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Borough of

Cheltenham.

ANNUAL REPORT

OF THE

Sanitary Condition,

ETC., ETC., OF THE

BOROUGH OF CHELTENHAM,

FOR THE YEAR 1898,

BY

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LICENTIATE IN SANITARY SCIENCE, UNIVERSITY OF DURHAM,
DIPLOMATE IN PUBLIC HEALTH, UNIVERSITY OF CAMBRIDGE.

MEDICAL OFFICER OF HEALTH.

TOGETHER WITH

The Annual Meteorological Report

BY R. TYRER, B.A., F.R. MET. SOC.

"Salus Populi Suprema Lex."

PRINTED BY ORDER OF THE SANITARY AUTHORITY.

CHELTENHAM

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1899.

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BOROUGH OF CHELTENHAM.

Public Health Committee:

MR. COUNCILLOR GEORGE BENCE (CHAIRMAN)

MR. ALDERMAN G. NORMAN (MAYOR).

MR. COUNCILLOR M. DAVIS.

MR. COUNCILLOR W. G. GURNEY.

MR. COUNCILLOR S. LENTHALL.

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MR. COUNCILLOR J. V. MOLES.

MR. COUNCILLOR W. N. SKILLICORNE.

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TOWN CLERK—MR. E. T. BRYDGES.

BOROUGH SURVEYOR—MR. JOSEPH HALL.

Medical Officer's Department:

CHIEF INSPECTOR OF NUISANCES—A. E. HUDSON.

ASSISTANT INSPECTOR—J. H. LONG.

2ND ASSISTANT INSPECTOR—E. JONES.

MEDICAL OFFICER OF HEALTH—J. H. GARRETT, M.D.



*To the Chairman and Members of the Public Health
Committee.*

GENTLEMEN,

I have the honour to present to you my Annual Report for the year 1898.

The interest taken in matters relating to Public Health has greatly increased of late years, and every succeeding year brings with it its suggestions for action upon new lines, as well as for the furtherance of work upon the older lines. The community has been awakened to the great importance of preventive measures for lessening the occurrence of disease, and to-day preventive medicine occupies a very honoured place amongst scientific studies, even taking precedence perhaps, of the other great department of medical practice, which has for its object the healing of the sick, the accuracy of the adage that prevention is better than cure being so very palpable. The old spirit of resistance to sanitary reform, and the apathy by which the earlier appointed Sanitary Authorities were paralysed, and which for fifty years have together formed the chief bar to sanitary progress, and have rendered to a considerable extent inoperative during all that time the laws that have been passed for the protection of the public health, are at length giving way before the force of an extended education. There still remains however, many examples of the obstinate obstructive, who, ancestor worshipper as he is, is for ever proclaiming himself satisfied with the mode of living of his grandfather. But with the majority the idea gains ground daily that it is proper and advantageous to attach the utmost importance to the conditions and susceptibilities of their own bodies, as affected by all they eat and drink, the air they breathe, the place in which they live, the circumstances and occupations of their lives, and their relations with their fellows, with the lower animals, and with all other bodies,

living and unliving, with which they are bound to come into contact. And the result of this increased popular appreciation is a growing demand that all these matters shall receive expert attention, so that, as far as is practicable, the public at large may be safeguarded against the harmful influences which are known to be destructive of human life, comfort and happiness, and which are ever at work. It is a matter of public interest, for no individual could possibly ensure for himself the benefits alluded to as apart from the rest of the community, and thus it is appropriately provided for in a public way. The growth of public health work necessitates an increase in the number of persons employed to do it and a corresponding increase of expenditure if it be desired that it should be effectively done. It is for the want of a sufficient strength in the number and quality of the officials appointed by Sanitary Authorities that sanitary work is so often ineffectively done or entirely neglected. There appears to be a tendency on the part of most popularly elected governing bodies to consider the saving of money before aught else. They are seldom imbued with the spirit of thoroughness and the desire to do, and do well, all that lies within the scope of their duties as prescribed by the laws under which they are appointed to work. What is more frequently observed is a hesitation in doing anything, or an evident if unexpressed determination not to spend a farthing more than can be avoided, though such dereliction of duty attaches to-day more to Rural Sanitary Authorities and the lesser Urban Authorities than to the rulers of the larger Boroughs.

The result of any practical earnest application to public health work has the invariable effect of disclosing a great number of remediable defects, and a great many possible safeguards that might and ought to be taken in connection with human life. The closer and longer continued the study the greater is the knowledge acquired, and the wider become the possibilities of protecting life. The progressive effect of Sanitary work since the passing of the Public Health Act, 1875, *i.e.*, during the last twenty-five years, is plainly apparent to anybody possessed of a limited education in such matters who will trouble to apply himself to the Annual Reports of the Registrar-General. There he

will find evidence of the beneficial effects wrought under the laws relating to health in a decreasing death-rate, especially from certain diseases, with a concomitant suggestion of a dropping off in the incidence of disease, and a better diagnosis and understanding of the diseases to which humanity is subject. And a furtherance of this work in town and country must undoubtedly lead to still greater results, and there yet remains great scope for such work.

But as I have before hinted, it is necessary to pay for the advantage, and no work can be expected to be done unless capable men are appointed to do it, and as the work grows, more persons must be employed.

In Cheltenham, owing to the adoption of new methods and new measures one after another, the work has entirely outgrown the capabilities of the staff of the Health Department. It is only necessary to compare the account of the work done during the last year as set out in the pages of this Report, with the work reported to have been done in the Annual Report of ten years ago to find that the work is now of a totally different character and its accomplishment carried out in an entirely different way. A glance at the diaries and registers of the Inspectors and of the Medical Officer of Health, and the counterfoils of the notice books, would afford corroboration of this if needed. The work demanded by the bye-laws, provisional orders, &c., which have been recently obtained is all additional, and since the adoption of notification of infectious diseases there has been a large amount of disinfection and other work to be done in connection with the cases notified. The detailed specifications for improvements in household property, drainage, &c., and the inspections entailed thereby, are now sufficient to give one Inspector full employment. The notices formerly sent out by the Town Clerk upon specifications made by the Borough Surveyor are now prepared and sent out by the Health Department.

But although there is some regret in my mind that the work which I see requiring to be done has proved beyond our strength, I am able to record a very good show of work accomplished within the past year, and the conditions of our town have been to that extent maintained and improved, as indicated in the second half of this Report.

The general health of the town was on the whole well maintained during the year 1898, the death-rate from all causes for the year being slightly below the average for the last ten years. There was a greater prevalence than usual in the last quarter of the year of infectious throat complaints, and the number of cases of Scarlet Fever and Diphtheria notified were in excess of the average. The numerical climax of notifications was probably reached by the end of November, and at the time of writing there are indications that the exacerbation has spent itself. There was nothing uncommon about this prevalence, nor more than was shared in to an equal extent by many other towns last year. Our experience of Scarlet Fever, Measles, and other diseases leads us to expect an alternating rise and depression in the curve that represents the number of persons annually attacked, and in regard to Scarlet Fever we have just experienced another well marked wave in our town.

The increase in accommodation recently provided at the Delancey Isolation Hospital proved of extreme advantage, enabling us to effect the isolation in hospital of every case in which such isolation was to be desired, with the result that the Scarlet Fever was at no time out of hand or beyond control.

In the following pages will be found the usual statistics and a record of the work done during last year. Mr. Tyrer's full report of the meteorological conditions which held in Cheltenham during 1898, with his remarks thereon, will also be found in the form of an appendix.

During last year, as always before, the relations of the Public Health Department with that of the Town Clerk and the Borough Surveyor have been of the most genial nature, and I have to acknowledge the ready assistance which I have at all times received from my fellow officers, as well as the patient consideration shown towards me by yourselves in the conduct of any business which I have had occasion to bring before you.

I am,

Gentlemen,

Your obedient Servant,

J. H. GARRETT.

February, 1899.

VITAL STATISTICS.

SUMMARY.

Area of Municipal Borough	...	...	...	4677 acres
Rateable Value	...	...	...	£270,312
Present Population	...	...	...	49,000
Population 1891 Census	...	...	...	47,514
Persons per acre in the Borough	...	...	...	10·4
Average number of Persons per house	1891 Census			4·9
Death-rate 1898...	...	...	per 1,000 ^{living} inhabitants	16·4
Average Death-rate for previous				
10 years	...	...	" "	16·7
Zymotic Death-rate 1898	...		" "	1·06
Average Zymotic Death-rate for				
previous 10 years	...	...	" "	1·00
Birth-rate 1898	...	...	" "	22·2
Average Birth-rate for previous				
10 years	...	...	" "	21·9
Infant Death-rate (under 1 year old)	per 1,000 births			146
Infant Death-rate Average for				
previous 10 years	...	...	" "	145

THE BOROUGH OF CHELTENHAM.

Cheltenham has the well-deserved reputation of being one of the most attractive towns in England, and to the minds of many people who know it, and who have had opportunities of making comparisons, it appears impossible to mention another town that possesses the many advantages of this in an equal degree. It occupies a site of great natural beauty on the edge of the Severn Valley, and is some seven or eight miles distant from the river. The position is neither greatly exposed nor in any way shut in, but having a gentle slope riverwards the town lies facing the broad vale, and has the benefit of all its breezes, whilst the hills which lie behind it protect it from the winds that blow

from the Eastern half of the compass. This long line of hills—the Cotteswolds—extending up and down the county of Gloucestershire above and below Cheltenham for twenty miles and more either way, with its spurs and outliers jutting into the vale, assists in making the locality one of great picturesqueness and beauty, and each of the summits of the hills affords a most extensive and pleasing view. In the town itself, however, the gradients are so very gradual as to render locomotion easy everywhere. The fine streets, most of them planted with avenues of trees of various species, and the many imposing terraces, together with the numerous villas with their gardens, and the several public parks, must always impress the new comer as being something distinctly out of the common. It is a place of such size, too, that it requires more than a single day to see it. The conveniences of the town are also considerable. Two of the greater railways of the country communicate directly with it, as well as subsidiary local lines, and the making of others is projected. There are many fine shops supplying all the necessities and luxuries of life; and in its adoption of electric light and other modern inventions, the corporate government has stepped into the van of progress. There are numerous places and halls for the provision of entertainment, including a good modern theatre, and there is a constant round of indoor and outdoor amusements. The town has acquired a great reputation as an educational centre, and if one should now speak of the Cheltenham College, one might be questioned as to which of the several colleges was meant. The Cheltenham College for boys takes a prominent place amongst the primary public schools of England, and as a preparatory school for the army is a leading institution. The Cheltenham Ladies' College, for the education of girls and the higher education of young women, has risen to a most distinguished position, and within its imposing buildings possesses every facility for imparting an education to girls according to the most modern and advanced ideas. There are also several important secondary schools, and training colleges for men and women teachers. In no place is there a greater amount and a greater variety of professional talent available for teaching than here, and the opportunities for acquiring information in every branch of knowledge and art

are correspondingly great. There are several good clubs in the town. In fact all the interests of life—religious, educational, athletic, musical, social—are in a flourishing condition in Cheltenham, and it is no wonder that as a place of settlement the town is growing in popularity.

SANITARY CONDITIONS.—The sanitary conditions of the town are well looked after, and any intending resident may make it a proviso to taking a house that the landlord or agent shall obtain the Corporation Sanitary Certificate for the house, which will ensure the place and fittings being made as sanitarily perfect as possible, a careful inspection being made, and a detailed list of requirements furnished by the Chief Inspector of Nuisances for that purpose. These requirements have all to be carried out to the Inspector's satisfaction before the Certificate is granted. In case of an already tenanted house, where any fault exists that can be complained of, complaint should be made in writing to the Inspector of Nuisances or the Medical Officer of Health, at the Municipal Offices, when enquiry will be immediately made and action be taken to cause any defects to be remedied. The local conditions being thus ensured, it may be taken for granted that Cheltenham is a healthful as well as a beautiful place, and one in which there are no known circumstances likely to prove unpropitious to any particular constitution or class of invalid.

GEOLOGY AND ALTITUDE.—The subsoil partakes of the character of the blue argillaceous deposit of the lias system, which in places is covered with sand to considerable depths, and there is a happy choice between sand and clay so far as the sites of dwelling houses are concerned, many good houses being situated on either kind of soil. The subsoil of the neighbouring Cotteswold Hills consists of calcareous oolitic rock. Nearly the whole of the chief residential portions of the town have an altitude above mean sea level of over 200 feet; for the greater part it is from 200 to 260 feet, whilst there are opportunities of taking houses in the near vicinity at a much greater altitude, since the hills within three or four miles of the centre of the town rise to a height of a thousand feet.

POPULATION.—The population of the Borough is about 49,000. For some years the population remained nearly stationary, but there are now signs of a gradual increase; building operations are going on, and there is a decrease in number of vacant houses. Whether by the Census of 1901 the numbers will have risen to the 50,000 requisite to give us the privilege of becoming a county borough remains to be seen. The quality of the population varies to a greater degree than in the case in most of the newer residential towns, and this fact must be borne in mind in comparing the general death-rate of Cheltenham with the death-rates of certain other towns. If the best half of our town be compared with those places in which the poor-class element is almost absent the comparison will be fairer, and will show that Cheltenham is not less healthful than the most carefully selected places. As our poor-class districts lie chiefly together, and away from the more fashionable promenades, their existence remains usually unknown to the visitor.

THE BIRTH-RATE.—An average birth-rate of 21·9 is a low birth-rate. The birth-rate of a town appears to be affected to some extent by the nature of the pursuits of the inhabitants, and we get the highest birth-rates in manufacturing towns and amongst the artizan and labouring classes generally. The birth-rates in the neighbouring towns of Worcester and Gloucester exceed that of Cheltenham by more than 30 per cent. According to the last issued Annual Report of the Registrar-General, the birth-rate for the whole country was 29·7 in 1896, this being below the average. The county of Durham had the highest rate in that year of all the English counties with 35·0 births per thousand of the population. There are other and wider influences which affect the birth-rate, such as variations in the degree of commercial prosperity in the country for the time being; but by such a cause as this Cheltenham is not affected to the same extent as in the case of the manufacturing towns, and the fluctuations in the birth-rate are consequently not of so pronounced a character here as elsewhere.

THE DEATH-RATE.—In estimating the death-rate of Cheltenham, no deductions are made of deaths which occur in the town excepting those that take place in the Workhouse and General Hospital amongst persons sent there directly from outside districts. Our death-rate of 16·4 is satisfactory under these circumstances, and compares favourably with a rate of 17·1 for the whole of England and Wales (1896), and 16·7 for the whole of Gloucestershire.

ZYMOTIC DEATH-RATE.—The zymotic death-rate last year of 1·06 was about the average. The deaths which make this rate are from causes known as the seven chief zymotics, and include all cases of diarrhœa. The prevalence of Scarlet Fever led to six deaths from that disease; each of the other zymotics, with the exception of Small-Pox, contributed a moderate number of deaths. As against our average zymotic death-rate of 1·00 may be compared that for all England in 1896 of 2·20 for the same seven chief zymotics.



