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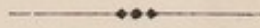
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BOROUGH OF TORQUAY.



Annual Report
OF THE
MEDICAL OFFICER OF HEALTH
For the Year 1903,
BY
THOMAS DUNLOP, M.B., C.M., D.P.H.
TOGETHER WITH THE
Annual Reports of the Sanitary Inspectors
AND THE
Report of the Borough Meteorologist.

BOROUGH OF TORQUAY, 1903.



Area of the Borough, 3,858 acres.

Rateable value, £201,773.

Population—Census (1901), 33,625 ; estimated at the middle of 1903, 33,800.

Number of inhabited houses—Census (1901), 6,614 ; middle of year 1903, 6,762.

Average number of persons per house, 5.

Density of population, 8·7 persons per acre.

Crude death rate, 1903, 13·4 per 1,000. Average for previous 8 years, 15·9 per 1,000.

Corrected death rate, 1903, 13·3 per 1,000. Average for previous 8 years, 14·4 per 1,000.

Death rate if all visitors excluded, 11·5 per 1,000.

Birth rate, 15·8 per 1,000. Average for previous 8 years, 17·8 per 1,000.

Infantile mortality, 1903, 95. Average for previous 8 years, 142.

Death rate from zymotic diseases, ·35 per 1,000.



Borough of Torquay.

ANNUAL REPORT

OF THE

Medical Officer of Health

For 1903.

*To His Worship the Mayor, the Aldermen, and Councillors of
the Borough of Torquay.*

GENTLEMEN,

In accordance with my statutory duty, I beg to present my Annual Report on the health of the inhabitants and the sanitary circumstances of the Borough of Torquay. Although my appointment dates from the 25th of March, 1903, I have been furnished by Alderman Dr. Winter, who acted as Medical Officer of Health for the first three months of the year, with full statistics and particulars, thus enabling me to present a complete report. The Medical Officer of Health is also required to report on the administration of the Factory and Workshops' Act in his district, and in this report are included details of the work done under this Act.

It is gratifying to be able to report the very low death rate of 13·4 per 1,000, being 2·4 per 1,000 lower than the average for the past 8 years, and 2 per 1,000 lower than the rate for England and Wales in 1903. The infantile mortality of 102 per 1,000 births is the lowest yet recorded.

I have to thank the members of the Sanitary Committee, and of the Town Council, for their kindness and support throughout the year, and also the Members of the Staff of the Department for the assistance I have always had from them.

I am, Gentlemen,

Your obedient servant,

THOMAS DUNLOP, M.B.

Medical Officer of Health.



POPULATION.

The population of the Borough at the 1901 census was found to be 33,625, of whom 13,339 were males, and 20,286 females. The number of inhabited houses being 6,614, and the average number of persons per house was 5.

For statistical purposes it is usual to estimate the population for the year under review. Taking the natural increase only, that is, the excess of births over deaths, I find that for the past three years this was 144, which would make the population 33,762. Another method is to obtain the number of inhabited houses, less lock-up shops, in the middle of 1903, from the rate books, and multiply this by the average number of persons found to be inhabiting each house at the census in 1901. This I have done and find that the number of houses then inhabited was 6,762; multiplying this figure by 5 we get a population of 33,810.

In preparing the various rates for the year, I am taking 33,800 as the estimated population.

AREA.—The area of the Borough is 3,879 acres, and the average number of persons per acre is 8·7.

It is necessary in preparing statistics and comparing the various death rates of Torquay with those of the whole country, to consider the age and sex distribution of the population. The population of a district, in which the proportions of males to females or of young persons to old persons are different to those of the country generally, will suffer more than the whole country from the diseases which particularly affect persons of the age and sex which predominate in the district. In order to ensure a just comparison between the death-rate of such a district and the country as a whole, it is necessary to raise or lower the gross death-rates of the district to what they would be if the proportions of the local population in respect of age and sex were the same as those in the country generally.

To eliminate the error due to age and sex distribution varying from that of the whole country, the number of males and females at each age-period for the district being known from the last census, and the mean annual death-rate for each age and sex given by the Registrar General for the 10 years, 1891-1900, calculate the number of deaths which should take place in each class, if the local death rates were the same as those for the whole country.

The sum of the calculated deaths for all ages gives the "standard death rate" as the actual number gives the recorded rates, and dividing the mean death rate for the whole country by the standard death rate for the local population, we obtain a factor. Multiplying the recorded rate by this factor, we obtain the corrected death rate for the district.

I have made the calculations for Torquay as is shown in the following table :—

Ages.	Mean annual death rate for England and Wales, corrected for age constitution for years 1891-1900.		Population of Torquay. Census 1901.		Calculated number of Deaths.	
	Males.	Females.	Males.	Females.	Males.	Females.
under 1 year	62·7	52·8	259	250	16·239	13·200
5	4·3	4·4	2397	2396	10·307	10·542
10	2·4	2·6	834	934	2·001	2·428
15	3·8	3·7	822	953	3·123	3·526
20	5·1	4·5	1220	1982	6·222	8·919
25	6·8	6·1	1716	3625	11·668	22·112
35	11·5	9·6	1793	3059	20·619	29·366
45	19·0	14·8	1542	2563	29·298	37·932
55	35·0	28·5	1232	1998	43·120	56·943
65	70·4	60·7	939	1456	66·705	88·379
75	146·1	130·6	467	824	68·228	107·614
85 & upwards	286·8	261·4	118	246	33·842	64·304
	19·2	17·0	13,339	20,286	311·372	445·265

That is 756·637 deaths in a population of 33,625, or a standard death rate of 22·50.

The annual death rate for England and Wales for 1891-1900 was 18·10 ; then $\frac{18·10}{22·50} = \cdot 8044$. Therefore ·8044 is the factor by which death rates for Torquay require to be multiplied to give the rates corrected for age and sex distribution.

PHYSICAL FEATURES AND GENERAL CHARACTER OF THE DISTRICT.

These are of a highly diversified character, especially the central portions forming the Torquay promontory. In this district the two principal heights are the Warberry, 448 feet, and the Lincombe Hills, 372 feet, forming long ridges running N.E. and S.W., which are composed of the Lower Devonian grits and slates. The lesser heights, such as the Braddons, Waldon Park, and Chapel Hill, are formed of Middle Devonian limestone, which rests above the grits and slates mentioned.

On each side of this central area, viz., at St. Mary-Church and Chelston, rocks higher in the Geological Scale for the most part prevail. These rocks belong to the Permian formation, and consist of beds of Breccia—a kind of conglomerate—and sandstones of a deep red colour, owing to the presence of peroxide of iron.

