevailing forms of refuse removal in an infected area, is well shewn by the geographical distribution of the cases under consideration. During the early weeks of the outbreak the disease was active on each side of the Ouseburn, to the foulness of which it is indeed strongly suspected to have been originally due. Since the latter part of August, Enteric Fever has been almost extinct on the west side of the stream, but is still prevalent on its east. Up to date the number of cases to the east of the Burn is 87, as compared with 16 to its west. The only explanation to hand as to this somewhat remarkable limitation on the one side appears to lie in the fact that of the 13 infected houses to the west of the Burn, 11 have water closets and 2 only have pail closets.

Two maps of the Fever-infected area are submitted. One of these gives the distribution of the cases. The other indicates approximately the different forms of excrement and refuse removal in vogue. From the first of these, it may be seen that the disease has been most prevalent in the district between the Ouseburn, Byker Bank, and Albion Row. A considerable number of cases, however, have occurred in the streets to the south of Shields Road, including St. Peter's.

In the second map, the streets are tinted in different colours, each colour representing a different form of convenience. Thus, red represents privies; blue, pail closets; plain shading in black, water closets, &c. In the infected area pail closets are by far the most prevalent form of convenience.

As nearly as can be ascertained the different forms of convenience in that part of the infected area which lies to the east of the Ouseburn, and the relative proportion of the cases of Fever to each are as follows:—

	No.	Ratio of Total Cases of Enteric Fever to Conveniences.*
Houses with Privy Middens ...	611	1 to 51 Privy Middens.
„ „ Pail Closets ...	2,529	1 to 56 Pail Closets.
„ „ Water Closets ... (including Fowler's and Duckett's Closets.)	1,426	1 to 68 Water Closets.

\* To 8th October, 1898.

The proportion of cases of Enteric Fever to conveniences in the present outbreak is therefore lowest in water-closetted dwellings. This experience is not limited to the area in question. An examination of the records during the past ten years (1888-97) shews that the number of cases of Enteric Fever in the city in houses on the water closet system has been at the average annual rate of one case for every 244 houses, against one to every 183 houses on the pail closet system.

From the Reports of the City Engineer it appears that there were 5,346 pail closets in the city in the year 1897, as compared with 2,535 in 1888. The number is therefore increasing at an average rate of

about 280 per year. On the other hand the number of privy middens last year was 2,730, against 6,047 in 1888, or a reduction of about 330 per annum.

Newcastle is not so prominently pail closetted as some other towns ; but the system is on the increase here, and its general extension will, it is to be feared, be accompanied by an increase of Enteric Fever, a disease from which we have in the past been comparatively free. At present Newcastle has one case of Typhoid Fever to every 183 pail closetted houses. In Nottingham, where there are 40,000 such houses, the proportion of cases in them is about one per cent.

Privy middens have been abolished in favour of other conveniences, chiefly pail closets. A certain proportion of new houses have also been built in which pail closets have been provided.

Under the direction of your Committee the abolition of midden privies has been carried out by the Health Department, and the above figures indicate what has been done in this respect. To secure this, with as little opposition as possible, you several years ago decided that every notice issued for the removal of a privy midden should leave to the owner the option of replacing it by either a pail closet or a water closet. When this option is not exercised you have then generally directed that the privy shall be replaced by a water closet. The result of the notice has very commonly been the provision of the less costly though less sanitary pail closet.

In view of the constancy with which you now record your preference for the water closet system, the re-consideration of your former resolution allowing pail closets on old tenement property in place of privies appears desirable.

Nor is the foregoing the only way in which the pail closet system has in the past been sanctioned by the Sanitary Authority. The Tenement Bye-laws, made by the Council in the year 1885, leave to the landlord the alternative of providing privies (this term presumably including pail closets) for his property if he objects to water closets, which he generally does on the ground of expense.

But this is not the whole of the evil. The above Tenement By-law is complied with by the provision of one such privy (or pail closet) to every twelve persons or to every four holdings. Here is authorised a condition of things especially favourable to the spread of Enteric Fever; since not only is this common use of a closet by different families a danger to health, but that danger is multiplied by the fact that one pail for the reception of the refuse and excreta of so many persons or families is not enough, either in winter, when the ashes are more than the pail can contain, and, together with filth get scattered over the surface of the yard, or in summer, when the ashes are scanty and insufficient for the purpose of absorbing the urine and deodorising the excreta. The Tenement Bye-laws on this point urgently need revision.