Table of Statistics for the last 10 years, shewing Deaths from Chief Zymotic Diseases, and Zymotic Death-rate, and Total Deaths and General Death-rate; also Total Births and Birth-rate per 1,000 of population, and (under 1 year old) Infant Death-rate per 1,000 children born. Population for first 5 years, 44,000; for last 5 years 49,000.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898
Small Pox ...	...	...	...	...	...	...	...	...	...	...
Measles ...	...	12	5	41	12	2	5	47	2	13
Scarlet Fever ...	...	...	1	7	3	7	...	...	1	6
Diphtheria ...	2	5	4	2	6	4	5	13	6	7
Whooping Cough ...	8	4	1	4	...	3	8	1	22	5
Enteric and Continued Fevers ...	7	8	4	1	6	2	6	9	2	5
Diarrhoea ...	13	14	4	11	20	8	13	18	12	16
Total Deaths from seven chief Zymotics...	30	43	19	66	47	26	37	88	45	52
Death-rate from Chief Zymotics ...	68	97	43	150	106	53	75	179	91	106
Total Deaths belonging to District	696	737	772	794	769	732	827	826	776	804
General Death-rate ...	15.8	16.7	17.5	18.0	17.4	14.9	16.8	16.8	15.8	16.4
Total Births ..	991	955	987	943	993	1008	1070	1041	1043	1090
Birth rate ...	22.5	21.7	22.4	21.4	22.5	20.5	21.8	21.2	21.3	22.2
Infant Death-rate ...	137	155	132	135	167	128	156	135	151	146

Ward Death-rates.

I give the death-rates of the six Wards of the town separately, as usual, as being of some comparative interest. The rate varies a little from year to year in either Ward. The Middle Ward appears to have the fewest relative number of deaths, and the West Ward runs second to it. The South, East, and Central Wards are liable to change places, whilst the North Ward has invariably the highest death-rate. The differences are mainly the result of the varying numbers of the poorest poor in the several Wards. The North Ward has the greatest number of poor-class houses, and the Middle and West Wards have the fewest. Last year there was all the difference between 18·6 and 10·7 in the respective death-rates of the North and Middle Wards, the population being nearly the same in both Wards, *i.e.*, between nine and ten thousand. Whether there is any other beneficent influence or reason why the death-rate in the Middle Ward is so comparatively low—it has averaged only 10·2 for the last five years—I do not know, but I am not definitely aware of any. It is various in elevation, and stands almost equally upon sand and clay soil, the North Ward being wholly upon sand, and the West Ward almost wholly upon clay. The Middle Ward has a fair number of the better class artizan houses, and a good many of the better shops and lodging-houses are situated in it. The lodgers are for the greater part adult, and perhaps form a healthy class. There are many more pleasure seekers than invalids amongst the lodgers in the Middle Ward, and possibly there may be a greater exodus from this Ward during the months of July, August and September, than from either of the other Wards, and this would make some comparative difference since the census is taken in the Spring when the town is as full as at any time of the year. The fact of the shopkeepers of the Promenade not living upon their business premises would make no difference, as has been suggested, since the enumeration of the people is, in regard to residence, referred to the place in which they sleep, and their deaths are referred to these latter addresses.

DISTRIBUTION OF DEATHS IN WARDS AND IN INSTITUTIONS,
WITH DEATH RATE IN EACH WARD FOR YEAR 1898.

Wards (excluding Institutions)		Population 1897 Census.	Deaths.	Death Rate per 1000 living.
North Ward...	...	9,428	176	18·6
South Ward...	...	7,068	98	13·8
East Ward ...	...	8,191	114	13·9
West Ward ...	...	7,005	80	11·4
Central Ward	...	8,033	102	12·6
Middle Ward	...	9,219	99	10·7
Institutions (Including 24 not belonging to the District)				
General Hospital ...	...	...	61	
Workhouse ...	...	...	88	
Nazareth House ...	...	.	2	
Children's Hospital	...	...	2	
Delancey Hospital	...	...	6	

Last year five Wards out of the six into which Cheltenham is divided, and containing together a population of 39,516, or about four-fifths of the whole town, gave a death-rate of only 12·4. This figure, however, does not include the deaths occurring in the General Hospital and Workhouse, many of which would, of course, go to the North Ward if referred to their proper locality, and practically the whole of them would belong to the poorest class.

The table classifying some of the causes of death, &c., in the several Wards shows the infant death-rate to be excessive in the North Ward, and the deaths from zymotic diseases which took place in this Ward also far exceeded those occurring in either of the other Wards. This again is a matter of quality of population. It is amongst the poor

that infectious diseases chiefly occur, and to improve the quality of a poor-class population would be a sure way of lessening the incidence of zymotic disease, as well as of diminishing the general death-rate.

TABLE SHOWING DEATH-RATES PER 1,000 LIVING IN THE SEVERAL WARDS IN 1898.

[INSTITUTIONS EXCLUDED.]

Of Infants 1 year old and under ; of Old People over 70 years of age ; from Phthisis ; from other diseases of Respiratory System—Pneumonia, Bronchitis, Pleurisy, &c. ; from Cancer, and from Zymotic Diseases, including all Notifiable Diseases, together with Erysipelas, Diarrhœa, Enteritis, Membranous Croup, Measles, and Whooping Cough.

	North Ward.	South Ward.	East Ward.	West Ward.	Central Ward.	Middle Ward.
1 year old and under ...	6.36	1.41	2.93	1.85	2.61	1.19
Over 70 years old ...	3.07	5.09	4.02	3.44	4.48	4.33
Phthisis ...	1.06	1.13	1.09	0.57	1.36	0.32
Pneumonia, Bronchitis, Pleurisy, &c. ...	2.75	1.98	1.95	0.85	1.49	0.86
Cancer and Malignant Growths ...	0.84	0.84	0.97	1.14	0.87	0.97
Zymotic Diseases ...	2.12	0.70	1.22	0.42	1.24	0.32

In the following Lists the Deaths are given in the Streets in which they occurred. The figures after the disease represent the ages at death, the comma separating one death from another. All ages up to 1 year are stated as 1 year, ages between 1 and 2 as 2 years, and so forth where fractions of years occur in the Death Returns. This mode of setting out the deaths is likely to be of use for making a ready comparison of the deaths that occur in any street through a series of years, and if Cancer or any other disease has an excessive incidence to any particular locality, it will be easily discovered by a comparison of the Lists of several years.

NORTH WARD.

Albert Street, St. Peter's	...	gastro-enteritis 1, 1, diarrhoea 1, old age 76, paralysis 72
Albert Street, St Paul's	...	epilepsy 34, malignant disease 63
Alstone (Lower)	...	old age 84, stomatitis 1, heart disease 57, 71, convulsions 1, phthisis 48, suicide by drowning 20
Arle	...	heart disease 36
Baker Street	...	old age 81, overstrain of heart 45
Bloomsbury Place	...	bronchitis 1
Bloomsbury Street	...	convulsions 1, marasmus 1
Burton Cottages	...	cancer 77
Burton Street	...	bronchitis 72, 2, phthisis 44, 22, old age 89, cerebral hæmorrhage 73, 69, diabetes 71, heart disease 54
Calcutta Terrace	...	gastritis 75
Chapel Street	...	premature birth 1, heart disease 50
Cheltenham ?	...	syncope due to the anæmic condition of brain 18
Cleveland Street	...	exophthalmic goitre 22, broncho-pneumonia 5
Devonshire Street	...	phthisis 26, debility 1, 1
Elmstone Street	...	atrophy 1, heart disease 67
Granville Street	...	meningitis 4, bronchitis 67, syncope 60, premature birth 1
Grove Street...	...	bronchitis 58, emphysema 66, measles 4, 2, 1, 4
Hereford Place	...	influenza 55
High Street	...	premature birth 1, cancer 53, hemiplegia 72, syphilitic eczema 1, imperfect from birth 1, suicide by hanging 35, chill 34, convulsions 1, pneumonia 69, atrophy 1, dentition 1, phthisis 24
Julien Terrace	...	icterus neonatorum 1
Keighley Terrace	...	phthisis 17

King Street ...	...	bronchitis 86, syncope 66
Lower Park Street ...	...	diarrhœa 1, 1, heart disease 9, debility 1, arthritis 68
Linden Terrace ...	...	influenza 11
Malvern Street ...	...	cancer 52, bronchitis 63
Marsh Lane ...	...	broncho-pneumonia 2, pneumonia 3, hemiplegia 56
Nailsworth Terrace ...	...	ulceration of legs 49, phthisis 16
New Street ...	...	heart disease 66, dentition 2, debility 1, old age 90, 78, diarrhœa 1, syphilis 1
Normal Terrace ...	...	gastritis convulsions 1
Queen Street...	...	pneumonia 1, 64, premature birth 1
Russell Place ...	...	pericarditis 60, convulsions 1, emphysema 54
Russell Street ...	...	old age 78, malnutrition 1
Severn Hill ...	...	phthisis 42
Station Street ...	...	old age 95
Stoneville Street ...	...	atheroma 59
Stanhope Street ...	...	measles 2, accidentally suffocated 1, sores on penis 1, bronchitis 73, 1, 1, dentition 1, diarrhœa 1
St. Paul's Street North ...	...	pleurisy 58, croup 2, suicide by cutting throat 38, cancer 49
St. Paul's Street South ...	...	child birth 42, syncope the result of an accidental fall 57, old age 76, nephritis 49, bronchitis 73, asthenia 1, heart disease 71, premature birth 1, phthisis 27, gangrene of lungs 59
Sun Street ...	...	heart disease 64, 63, 65, necrosis of spine 18, bronchitis 81, 2, child birth 28, tabes mesenterica 1
Swindon Road ...	...	cerebral tumour 10, syncope 83, measles 2, cancer 58, debility 1, jaundice 88, convulsions 1, influenza 89, imperfect circulation 1, diarrhœa 1, inflammation of brain the result of an accident 40
Swindon Place ...	...	dermatitis 1, premature birth 1
Swindon Street ...	...	scarlet fever 3, whooping cough 1, gastric catarrh 71
Tewkesbury Road ...	...	cancer 67, heart disease 57, 35, gastro-enteritis 1, debility 1, tabes mesenterica 2
Townsend Place ...	...	marasmus 1, anæmia 1
Townsend Street ...	...	diarrhœa 1, 1, inflammation of lungs 1, cancer 46, old age 87
Victoria Street, St. Paul's ...	...	hemiplegia 76, bronchitis 79, paralysis 53
Waterloo Street ...	...	otitis media 1, phlebitis (septic) 32, gastro-enteritis 1, heart disease 56
Worcester Street ...	...	influenza 62, cerebral effusion 47, broncho-pneumonia 1, malnutrition 1
White Hart Street ...	...	phthisis 29, convulsions 1, 1, paralysis 67, congestion of lungi 24

THE UNION WORKHOUSE.

heart disease 62, 45, 66, 53, 64, 45, 36, 79, 59, 69, 72, 83, 60, 82, 62, 77, confinement 32, glosso-labio-laryngeal paralysis 35, cancer 66, 65, 79, 71, 65, 75, cerebral hæmorrhage 81, 68, 65, 77, 75, 60, 85, 73, 70, old age 90, 77, 86, 91, 84, 78, 75, 80, 87, 79, 86, 72, 82, phthisis 64, 56, 38, 65, 63, 42, 48, bronchitis 83, 78, 73, 83, 74, 66, gastro-enteritis 2, renal disease 76, 63, 67, 78, Bright's disease 70, malignant disease 70, 75, 62, 79, dementia 59, 63, anæmia 66, rheumatoid arthritis 59, syphilis 1, 1, fracture of femur the result of an accidental fall 83, influenza 80, gangrene of leg 79, premature birth 1, ulcerative colitis 64, pleurisy, 77, atelectasis 1, diabetes 57, cirrhosis 56, marasmus 1, parturition 22, erysipelas 79, hæmatemesis 67.

SOUTH WARD.

Avenall's Parade	...	...	asthmatic bronchitis 47
Bath Parade	...	...	cancer 62, Bright's disease 66, bronchitis 43
Bath Road	...	...	premature birth 1, influenza 62, apoplexy 51, phthisis 39, hepatitis 52, old age 87, gastro-enteritis 1, cerebral hyperæmia 79, pertussis 2, cerebral hæmorrhage 81
Bath Terrace	...	...	phthisis 34, tubercular peritonitis 1
Cambray	...	...	heart disease 82, diabetes 42, hemiplegia 80, concussion of brain 22
Commercial Street	...	...	heart disease 67, 85, phthisis 58
Corpus Street	...	...	phthisis 33
College Road	...	...	angina pectoris 63
Clare Place	...	...	gastritis 24
Dovedale Villas	...	...	old age 93
Delancey Hospital	...	...	enteric fever 10, scarlet fever 8, 3, 15, 3, 7
Exmouth Street	...	...	gastro-enteritis 1, old age 75, tubercular meningitis 2
Ewlyn Terrace	...	...	meningitis 3, congestion of lungs 75
Ewlyn Road	...	...	congestion of lungs 1
Fairfield Place	...	...	old age 78, cerebral tumour 10, influenza 50, gastro-enteritis 1
Francis Street	...	...	apoplexy 79
Greville Terrace	...	...	enteritis 1
Great Norwood Street	...	...	meningitis 5, cancer 56, pneumonia 1, malignant disease 72
High Street	...	...	phthisis 64, bronchitis 72, influenza 5
Kew Place	...	...	bronchitis 73
Keynsham Road	...	...	enteric fever 53
Kilchberg Villas	...	...	premature birth 1
Leckhampton Road	...	...	cerebral softening 71, old age 83, leucocythæmia 4, congestion of brain 2, cancer 68

Montpellier Terrace...	...	rachitis 6
Montpellier Villas ...	...	asthma 77, prostatic enlargement and hæmorrhage 82, bronchitis 76
Montpellier Grove ...	...	apoplexy 71
Nazareth House ...	...	prostatitis 80, softening of the brain 61
Naunton Crescent ...	...	phthisis 18, rheumatism 4, tubercle of lungs 10, hemiplegia 62, old age 75, heart disease 53
Northwick Terrace ...	...	old age 78, debility 1
Norwood Terrace ...	...	atheroma general 82
Old Bath Road ...	...	heart disease 75
Orrisdale Terrace ...	...	intestine obstruction 81, heart disease 68
Oxford Place ...	...	diabetes 68
Oriel Villas ...	...	atrophy of brain 85
Oriel Walk ...	...	influenza 28
Oriel Place ...	...	influenza 52
Pilley Lane ...	...	heart disease 43
Rodney Terrace ...	...	heart disease 80
Sandford Terrace ...	...	old age 82
Sandford Street ...	...	cerebral hæmorrhage 61
Southampton Place...	...	cancer 87
St. Luke's Road ...	...	influenza 85, 60, heart disease 75, bronchitis 65, cerebral hæmorrhage 44
Suffolk Parade ...	...	phthisis 32, diphtheria 11
Suffolk Street ...	...	phthisis 60, congestion of liver 74, hypertrophy of spleen 64, epileptiform seizure 70
Suffolk Road...	...	cancer 36
Upper Bath Street ...	...	congestion of lungs 76, heart disease 66
Union Street...	...	cirrhosis of liver 58
Victoria Parade ...	...	pneumonia 53
Wellington Street ...	...	bronchitis 89
White Cross Square ...	...	cerebral hæmorrhage 42

THE GENERAL HOSPITAL.

general arterial degeneration 59, broncho-pneumonia 1, 1, 3, 1, 2, 1, delirium tremens 36, hernia (inguinal) 68, malnutrition 1, syncope following burns accidentally sustained 8, diphtheria 3, 2, 4, 3, 4, cancer 58, exophthalmic goitre 20, endocarditis 24, 36, ruptured pyosalpinx 38, diabetes 33, septicæmia 20, 35, heart disease 24, 52, 61, 28, 1, fracture of skull accidental fall 32, 24, 13, pneumonia 52, 67, 60, 1, 49, phthisis 20, gastro-enteritis 1, 1, 1, 1, peritonitis 60, pericarditis 11, bronchitis 5, cerebral hæmorrhage 72, strangulated hernia 71, 48, 58, pyelitis 45, tubercular enteritis 10, 2, diphtheritic paralysis 3, internal hæmorrhage the result of an accidental gunshot wound 19, tetanus 18, tubercular disease of intestine 13, perforating gastric ulcer 28, nephritis 21, tubercular meningitis 2, erysipelas 64, injuries through fall 35.