There is very little clay in any portion of the area, and what does occur is of the nature of marl, and is confined to the lower levels of certain valleys or depressions, so that rain is not detained on the surface, as it rapidly disappears through these rather pervious rocks and soils.

BIRTHS.

During the year 536 births were registered, 252 being males, and 284 females. The average number of births for the previous eight years was 598. The birth rate for the year is therefore equal to 15·8 per 1,000 of the population. This is a very low rate, but in comparing this with other districts or the whole country, one has to bear in mind the peculiar constitution of the Torquay population, containing as it does a higher proportion of persons at the more advanced periods of life than obtains in the population of the country as a whole.

DEATHS.

The total number of deaths registered during the year was 455, of whom 66 were persons staying temporarily in the district. This would give a gross death rate of 13·4 per 1,000. If it was permissible to eliminate these 66 deaths of visitors, we should get a death rate of 11·5 per 1,000 of the resident population. The Local Government Board, however, only permit us to classify as *non-residents* those visitors dying in hospitals and public institutions. These numbered 28 during the year.

In order to obtain the corrected death-rate, it is necessary to subtract from the total of 455 these 28 deaths of non-residents, and add the deaths of 20 persons belonging to the town, who died in the Newton Abbot Workhouse, and the deaths of one resident, who died in the Borough Sanatorium, situated in the Newton Abbot Rural District. The corrected death-rate for the Borough is therefore 13·3 per 1,000. But in order to render this rate comparable with that for England and Wales, it is necessary to correct it for age and sex distribution. When this is done we get a rate of 10·7, which is extremely low, showing that the past year has been a remarkably healthy one. The death rate for England and Wales for 1903 was 15·4 per 1,000, that for the 76 great towns 16·3, and that for the 103 smaller towns 14·6.

The rate of 13·3 is the lowest recorded during the past eight years (the period during which records are obtainable for the enlarged Borough), although in Table I. it will be noticed that rates of 12·5 and 12·8 are given as corrected rates for the years 1897 and 1900 respectively, in these years apparently the deaths of all visitors have been eliminated, and no record given of the deaths of residents in the Newton Abbot Workhouse.

During the year 18 inquests were held.

There were 5 deaths uncertified.

DEATHS AT VARIOUS AGES.

Of the 448 deaths registered

55	occurred in children under 1 year of age	12·28	per cent.
16	between the ages 1 to 5	3·57	„
179	„ „ 5 to 65	39·95	„
198	in persons over 65	44·20	„
448		100·00	„

INFANTILE MORTALITY.

The total deaths under one year registered in the district was 51, but to this must be added 4 deaths of infants which occurred in Newton Abbot Workhouse. As there were 536 births during the year, the infantile mortality is equal to 102 per 1,000 births, as compared with 155 in 1902, or 142 the average for the past 8 years.

This is a very satisfactory figure, and is the lowest yet recorded. The infantile mortality in England and Wales during 1903 was 132 per 1,000 births, that of the 76 great towns 141, and that of the 103 smaller towns 135.

The following table gives the cause of death among infants for the past four years :—

			1903.	1902.	1901.	1900.
Measles	..	..	0	1	5	1
Whooping-cough	..	..	3	7	0	1
Influenza	..	..	0	0	1	0
Diarrhoea	..	..	3	3	1	11
Enteritis	..	..	3	3	2	3
Septic Diseases	..	..	1	0	0	0
Phthisis	..	..	0	1	2	1
Other Tubercular Diseases			1	4	2	1
Bronchitis	..	..	6	12	8	6
Pneumonia	..	..	1	4	2	7
Premature Birth	..	..	8	15	19	15
Heart Disease	..	..	2	0	1	0
Accidents	..	..	2	3	1	1
All other causes	..	..	25	37	26	23
			—	—	—	—
Totals			55	91	70	70

From the above figures it will be seen how continuously free the town is from Diarrhoea deaths, that great cause of mortality among infants in all large towns.

CAUSES OF DEATH.

In table II. at the end of this report will be found a full classification of the causes of death.

PHTHISIS AND TUBERCULAR DISEASES.

The number of deaths registered as due to this disease was 57, of whom 26 were visitors. As 20 of these visitors died in public institutions, they may be deducted from the total, leaving 37, which gives a death rate of 1·10 per 1,000 from this disease. The rates for the past four years are as follows :—

1903.	1902.	1901.	1900.
1·10	1·42	2·02	1·90

There were 5 deaths due to other forms of Tubercular disease. When deaths occur from Phthisis in private houses, a notice is forwarded to the householder, offering to fumigate the rooms with

formalin, free of cost. In only a small percentage of the cases is the offer accepted. This is to be regretted ; I believe that a word from the medical attendant advising such fumigation, would have more effect than any number of notices.

CANCER MALIGNANT DISEASE, ETC.

During the year 47 deaths were attributed to these diseases, in 1902 there were 35, and in 1901, 44. Nine of the 47 deaths were those of visitors.

That cancer throughout the country is on the increase there can be little doubt. The Registrar General, in his last annual report, stated : "The deaths referred to cancer or malignant disease in the year 1901 numbered 27,487, and were more than the corrected average number recorded in the preceding ten years by 2,784."

It must be borne in mind that in a health resort such as Torquay cancer patients are frequently sent here, in the hope that the mild climate and bright sunshine may possibly prolong their lives. This materially increases the death-rate from this disease. Again, as I previously stated, no conclusion of any value can be deduced from a bare comparison between the death-rates of two populations very differently constituted as to age and sex. In a community such as Torquay, where the number of persons at advanced ages and of females is greater than that pertaining to the country as a whole, we expect to find a greater number of persons dying from cancer.

Deducting the nine deaths of visitors, we get a cancer death-rate of 1·12 per 1,000 of the resident population. If this figure is corrected for age and sex distribution, it would only be ·88 per 1,000 of the population. The rate for England and Wales for 1901, the only figures at present published, is ·84 per 1,000 of the total population.

AGE AND SEX DISTRIBUTION OF CANCER DEATHS.

	35—45	45—55	55—65	65—75	over 75	Totals
Males	3	3	4	9	0	19
Females	1	7	9	5	6	28
Total	4	10	13	14	6	47

In the following table the chief headings under which deaths from cancer occur are given :—

REGISTERED DEATHS FROM CANCER (MALIGNANT DISEASE),

Seat of Disease.	Sarcoma.		Carcinoma.		Malignant Disease or Cancer.		Total.
	M.	F.	M.	F.	M.	F.	
Neck, Throat, Tonsils, Larynx ..	1	—	1	—	—	—	2
Oesophagus	—	—	2	—	—	—	2
Breast	—	—	—	3	—	2	5
Stomach and Pylorus ..	1	—	2	2	5	2	12
Liver and Gall Bladder ..	—	—	3	1	1	4	9
Pancreas'	—	—	—	—	1	—	1
Intestines (excluding Rectum) ..	—	—	1	2	—	2	5
Rectum	—	—	1	—	—	3	4
Uterus	—	—	—	2	—	2	4
Arm, Wrist, Hand	—	1	—	—	—	—	1
Parts unspecified	—	—	—	—	—	2	2
Totals	2	1	10	10	7	17	47

NOTIFIABLE ZYMOTIC DISEASES.