Pail closets in tenement property are filthy things. Although cheaper to the landlord than water closets, they are costly to the ratepayer by reason of the necessarily frequent removal of their contents, and, less directly, as a cause of Fever and consequent expense of Hospital maintenance and other preventive measures. The water rate for water closets in such property is a tax, but it is one that falls on the person directly deriving profit from the property. His avoidance of it by adopting the pail closet system is a tax on sanitation. How this difficulty is to be met,—and every ill has its remedy,—is a matter of vital importance to the health of the City, calling for the most serious consideration.

Should the foregoing observations be favourably received, the writer would further venture to suggest that your Committee consider the propriety of recommending the Town Improvement Committee to take steps to prevent the erection of pail closets or privies in all houses to be built in future.

I have the honour to be,

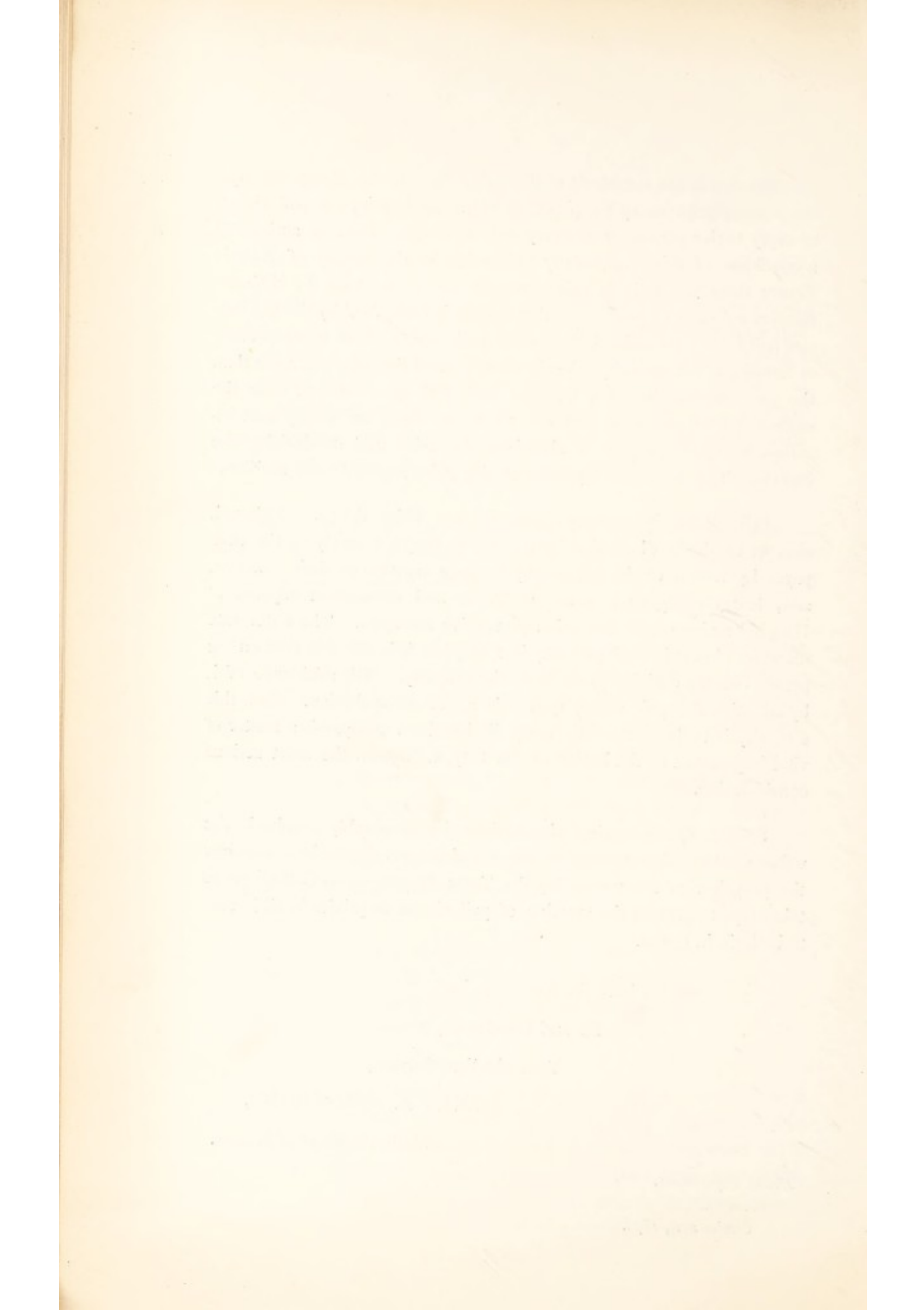
Sir and Gentlemen,

Your obedient Servant,

HENRY E. ARMSTRONG,

Medical Officer of Health.