EAST WARD.

Albert Place ...	...	convulsions 3, atheroma 76
All Saints' Road ...	...	heart disease 72, tuberculosis 40, premature birth 1, bronchitis 81
All Saints' Terrace ...	...	convulsions 1, heart disease 21, cancer 19, cirrhosis of liver 51
All Saints' Villas ...	...	leucocythemia 34
Belle Vue Lawn ...	...	fracture of femur the result of an accidental fall 82
Berkeley Place ...	...	phthisis 29
Britannia Place ...	...	debility 1
Brighton Road ...	...	diabetes 54, tuberculum 8, rheumatism 49
Carlton Street ...	...	phthisis 24
Cakebridge Terrace ...	...	phthisis 39
Cemetery Road ...	...	premature birth 1, 1, influenza 69
Columbia Street ...	...	cirrhosis of stomach 49, old age 73, 82, peritonitis 26
Denmark Villas ...	...	debility 1
Duke Street ...	...	gastric catarrh 62, pneumonia 49, phthisis 45, 28, bronchitis 78, 89, congenital specific 1
Fairview Street ...	...	paralysis of throat 63, phthisis 38, old age 101, heart disease 68, wasting 1, convulsions 1
Fairview Road ...	...	phthisis 48
Glenfall Street ...	...	old age 82, pertussis 2
Grosvenor Street ...	...	bronchitis 87, cancer 58
Grosvenor Terrace ...	...	bronchitis 59, cancer 71, marasmus 1
Hales Road ...	...	hepatic cirrhosis 72, hemiplegia 74, malignant disease 45, old age 81, cancer 57, enteric fever 44, bronchitis 76
Hewlett Street ...	...	heart disease 72
Hewlett Road ...	...	convulsions 2, nephritis 1
High Street ...	...	Bright's disease 57, cancer 81
King's Road ...	...	tabes mesenterica 1, pleurisy 73
Keynsham Street ...	...	heart disease 68, phthisis 38
Keynsham Parade ...	...	old age 83
Keynsham Bank ...	...	shock the result of an accidental fall 82
Leighton Road ...	...	bronchitis 1, 5, apoplexy 64
London Road ...	...	cerebral hæmorrhage 84
Pittville Circus Raad ...	...	gastro-enteritis 2
Princes Street ...	...	pertussis 1, renal disease 68, gout 72
Priory Terrace ...	...	influenza 72
Priory Street ...	...	congenital disease of heart 1
Rosehill Street ...	...	hip disease 16
Rosehill Terrace ...	...	meningitis 2
Selkirk Street ...	...	diabetes 18
Selkirk Parade ...	...	heart disease 77, old age 81
Sidney Street ...	...	bronchitis 77

Sherborne Street	...	...	heart disease 72, old age 82, pleuro-pneumonia 43, alcoholism 50
Sydenham Road	...	...	cancer 57
Sydenham Villas	...	...	heart disease 74
St. James' Street	...	...	gastro-enteric catarrh 2, pneumonia 2
St. Anne's Villas	...	...	influenza 67
Union Street...	...	...	cancer 51, measles 2, 3, premature birth 1, middle ear disease 54
Upper Park Street	...	...	strangulated hernia 69, pneumonia 40, heart disease 71, premature birth 1, 1
Victoria Street	...	...	phthisis 7, bronchitis 2, measles 2
Victoria Terrace	...	...	gastro-enteritis 1, pneumonia 63
Whaddon Villas	...	...	old age 73
Whaddon Lane	...	...	syncope 84
Winstonian Terrace	...	...	strangulated hernia 56
Witcomb Place	...	...	diarrhoea 1, premature birth 1, bronchitis 1
York Street	...	...	convulsions 1, median hare lip 1

WEST WARD.

Arle	...	...	follicularis 60, old age 79, cancer 55
Bayshill Terrace	...	...	influenza 69
Briton Terrace	...	...	diabetes 29
Brooklyn Terrace	...	...	premature birth 1, 1
Castle Terrace	...	...	debility 1
Christ Church Terrace	...	...	apoplexy 69
Christ Church Villas	...	...	cerebral hæmorrhage 86
Christ Church Road...	...	...	heart disease 39, malignant disease 78
Douro Villas	...	...	nephritis 75
Denmark Terrace	...	...	cerebral hæmorrhage 51, diabetes 62
Fiddler's Green Lane	...	...	suicide by hanging 66
Gloucester Road	...	...	enteric fever 25, heart disease 82, cerebral hæmorrhage 44, diabetes 24, influenza 45
Grange Crescent	...	...	cancer 53
Granley Villas	...	...	pneumonia 75
Great Western Terrace	...	...	pneumonia 70
Lansdown Road	...	...	old age 80, influenza 78, ruptured liver 47
Lansdown Terrace	...	...	old age 86
Lansdown Parade	...	...	cancer 63
Lansdown Place	...	...	rheumatism 46, heart disease 81
Lansdown Crescent...	...	...	rheumatic arthritis 73, erysipelas 26, phthisis 42
Libertus Road	...	...	syncope 64
Malvern Road	...	...	over exertion 58
Millbrook Terrace	...	...	peritonitis 64, heart disease 76
New Street	...	...	Bright's disease 71, heart disease 49, accidentally drowned 16

Queen's Retreat	...	...	syphilis 1, old age 82, strangulated hernia 75
Queen's Parade	...	...	heart disease 70
Roman Road	...	...	apoplexy 79, heart disease 72, old age 74, cancer 63, broncho-pneumonia 1, premature birth 1
St. George's Retreat	...	...	cerebral hæmorrhage 73, bronchitis 1
St. George's Place	...	...	sclerosis 52, rheumatism 21, paraplegia 67, 37, stricture of pylorus 69
St. George's Road	...	...	cancer 80, scirrhus pylori 59, diarrhœa 1
St. James' Parade	...	...	phthisis 39
St. James' Square	...	...	premature birth 1, 1, heart disease 45, pregnancy 36, chronic suppuration of right middle ear 26
St. James' Place	...	...	atheroma of arteries 71, diarrhœa 1, paralysis 63
St. Mark's	...	...	heart disease 77, old age 89, broncho-pneumonia 1, debility 1, paralysis 68, phthisis 51
St. Mark's Emporium	...	...	cancer 59
Vulcan Terrace	...	...	phthisis 39
York Terrace	...	...	renal calculus 68, influenza 61, bronchitis 71

CENTRAL WARD.

Albion Street	...	...	heart disease 49
Bennington Street	...	..	bronchitis 72
Beaufort Buildings	...	...	pneumonia 2, old age 73, phthisis 50, measles 2
Brunswick Street North	...	...	congenital malformations 1
Brunswick Street	...	...	ricketts 2, heart disease 81, diarrhœa 1
Brunswick Place	..	...	influenza 75
Brunswick Terrace	...	...	gastro-enteritis 1, measles 3
Children's Hospital	..	...	marasmus 1, pneumonia 1
Clarence Square	...	...	renal calculus 80, aneurism 68
Courtenay Street	...	..	phthisis 36, necrosis 15, cancer 58, 59, heart disease 17
Dunalley Parade	...	...	cancer 46
Evesham Road	...	...	hemiplegia 76, marasmus 1
Gloucester Place	...	...	convulsions 1, cancer 79
Grosvenor Place South	...	...	bronchitis 80, influenza 84
Grafton Passage	...	...	old age 78, 83
Hanover Street	...	...	premature birth 1
Henrietta Street	...	...	hemiplegia 71
High Street	...	...	heart disease 58, phthisis 41, pneumonia 5
Hungerford Street	...	...	phthisis 27, pertussis 2
Leamington Place	...	..	heart failure due to old age 74, heart disease 74

Marle Hill Parade ...	...	phthisis 58
Marle Hill Road ...	...	rachitis 2, marasmus 1
Mountpleasant ...	...	pneumonia 32, dentition 1, old age 80
North Place ...	...	Hodgkin's disease 8, ulcer of leg 75
Northfield Terrace ...	...	abcess 1
Orchard Place ...	...	syphilis 1
Orphan Boys' Asylum ...	...	endocarditis 54
Oxford Passage ...	...	stomatitis and enteritis 1
Pate's Alms Houses ...	...	old age 80, 85
Pittville ...	...	heart disease 77, phthisis 32
Pittville Parade ...	...	pulmonary congestion 73
Pittville Lawn ...	...	heart disease 75, old age 87
Pittville Crescent ...	...	congestion of lungs 81
Portland Street ...	...	measles 2, diarrhœa 1
Portland Square ...	...	old age 76, renal disease 68
Portland Place ...	...	Bright's disease 74, tabes mesenterica 1
Rose and Crown Passage ...	...	bronchitis 1, cancer 64
Regent Place ...	...	marasmus 1
Rutland Street ...	...	hemiplegia 82, ptomaine poisoning 2, convulsions 1, diarrhœa 77, heart disease 59, empyema 2
Segrave Place ...	...	stricture of small intestine 66
Sherborne Street ...	...	phthisis 2, measles 2, atelectasis 1
St. Paul's Parade ...	...	phthisis 50, debility 1
St. George's Street ...	...	heart disease 61, cerebral hæmorrhage 51, phthisis 18, gangrene of leg 91, cancer 9, diarrhœa 1
Swindon Road ...	...	cancer 70
Trinity Terrace ...	...	nephritis 74
Warwick Place ...	...	pertussis 5
Wellington Grove ...	...	phthisis 16
Wellington Square ...	...	broncho-pneumonia 83
Wellington Passage ...	...	emphysema 26
Winchcombe Street ...	...	cirrhosis of liver 58, influenza 70, old age 73, 87, heart disease 83, 67, anæmia 63, hemiplegia 64, phthisis 24
Winchcombe Place ...	...	heart disease 22
Windsor Street ...	...	old age 81

MIDDLE WARD.

Albany Street ...	...	phthisis 32
Andover Road ...	...	cerebral softening 75
Andover Terrace ...	...	heart disease 75, rheumatic arthritis 84
Brandon Terrace ...	...	bronchitis 63, hemiplegia 75, apoplexy 71
Brooksdale Road ...	...	asphyxia 1
Brooksdale Cottages ...	...	bronchitis 81
Cambridge Villas ...	...	diabetes 72.
Clarence Place ...	...	rachitis 2, broncho-pneumonia 1

Cloverdale Villas ...	...	broncho-pneumonia 38, pneumonia 35
Cloddimore ...	...	run over by train 67, 24
Croft Street ...	...	congestion of lungs 48
Edward Place ...	...	bronchitis 74, heart disease 74, cancer 41
Edward Street ...	...	bronchitis 41, broncho-pneumonia 1
Edward Terrace ...	...	bronchitis 2
Gratton Road ...	...	debility 2
Great Norwood Street ...	...	old age 90, bronchitis 66, heart disease 33
Hatherley Place ...	...	influenza 69, stomatitis 87
Hatherley Street ...	...	alcoholism 59
Hatherley Road ...	...	anæmia 44, bronchitis 77
Imperial Square ...	...	old age 76, 84
Lypiatt Street ...	...	phthisis 18
Montpellier Terrace ...	...	heart disease 69, broncho-pneumonia 53
Moorend Road ...	...	pyonephrosis 44, cancer 61, 72
Moorend Street ...	...	pertussis 2, hemiplegia 75, heart disease 48
Ormond Terrace ...	...	old age 81
Park, The ...	...	gastritis 1
Park Place ...	...	heart disease 84, phthisis 57
Park Promenade ...	...	cerebral thrombosis 70
Promenade, The ...	...	hemiplegia 77, old age 78, 89, heart disease 57, 79, cancer 60, prostatitis 84, hepatitis 49, myelitis 74
Promenade Terrace ...	...	influenza 42, broncho-pneumonia 69, bronchitis 88
Princes Road ...	...	premature birth 1
Regent Street ...	...	convulsions 1, old age 64
Rochford Terrace ...	...	cancer 66
Rodney Place ...	...	cancer 79
Rotunda Terrace ...	...	nephritis 50, heart disease 60
Rosslyn Villas ...	...	pleurisy 30
Royal Parade ...	...	heart disease 83, asthenia 61
Royal Crescent ...	...	apoplexy 75
Royal Well Terrace ...	...	heart disease 82, influenza 71
Shurdington Road ...	...	premature birth 1, 1, peritonitis 63, enteric fever 36, old age 75, cerebral hæmorrhage 56
Spa Buildings ...	...	nerve degeneration 75, bronchitis 80, broncho-pneumonia 67
St. Philip's Terrace ...	...	nephritis 59
St. Philip's Street ...	...	tuberculosis 1, broncho-pneumonia 2, cancer 60
St. Stephen's Road ...	...	debility 1, heart disease 21
Suffolk Square ...	...	paralysis 76
Suffolk Place ...	...	osteo-arthritis 62
Tivoli Road ...	...	diarrhœa 80
Tivoli Street ...	...	cellulitis 76, influenza 81
Tivoli Terrace ...	...	cerebro-spinal meningitis 2
Upper Norwood Street ...	...	bronchitis 2, 1, cancer 72, malignant cyst of neck 54
York Villas ...	...	cirrhosis of liver 70

Zymotic Diseases.