During the year 54 cases of infectious disease were notified ; 5 were cases of chicken-pox which was notifiable for the first quarter of the year. In 1902, 70 cases were notified, 33 of these

were chicken-pox; and in 1901, 89 were notified. The following table gives the notifications during each month of 1903 :—

	Small-pox.	Diphtheria and Membranous Croup.	Enteric Fever.	Puerperal Fever.	Scarlet Fever.	Erysipelas.	Chicken-pox	Total.
January ..	—	1	1	—	1	—	2	5
February ..	—	2	—	—	1	1	3	7
March ..	—	1	—	—	1	—	—	2
April ..	—	1	—	—	2	—	—	3
May ..	—	—	1	—	1	—	—	2
June ..	—	—	2	—	3	—	—	5
July ..	—	—	1	—	5	—	—	6
August ..	2	2	1	—	1	—	—	6
September ..	—	—	2	1	2	—	—	5
October ..	—	2	1	—	4	1	—	8
November ..	—	4	—	—	—	—	—	4
December ..	—	—	—	—	—	1	—	1
Totals ..	2	13	9	1	21	3	5	54

In Table III. of the Local Government Board returns on page 32, details are given as to the age of patients, the number of cases occurring in each ward, and the numbers removed to the Sanatorium.

From this table we find that 29 cases out of 54 were removed to Hospital, equal to 53 per cent.

Small-pox	...	2	to Cockington Sanatorium
Diphtheria	...	7	„ Sanatorium, Newton Road.
Scarlet Fever	...	15	„ „ „
Enteric Fever	...	4	„ Torbay Hospital.
Puerperal Fever	...	1	„ „

Total ... 29

SMALL-POX.

In August a case of small-pox was notified. I visited the case with the medical attendant, and there being no doubt as to the nature of the disease, I at once communicated with the Mayor, the Chairman of the Sanitary Committee, and the Town Clerk.

After consultation, it was decided to prepare the Sanatorium at Cockington for the patient's reception. With the assistance of the Borough Surveyor this was quickly done, and the patient removed the same afternoon. Dr. Cook, the Public Vaccinator, was informed of the case, and all the inmates of the house were at once re-vaccinated, as were several other persons who had been in contact with the patient.

The case was undoubtedly imported from London, the patient coming to Torquay for a holiday with his wife. He was ill on his arrival, and within the week the rash was fully developed. His wife, although re-vaccinated when her husband was removed, took the disease in a modified form ten days later, and was removed to the Sanatorium.

The infected rooms and bedding, etc., were thoroughly disinfected, and the "contacts" kept under observation for three weeks. By these precautions the disease was quickly stamped out.

The above facts demonstrate the absolute necessity of having isolation accommodation ready for the reception of small-pox cases, especially in a health resort such as Torquay, where the introduction of such a disease is not unlikely, and the consequence of an epidemic would be disastrous.

VACCINATION.

Through the courtesy of Mr. Edwards, the Vaccination Officer, I am able to give the results of primary vaccination for the years from 1897 to 1902. It is very satisfactory to note the large percentage of children protected from this loathsome disease.

Year.	Total births registered	Successfully vaccinated	Unsusceptible of Vaccination	Had Small-pox	Number of Certificates from Conscientious Objectors	Died Unvaccinated	Postponed by Medical Officer	Removed to other districts the Vaccination Officer of which has been apprised	Removed Address unknown	Percentage successfully Vaccinated	Excluding those who died Unvaccinated. Percentage
1897	683	581	2	—	—	59	—	4	20	85	93
1898	664	544	2	—	10	64	6	7	25	82	90
1899	612	505	6	—	14	67	6	3	11	83	93
1900	596	502	1	—	15	47	7	3	21	84	91
1901	597	491	2	—	16	57	13	1	17	82	91
1902	579	475	2	—	7	61	7	6	6	82	92

DIPHTHERIA.

Thirteen cases of this disease were notified during the year, two of which proved fatal. From the table giving the monthly notifications, it will be seen that the cases occurred in the spring and autumn months. Six out of the nine wards were affected, showing that there was no special localisation of the disease.

SCARLET FEVER.

Twenty-one cases were notified, and were all of a mild character, no deaths being registered. Fifteen were removed to the Sanatorium.

ENTERIC FEVER.

Nine cases occurred in the district, and two died, a case mortality of 22 per cent., and a death rate of '06 per 1,000 on the total population. Four of the patients were removed to the hospital. In five cases the disease was most probably contracted outside the district, the patients having been away for some time and only returning a few days prior to the onset of the disease. In four houses drainage defects were found, and two cases were undoubtedly due to eating cockles.

As we invariably get cases of enteric each year, through the consumption of sewage polluted shellfish, a notice, warning inhabitants to abstain from eating such shellfish, was printed and posted throughout the district early during the past summer.

CHICKEN-POX.

This disease was compulsory notifiable for the first three months of the year. Five cases occurred.

ERYSIPELAS.

Three cases were notified and there were no deaths.

PUERPERAL FEVER.

Only one case was notified, and this unfortunately proved fatal. Up till now the Sanitary Authority have had no legal authority over midwives who have attended such cases. However,

under the new Midwives' Act, the Council have taken over the local administration of the Act, and will have power to prevent the attendance of midwives, who are attending patients suffering from this disease, from going to other cases until they are satisfied that she is free from infection. All women practising as midwives must also be registered.

STEPS TAKEN TO PREVENT THE SPREAD OF INFECTIOUS DISEASE.

On the receipt of the notification, the house is visited as soon as possible, particulars as to source of infection, milk supply, school attended, drainage, etc., obtained, and if necessary arrangements made for the removal of the patient to the Sanatorium. Frequently the Medical Attendant notifies that the case is one suitable for treatment in the Sanatorium, a step which greatly facilitates their early removal.

After removal, or on recovery should the patient be isolated at home, the infected rooms and bedding are fumigated with formaline.

I am glad to be in a position to state that the Council have decided to purchase a modern steam disinfecter, and have applied to the Local Government Board for sanction to borrow the money for this purpose.