*Health Department,  
Town Hall,  
October 21st, 1893.*



APPENDIX F.

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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REPORT

ON THE PRACTICE AND EXPERIENCE OF THE LARGE TOWNS OF ENGLAND  
AND WALES WITH RESPECT TO THE

PREVENTION OF BLACK SMOKE,

BY THE

MEDICAL OFFICER OF HEALTH.

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NOVEMBER, 1898.

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Newcastle-upon-Tyne :  
TYNE PRINTING WORKS Co., 22 TO 26, SIDE.

—  
1898.

THE HISTORY OF THE UNITED STATES

CHAPTER I

THE EARLY HISTORY OF THE UNITED STATES

THE EARLY HISTORY OF THE UNITED STATES

CITY AND COUNTY OF NEWCASTLE-UPON-TYNE.

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REPORT ON THE  
PREVENTION OF BLACK SMOKE,

BY THE  
MEDICAL OFFICER OF HEALTH.

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*To the Chairman and Members of the Sanitary Committee.*

GENTLEMEN,

In compliance with your request for information as to the practice and experience of other towns with respect to the prevention of Black Smoke, a circular of the queries stated below has been addressed to each of the Medical Officers of Health of 31 large towns of England and Wales. Twenty-nine replies have been received, of which the following is a summary :—

QUERY 1.—*What is the minimum duration of emission of black smoke on which magisterial proceedings have been successfully instituted by your Authority?*

The replies to this query indicate a wide and interesting range of from as short a period as 3 minutes to one as long as from 20-25. Successful prosecutions have followed the evolution of black smoke for periods

of 3 minutes in Nottingham, 4 minutes (Birkenhead), 2 in half-an-hour (Manchester), 4 minutes as a maximum (Liverpool\*), 5 minutes (Cardiff, Halifax, and Leeds),  $2\frac{1}{2}$  minutes in half-an-hour (Bolton), 6 minutes per hour (Salford), 9 minutes (Blackburn),  $4\frac{1}{4}$  in half-an-hour (Oldham), 10 minutes per hour or 1 in 6 (Preston and Leicester), 10 per hour or 3 per half-hour (Huddersfield), 18 per hour (Birmingham), 20 to 25 of dense black smoke per hour (Gateshead).

The replies from Sheffield and Blackburn shew that in these towns the practice holds of making a distinction in relation to the number of boilers. Thus, the number of minutes per hour beyond which any emission of dense black smoke is considered excessive is—

	SHEFFIELD.	BLACKBURN.
For 1 Boiler ... ..	2 minutes.	4 minutes
„ 2 Boilers ... ..	3 „	5 „
„ 3 „ ... ..	4 „	6 „
„ 4 „ ... ..	6 „	7 „

In Liverpool, all of the Smoke Inspectors are first-class certificated marine engineers, and thoroughly understand boilers, furnaces, &c. During the year 1897, the number of convictions for smoke nuisance was 882, and the amount of fines £1,138 15. 3d.

The following practical observations on Smoke Prevention are extracted from the Annual Report of Dr. Hope, Medical Officer of Health for Liverpool, for 1897 :—

“ From careful observations during the course of inspections, it has been found that the nuisance caused by the emission of excessive smoke from chimneys is due to the following causes :—

\* In Liverpool, in the event of frequent repetitions at intervals of a few minutes, a prosecution would be instituted, even although the maximum of four minutes was not reached.

“ 1. Improper construction of the furnaces, and the want of sufficient boiler room.

“ 2. Inferior quality of the fuel used.

“ 3. Improper firing and want of attention on the part of the stokers.