CASES OF INFECTIOUS DISEASES NOTIFIED IN EACH QUARTER OF 1898.					
Disease.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Total for the year.
Scarlet Fever... ..	65	51	43	137	296
Enteric Fever	2	1	3	17	23
Puerperal Fever	2	...	2	1	5
Diphtheria	15	7	8	22	52
Total of all Diseases Notified in 1898 ...					376

CASES OF INFECTIOUS DISEASES NOTIFIED IN 1898, DISTRIBUTED IN WARDS AND INSTITUTIONS.					
Ward or Institution.	Scarlet Fever.	Enteric Fever.	Puerperal Fever.	Diphtheria	Total in each Ward or Institution.
North Ward	100	...	3	13	116
South Ward	46	5	...	7	58
East Ward... ..	31	7	1	15	54
West Ward	30	6	...	4	40
Central Ward	35	2	1	3	41
Middle Ward	53	3	...	10	66
Boys Orphanage	1	...	...	...	1
Totals in Borough	296	23	5	52	376

SCARLET FEVER.

Of the notification certificates received during 1898, by far the larger number were for Scarlet Fever. This

disease in fact is the most commonly occurring of all the diseases that are included amongst those that have to be notified, and next to measles is the most common exanthem or disease with a rash to which child life is subject. There had been an annual increase during the three previous years and this increase was continued last year, the numbers notified in the four years 1895-8 being 89, 126, 224, 296. It is probable that a few of the mildest cases escaped notification and these would aid materially in keeping alive the infection. Scarlet Fever may occur in any degree of severity, the symptoms being sometimes limited to a sore throat and a headache, with perhaps a small amount of rash of very local distribution, or no perceptible rash at all. So that in any prevalence of this disease a certain number of the mildest cases are sure to escape detection. Sore throat is always a suspicious symptom and should lead to a careful examination of the skin and attention to the patient at all times. The parents and guardians of children cannot be too careful in this respect, but considerable carelessness upon their parts is from time to time displayed when neglected cases in the second or third week of the illness, or later, are brought to light through the profuse desquamation of the skin, or the secondary symptoms of kidney affection with dropsy, or continuing discharges from the ear or nose, the latter being particularly potent in setting up new cases of the disease in other persons with whom the neglected patient may be brought into contact.

Every quarter of the town was affected by the Scarlet Fever prevalence. At one time there was very clear evidence of at least a score of children having contracted the disease by visiting a fair held in the town. As soon as this was plainly indicated, enquiry was made as to the possible existence of cases in one of the families travelling in the caravans that visited the fair. These however were very numerous and most of them by this time had gone no one knew whither. A careful examination of the children in those that remained did not lead to any discovery. In a great many of the other cases which occurred here and there in widely separated places in the town, no clue could be obtained of any exposure of the sufferer to direct infection. In certain instances where there appeared to be hardly a

possibility of direct or even indirect exposure to an infected person, the possibility of Scarlet Fever sometimes arising from infection developed and carried in some more general way than by case to case infection strongly suggested itself.

DIPHTHERIA.

The number of cases of Diphtheria last year notified was also in excess of the average. I was also made aware of the fact of there being a good deal of sore throat in the town which was not notified as Diphtheria or Scarlet Fever. Whether any of these sore throats were caused by the specific organisms of Diphtheria or Scarlet Fever there is no means of determining, but probably they were of more simple nature for the greater part.

STREPTOCOCCIC INFECTIONS.

The Streptococcic germ was probably responsible for many of the above-mentioned sore throats. Although we do not notify Erysipelas in Cheltenham some few cases came to my knowledge, and I believe that towards the end of the year abscesses in one location of the body or another were of more than average occurrence, suggesting the probability of the mild weather, or some other cause, being favourable to the virulent growth of the streptococcus as well as the more definite specific germs of the two principal diseases above-mentioned. The five cases of puerperal fever may also be mentioned under this heading.

ENTERIC FEVER.

Twenty three notifications only for Enteric Fever cases were received, although last year was reckoned as an enteric year in many districts. Cheltenham thus maintained its reputation as a non-enteric district, and the fact of so few cases being notified speaks eloquently for the comparatively safe general character of our water supply. Three cases that occurred in one house simultaneously appeared to have contracted the complaint from another member of the same family who had been invalided from Birmingham with supposed rheumatic fever. Several of the other cases were imported, and more than one case had its origin in a seaside lodging-house.

MEASLES.

There was some considerable amount of Measles in the town last year, although it was somewhat limited in regard to locality, occurring chiefly in the North Ward. There were 12 deaths assigned to this cause during the year. In the early summer it became necessary to close three schools on account of the prevalence of Measles.

CHICKEN-POX.

This was prevalent particularly in one locality. The cases were generally not severe, the general health of the patients being little interfered with, a fact which led to some of them being sent to school with the rash upon them. This speedily resulted in an epidemic of Chicken-Pox amongst the children of that school, and the school had to be closed in consequence.

SMALL-POX.

There was no case of Small-Pox notified last year. In previous years we have generally had a case or two from the casual ward of the Workhouse, or from one or other of the Common Lodging-houses. One case notified to me as a suspicious case was promptly quarantined at the isolation hospital but afterwards proved to be Chicken-pox.

WHOOPIING COUGH.

The fact of five deaths only being assigned to Whooping Cough during the year points to a comparatively small incidence of this disease during 1898, and tends to confirm what I have before pointed out, viz: that Cheltenham is not so greatly troubled with this disease as many other places—taking an average of years.

INFLUENZA.

There was evidence in our death-returns of an increase in the number of persons attacked with Influenza last year as compared with the two previous years, and the disease is prevalent in the town at the time of writing. The attacks

are reported to be usually of a milder type than those that came under treatment during the first two or three years of the visitation, which may be either due to the saving influence upon the body of former attacks, or to a decadence in the virulence of the causing germ. In accordance with the previous history of this disease we may look for its disappearance at some time; there is unfortunately however at this moment no appearance of so desirable a finale to the scourge. The annual numbers of deaths, with Influenza given as the chief cause, occurring in the Borough since the first appearance of this disease are given below:—

1890...	...	...	...	...	10
1891...	...	...	...	...	31
1892...	...	...	...	...	34
1893...	...	...	...	...	26
1894...	...	...	...	...	10
1895...	...	...	...	...	28
1896...	...	...	...	...	2
1897...	...	...	...	...	11
1898...	...	...	...	...	26

ISOLATION AND HOSPITAL TREATMENT.

The Delancey Isolation Hospital is now a complete and most serviceable institution. The recent enlargements have given us not only a greatly increased accommodation for Scarlet Fever cases, but have provided some fine wards for the treatment of Enteric Fever and Diphtheria. The Diphtheria new detached block proved of considerable service last year. Sixteen cases of Diphtheria were treated there without a single death. These cases were sent in as they arose, the symptoms of some of them being urgent at the time of admission. The treatment by anti-diphtheritic serum subcutaneous injections was markedly beneficial, and probably saved many lives. Of course sometimes cases are too far progressed before notification for any treatment to avail, and the fact of no death occurring in the hospital was a matter in part of good fortune. Six cases of Enteric Fever were treated in the Delancey Hospital with one death. Also

two hundred and sixty-one cases of Scarlet Fever with five deaths. In the General Hospital there were also treated thirteen cases of Diphtheria and eight cases of Enteric Fever.

The following table gives the relative numbers of these diseases notified and treated in hospital during 1898 :

Disease.	Notified.	Treated in Hospital.
Scarlet Fever ...	296	261
Diphtheria ...	52	29
Enteric Fever ...	23	14

UNCERTIFIED DEATHS IN 1898.

The following is a list of deaths for which no death certificate was given, and into the cause of which no inquest was held. The list is regrettably long, numbering twenty-five :—

Apoplexy at age 75	1
Cirrhosis of Stomach and Liver at age 49	1
Convulsions at ages 3 months, 14 months, 1 day, 4 days	4
Failure of heart's action due to old age, at age 74	1
Gastro-enteritis at age 8 months	1
Heart disease at ages 64, 54, 74	3
Heart failure following bronchitis at age 67	1
Hæmoptysis following phthisis at age 42	1
Old age at ages 82, 75, 80	3
Paralysis of throat at age 63	1
Premature birth at ages 3 hours, 2 hours, 5 days	3
Syncope at ages 83, 82, 84, 57	4
Weak heart at age 83	1
	<hr/> 25

RESULTS OF CORONER'S INQUESTS, 1898.

Forty-five deaths were reported as having been certified by the Coroner after inquests, the finding in each case being as set out below :—

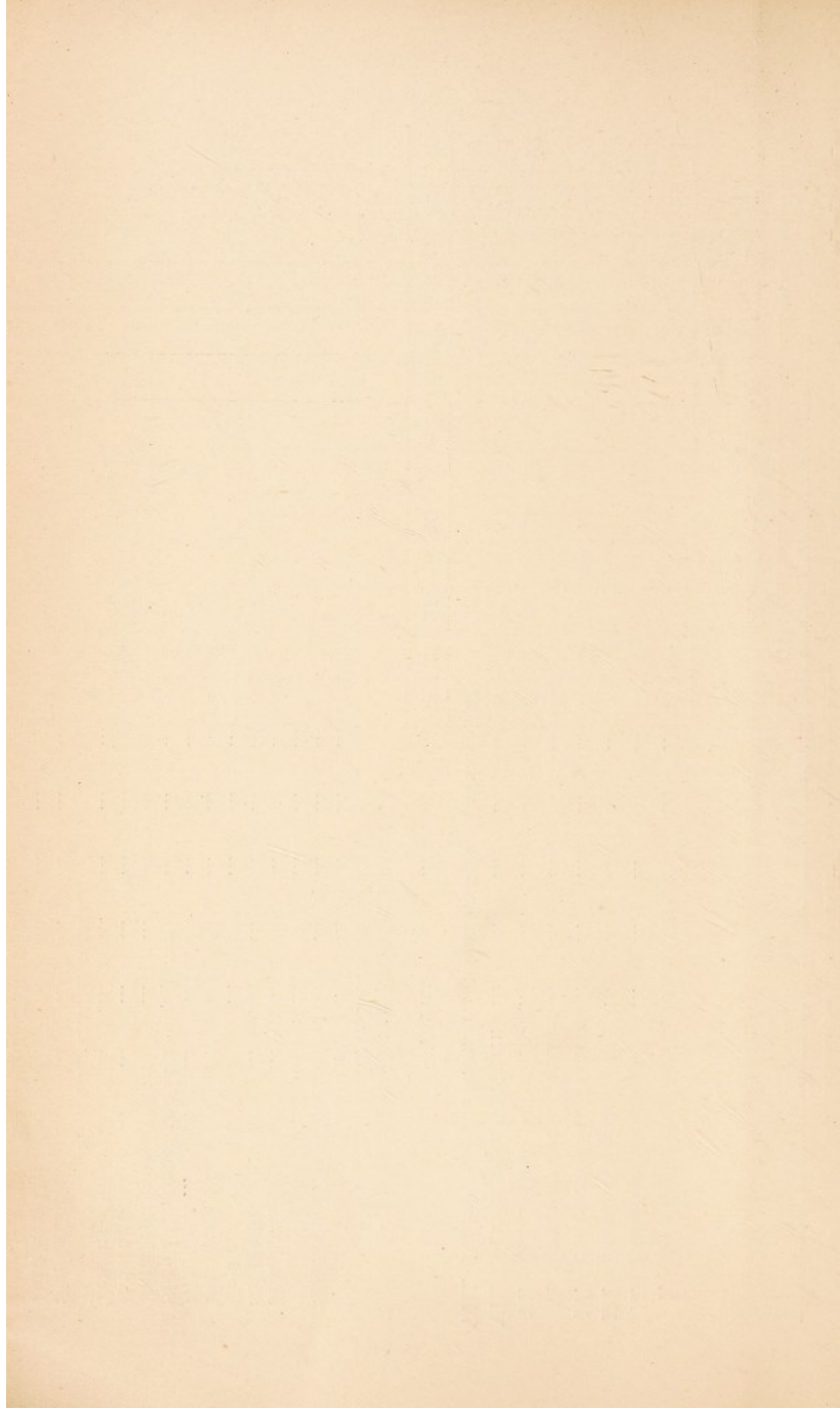
Atalectasis	1
Accident by suffocation whilst in bed with parents	2
“ by drowning	1
“ by scalds, broncho-pneumonia following	1
“ by fall and its consequences	9
“ run over by train (? accidental)	1
“ resulting in inflammation of brain	1
“ by shooting	1
“ by burning	1
“ run over by cab resulting in fractured skull	1
Bronchitis	1
Congestion of lungs	1
Convulsions	1
Heart disease	5
Hernia strangulated	1
Inflammation of lungs	1
Jaundice accelerated by fractured thigh	1
Over exertion	1
Old age	1
Pleuro-pneumonia	1
Peritonitis	1
Pericarditis	1
Ptomaine poisoning	1
Ruptured Liver	1
Syncope from hæmorrhage in region of womb	1
“ from a weakened condition	1
“ from anæmic brain and pneumonia	1
Suicide by drowning	1
“ by hanging	2
“ by cutting throat	1
“ by being run over by train	1

Table of DEATHS during the Year 1898, in the Cheltenham Urban District, classified according to Diseases, Ages, and Localities.

Mortality from all causes, at Subjoined Ages.										Mortality from Subjoined Causes, distinguishing Deaths of Children under 5 years of age.																					
(a)	At all Ages.						(i)																				Total				
	(b)	(c)	(d)	(e)	(f)	(g)		(h)	Smallpox	Scarlatina	Diphtheria	Membranous Croup.	Typhus	Enteric or Typhoid	Continued Relapsing	Puerperal.	Cholera	Erysipelas	Measles	Whooping Cough	Diarrhoea and Dysentery	Rheumatic Fever	Phthisis	Bronchitis and Pleurisy.	Heart Disease.	Influenza		All Injuries.	Diseases other than		
Cheltenham	666	141	46	17	29	195	238	Under 5 upwards	1	...	...	...	...	...	...	2	...	...	13	4	14	...	...	...	28	...	...	3	124	187
Union Workhouse...	88	5	1	...	1	26	55	Under 5 upwards	...	1	...	...	4	...	...	...	...	1	...	1	2	40	...	...	64	74	25	16	249	479
Delancey Hospital	6	...	2	4	...	...	...	Under 5 upwards	...	...	...	...	...	...	...	...	...	1	...	...	...	7	...	...	7	16	1	1	49	82
General Hospital ...	61	11	10	6	8	22	4	Under 5 upwards	...	6	7	1	4
Minor Institutions...	7	2	...	...	...	2	3	Under 5 upwards	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	6	5	...	6	21	40
								Under 5 upwards	1	1	2	5
TOTALS	828	159	59	27	38	245	300	Under 5 upwards	3	6	...	...	...	5	2	...	...	...	13	4	14	...	...	...	36	1	...	3	138	218
									3	1	...	...	...	...	...	...	...	3	...	1	2	48	...	...	77	95	26	23	324	610

The Subjoined Numbers have also to be taken into account in judging of the above Records of Mortality.