Where it is found that children in an infected house are attending one of the public elementary schools, the Attendance Officer is notified of the case. All cases suspected to be infectious by the School Attendance Officer, and where no doctor is in attendance, are notified to me as Medical Officer to the Education Authority.

NON-NOTIFIABLE ZYMOTIC DISEASES.

MEASLES.

The Town has been practically free from this disease throughout the year.

WHOOPING COUGH.

Many cases of this disease were known of in November and December of 1902. It was apparently on the increase during January and February, 1903, and in the latter month it was found necessary to close the Babbacombe Infant School. Five deaths were caused by whooping cough, all being children under five years of age.

INFLUENZA.

Influenza was responsible for eight deaths, all of persons over 65 years of age.

DIARRHŒA.

Only three deaths were due to this disease ; in 1902 there were four ; and in 1901 two. As pointed out when dealing with infant deaths, the Borough is singularly free from this disease. On examining the causes of death for past years, I find that in 1900 there were 13 deaths due to diarrhœa. What was the cause of this unusual mortality ? An examination of the meteorological returns for that year shows that July was a particularly dry month, and it is further stated in those returns, that the months of August, September, and October were abnormally dry, the rainfall being about half the usual amount. Many Medical Officers of Health, in their reports for 1902, state that the large decrease in their diarrhœa deaths was due to the wet summer. Dr. Newsholme, Medical Officer for Brighton, states : " Much of our relative immunity from diarrhœa was doubtless caused by the fact that each week throughout the summer there was more or less fall of rain." As a practical lesson from this, he advises the thorough flushing of streets, especially the gutters, when the natural scavenging of rain fails.

ZYMOTIC DEATH RATE.

There were 12 deaths ascribed to zymotic diseases, as compared with 18 in 1902, and 31 in 1901. They were as follows :— Small pox 0, scarlet fever 0, diphtheria 2, fevers, including enteric, 2, measles 0, whooping cough 5, diarrhœa 3 ; total 12.

The zymotic death rate is equal to '35 per 1,000 of the population.

NINETEENTH ANNUAL REPORT on THE SANATORIUM.

For the Year ending March 31st, 1903.

TO THE CHAIRMAN & MEMBERS OF THE SANITARY COMMITTEE.

GENTLEMEN,

On the 1st of April, 1902, there were no patients under treatment, and from that date to March 31st, 1903, twenty-six patients were admitted. These patients remained under treatment a period of 1,242 days, giving an average stay in hospital of 48 days each.

There were 16 cases of scarlet fever, two diphtheria, six measles, one German measles, and one mumps.

Three of the above patients were visitors, two of whom were admitted to private wards; nine were from H.M.'s ships, two were shop assistants; while the remaining twelve patients came from the homes of the working classes.

Only one death occurred, and this was a patient suffering from diphtheria, who died a few hours after admission.

The following table shows the cost of working during the 12 months:—

1903.	EXPENDITURE.			£	s.	d.
Diet of Patients	...	...	...	90	9	0
Wages and Diet of Nurses	...	...	...	121	12	6
Laundress	...	...	...	57	4	0
Curator	...	...	...	64	15	0
Surveyor's Account	...	...	...	12	6	8
Tradesmen's Accounts	...	...	...	46	9	11
Rent, Rates and Insurance	...	...	...	67	12	7*
Drugs	...	...	...	10	12	5
Medical Fees	...	...	...	5	5	0
Conveyance of Patients	...	...	...	6	18	0
Coal, Coke and Wood	...	...	...	73	12	4
Rent of Telephone	...	...	...	10	0	0
Fire Appliances	...	...	...	3	15	0
				£570	12	5
RECEIPTS.						
Paid by Patients	...	...	...	184	8	3
Deficit	...	...	...	386	4	2
				£570	12	5

These figures should be compared with those of previous years:—

1898	Report	...	30	Patients cost	„	493	13	2	...	Deficit	463	19	2
1899	„	...	35	„	...	513	14	11	...	„	496	18	11
1900	„	...	42	„	...	564	2	10	...	„	519	8	10
1901	„	...	26	„	...	515	15	11	...	„	402	18	11
1902	„	...	58	„	...	903	6	6	...	„	880	14	6
1903	„	...	26	„	...	570	12	5	...	„	386	4	2

* NOTE.—£48 10s. 10d. of the above is the rent, etc., paid for Cockington Sanatorium.

I am, Gentlemen,

Your obedient servant,

T. DUNLOP,

Medical Officer of Health.

August, 1903.

WATER SUPPLY.

The water supply of Torquay is derived from upland surface, gathering ground about 15 miles from Torquay, on the borders of Dartmoor. The area of the gathering ground is about 2,241 acres, and is composed of:—

						Acres.
Moorland	..	..	..	..	..	584
Woods..	..	..	..	..	..	75
Woods (new)	..	..	..	..	..	30
Land within zone	..	..	..	..	..	350
Land under cultivation..	..	..	..	..	..	212
Grazing	..	..	..	..	..	990
Total						2241

By the powers conferred on them by an Act of Parliament in 1896-7, the Corporation have purchased the whole watershed, freeing the area from all inhabited houses and taking other steps which render the possibility of contamination of the water almost impossible.

At the present time the water is stored in two large reservoirs, the Tottiford Reservoir containing 103,000,000 gallons, and the Kennick Reservoir 194,000,000 gallons.

The supply is augmented by taking water from the Trenchford stream, the yearly average amount being 170,000,000 gallons. In order to reduce to a minimum the possibility of there being any shortage of water in very dry seasons, the Corporation applied for

and obtained an Act of Parliament enabling them to build another reservoir, in the Trenchford Valley, impounding the waters of the Trenchford stream. This reservoir will be capable of containing 200,000,000 gallons.

The average amount of water supplied per head per day during the past year was found to be 35.55 galls. for all purposes.

As to the quality of the water, I cannot do better than quote from the opinion of Professor Percy Frankland, given in a report made in May, 1903, after visiting the gathering grounds and examining, chemically and bacteriologically, samples of the supply :
"A source of water supply, which in respect of freedom from suspicion ranks with the best upland surface supplies in the Kingdom. The water also contains such a small amount of lime and magnesia salts that it possesses all the well-known advantages of very soft water, whilst its slightly alkaline reaction prevents it from having any solvent power on lead."

Appended is Professor Frankland's report :—

Report on an Inspection of the Gathering Ground and Reservoirs of the Torquay Corporation, and on the Results of Chemical and Bacteriological Examination of Samples of Water supplied, by
 PROF. PERCY FRANKLAND, F.R.S.

THE UNIVERSITY, BIRMINGHAM,

11th May, 1903.

THE TOWN CLERK,
 TORQUAY.