“ These causes are usually associated; even an improperly constructed furnace, if fed with a good quality of fuel and attended to by a careful and skilful man, can be so used as to avoid making unnecessary smoke, and, at the same time, the utmost amount of work of which it is capable can be obtained from it. A furnace of the best construction, and fitted with the most approved appliances for preventing smoke, may, on the other hand, give rise to the greatest nuisance owing to improper attention and the use of poor fuel.

“ A number of manufacturers have had the furnaces in their works fitted with self-feeding or automatic stokers, which may be classified as ‘cokers’ and ‘sprinklers’; the former are by far the best, the principle being the coking of the coal at the front of the furnace, while the volatile gases have to travel over the full length of the incandescent fuel on the fire bars.

“ Bad fuel, careless stoking, and attempts to obtain more work from the furnaces of this description than they were originally intended for, cause emission of unnecessary smoke from chimneys attached to furnaces fitted with automatic stokers, which require skilled and careful attention.

“ The points to be attended to by the stoker are—Frequent and regular firing, the best results being obtained by firing every 3 minutes, making, for 2 cwts. of coal used per hour, charges of 12 lbs. each, and the admission of a sufficient supply of air over the top of the fuel to cause the combustion of the gases given off by the coal, as well as a sufficient supply to the solid portion of the fuel itself.”

In other towns the practice varies. Thus, in some, no limit of time is fixed beyond which evolution of smoke is liable to be followed by legal prosecution (Bradford, Burnley, Derby, Wolverhampton). In Brighton, 2 minutes is allowed before the service of a notice, and chimneys are watched for one hour before the institution of legal procedure. In Burnley, each case is "treated on its merits." In Bradford, action is taken when the nuisance is "habitually bad." No proceedings have been taken at Plymouth, Portsmouth, Sunderland, Croydon, Hull, Swansea, or West Ham. In Plymouth, there are only a few factories, which practically give "no trouble in the matter of smoke nuisance."

QUERY 2.—*Have you had any unsuccessful prosecutions? If so, what were the grounds of failure to obtain conviction?*

Here again experience varies considerably.

"No failure" is the reply from the following towns, viz.:—Birmingham, Brighton, Burnley, Blackburn, Cardiff, Croydon, Gateshead, Halifax, Huddersfield, Leicester, Nottingham, Oldham, and Salford.

One prosecution (Birkenhead), failed owing to "conflicting evidence." In Manchester failures are "very unusual. Cases are sometimes dismissed on the assurance that steps will be taken to prevent nuisance."

In Leeds there are "not many failures." In one case against the stokers where there were 4 boilers to one chimney, proceedings failed owing to inability to prove which of the stokers was the culprit. In Bolton, the proceedings fail through "technical objections chiefly." In Bradford failures occur, but the grounds of these are not stated. Sheffield has "many failures" arising from:—

1. Want of corroboration.
2. Impossibility of preventing smoke from certain furnaces.
3. Difference of opinion as to what constitutes "black smoke."

The query is left unanswered in the reply from Liverpool.

QUERY 3.—*In smoke observations with the view of legal procedure, do you make any distinction as to the duration of periods of emission in the case of particular manufactories using special forms of furnace, such as breweries, glassworks, large iron foundries, &c.? If so, what are these distinctions?*

With certain exceptions stated below, the authorities of the large towns make no distinction other than those laid down by the Public Health Act, 1875, Section 334, with respect to smoke in the case of the manufactories referred to in the query.

In Bolton, the Corporation have special powers under the "Bolton Provisional Orders Act, 1893," Section (2) (a), as follows:—

"(2) (a). If from any chimney, not being the chimney of a private dwelling-house, black smoke is emitted in such quantity as to be a nuisance, or where the best practicable means for preventing such emission are not in use, the Corporation may, and, on complaint by any person aggrieved or by two inhabitant householders of the Borough, shall cause notice to be given to the owner or occupier of the land on which chimney is situate, or to the owner or occupier of the furnace or fireplace in connection with which such chimney is used, to discontinue such emission, and if after such notice the emission is repeated, such owner or occupier shall for each offence be liable to a penalty not exceeding five pounds, and on each subsequent conviction to a penalty not exceeding twenty pounds.