Deaths occurring outside the district among persons belonging thereto.	...	...	...	...	...	...	...	Under 5 upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deaths occurring within the district among persons not belonging thereto	24	3	3	1	3	6	8	Under 5 upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	2	...	4	14	18



(B) Table of Population, Births, and of New Cases of Infectious Sickness, coming to the knowledge of the Medical Officer of Health, during the Year 1898, in the Cheltenham Urban District; classified according to Diseases, Ages, and Localities.

Names of Localities adopted for the pur- pose of these Sta- tistics: Public Insti- tutions being shown as separate localities.	Population at all ages		Registered Births	Aged Under 5 or over 5	New Cases of Sickness in each locality, coming to the knowledge of the Medical Officer of Health				Number of such cases removed from their homes in the several lo- calities for treat- ment in Isolation Hospital.												
	Last Census.	Estimated to middle of 1898.			Scarlatina	Diphtheria	Fevers		Scarlatina	Diphtheria	Fevers										
							Enteric or Typhoid	Puerperal			Enteric or Typhoid	Puerperal									
Cheltenham	47514	49000	1090	Under 5.....	70	19	60	13	5 upwards...	226	33	23	5	201	16	14	3
TOTALS ...	47514	49000	1090	Under 5.....	70	19	60	13	5 upwards...	226	33	23	5	201	16	14	3



WORK DONE.

SUMMARY.

The following is a report of the work done by the Staff of the Health Department during the year 1898, drawn up by the Chief Inspector of Nuisances:—

Houses and Premises Inspected	...	...	11,335
Ordinary General Inspections	...	...	2,434
House-to-House Inspections	...	...	3,767
Reinspections	...	...	3,208
Visits to Slaughterhouses	...	...	120
“ Common Lodging-houses	...	...	36
“ Cowsheds, Dairies, &c.	...	...	122
“ Bakehouses	...	...	112
“ Workshops	...	...	169
Visits <i>re</i> Infectious Disease	...	...	1,366
Complaints received	...	...	92
Notices served	...	...	2,645
Circulars sent referring to Notices	...	...	286
Authorities under Sec. 41 Public Health Act, 1875, to open ground, &c.	...	...	151
Corporation Sanitary Certificates granted	...	...	62
New drains laid, and drains relaid, on notice	...	...	186
Water test applied to drains	...	...	398
Length, in feet, of stoneware pipe drains laid	...	...	12,037
“ “ heavy cast-iron (coated) pipe drains	...	...	2,724
Brick drains removed	...	...	49
Cesspools abolished	...	...	8
Manhole disconnecting and inspection chambers provided	...	...	56
Soil pipe and ventilating shafts fixed	...	...	185
“ “ “ smoke tested	...	...	93
Intercepting traps fixed	...	...	163
Dip and bell traps removed	...	...	1,334
Stoneware gully traps fixed	...	...	1,583
Rain-water and other pipes disconnected from drains	...	...	42
Lead waste pipes provided	...	...	398
Lead siphon traps fixed to waste pipes	...	...	360
New water closet apartments built	...	...	20
New w.c. pans of the Washdown type fixed	...	...	1,100
Flushing boxes fixed to w.c.'s	...	...	1,307
Urinals built and reconstructed	...	...	23

Urinals provided with a proper supply of water	30
Drains unstopped and cleansed	31
Samples of water collected for analysis	299
Wells closed on notice	239
Water supply provided to houses for drinking purposes, which, when inspected, were without same (Sec. 62 Public Health Act)	11
Nuisances from overcrowding abated	26
“ animals, fowl, &c.	25
“ smoke	4
“ insufficient closet accommodation	5
Houses cleansed and limewashed on notice	124
Bakehouses “ “ “	28
Slaughter-houses “ “ “	14
Workrooms “ “ “	24
Common Lodging-houses “	2
Houses closed under Sec. 32, Housing of the Working Classes Act, 1890	8
House walls repaired	15
Roofs, eaves, and gutters repaired	53
Floors, yards, and areas repitched	58
Pigstyes repaired, cleansed or redrained	12
Nuisances from accumulations of hogwash abated	6
Accumulations of manure removed	23
Manure receptacles provided	7
Ash receptacles provided on notice	775
Rooms fumigated	263
Notices to schools <i>re</i> infectious disease	281
Notices to parents “ “	230
Articles of clothing, bedding, &c., disinfected	4,759
Loads of ditto for outside Sanitary Authorities	25

**The following Matters have received Special Attention
during the Year :**

Improvements in Sanitary Conveniences at Schools.—

In several of the elementary schools the w.c.'s and urinals were found insufficient in number, and of old fashioned and insanitary type, the drains also being sometimes defective. In this regard the following schools have been greatly improved by compliance with notices served upon the managers, or by voluntary action on their part :—

St. John's Schools.
The Leckhampton Schools.
Mr. Preston's Commercial Schools.
The British Schools.
St. Paul's Schools.

Improvements in Sanitary Conveniences at Public-Houses.—Many of the Public-house urinals were without any provision for flushing, and many were also defective in construction, and in a foul and filthy state, causing nuisance. Twenty-three Public-house urinals were altered, or re-constructed on more sanitary principles, their sides, floors, and channels being re-made and in one way and another rendered impervious and easy to cleanse; in other cases stoneware urinals or troughs were provided, the traps and drains being renewed where necessary. Thirty urinals not previously supplied with regular means of flushing had water laid on to them for flushing purposes, by flushing cisterns or automatic tanks.

Affixing of Flushing Cisterns to w.c.'s.—This matter has received great attention during the last year. As a proof of this no less than 1,307 of these flushing cisterns have been fixed to w.c.'s, and the Corporation water laid on to them.

New Closet Pans.—In nearly every case where a flushing cistern is fixed, it is necessary to fix a new pan to the w.c. The old insanitary long hopper pan without a flushing rim is taken out and replaced by one of the "Washdown" type. 1,110 new pans were fixed last year.

Ash Receptacles.—Under Section 27 of the Cheltenham Improvement Act, the Corporation is empowered to call upon owners of property to provide an ash-receptacle of such size, pattern, and construction as they shall approve. Under this Section 775 new galvanized iron moveable ash-receptacles have been provided during the year on notice from this Department.

Improvements in House Drains.—A very large amount of time and attention has again been paid to the condition of house drains. The Public Health Committee has given instructions in 151 cases to open down and examine the drains under Section 41 of the Public Health Act, 1875, and in 139 instances it was found necessary to serve a notice upon the responsible person to take up the defective drain and lay a new drain of salt-glazed stoneware

or heavy cast-iron coated pipes. In addition to the drains which have been laid upon service of notice or for a Corporation Certificate, the Inspectors have been called, in a great many instances by the owner or builder, to examine and supervise sanitary work in progress. Altogether the Inspectors have supervised the laying or relaying of 14,761 feet of pipe drains, and have applied the water test to the drains before the pipes are covered up, and in a considerable number of cases after the ground is filled in, so as to be sure that no joints or pipes are broken in the process of filling up the trench. This of course necessitates a number of visits to each job, but it is only by applying such tests and paying periodical visits whilst the work is in progress that one can be sure that the work is carried out in a thorough manner and in such a way as to prevent a recurrence of the nuisance.

A very large number of D and bell traps are still in existence. Where such traps are found the owner is requested to remove them and replace them where necessary with proper stoneware gully traps. During the year 1,334 of these D and bell traps were removed and replaced by 1,583 stoneware gullies.

The owners of property are beginning to realize the advantages to be gained by having manholes built over the intercepting traps, and also inspection chambers where a number of branches join the main drain. These manholes and inspection chambers are of great use in the inspection, testing or cleansing of the drains. The total number of manholes built during the course of the year was 56.

In all cases where new drains are laid or relaid, efficient intercepting traps of the Winsor or Buchan type are fixed on the line of the drain and provided with a fresh air inlet. At the head of the drain a ventilating shaft is fixed and continued up full bore above the roof, well away from all windows, chimnies, &c. These ventilating shafts are invariably of heavy cast-iron pipes, coated with non-corrosive solution, with metallic joints. By this system the drains are well air flushed. With the old type of ventilating

shafts formed of cast-iron pipes of rain-water strength and not protected against internal corrosion, it is no unusual thing to find them completely blocked with rust at a bend, thus preventing proper ventilation of the drains. In addition to this failing the joints of this class of pipe are made with putty or red lead, and the space between the socket and spigot is so small as to prevent sufficient jointing material being inserted, and the material itself cannot be depended upon for keeping the pipes smoketight for any length of time.

Houses Closed as Unfit for Human Habitation.—

During the year eight houses were represented as being unfit for human habitation. They were damp, ill ventilated, and dilapidated, and were closed by the owners on service of notice upon them under Section 32 of the Housing of the Working Classes Act, 1890. The following are the houses closed :—

A cottage in Cousens' yard, Waterloo Street.

A cottage behind 223, High Street.

A room over stable in Hermitage Street.

A room over blacksmith's shop in New Street.

A house in Albion Gardens, Gloucester Road.

Nos. 1, 2, and 3, Barnard's Row.

Houses and Premises in an Insanitary State dealt with and Improved.—In addition to the above, 225 houses were reported as being in an insanitary condition owing to leaky roofs, and walls, ceilings and floors of houses in a bad state of repair, defective eaves-spouting, and rain-water pipes, &c. Notices were served to put the houses into proper condition, and these notices have been complied with the exception of those served at the end of the year which are in hand.

Houses and Premises in a Dirty and Unwholesome Condition.—No less than 124 houses were found to be in such a dirty condition as to require cleansing and lime-washing. Notices were served, and these houses have been thoroughly cleansed and limewashed

Overcrowding.—Twenty-six separate cases of overcrowding have been dealt with during the year. Each of these was so overcrowded as to be deemed a nuisance, and the occupiers were served with notices under the Nuisances Clause of the Public Health Act to abate the nuisance by removing to larger and more commodious premises. It is a very difficult matter to deal with some of these cases. The parents are very poor and have generally a large family of small children and cannot afford to pay a large rent, the wages earned by the father being insufficient to pay a big rent. The owners of property, generally speaking, are loth to let their houses to persons having large families.

Dairies, Cowsheds and Milkshops.—During the year there were 14 applications for registration as Purveyors of Milk, Dairy-men or Cowkeepers. Before registration the premises were inspected as to their sanitary condition, &c., and the condition of 12 having been found satisfactory they duly registered. The Cowsheds already registered were frequently inspected and the bye-laws for regulating these premises were found to be fairly well observed.

Common Lodging-Houses.—The Inspectors have visited these houses both by day and night and found that the bye-laws have been properly carried out. The houses have been kept in an orderly and cleanly condition. The keepers of two lodging-houses having left the business, two applications were received for registration, and the Public Health Committee being satisfied with the references furnished by the applicants they were accordingly registered.

Factories and Workshops.—The importance of maintaining workshops in a good sanitary condition is greater than usually appreciated. During the last four years great attention has been paid to work-places, and there has been a marked improvement in the condition of many of them. Better ventilation of rooms has been provided, overcrowding abated in several cases, cleanliness has been insisted upon, and improved sanitary arrangements provided. During the year 169 workshops were visited, and 24 of these were found to be in such a dirty condition as to require cleansing and

limewashing, which on intimation to the occupiers by notice or otherwise was carried out.

Bakehouses.—The bakehouses in the Borough were all inspected both by the Medical Officer of Health and by the Inspectors, and as a result numerous notices were served requiring the limewashing of the bakehouse, and others requiring amendments to the drains, w.c.'s, &c. An underground bakehouse situated in Grosvenor Street had been opened without permission and in contravention to Sec. 27 of the Factory and Workshop Act, 1895, which prohibits the use of underground places as bakehouses which were not so used or occupied before the 1st June, 1893. Notice was served to prevent its being used, with the result that it is no longer a bakehouse.

THE SANITARY CERTIFICATE OF THE CORPORATION.

There is still a good demand for Sanitary Certificates, and although there is some demur occasionally on the part of the owners in carrying out the improvements required for the granting of the Certificate, the work is ultimately done and the Certificate granted in nearly all cases, in which, as a result of an application for the Certificate an inspection has been made and a detailed report and specification of the required alterations and amendments sent to the applicant. There were 61 Certificates granted last year as against 52 in the previous year.

LIST OF HOUSES FOR WHICH SANITARY CERTIFICATES WERE GRANTED DURING 1898.

Name of House.	Annual Value.
Amherst Villa, Lansdown Road ...	£ 60
Argyle Villas, 2 ...	75
“ 2 (2nd certificate) ...	75
Argyle Place, 3 ...	40
Battledown Grange ...	100
Bayshill Villas, 1 ...	50
Brandon House ...	163
Cambridge Villas ...	100
Carlton Place, 3 ...	40

Name of House.	Annual Value.
	£
Clareville, Lansdown ...	90
Clarence Square, 6 ...	30
Deenhurst. St. Mark's ...	50
Delebere Villas, 2 ...	60
Eastbourne Villas, 2 ...	40
Eldon Villas, 2 ...	34
" 1 ...	32
Eva Villa, Bayshell ...	50
Fairfield Villas, 2 ...	26
Fairview Street, 14 ...	8
Fromefield, St. George's Road ...	60
Glenfall Lodge, All Saints' Road ...	90
Greville Terrace, 7 ...	15
Hatherley Place, 12 ...	42
" 7 ...	40
" 9 ...	45
High Street, 334 ...	80
Imperial Square, 18 ...	55
" 7 ...	55
Lansdown Place, 12 ...	80
Lansdown Terrace, 16 ...	55
Mayhill Villa, St. John's ...	26
Mersham Villa, Gloucester Road ...	24
Montpellier Parade, 2 ...	100
Montpellier Terrace, 3 ...	60
" 7 ...	55
" 20 ...	30
" 33 ...	55
" 43 ...	35
" 44 ...	40
Northfield Terrace, 15 ...	13
Oriel Villas, 1 ...	35
" 2 ...	35
Oriel Place, 7 ...	35
Pomfret House, Pittville ...	40
Park Place, 28 ...	36
Pittville Parade, 16 ...	50
Pittville ...	95
Pittville Villas, 15 ...	35
Promenade, 29 ...	75
Ryeworth House, London Road ...	55
Royal Crescent, 4 ...	55
Stanbrooke, Pittville Circus ...	70
Seagrave Villas, 2, The Park ...	80
Suffolk House ...	150

Name of House.	Annual Value.
St. Helier's, Hales Road	£ 60
St. James' Street, 15	8
St. John's Villae, 1, Berkeley Street	28
Sydenham Grove, 2	45
The Pines, Tivoli	90
Walton Court, Lansdown Road	165
Wellington Place, 1	55

A. E. HUDSON,

Chief Inspector of Nuisances.