DEAR SIR,

I have to report to you on the inspection which I have made of the gathering ground and reservoirs from which the Torquay Water Supply is derived, as well as on the chemical analysis and bacteriological examination of the several samples of water, which I personally collected on the 25th ult. I was already, to some extent, acquainted with the supply, having made chemical analyses of certain representative samples of water from Torquay in 1893, and also analyses and bacteriological examinations of some further samples in 1898.

The history of the Torquay Water Supply is a particularly interesting one, going back as it does to the year 1856. At that time it was quite usual to abstract for waterworks purposes the water of streams passing through land under cultivation and supporting a larger or smaller number of farms and other habitations. Such a source was taken for the supply of Torquay nearly half a century ago.

With the progress of sanitary science, which was such a conspicuous feature of the latter half of the nineteenth century, it became more and more fully realised that water liable to be polluted with the drainage and other refuse from human habitations is capable of communicating Zymotic disease, and is unfit, without most careful purification, for domestic supply.

Under these circumstances it became necessary for communities possessing supplies of the above suspicious character to adopt one of the two different courses in order to secure water complying with the modern standards of purity.

(1) The first course consists in changing the source by removing to an unpopulated or almost unpopulated gathering ground.

(2) The second course consists in purchasing the existing gathering ground, and removing all habitations and other sources of pollution.

It was for this latter drastic measure, selected by the Corporation of Torquay, that the sanction of Parliament was obtained in the Act of 1896-7.

This Act has enabled the Corporation to acquire an estate of 2,241 acres, which, by the abolition of every habitation within the watershed, has been converted into a magnificent gathering ground in which a number of springs come to the surface, and give rise to two principal streams, the Trenchford and Kennick Brooks.

On the occasion of my visit I was able to see the great improvements which have been made in protecting the water derived from this area since it came into the hands of the Corporation.

I saw several of the sites formerly occupied by farmhouses which must have been in dangerous proximity to the streams; also the fences which have been erected to prevent cattle from approaching the water courses, as well as the trenches which have been dug to prevent the water running off the surface of the land from flowing directly into the streams. Finally, owing to the entire watershed being now under the complete control of the Corporation, the land under cultivation can be restricted to outlying portions, and the use of objectionable fertilizers prevented.

I am of opinion that these improvements have been carried out on a well-conceived plan, and that they are calculated to preserve the purity of the water furnished by the gathering ground.

EXAMINATION OF SAMPLES.

I have examined, both chemically and bacteriologically, representative samples of water taken in the Trenchford and the Kennick valleys respectively, as well as a sample of the water actually supplied in the town of Torquay itself.

TRENCHFORD VALLEY.—In this valley I collected two samples, one near the source of the stream, where the latter passes over a small fall a few feet in height, and another at the bottom of the valley, where the stream passes over the gauge-weir just above the "intake."

The sample taken at the source was colourless, only very slightly turbid, and of an extremely high degree of organic purity; in fact, it is essentially spring water as regards its chemical composition, although in consequence of its having passed over the surface of the ground it contains more bacterial life than is found in typical spring water issuing directly from a water-bearing stratum.

The sample taken from the Gauge was also only very slightly turbid, but contained, as was to be expected, a little more organic matter than that from the source, although the actual amount is so small that the water is still of a high degree of organic purity, and possesses practically the composition of spring water. It is bacteriologically of essentially the same quality as the previous sample. Thus the water of the Trenchford Brook undergoes but little change during its course from the source to the Gauge.

At present the water of the Trenchford Brook passes on directly to the service reservoirs for supply, but the proposed interposition of a storage reservoir, for which powers are being sought in the present session of Parliament, will be a most valuable addition to this portion of the supply. By storage in such a reservoir the amount of bacterial life in the Trenchford Brook will doubtless be considerably reduced.

KENNIC VALLEY.—At the head of this valley the springs discharge over the surface of the ground in such a thin layer that I was not able to obtain a sample until a distinct brook has been formed near what used to be Blackingstone Farm. This sample was slightly turbid, pale yellow, and contained more than twice as much organic matter as was present in the Trenchford Brook at the Gauge. This water partakes more of the character of moorland water, and is of a somewhat peaty nature. For moorland water the amount of organic matter is, however, by no means large.

The amount of bacterial life is also greater than in the Trenchford Brook, and the nature of the bacteria indicates that the water has been more in contact with the surface soil.

A sample collected from a boat at the foot of the Kennick Reservoir, although, chemically, almost identical with that taken from the Kennick Brook at Blackingstone Farm, contained much less bacterial life, the number of bacteria being considerably smaller than that present in the Trenchford Brook, and thus affording a striking illustration of the great bacterial improvement which is effected by storage in a large reservoir.

Another sample, similarly collected from a boat near the dam of the Tottiford Reservoir, was of a very pale yellow colour, and contained slightly more organic matter than the sample from the Kennick Brook at Blackingstone Farm; it was, however, only very slightly turbid, and of a very high degree of bacterial purity. This sample thus affords a further and still more striking illustration of the bacterial improvement which is effected in water by long-continued storage.

WATER SUPPLIED TO TORQUAY.—The water actually supplied to Torquay is a mixture of the water from the Trenchford Brook and of that from the Tottiford Reservoir, and the sample collected at the Town Hall exhibited a composition which was, both from a chemical and bacteriological point of view, intermediate in character between that of the samples from these two sources respectively. It was only very slightly turbid, of a very pale yellow colour, and contained only a very moderate amount both of organic matter and of bacterial life. The removal of all habitations from the watershed, and the other improvements made on the gathering ground, since its acquisition by the Corporation, have thus guaranteed to Torquay a source of water supply which, in respect of freedom from suspicion, ranks with the best upland surface supplies in the kingdom. The watershed is, moreover, favoured by nature in yielding a large quantity of spring water in the Trenchford Valley, whilst, owing to the relatively small area of peat, the entire supply from both valleys contains for upland surface water only a very moderate proportion of vegetable organic matter. The water also contains such a small amount of lime and magnesia salts that it possesses all the well-known advantages of very soft water, whilst its slightly alkaline reaction prevents it from having any solvent power on lead.

I am, Sir,

Faithfully yours,

PERCY F. FRANKLAND.

RESULTS OF ANALYSIS EXPRESSED IN PARTS PER 100,000.