"(b). Where more fireplaces or furnaces than one communicate with a single chimney, or a chimney is used in connection with more fireplaces or furnaces than one. the names of the several owners or occupiers of the buildings or land on which such fireplaces or furnaces, or chimney are situate may be included in one summons, and the justice or justices before whom the case is brought may, in his or their discretion, apportion the penalty between the several owners or occupiers, as the case may be, or impose a penalty on one or more of such owners or occupiers to the exclusion of the others."

In Leeds are several "protected industries, chiefly iron foundries, nailworks, potteries, and glassworks." "The Leeds Improvement Act, 1866," Sec. LXX. (c) provides as follows:—

"(c) No means for the prevention or consumption of smoke shall be deemed practicable within the meaning of this Act, as regards the application to any dye pan, dye vat, or dye vessel, used for the dyeing of wool, woollens, or worsted stuffs, or as regards the smelting of iron ores, or the refining, puddling, shingling, and rolling of iron or other metals, or the melting and casting of iron into castings, or as regards the coking of coal, or the calcining of ironstone or limestone, or the making or burning of bricks, quarries, tiles, or pipes, unless it shall be proved to the satisfaction of the justice or justices, or, in case of an appeal, to the satisfaction of the court of quarter sessions, that the same have been successfully applied in similar processes, and are in actual operation, and have been used for twelve months in similar processes, or in similar trades, under like circumstances."

In Manchester, the only distinction made is that of "ironworks where puddling is carried on. In these cases it is the intention of the Corporation to prosecute, and a case is now being prepared against a large firm in one of the recently incorporated districts."

In Sheffield (where there is no limit for furnace chimneys), it is "found best to get a limit for each chimney."

QUERY 4.—*Has your Authority ever taken proceedings against stokers? If so, has this been done under general or local law? If the latter, kindly forward copy of the provision.*

The majority of the replies to this query are in the negative. The exceptions are:—

1.—Halifax, Nottingham, and Manchester. Proceedings have been issued under the Public Health Act, 1875.

2.—Bolton. Proceedings have been taken under "The Bolton Provisional Orders Act, 1893," S. (2) (a), above quoted.

3.—Bradford. Procedure under local Police Byelaws.

4.—Leeds, under "The Leeds Improvement Act, 1866," Sec. 70 (Smoke Consumption), "the owner or occupier of the premises or a foreman or other person employed by such owner or occupier shall upon a summary conviction . . . forfeit and pay a sum not more than five pounds nor less than forty shillings, and upon a second conviction for such offence the sum of ten pounds, and for every subsequent offence the sum of twenty pounds."\*

5.—Salford. Procedure against stokers under "The Salford Improvement Act, 1862," Sec. 228, as follows :—

"If any fireplace or furnace employed or to be employed within the Borough after the commencement of this Act in the working of engines by steam, or in any building used for the purpose of trade or manufacture, or baths or washhouses (although a steam engine be not used or employed therein), shall not be so constructed as to consume or burn the smoke arising from such fireplace or furnace, the owner or occupier of the premises on which such fireplace shall be situated, shall be liable to a penalty not exceeding five pounds, and every person being the owner or occupier of the premises, or being a foreman or other person employed by such owner or occupier, who shall after the commencement of this Act use any such fireplace or furnace which shall not be so constructed as aforesaid, or shall so negligently use any fireplace or furnace which has been so constructed as aforesaid so that the smoke arising therefrom shall not be effectually consumed or burnt shall be liable to penalty not exceeding ten pounds, and to a further penalty of forty shillings for every day during any part of which such fireplace or furnace shall be so used and continue after one month's notice in writing shall have been given by the Corporation to the owner or occupier to remedy or discontinue the same; provided that in every case where one or more

\* The Leeds Act above quoted also contains provisions with respect to smoke in addition to the exemptions given under replies to query 3, such as the compulsory adaptation of chimneys to consume smoke, power to regulate height of chimneys, &c.

fireplaces or furnaces shall communicate with a single chimney the names of the several owners and occupiers of the premises on which such fireplaces or furnaces shall be situated, and the several foremen or other persons having the control or management of such fireplaces or furnaces may be included in one summons, and the justice may in his discretion apportion the penalty amongst such persons in such proportions as he may see fit, or may impose the payment of such penalty on one or more of such persons in exclusion of the others."

In several towns circular letters are sent to offenders, or the managers or stokers are occasionally brought before the Health Committee for admonition, protest, or persuasion.

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Medical Officer of Health.

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Town Hall,  
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