THE TOWN SEWERAGE.

Some of the main and larger branch sewers in Cheltenham were made some forty or fifty years ago, and sewers are no longer constructed in the manner they were in those days. The question of renewal of sewers must be one that will crop up in every town in the course of time, and blame would attach to any Urban Sanitary Authority who neglected the reconstruction of their sewers as the need arose. In London and the largest towns this reconstruction of sewers is in progress unceasingly. In our town when it became evident that from faults of construction, irregular laying, and want of proper gradient, some of the sewers were not doing their work so well as could be desired, advice was given to the Council to re-sewer or amend the sewers wherever necessary throughout the town. The matter was first taken in hand three or four years ago, and the Borough Surveyor was instructed to take the town district by district in a systematic way, examine into the condition of the sewers, and bring up a report as to the needs of re-sewering in each district seriatim. This he proceeded to do, and reports with specifications and costs of works as to "Nos. 1 and 2 Sewerage Districts" were in due course presented. It was necessary to borrow money to proceed with the work, and this required

the sanction of the Local Government Board. Some slight criticism arose in regard to the details of a small part of the proposed works in No. 1 District, and owing to the apparent inability of the Local Government Board to hold the necessary enquiries within any reasonable time after application had been made by the Corporation to borrow the money, the carrying out of the works in these two districts has been greatly delayed. Now, at last however, the approval of the Local Government Board for the works to be carried out has been obtained, with permission to borrow the necessary capital, and the work of resewering will be at once begun in that quarter of the town comprised in Nos. 1 and 2 Sewerage Districts, and which is enclosed by the Lower High Street on the one hand, and Lansdown Road on the other with a base at the Promenade.

PRIVATELY-OWNED SEWERS.—In continuing this work into another District an obstacle is met with in the shape of certain sewers that are privately owned. This private ownership for the main part, dates back to an era when the enterprise of the governing body of the town in the public behalf was much less pronounced than at the present time. The Public Health Act, 1875, in Sec. 14, undoubtedly contemplates the taking over by purchase of any existing private sewers by the Sanitary Authority. Definite legal powers for this object are conferred to enable the Authority to acquire such sewers if they think fit, but considering the great importance of the sewers being entirely under the control of the governing body, it is a pity that the public acquisition of all sewers connected with the general sewerage system of the town was not made obligatory. The difficulty of sewers being properly managed by private owners after the lapse of many years, and the public and private inconvenience occasioned by an attempt to rectify their sewers by such private owners, will be appreciated when we consider the position of these sewers—sometimes under public roads and sometimes under private gardens. The several properties, and sewers rights, may have passed from hand to hand and been so divided that short lengths of continuous sewer may be owned by half a dozen different people. The grave difficulties encountered in the re draining of houses connected

with private sewers by notices under Sections 41 or 91 of the Public Health Act, 1875, has brought this matter to a head. On complaint as to a defective drain in any house in the Borough, it becomes the duty of the Sanitary Authority by their Inspector to inspect, and in case defects are discovered to serve a notice upon owner or occupier for their rectification. It has been found in carrying out such notices that the sewer was really chiefly at fault, and owing to the bad condition of the sewer the house drain could not properly be connected to it. It is necessary to first amend the condition of the sewer, which can only be done by a roundabout method, entailing a delay of many weeks or more probably months, and the recovery of the cost where the Sanitary Authority has itself been obliged to do the work, is a most complicated and lengthy matter; in fact, the position in regard to privately-owned old sewers in this town is anomalous, impracticable and absurd. I have therefore strongly advised the acquisition by purchase or otherwise of all such sewers in the town by the Sanitary Authority. Great care also should be taken in the future to prevent the continuance of such a grievance by reason of other sewers being laid down for private profit. Every new sewer that is made and connected with the general system ought to pass forthwith into public possession.

THE DISPOSAL OF THE TOWN'S SEWAGE.

In connection with a proposal to borrow money for expenditure upon the sewage farms, some little complaint and opposition was met with from residents at Staverton and other parishes in which the farms are situated. I believe at the present time there is no town of this size, unless it be one upon the sea coast, which gets rid of its sewage with an entire absence of unpleasantness. Our system here is first to pass the sewage through large subsidence tanks (without the use of chemical precipitants) and then in pipes to the fields, over which it is distributed by broad irrigation, the

land being chiefly cultivated in permanent pasture. The farms (owned by the Corporation) hitherto have been let to tenants, in whose hands the local distribution of the sewage has remained. A proportion of sewage has also been supplied to farmers for irrigation of land not belonging to the Corporation. Under this system the treatment of the sewage has not been wholly and invariably successful. Farmers take sewage upon their land with the object of increasing their crops, and cannot be trusted to give first consideration to the purification of the sewage. As the land is not levelled or prepared some of the sewage is apt to form small pools in the hollows, and the subsoil consisting of clay, permits of a very slow percolation, and such stagnant sewage is liable, particularly in summer weather, to emit a considerable amount of ill-smelling gases. The neighbouring water-courses have also at times received a too crude effluent from the land upon which the sewage is turned. At the present time one or two new systems of sewage treatment are under trial at Exeter and elsewhere, and in the end it is to be hoped that one of them may prove so successful as to do away with all nuisance, and prove worthy of being everywhere adopted. Whilst waiting for the septic tank system, or some other method, to prove itself that perfect and innocuous mode of sewage disposal which has for so long been sought, some important changes are to be made upon our sewage farms with a view of increasing their efficiency. The tenants have been given notice to quit, and at the expiration of their agreements the Corporation will take over the direct management of the land, presumably farming it under a bailiff, when by cultivating the land with the idea more of purifying the sewage than gaining a profit, it is hoped that more satisfactory results will be obtained. In the meantime a capable man has been engaged to manage the distribution of the sewage, and see that it is properly applied to the land, and that the brooks are not polluted. The result of this new trial of the irrigation system will be seen in time, and if it is unavailing to prevent the occurrence of a nuisance, and pollution of the streams, recourse must be had to some new or additional means. There will always be an effluent to be dealt with whatever means are adopted, and, however clear and free of solid particles and odour, the

effluent water will always possess a value as irrigating water upon farms, greatly increasing the yield of the poor quality land of which the Corporation farms partly consist, so that the system of pipes and carriers are not likely under any conditions to fall out of use.

THE COLLECTION OF HOUSE REFUSE.

As stated upon a previous page, we have continued our efforts to get the houses supplied with moveable receptacles for ashes and refuse under Sec. 27 of the Cheltenham Improvement Act. Between seven and eight hundred of such additional receptacles were caused to be provided last year in places where ashes, &c., were formerly thrown down in corners, or in pits below the level of the ground surrounded by a few courses of bricks, which had previously done duty as an "ash-pit." This work is still a long way from finished, but we are progressing with it. Where a brick-built receptacle covered and wholly above ground exists, as in the case of most of the larger houses, no interference can be made. Such ash-bins, however, are not very sanitary, and householders would do better to leave off using them, and buy one or two, or as many as may be necessary, of the galvanized iron moveable receptacles. They are close fitting, clean, and can never create a nuisance, and their cost is only small. A sovereign will buy three. They facilitate ash-collection to an incalculable extent, as they do away with all the shovelling up and putting into baskets with the accompanying spread of dust and dirt. The dustman has simply to put the galvanized vessel upon his shoulder and empty it into the cart, replace the vessel and the ash-collection is done. The ashes have never been so well and regularly collected as during the past year. I think it may be now said that the collection is made once a week at least at every house in the Borough. This is what is required and nothing less.

THE WATER SUPPLY.

Last year proved to be another year of deficient rainfall, and the Autumn and early Winter were particularly dry. The springs and streams supplying the Dowdeswell and Hewlett's Reservoirs were at their lowest ebb, and the store of water sank until the combined stock only represented a two or three weeks' supply for the town, being less even than in the previous dry year. What would have been a very serious deficiency was met and prevented by again drawing from our river source at Tewkesbury. For some considerable number of weeks all the filters and pumps were doing their utmost to maintain this supply, and the danger of any shortness of water was averted in this manner. Some considerable strain was placed upon the old engines at Tewkesbury Waterworks. It was not contemplated when these engines were erected that they would be called upon to pump five or six hundred thousand gallons of water per diem from Tewkesbury to Cheltenham, and the Water Committee has wisely decided to supplement them by new engines, a house for which is now in course of erection at the Tewkesbury works. By this provision any risk of breakdown at a critical moment in our power to pump water into Cheltenham will be obviated. By notices from the Health Department a further large number of houses were last year connected with the Corporation water mains, but this work is now well advanced towards completion, and the increase in the consumption of water will not henceforth progress at the rate it has been doing for the last five or six years. The Water Engineer will shortly be able to make a fairly correct estimate of the average quantity of water likely to be required in the Borough, and we shall have obtained sufficient experience of our wants, and of what is to be expected of our several sources of water supply under varying seasons of rain and drought, to estimate the necessity of making further provision by laying another pipe to Tewkesbury. At present, with the additional power afforded by the new engines now being erected, there would seem no necessity to go to this expense. The idea of putting down another pipe with a view of pumping unfiltered Severn water to Dowdeswell

would be an exceedingly doubtful expedient in my opinion. For three-quarters of the year at least the houses of the town can be supplied with water from the hill sources, and these should not be unnecessarily disturbed. It will probably be found that even still, in the more rainy years, comparatively little pumping from Tewkesbury will be needed at all.

During last year, as now for several years, I made numerous and more or less regular inspections of the reservoirs, filters, &c., and took samples of water at fortnightly intervals for examination by chemical and bacteriological methods. The numerical estimation of bacteria in the water before and after filtration is a most useful means of ascertaining the efficiency of the filtration, particularly as applied to the river water. From one time to another both the Dowdeswell water and the river water varied in the amount of organic material they contained, and the river water varied between rather wide limits in its degree of hardness, according to the rainfall, the districts in which this has chiefly taken place, and the consequent amount of "fresh" in the river. From one season to another, wide chemical differences (organic) were to be noticed in the Dowdeswell water, and considerable bacteriological differences in the unfiltered Severn water. Evidence was obtained however, of filtration having been carefully and efficiently performed in the case of every sample of water obtained from the Tewkesbury filters. The people of Tewkesbury have benefitted to a considerable extent by water being drawn from the water-works there to partly supply Cheltenham, for the water that is now served to them is much more carefully filtered than formerly, and the complaints that used occasionally to occur as to the Tewkesbury supply have died out as a natural consequence.

THE PUBLIC ABATTOIR, PRIVATE SLAUGHTER- HOUSES, INSPECTION OF MEAT, &c.

The Royal Commission upon Tuberculosis which was

appointed some two or three years ago has issued an exhaustive report as the result of its prolonged deliberations. In this it is clearly pointed out that the flesh and organs of animals that were suffering from tuberculous disease at the time of slaughter constitute an important source of tuberculosis in the human subject. Inspection of all meat intended for human food is recommended with a view to prohibiting such flesh and organs being sold and eaten, and incidentally as a measure necessary to the proper inspection of meat, the abolition of private slaughter-houses, and the establishment of central public abattoirs is also recommended.

I have repeatedly pointed out that it is not only, nor chiefly, to avoid a nuisance from filth and general insanitary conditions, such as may be prevented to a great extent by bye-laws, that private slaughter-houses should give way to public abattoirs, but rather in order that this very necessary inspection of animals intended for slaughter, and of their organs and carcasses after slaughter, and of their mode of slaughter should be rendered possible, and the seizure or setting aside of the flesh and parts of diseased animals be facilitated. Whilst the slaughter of animals goes on in a large number of slaughter-houses scattered at wide intervals over the district, and takes place at any time day or night, efficient inspection is practically impossible. Looked at from the other point of view, namely that of suitability for the purpose, cleanliness, and avoidance of nuisance, there is not one of the whole 26 private slaughter-houses in use in this Borough which will compare for an instant with the Public Abattoir, whilst nine-tenths of them are places of a very inferior grade indeed. The interests of butchers is in some considerable degree in conflict with the interests of the public, and the Butcher's Association has constituted itself a sort of anti-private-slaughter-house society. No doubt there are certain conveniences for the butcher attaching to his private slaughter-house, but the giving up of these conveniences does not constitute his chief objection to the compulsory use of the publicly-managed institution. It is the fear of having meat seized, and the great loss to which such seizure renders him liable in the absence of any legal compensation or allowance to him for his loss, when the animal has been purchased and slaughtered in good faith of its being sound. When the

County Council orders the destruction of pigs on account of swine fever, the owners of the pigs are allowed a fair compensation for the loss, but if a butcher should chance to buy a pig, and kill it at the Abattoir, he is liable to the entire loss by seizure under Section 116 of the Public Health Act if it be then discovered to be diseased. These inconsistencies are unsatisfactory to the butcher, and some compensation where no wilful attempt at sale of diseased meat has been attempted seems to be required for the proper working of the Act. In the end the butcher will probably provide this himself by a system of insurance.

Some years ago a public abattoir was built by our Corporation with the hope that it would take the place of the existing private slaughter-houses. There were nine slaughter-houses held and used by butchers under annual licence. Renewal of the licence of six of these was refused and these butchers with others now use the abattoir. As to twenty-three other slaughter-houses that were in use in the town, they had been registered under an old Act for use in perpetuity, and in order to get behind that Act, application was made to the Local Government Board for a Provisional Order containing powers to compulsorily close these slaughter houses. The order was obtained but it contained a clause allowing compensation by agreement or arbitration to the butcher for the closing of his place—a point of very doubtful equity so far as the public side of the question is concerned. Two years ago I advised the closing of four slaughter-houses under the terms of the Provisional Order, and although notices were ordered to be served upon owners and occupiers, and were served with fair promptitude, to cease slaughtering upon the premises, no settlement as to compensation has yet been arrived at. It would have been fairer I think, and have saved much trouble had powers been conferred upon the Sanitary Authority to order the closing of all these old registered slaughter-houses at the end of a number of years—say ten years, without compensation, it being of course obligatory upon the Sanitary Authority to provide sufficient accommodation for all the butchers at an abattoir, as their private places fell out of use. As the matter stands, the considerable cost to the public of putting the Provisional Order into force is likely amongst other causes to have

weight in preventing the closing of the private slaughter-houses in Cheltenham.

About a thousand more animals were killed in the abattoir last year than in the previous year, the numbers for the last three years being as below. The sum of £117 17s. 2d. was received last year as fees for the use of the abattoir by the several butchers using it. This sum is considerably below that necessary to defray current expenses together with interest upon the cost price of the building. Up to the present time the fees chargeable for lairage have not been made. A larger institution could be worked at a comparatively smaller cost, and there is great probability that if all the butchers in the town made regular use of the abattoir under the byelaws in force to regulate fees for lairage, &c. it would pay its own way.

ANIMALS KILLED IN THE PUBLIC ABATTOIR DURING THE LAST THREE YEARS.