Number of Sample.	Description.	Total Solid Matters.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen as Nitrates and Nitrites.	Total Combined Nitrogen.	Chlorine.	Hardness.			Remarks.
									Temp-orary.	Perma-nent.	Total.	
TORQUAY WATER SUPPLY. <i>April 25th, 1903.</i>												
12,851	Trenchford Source, 12.40 p.m.	6.36	.056	.008	Trace.	.206	.214	1.30	0.4	2.3	2.7	Very slightly turbid, palatable, free from poisonous metals and nitrites.
12,852	Trenchford Gauge, 3.10 p.m.	7.00	.094	.009	Trace.	.165	.174	1.47	0.2	2.5	2.7	Very slightly turbid, palatable, free from poisonous metals and nitrites.
12,853	Main Stream, near Blackingstone Farm, 1.40 p.m.	6.20	.212	.029	Trace.	.044	.073	1.35	0.3	2.0	2.3	Slightly turbid, very slight peaty taste, free from poisonous metals and nitrites.
12,854	Kennick Reservoir, 2.25 p.m.	6.40	.192	.028	Trace.	.095	.123	1.50	0.4	2.1	2.5	Very slightly turbid, very slight peaty taste, free from poisonous metals and nitrites.
12,855	Tottiford Reservoir, 2.55 p.m.	6.80	.236	.032	Trace.	.097	.129	1.45	0.5	2.1	2.6	Very slightly turbid, very slight peaty taste, free from poisonous metals and nitrites.
12,856	Town Hall, 8.25 a.m.	6.84	.141	.018	Trace.	.118	.136	1.50	0.3	2.2	2.5	Very slightly turbid, very slight peaty taste, free from poisonous metals.

PERCY F. FRANKLAND, Ph.D., M.Sc., LL.D., F.R.S.
May 11th, 1903.

RESULTS OF BACTERIOLOGICAL EXAMINATION.

Number of Sample.	Description.	Number of Micro-organisms obtained from One Cubic Centimetre of Water.				Cultivation in Plain Broth.	Cultivation in Carbollic Broth.	Anaërobic Cultivation of Spores in Milk.	Remarks.
		Ordinary Gelatine Culture.	Number of Days Incubd.	Carbollic Gelatine Culture.	Number of Days Incubd.				
TORQUAY WATER SUPPLY. <i>April 25th, 1903.</i>									
12,857	Trenchford Source, 12.40 p.m.	248 347	2 3	3 —	7 —	No Indol. ..	No Indol. ..	0	
12,858	Trenchford Gauge, 3.10 p.m.	228 520	2 5	0 —	7 —	Very faint Indol. ..	No Indol. ..	0	
12,859	Main Stream, near Blackingstone Farm, 1.40 p.m. ..	435 770	2 3	16 —	7 —	No Indol. ..	No Indol. ..	Coagulated (4 days)	
12,860	Kennick Reservoir, 2.25 p.m.	133 209	2 3	0 —	7 —	No Indol. ..	No Indol. ..	0	
12,861	Tottiford Reservoir, 2.55 p.m.	45 160	2 7	0 —	7 —	Very faint Indol. ..	Very faint Indol. ..	0	
12,862	Town Hall, 8.25 a.m.	218 410	2 5	1 —	7 —	No Indol. ..	No Indol. ..	0	

PERCY F. FRANKLAND, Ph.D., M.Sc., LL.D., F.R.S.

May 11th, 1903.

In order that the quality of the water may be constantly kept under observation, the Corporation have decided to fully equip a laboratory for the regular chemical analyses of the supply. The work is now well in hand, and in a few weeks should be ready for use.

MILK SUPPLY.

Much attention has, during the year, been drawn to the milk supply of large towns throughout the country, and if all that has been written is true, it is well that consumers of milk are ignorant of the facts.

It ought to be satisfactory to the inhabitants and visitors of Torquay to know that through the continued efforts of the late Medical Officer of Health, Dr. Karkeek, systematic inspections are made, not only of the registered cowsheds and dairies in the Borough, but of all the dairy farms outside the district which supply dealers in the town. The system is as follows:—Twice a year the Sanitary Inspectors make their routine inspections of the cowsheds and dairies in the Borough, obtaining from each dealer the names and addresses of the various farmers from whom they obtain their supply. Each farm outside the district is then visited by me and one of the inspectors, an inspection being made of everything connected with the production of milk. Particulars are obtained of the condition of the cowsheds as to cleanliness, lighting, ventilation, and paving; the washing of milk vessels; cleanliness of dairies, etc.; the water supply as regards its freedom from possible pollution; and the number and condition of the cows being milked.

After these inspections a complete register is compiled of all dairies and cowsheds in the Borough, together with the farms outside which supply them with milk, etc. This register is printed in the form of a bill, and is posted up throughout the town, copies being forwarded to all dairymen and farmers concerned. Such bills are a guarantee that we are satisfied with the sanitary state of the places inspected, and is in force for six months. Thus two thorough inspections are made each year. It is satisfactory to be able to report that the farmers meet us with every courtesy, and endeavour to carry out any improvements that are suggested. The dairies everywhere are beautifully kept, and there is a noticeable improvement in the condition of the cowsheds. Cowsheds, which in the past rarely saw the whitewash brush, are now limewashed twice a year; cobble paving, which is almost impossible to keep clean, has in many places been replaced by brick paving. It must also

be remembered that in South Devon, for the greater part of the year, the cows are kept out night and day, only being brought in at night from the middle of December to the end of March, so that the animals live under the best conditions possible.

I do not think that sufficient care is exercised in the milking of the cows, and it is then that there is great liability to pollution, a fact which any farmer who has a milk separator can prove for himself by examining the sediment, which contains numerous hairs and other extraneous matter, which never came from the udder of a cow. It is very rare to see overalls or even aprons used by the milkers, except where women do the milking. Proper means for washing the hands are seldom seen. I am afraid in many cases the hands get nothing more than a rinse in the pump water, and sometimes not even that. It is in this direction that improvement is needed. I have recently read of a dairy farm in Yorkshire where all these precautions are strictly observed. Now this has not resulted in a monetary loss as some might expect, but in a daily increasing demand for milk from this farm, and the proprietor has been able to obtain a better price for his milk than other farmers near who do not adopt such precautions.

There are 87 registered dairymen and cow-keepers in the Borough which receive their milk from 62 farms situated outside the district.

SALE OF FOOD AND DRUGS ACT.

Samples are taken by the County Police. The following table is a summary of their action under the Act :—

Articles examined.	Number of samples taken	Result of Analysis.		Result of proceedings taken.
		No. genuine.	No. adulterated.	
Beer	12	12		
Brandy	5	5		
Bread	6	6		
Coffee	4	4		
Milk	19	18	1	Fined 5/- & 11/- costs
Rum	1	1		
Gin	7	7		
Tea	4	4		
Sugar	4	4		
Whisky	5	5		

FACTORY AND WORKSHOPS ACT.

By section 131 of this Act, the Local Authority is directed to keep a register of workshops situated in their district. During the year much time has been spent by the Sanitary Inspectors, not only in inspecting the workshops in their areas, but in measuring up the various rooms, and obtaining other particulars for compiling the register. This has been completed, but owing to its cumbersome nature, and the necessity of erasures through changes of occupation and the nature of the work carried on, the card system as initiated by the Brighton Authority has been adopted, and has been found to be simple, complete, and easy to keep up to date.

The following table gives a summary of the various trades and the number of each :—

Description of Trade.				Number of Workshops.	
Drapers, Dressmakers, Milliners	...	...	...	...	60
Cabinet Makers and Upholsterers	...	...	...	...	14
Coach-builder and Wheelwright, Cycle Works	...	...	...	...	18
Printers	...	...	...	...	5
Tailors	...	...	...	...	23
Laundries	...	...	...	...	36
Builders, Carpenters	...	...	...	...	16
Saddlers, Harness, and Sailmakers	...	...	...	...	10
Watch Maker and Jewellers	...	...	...	...	6
Plumbers, Painters, etc.	...	...	...	...	28
Bakehouses	...	...	...	...	54
Dye Works	...	...	...	...	1
Bootmakers	...	...	...	...	3
Corset Makers	...	...	...	...	1
Marble Masons	...	...	...	...	2
Picture Framers and Wood Turners	...	...	...	...	2
Photographers	...	...	...	...	1
Iron Founder	...	...	...	...	1
Quarries	...	...	...	...	5

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Many workshops besides those on the list supplied by H.M. Inspector of Factories have been added to the register, and I have no doubt there are others, which in the course of next year's inspection I hope will be visited.

OUTWORKERS.

Much trouble has been experienced in obtaining the lists of outworkers. By section 107 of the Act, manufacturers of wearing apparel and lace, occupiers of workshops for fur-pulling, cabinet making, furniture making and upholstery, electro-plate, and file making, must keep lists of all outworkers, and must furnish the

Local Authority with such lists before the 1st of February and the 1st of August in each year. Circular letters have been sent to those persons supposed to employ outworkers, and recently large bills were posted up drawing attention to the above section, and yet with little effect. In future, occupiers who neglect to furnish lists are to be reported to the Sanitary Committee.

BAKEHOUSES.

There are 54 bakehouses on the register. During the year I made an inspection of each; only two were found which could be said to come under the definition of underground bakehouses. In one case it was found impossible to make such alterations as to render it suitable for a certificate. It was therefore closed and another bakehouse obtained. The other, on complying with certain suggestions, has been granted a certificate. Several of the bakehouses had traps inside directly connected to the drain or sewer; these have in all cases been disconnected. Defective floors were found in some places, while others required limewashing. The defects have been remedied in every case.

Many visits and re-visits were made by the Inspectors during the course of remedying defects found in the workshops, and are dealt with by them in their reports.

ICE CREAM TRADE.

As far as I could ascertain, there are only two manufacturers of ice cream in the town. I inspected both. In one, everything possible appeared to be done to insure the purity of the ice cream, the other was satisfactory.

COMMON LODGING-HOUSES.

There are three registered common lodging-houses. I visited these, and found two very clean and well looked after; the third required limewashing, and was not as clean as it should be.

FRENCH ONION HAWKERS.

Early in the autumn of each year gangs of these hawkers come to Torquay with cargoes of onions, making the town their headquarters, and hawking their goods for miles into the country. They stay until they have disposed of all their onions. As they all live together, occupying large lofts, it is necessary to keep them

under observation to prevent overcrowding. This year, with Mr. Watson, I paid a midnight visit on a Saturday night, so as to find the greatest number present, as those on country rounds usually return for Sunday. We visited the three gangs, and in only one instance detected overcrowding, and that was where a portion of the gang slept in a cottage. This overcrowding was at once abated.

HOUSING OF THE WORKING CLASSES.

From an examination of the details given in the census returns for 1901, and there is little reason to believe there has been any material change since then, we find that the number of tenements (*i.e.*, houses or parts of houses separately occupied) was 7,616; of these 2,324, had less than five rooms. The following table gives the number of rooms in each tenement, and the number of occupants to each tenement:—

Tenements.	No. of Tenements.	Number of Occupants to each Tenement.											
		1	2	3	4	5	6	7	8	9	10	11	12 or more.
1 roomed	186	137	40	9	—	—	—	—	—	—	—	—	—
2 roomed	545	155	210	100	49	21	10	—	—	—	—	—	—
3 roomed	767	61	218	190	102	104	45	27	15	3	1	1	—
4 roomed	826	42	171	195	176	93	63	46	24	14	—	—	2
Totals	2324	395	639	575	327	218	118	73	39	17	1	1	2

On the whole there appears to be little evidence of overcrowding. It is noticeable that the size of the rooms, in what may be termed exclusively tenement houses in Torquay, is greater than is usually found in many other districts.

SLAUGHTER HOUSES.

There are seven licensed slaughter houses in the Borough—six are in the St. Mary-Church District, and one belonging to a company in Upton; this is a large one, and is used by a number of butchers.

I have inspected them all and had no complaint to make as to their condition.

OFFENSIVE TRADES.

The only one in the district is that of a tripe-boiler. On my inspection I found it clean and suitable for the purpose.

COLLECTION AND DISPOSAL OF REFUSE.

House refuse is removed by the employees of the Corporation, under the Surveyor's Department. In most parts of the town it is removed once a week, but in certain parts twice. It is carted to the destructor works in Upton Valley, and there consumed, about 12,000 tons being dealt with annually. The destructor is a "Warner Perfectus" of four cells. The boilers are heated from the furnaces, and the steam generated can be used to drive donkey-engine, vertical engine for running blower, 25-horse power engine for running mortar mill and electrical installation. The clinker produced is ground and used for mortar; for this there is a good demand.

DRAINAGE.

The sewage of the whole district and most of the storm water is conveyed by branch sewers to the 7ft. main sewer, which runs from Fleet Street to Hope's Nose, a distance of almost two miles. Here the sewage is discharged untreated into the sea. The natural set of the current is out towards mid-channel beyond Berry Head.

A portion of the tile sewer in the St. Mary-Church Road has been relaid with stoneware pipes. An application has also been made to the Local Government Board for sanction to borrow money for re-laying the main sewer through Hele, and for laying certain sewers in Babbacombe Road, to relieve the present sewers in time of heavy rain, and thus prevent flooding of houses in this district.

HOUSE DRAINAGE.

During the past year the drainage, etc., of 43 houses has been examined for intending occupiers, on payment of the 10s. fee, prior to granting a sanitary certificate. In 23 other places where, on complaint, drainage defects were found, and where the owner, in remedying them, complied with the requirements necessary to obtain a certificate, the same were granted.