	1896.	...	1897.	...	1898.
Beeves	521	...	566	...	747
Calves	494	...	446	...	532
Sheep.....	3884	...	3915	...	4689
Lambs	854	...	860	...	993
Pork Pigs.....	1746	...	701	...	580
Bacon Pigs ...	227	...	133	...	116
	<hr/>		<hr/>		<hr/>
Totals ...	7726	...	6621	...	7657
	<hr/>		<hr/>		<hr/>

The following Butchers made use of the Abbatoir last year :—

Pork Butchers.

Mr. Ashcroft, 77, High Street.
Mr. Canack, 294, High Street.
Mrs. Fisher, High Street.
Mrs. Giles, High Street.
Miss Gwinnell, Winchcomb Street.
Mr. Jackson, Winchcomb Street.
Mr. Jackson, High Street.
Mr. Smith, High Street.
Mr. Wilcox, High Street.

General Butchers.

Mr. W. C. Davis, 244, High Street.
Mr. Green, 102, Albion Street.
Mr. Lane, 267, High Street.
Mrs. Pleydell, High Street.
Mr. Pugh, High Street.
Mr. Pryor, High Street.
Messrs. Waghorne, Bros., High St.
Mr. F. Waghorne, 4, Tivoli Buildings
Mr. G. Willis, Regent House.

DESTRUCTION OF UNSOUND MEAT, &c. IN 1898.

The following is a list of meat, &c., destroyed under Section 116 of the Public Health Act, 1875. The cherries were in a rotting condition, and a large number of the pieces of meat seized upon one occasion were in the advanced stage of putrefaction; the whole carcasses were those of animals suffering some disease at the time of slaughter. The forequarter of beef destroyed on June 3rd had been rendered unfit for food by reason of some traumatic injury which had caused a very extensive extravasation of blood into the muscular tissues.

MEAT, &c., SEIZED AND DESTROYED ON MAGISTRATES ORDER.

May 5th	carcass of beef.
May 24th	1 cwt. of cherries.
July 23rd	3 cwt. 1 qr. of unsound meat, 88 pieces.
October 10th	carcass of mutton.

MEAT DESTROYED BY CONSENT OF THE OWNERS.

January 10th	carcass of mutton.
February 19th	"
March 6th	"
May 9th	carcass of pork.
June 3rd	forequarter of beef.
November 26th	carcass of mutton.

PROSECUTION FOR EXPOSING FOR SALE UNSOUND MEAT.

A seizure was made of 88 pieces of meat found exposed and deposited with intention of sale upon the hooks and blocks in a butcher's shop, and in a refrigerator, in the month of July. The meat consisted chiefly of pieces of foreign beef and mutton which had been allowed to thaw and had been kept until putrid. A week or two previous to the seizure illness had occurred in a family, with violent vomiting, diarrhœa, &c., and which had resulted in the death of one member, and at the coroner's inquest the death of

this child was attributed to ptomaine poisoning upon the evidence of the doctor and analyst. It was supposed that the poisoning had been caused by eating putrid meat bought at the same shop where the seizure was now made. The condition of the meat was extremely bad, putrefaction had proceeded far, and some of the pieces removed from the refrigerator were also covered by a luxuriant growth of mould. There was practically no defence, and the defendant was fined £15 and costs.

THE PRODUCTION AND SALE OF MILK.

The byelaws in force in Cheltenham under the Dairies and Cowsheds Order are not sufficiently comprehensive to effect a proper control of the milk supply, and to ensure the careful production of milk from none but healthy animals ; nor are there any powers in force in any district in England by which this desideratum is secured to that district. As in the case of meat, milk is known to be a common medium for conveyance of the tubercle bacillus from animals to mankind, and the power of the milk of the cow to set up tuberculosis in other animals has been demonstrated by actual experiment upon guinea pigs, and so placed beyond the region of doubt. In fact, such experiments have shown that a very large proportion of the milk supplied to a town has the power, at least when injected under the skin of the guinea pig, of producing tuberculosis. We have long been aware that a large number of deaths from *tabes mesenterica*, tubercular meningitis, and other forms of tuberculosis occur in infants during the time that cow's milk forms the chief item in their dietary, and we cannot escape the inference that the cause of many of these deaths is referable to milk, knowing as we now do that milk so frequently contains the vital germs of the disease. In the case of the mixed milk from a dairy it appears probable that the tubercle bacillus is always present. The results of experiments that have now been made with such milk by several observers with a view

of setting up tuberculosis in guinea pigs, tend to corroborate the diagnosis of tuberculosis made in cows by the use of tubercular injections ; for by the latter it is made to appear that at least half the cows in the country are more or less tuberculous, and by the former that nearly all mixed milk contains the bacilli characteristic of this disease.

On the supposition that tuberculous disease is only developed in cattle that are naturally wanting in the power of resistance to it, and that it is possible to get rid of the stock that is susceptible to the disease by breeding only from those cattle that are free of tuberculosis as proved by the tuberculin test, it is proposed to test all cattle with tuberculin with the view of making a selection of those suitable for breeding, and thus ultimately obtaining a strain that shall be free of the liability to tuberculosis. The test would also render possible the immediate removal of those tuberculous cows which are at present presumably responsible for the milk infected with tuberculosis which is everywhere being consumed. So far as the breeding of strains of cattle that shall be in great measure free of the liability to tuberculosis is concerned, there is considerable evidence of success where in a few cases it has been seriously attempted, and further trials are desirable in this direction. The milk from dairies which are thought to have been freed from tuberculous stock should also be tested as to its power of setting up tuberculosis in guinea pigs. In two or three towns the Sanitary Authorities have begun granting a certificate to farmers and cowkeepers whose cows have been tested with tuberculin and all those cows removed which have given the reaction indicating the presence of the disease. The difficulties and uncertainties by which the matter is at present surrounded has prevented me hitherto advising the adoption of such certification here. It would be misleading to the public to grant a Corporation Certificate which would be taken as a guarantee of the freedom of the products of a dairy from the germs of tuberculosis, whilst in reality our knowledge of the subject does not at present admit of the possibility of any such guarantee. The great practical difficulties attending the constant repetition of the test which would be needed, and the practical impossibility of making the sufficiently frequent and thorough inspection of the cows, the cowsheds, and the process of milking, which

would be required to maintain an observance of any regulations that might be imposed, would seem to render such a certificate of little value under existing circumstances. But the subject is nevertheless likely to become riper for some action at a later date, whilst in the meantime every encouragement should be given to the further investigation of the matter

A recent personal visit to the dairy farms and cowsheds of the district, and a close consideration of the method and circumstances of milking the cows and of distributing the milk, has further impressed me with the need of obtaining more stringent powers for the regulation of our milk supply and the production of milk. Besides tuberculosis the germs of other diseases are liable to be conveyed in milk, and in the case of several of the Zymotic diseases are known to have been so conveyed, and to have set up epidemics amongst the consumers. In fact, owing to a careless mode of production it is very possible for milk to become a nasty and dangerous article of commerce. It is time that some law was passed for general adoption which should ensure the universal registration of cowkeepers and sellers of milk, and prohibit the sale of milk in any district excepting by licence from the Local Authority.

SALE OF FOOD AND DRUGS ACT.

Return of Articles submitted to the Public Analyst during the year 1898, with the results of analyses.

(G. Embrey, Esq., Gloucester, Public Analyst.)

Samples submitted by Superintendent A. W. Hopkins.

Quarter ending March 31st.

<i>Articles submitted.</i>		<i>Result.</i>
13	Samples of Butter	all genuine.
1	„ Cocoa,	62 per cent. sugar and starch added. Prosecuted and fined 10/- and £1 3s, costs.
1	„ Coffee,	genuine
1	„ Flour,	„
1	„ Lard,	„
5	„ Milk,	„
1	„ Pepper	„
1	„ Whiskey	„

Quarter ending June 30th, 1898.

<i>Articles submitted.</i>		<i>Result.</i>
4	Samples of Butter, genuine	
2	„ Cheese „	
1	„ Coffee „	
1	„ Flour „	
1	„ Gin „	
3	„ Lard „	
2	„ Milk „	
4	„ Pepper „	
2	„ Rum „	
2	„ Sugar „	
2	„ Whiskey 1 genuine, 1 with 7 per cent. added water.	
	Prosecuted and fined £2 and £1 3s. costs.	

Quarter ending September 30th, 1898.

4	„ Butter genuine	
3	„ Coffee „	
5	„ Lard „	
3	„ Milk „	
4	„ Pepper „	
2	„ Sugar „	
3	„ Whiskey adulterated respectively with 5 per cent. 6 per cent. and 9 per cent. added water. All prosecuted and fined respectively £1 & £1 0s. 8d. costs, £1 and £1 0s. 8d. costs, £1 and £1 2s. 8d. costs.	

Quarter ending December 31st, 1898.

1	„ Brandy genuine	
9	„ Butter „	
2	„ Coffee „	
1	„ Gin „	
3	„ Lard „	
1	„ Milk with 30 per cent added water. Prosecuted and fined £1 and £4 3s. 4d. costs.	
3	„ Pepper genuine	
2	„ Sugar „	
2	„ Whiskey „	

APPENDIX.

ANNUAL REPORT

UPON THE

Meteorology of Cheltenham.

BY

RICHARD TYRER,

B.A., F.R. Met. Soc., Borough Meteorologist.

BEING AN ABSTRACT OF METEOROLOGICAL OBSERVATIONS
TAKEN AT THE OBSERVATORY, PRESTBURY ROAD,
CHELTENHAM, DURING THE YEAR 1898.

Latitude 51° 54' 57" N. Longitude 2° 3' 21" W.
Height above Mean Sea Level, 190ft.

THE INSTRUMENTS ARE ALL OF THE HIGHEST QUALITY,
AND HAVE BEEN VERIFIED AT KEW.

*To the Mayor, Aldermen, and Councillors of the
Borough of Cheltenham.*

GENTLEMEN,

I have the honour to present you with my Annual Report of the Meteorological work at the Observatory, Prestbury Road, for 1898.

The instruments, which are tested triennially by the Assistant Secretary of the Royal Meteorological Society, were examined by him during his visit last year, and compared with the Standards : everything was found in perfect order.

The observations have been taken regularly either by myself or, in my absence, by a trained Assistant, and may be accepted as thoroughly trustworthy.

During the past year the Corporation has purchased a Jordan Twin-Cylinder Photographic Sunshine-Recorder, which is mounted on the top of Pittville Spa Pump-Room. The position could not possibly be a more favourable one, as the horizon is clear from sunrise to sunset. This instrument has long been a desideratum : the difficulty, which is now removed, was to find a suitable position.

The weekly and monthly returns have been, as usual, published in the "Cheltenham Examiner," and, quarterly also, a Table comparing the Meteorology of Cheltenham with that of other well-known Health Resorts.

The monthly and yearly Reports have been forwarded to the Meteorological Office, the Royal Meteorological Society, to Mr. Symons, the Editor of "British Rainfall," and to many observers over the kingdom.

My best thanks are due to Mr. J. Baxendell, F.R. Met. Soc., the Borough Meteorologist of Southport, for supplying me with statistics from the Health Resorts, and also to those gentlemen who have sent me returns of the Rainfall from various stations over the County.

I am, Gentlemen,

Yours faithfully,

RICHARD TYRER, B.A., F.R. Met. Soc.

February, 1899.

THE METEOROLOGY OF CHELTENHAM.

Abstract of the Meteorological Observations taken at The Observatory, Prestbury Road, Cheltenham, during 1898,
by RICHARD TYRER, B.A., F.R. Met. Soc., Borough Meteorologist.

Latitude 51° 54' 57" N. Longitude 2° 3' 21" W. Height above Mean Sea Level, 190-ft.

Month.	Mean of atmospheric pressure at 9 a.m. and 9 p.m.	AIR TEMPERATURE.										Relative Humidity.		Rainfall.		Ozone 0-10
		9 a.m.	9 p.m.	Means of		Absolute Max. and Min.				9 a.m.	9 p.m.	Total fall.	No. of Rainy Days.			
				Max.	Min.	Max.	Date.	Min.	Date.							
January	INCHES. 30·322	° 43·5	° 44·3	° 48·0	° 39·2	° 29·2	° 19 & 31	° 55·0	° 16	% 90	% 88	IN ·67	8	1·0		
February	29·980	39·4	39·9	47·1	33·8	20·0	1	56·2	21	86	84	1·48	20	2·2		
March	29·929	39·4	36·6	46·9	30·9	21·9	17	55·4	10	78	84	·56	9	4·5		
April	29·906	48·2	45·4	56·3	37·6	23·4	8	65·5	5	74	80	2·39	14	6·6		
May	29·846	52·0	49·9	58·6	43·4	31·8	23	72·0	13	81	84	3·97	23	6·8		
June	29·997	57·8	55·9	66·8	48·5	35·0	11	75·0	15	75	81	1·04	14	5·1		
July	30·129	61·2	59·1	71·6	49·6	35·5	16	82·1	30	69	79	1·19	8	4·9		
August	30·017	62·8	60·3	72·2	53·1	43·0	21	81·6	24	81	84	3·93	18	5·0		
September ...	30·107	59·9	56·4	70·6	47·6	31·0	8	86·0	25	82	87	·65	7	3·2		
October	29·822	52·2	50·7	58·3	46·6	32·5	3	68·6	13	90	91	3·53	20	3·4		
November ...	29·841	44·7	45·1	50·7	38·9	21·0	3	61·0	23	91	90	2·36	17	3·6		
December	30·217	45·9	45·8	51·1	41·1	24·0	5	58·2	20	87	86	2·46	15	2·7		
Totals	360·113	607·0	589·4	698·2	510·3					984	1018	24·23	173	49·0		
Means	30·009	50·6	49·1	58·2	42·5					82	85	2·02	14	4·1		
	1	1	3	4	5	8	7	6	9	10	11	12	13	14		

NOTES ON THE TABLES.

COLUMN 1 is the mean reading of the Barometer at 9 a.m. and 9 p.m. corrected for temperature and reduced to mean sea level.

COLUMNS 4 to 9.—The maximum and minimum thermometers are read and set at 9 p.m., and the readings entered to the same day.

COLUMNS 10 & 11.—The relative humidity is calculated by dividing the elastic force of aqueous-vapour at the temperature of the dew-point for the month by that at the temperature of the air.

COLUMN 14.—Observations are taken by means of prepared tests. The amount of colour produced after 24 hours' exposure in an Ozone-cage is compared with a scale of ten degrees of colour of increasing intensity.

WIND.

During 1898 the observations taken show that the general directions have been as follows :—

From the North	on 16 days
„ North-East	on 14 „
„ East	on 9 „
„ South-East	on 31 „
„ South... ..	on 34 „
„ South-West	on 71 „
„ West	on 64 „
„ North-West	on 28 „
There were Calms	on 98 „

South-East Winds prevailed in April and November.

South-West „ „ in January, February, September, October and December.

West „ „ in February, March, June, July, and August.

North-West „ „ in May.

Calms prevailed in January, February, August, September, October and November.

BRIGHT SUNSHINE.

The amount of sunshine recorded during the latter half of the year is as follows :—

	HRS.	MIN.
July	227	57
August	186	15
September	219	50
October	59	5
November	55	50
December	54	32
Total	803	32

This gives a percentage of 37·6 of the possible sunshine during the period.

COMPARATIVE TABLE OF THE METEOROLOGY OF
CHELTENHAM FOR THE YEARS 1878-1898.

Year.	Atmospheric Pressure.	MEAN AIR TEMPERATURE				Humidity.		Rainfall	
		Max.	Min.	Mean	Range	9 a.m.	9 p.m.	Inches.	Days.
	INCHES.	°	°	°	°	°/5	°/5		
1878	29.913	56.1	41.5	48.8	14.6	83	88	33.18	176
1879	29.944	52.2	38.5	45.3	13.7	87	89	32.63	212
1880	29.971	55.8	40.5	48.1	15.3	85	88	33.72	177
1881	29.957	55.0	38.9	46.9	16.1	82	85	25.28	185
1882	29.914	55.9	41.5	48.7	14.4	81	86	37.92	214
1883	29.964	55.6	40.6	48.1	15.0	85	89	29.93	204
1884	29.978	56.8	41.9	49.3	14.9	84	89	24.04	190
1885	29.930	54.8	40.0	47.4	14.8	84	87	26.45	193
1886	29.912	55.0	40.6	47.8	14.4	83	86	32.55	193
1887	30.029	55.3	38.6	46.9	16.7	80	83	22.78	153
1888	29.959	53.8	40.1	46.9	13.7	82	84	28.85	195
1889	29.971	55.4	40.6	48.0	14.8	84	87	27.07	181
1890	29.959	55.6	40.1	47.8	15.5	84	88	20.09	191
1891	29.957	55.1	40.0	47.5	15.1	83	87	33.14	192
1892	29.948	54.6	38.7	46.6	15.9	82	85	19.45	175
1893	29.990	59.1	41.3	50.2	17.8	81	83	19.91	169
1894	29.963	56.2	41.6	48.9	14.6	83	87	29.12	194
1895	29.923	56.2	39.6	47.9	16.6	83	87	24.99	174
1896	30.030	57.0	41.4	49.2	15.6	83	86	21.54	185
1897	29.966	56.8	42.8	49.8	14.0	82	86	26.23	191
1898	30.009	58.2	42.5	50.3	15.7	82	85	24.23	173
Means	29.960	55.7	40.5	48.1	15.2	83	86	27.29	186

The year was in many respects a remarkable one.

Atmospheric pressure was not much disturbed during the spring and summer months, and was very steady during August. During the autumn and winter months the variations were great. The highest corrected reading was 30.679 ins. on January 28th, and the lowest 28.700 on November 25th.

The mean temperature of the year is 50.3 deg., the highest hitherto recorded; the nearest approach being that of 1893. On three months only was it below the average. In January, October and December it was very high, and the September heat was most abnormal. March was the only month with a mean considerably below. The range of temperature (the difference between the mean max. and min. readings) is 15.7 deg., which is slightly above the average.

The rainfall is 3.06 ins. below the average for the past twenty-one years, though only slightly below that of the past ten. On thirty-six

days the rain was only just measurable. There were three days on which the fall in the twenty-four hours exceeded one inch, two in August and one in October. There was scarcely any snow throughout the year—slight falls occurred on eight days.

There were thunderstorms on ten days, hail on seven, and fog, generally very slight, on seventeen.

The amount of wind is slightly below the average—March, April, November, and December had a high record, while July and September were comparatively calm. There was less wind in January than we have had in any month during the past seventeen years. Gales occurred on eleven days.

Ozone was very abundant, especially during the spring and early summer months.

The summer fruits ripened considerably later than usual—the autumnal ones were abundant and well ripened.

JANUARY.—Atmospheric pressure was very low at the beginning of the month, but rose rapidly till the 3rd: from that date till the 9th it was somewhat unsteady, and, rising gradually till the 12th, remained high and steady for the rest of the month. Range of pressure 1.347 ins.

The month was characterised by very high mean temperature, very low rainfall, scarcely any wind, no snow, and very slight fog. The weather for the first three weeks was very pleasant, and some days were beautifully fine: towards the close it became dull and misty. There were slight frosts on eight nights, but the night temperature never fell three degrees below the freezing point. On eleven days the maximum temperature rose to 50 deg. and upwards, and the night temperatures of the 19th and 20th were very high. Mean temperature 43.6 deg., 6.8 deg. *above* the average of the past twenty-one years.

FEBRUARY.—Atmospheric pressure was very irregular during the first week. From the 8th to the 17th it was very high and steady: then followed a well-defined cyclonic system which lasted till the 23rd: for the rest of the month it was fairly steady. Range of pressure 1.189 ins.

The weather during the first week was unsettled, with slight hail and snowstorms and some bright days. The next ten days were fine and bright, with comparatively high temperatures both by day and night. The rest of the month was much colder, with slight snowfalls and ice on the open water on the 23rd and 24th. The first thunderstorm recorded in February occurred on the morning of the 27th. Mean temperature 40.4 deg., 1.3 deg. *above*.

MARCH.—Atmospheric pressure varied very little during the greater part of the month: there was a shallow depression during the last week. Range of pressure, 0.839 ins.

The month was characterised by very low temperature, especially at night—there was frost on twenty-six nights; by dense fog on the 10th and 11th, and by strong and persistent gales from the 23rd to the 26th, accompanied by snow and sleet. During this period there was an abundance of ozone. The closing days were very fine and pleasant. Mean temperature 38.9 deg., 2.3 deg. *below*.

APRIL.—Atmospheric pressure was steady until the 8th, when there was a considerable, though irregular, fall till the evening of the 11th, followed by a rapid rise; there was not much change till the morning of the 25th, when it fell gradually and remained low for the rest of the month. Range of pressure 0.921 inches.

The weather during the first week was bright and beautiful, but from the 9th to the 11th it was very wet and stormy; the rest of the month till just the close was beautifully fine, when there was thunder, heavy rain, hail, strong wind and slight snow. The day temperatures were high, but the nights were cold, frost occurring in the screen on five nights and the range of temperature was great. Ozone was very abundant throughout the month. The birds of passage were rather late in arriving. Mean temperature 46.9 deg., 0.8 deg. *above*.

MAY.—Atmospheric pressure was steady for the first few days, rising rapidly until the 7th, after which it fell steadily till the 11th; then rising gradually, remained very steady from the 19th till nearly the close of the month. Range of pressure 1.201 inches.

The weather was cold, wet and unsettled during the greater part of the month, and the mean maximum temperature is nearly three degrees below the average. The nights were much warmer than usual, so that the range of temperature was comparatively slight. There was a very severe thunderstorm on the 23rd, after a hot and sultry morning, the only really hot day in the month. Mean temperature 51.0 deg.; 0.7 degree *below*.

JUNE.—Atmospheric pressure was remarkably steady during the greater part of the month; from the 10th to the 20th there was no variation; then followed a well-marked depression, and it was high at the close. Range of pressure 0.863 inches.

The weather was generally very fine and pleasant with no high temperature, the maximum rising above 70 deg. on ten days only, and on five it was below 60 deg.; the 13th was a particularly cold day, maximum 54.8 deg., a lower temperature than that of two days in January. There was a severe thunderstorm on the evening of the 26th, with heavy rain and hail. Mean temperature 57.6 deg.; 0.5 deg. *below*.

JULY.—Atmospheric pressure was high, and with the exception of a slight depression on the 22nd, was very steady throughout the month. Range of pressure 0.739 inches.

The weather was fine and bright, with no particularly hot days; the minimum temperature rose above 80 degrees on two days only. There was scarcely any rain from the 1st till the 28th, when a thunderstorm cooled the air and refreshed the parched ground. The night of the 30th was remarkably cold, the temperature on the screen, 35.5 deg., being by far the lowest recorded in July; on the grass it fell to one degree below freezing point. Mean temperature 60.6 deg., exactly the average.

AUGUST.—Atmospheric pressure was very steady throughout the month, and particularly so from the 13th to the 23rd. Range of pressure 0.555 inches.

The month opened with very fine, bright and warm weather. From the 11th to the 22nd the heat was very great, and some of the days,

owing to the almost complete absence of wind, were very oppressive. The last week was much cooler and particularly pleasant. There were very heavy rainfalls on the 6th and 15th, and thunderstorms on three days, that of the 21st being followed by magnificent sheet lightning, lasting far into the night. There was a fine display of meteors on the night of the 11th.

Mean temperature 62.6 deg., 2.8 deg. *above*.

SEPTEMBER. — Atmospheric pressure was high and steady throughout nearly the whole of the month; slightly irregular at the close. Range of pressure 0.829 inches.

The month was characterised by a very high mean maximum temperature, 6.6 deg. above the average, by two remarkable heat waves, and by almost absolute drought, scarcely any rain falling till the 29th. The first period of great heat lasted from the 3rd till the 9th, with a mean temperature of 68.5 deg., nearly 8 deg. above the average for July; the other from the 14th to the 17th, with a mean of 61.3 deg. The last week was cold, with frost on one night. On seven days, five of which were consecutive, the maximum reached 80 deg. and upwards, the greatest number recorded in September for at least twenty-one years. Mean temperature 59.1 deg., 3.5 deg. *above*.

OCTOBER. — Atmospheric pressure was high and steady from the beginning of the month till the 11th. Then followed a well-developed and persistent cyclonic system lasting till the 20th, with very low pressure during the whole of the 17th. There was a smaller one at the close. Range of pressure 1.552 inches.

The chief characteristics of the month are the high mean temperature, the slight range of temperature, the great amount of cloud, and the complete absence of frost in the screen. The month opened with fine, bright days, but there were few days afterwards with much sun, and on fourteen the sky was entirely overcast. There were fogs in the second week, and very heavy rainfalls from the 16th to the 18th, on which three days 2.32 ins. fell. On twelve days, the maximum temperature rose to 60 deg. and upwards, and on eleven nights it did not fall below 50 deg. Such a series of warm nights has not occurred before for twelve years. Mean temperature 52.4 deg., 5.1 deg. *above*.

NOVEMBER. — Atmospheric pressure was slightly disturbed during the first fortnight: It was very steady till the morning of the 22nd, when it fell very rapidly till the morning of the 25th, after which it rose steadily till the close. Range of pressure 1.673 inches.

The weather was very changeable, and the variations in temperature were great, the maximum varying from 61.0 deg. on the 3rd to 35.2 deg. on the 22nd. The first week was fine and bright with considerable wind: it was generally pleasant, though somewhat dull till the 22nd, when it turned very cold, and on the 23rd there were strong gales, accompanied by heavy rain and slight snow. Temperature was low for the rest of the month. Mean temperature 44.8 deg., 1.3 deg. *above*.

DECEMBER. — Atmospheric pressure was somewhat disturbed from the beginning of the month till the 15th. From that date till the 24th it was high and very steady. Then it fell rapidly, and was exceedingly irregular till the close, there being three well-marked cyclonic systems in less than a week. Range of pressure 1.441 inches.

The weather from the beginning to the 19th was remarkable for the high temperature, both during the day and the night, the mean for that period being 49·1 deg., which is not much below the average for May. The 5th, with a mean temperature of 56·7 deg., was the warmest December day we have had for at least 21 years. It was colder afterwards, with the exception of three warm days, 25th—27th. The maximum temperature rose to 50 deg. and upwards on 21 days, and the minimum did not fall below 50 deg. on five nights. There were only six nights when there was any frost in the screen. There was no snow during the month, nor any fog. There were strong gales and considerable rainfall during the last week. Many days were very bright, and there was a considerable amount of sunshine. The weather on the whole was very pleasant. Mean temperature 46·1 deg., 7·9 deg. *above*.

RAINFALL IN THE COUNTY OF GLOUCESTER IN 1898.

STATION.	OBSERVER.	RAIN- FALL.	RAINY DAYS.
		Inches.	
Beckford	F. Slade	20·68	143
Moreton-in-Marsh ...	W. Arkell	28·16	140
Cheltenham	R. Tyrer	24·23	173
Bourton-on-the-Water ...	E. W. Kendall ...	26·13	152
Great Barrington ...	H. J. Barrett ...	20·63	123
Coleford	I. Trotter	34·47	194
R.A.C., Cirencester ...	W. H. Sodeau ...	22·06	162
Berkeley	R. Shore	26·30	142
Lechlade	T. Arkell	19·98	140
Horcott	R. A. Iles	20·97	132
Over Court	R. C. C. Lippincott	31·60	194
Clifton... ..	R. F. Sturge ...	29·70	166

The rainfall was, as usual, unequally distributed over the county, and varied from 34·47 inches at Coleford to 19·98 inches at Lechlade. The number of rainy days was very irregular: there were 71 more at Coleford and at Over Court than at Great Barrington. The mean fall is 25·41 inches, which is 6·66 inches *below* the average of the past fourteen years, and 3·15 inches *below* that of the past ten years.

THE CLIMATE OF CHELTENHAM, 1898.

COMPARISON WITH OTHER HEALTH RESORTS.

	1st QUARTER.				2nd QUARTER.				3rd QUARTER.				4th QUARTER.			
	Mean Temperature	Mean Daily Range of Temperature	Relative Humidity	Rainfall, Total	Mean Temperature	Mean Daily Range of Temperature	Relative Humidity	Rainfall, Total	Mean Temperature	Mean Daily Range of Temperature	Relative Humidity	Rainfall, Total	Mean Temperature	Mean Daily Range of Temperature	Relative Humidity	Rainfall, Total
CHELTENHAM	40.9	12.7	84	2.71	51.8	17.4	77	7.40	60.8	21.3	77	5.77	47.8	11.2	89	8.35
Scarborough	42.2	12.3	82	3.54	49.2	12.4	83	6.95	58.2	14.7	77	4.20	47.0	10.0	88	9.16
Douglas	43.5	9.6	88	7.40	50.8	12.7	87	7.52	58.1	13.3	84	9.18	49.1	8.7	93	13.63
Blackpool	41.6	10.7	84	5.44	51.3	15.0	77	8.64	59.4	13.9	77	7.42	47.9	10.0	86	11.33
Southport	41.8	9.4	84	5.71	51.1	13.1	77	7.09	59.5	12.9	79	6.97	47.7	9.0	89	8.96
Llandudno	42.8	7.6	81	5.65	51.8	11.4	75	9.26	59.8	12.0	77	7.31	49.5	9.3	81	9.05
Eastbourne	43.1	8.5	83	3.94	51.8	10.1	82	6.72	61.9	12.7	78	2.71	50.8	9.1	85	9.50
Torquay	44.4	10.0	81	4.99	52.9	13.0	75	5.83	63.1	13.3	73	3.14	51.6	9.1	84	13.66