TABLE I.
VITAL STATISTICS OF WHOLE DISTRICT DURING 1903 AND PREVIOUS YEARS.

YEAR.	Population estimated to Middle of each Year.	BIRTHS.		Total Deaths Registered in the District.				TOTAL DEATHS IN PUBLIC INSTITUTIONS IN THE DISTRICT.	Deaths of Non-Residents registered in Public Institutions in the District.		Deaths of Residents registered in Public Institutions beyond the District.	NETT DEATHS AT ALL AGES BELONGING TO THE DISTRICT.	
		Number.	Rate.*	Under 1 year of age		At all ages.			Number.	Rate.*		Number.	Rate.*
				Number.	Rate per 1,000 Births registered.	Number.	Rate.*						
1	2	3	4	5	6	7	8	9	10	11	12	13	
1895.	33100	652	19.6	102	155	583	17.6	41	55		528	15.9	
1896.	33200	650	19.5	107	163	569	17.1	43	41		528	15.9	
1897.	33300	630	18.9	81	128	502	15.0	43	83		419	12.5	
1898.	33400	626	18.7	83	132	529	15.5	53	70		459	13.7	
1899.	33500	573	17.0	84	143	570	17.0	31	49		529	15.5	
1900.	33600	559	16.6	70	124	488	14.5	41	58		430	12.8	
1901.	33625	556	16.5	70	125	504	15.0	51	28		476	14.1	
1902.	33625	540	16.0	84	155	529	15.7	63	38		491	14.6	
Averages for years 1895—1902.	33420	598	17.8	85	142	534	15.9	45	52		482	14.4	
1903.	33800	536	15.9	51	95	455	13.4	57	28	21	448	13.3	

* Rates in columns 4, 8, and 13 calculated per 1,000 of estimated population.

NOTE.—The deaths to be included in Column 7 of this table are the whole of those registered during the year as having actually occurred within the district or division. The deaths to be included in Column 12 are the number in Column 7, corrected by the subtraction of the number in Column 10 and the addition of the number in Column 11.

By the term "Non-residents" is meant persons brought into the district on account of sickness or infirmity, and dying in public institutions there; and by the term "Residents" is meant persons who have been taken out of the district on account of sickness or infirmity, and have died in public institutions elsewhere.

The "Public Institutions" to be taken into account for the purposes of these tables are those into which persons are habitually received on account of sickness or infirmity, such as hospitals, workhouses, and lunatic asylums.

TABLE II.

CAUSES OF, AND AGES AT, DEATH DURING YEAR 1903.

CAUSES OF DEATH.	DEATHS IN OR BELONGING TO WHOLE DISTRICT AT SUBJOINED AGES.							Total Deaths in Public Institutions in the District.
	All ages.	under 1	1 and under 5	5 and under 15.	15 & under 25.	25 & under 65.	65 & up- wards	
Small-pox								
Measles								
Scarlet Fever								
Whooping-cough	5	3	2	—	—	—	—	—
Diphtheria and Membranous croup	2	—	1	—	1	—	—	—
Croup								
Fever { Typhus	2	—	—	—	1	1	—	1
Enteric								
Other continued								
Epidemic influenza	8	—	—	—	—	2	6	1
Cholera								
Plague								
Diarrhœa	3	3	—	—	—	—	—	—
Enteritis	8	3	3	—	—	1	1	—
Puerperal fever	1	—	—	—	1	—	—	1
Erysipelas								
Other septic diseases	3	1	—	—	—	1	1	1
Phthisis	37	—	1	2	6	24	4	21
Other tubercular diseases	5	1	1	—	1	1	1	3
Cancer, malignant disease	47	—	—	—	—	25	22	3
Bronchitis	35	6	1	—	—	8	20	1
Pneumonia	17	1	2	1	—	7	6	3
Pleurisy	2	—	—	—	—	—	2	—
Other diseases of respiratory organs	1	—	—	—	—	—	1	1
Alcoholism	7	—	—	—	—	6	1	2
Cirrhosis of liver								
Venereal diseases								
Premature birth	8	8	—	—	—	—	—	—
Diseases and accidents of parturition	1	—	—	—	—	1	—	—
Heart diseases	71	2	—	—	1	29	39	4
Accidents	7	2	2	—	—	3	—	3
Suicides	3	—	—	—	—	2	1	—
All other causes	175	25	3	2	2	50	93	13
All causes	844	55	16	5	13	161	198	57

TABLE III.

CASES OF INFECTIOUS DISEASE NOTIFIED DURING THE
YEAR 1903.

NOTIFIABLE DISEASE.	Cases notified in whole district.							Total cases notified in each locality.							No. of cases removed to hospital fr'm each locality										
	At all ages.	At Ages—Years.						Torre	Waldon	Upton	Ellacombe	Strand	Torwood	S. Marych.	Babe'mbe	Chelston	Torre	Waldon	Upton	Ellacombe	Strand	Torwood	S. Marych.	Babe'mbe	Chelston
		Under 1	1 to 5	5 to 15	15 to 25	25 to 65	65 and upwards																		
Small-pox ..	2	—	—	—	1	1	—				2									2					
Cholera ..	—	—	—	—	—	—	—																		
Diphtheria ..	13	—	1	4	5	3	—	1	3	.	2	2	2	3	.	.	1	2	.	1	2	.	1	.	.
Membranous croup	—	—	—	—	—	—	—																		
Erysipelas ..	3	—	—	—	—	3	—	1	.	1	.	.	.	1	.	.									
Scarlet fever ..	21	—	5	7	8	1	—	4	4	3	1	1	.	5	1	2	2	1	4	1	.	.	5	1	1
Typhus fever ..	—	—	—	—	—	—	—																		
Enteric fever ..	9	—	1	2	1	4	1	.	.	1	1	1	.	5	1	.	.	.	.	.	1	.	3	.	.
Relapsing fever ..	—	—	—	—	—	—	—																		
Continued fever ..	—	—	—	—	—	—	—																		
Puerperal fever ..	1	—	—	—	1	—	—					1								1					
Plague ..	—	—	—	—	—	—	—																		
Chicken Pox ..	5	—	4	1	—	—	—				5														
Totals ..	54	—	11	14	16	12	1	6	7	5	11	5	2	14	2	2	3	3	4	4	4		9	1	1

BOROUGH OF TORQUAY.

ANNUAL REPORT

OF

THE SANITARY INSPECTOR.

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

GENTLEMEN,

I have the privilege of making to the Council, as the Urban Sanitary Authority, this my Twenty-Sixth Annual Report, viz., that for the year 1903.

It will not be found to vary much in detail from those of previous years, except in the important particular of the operations under the Factories and Workshops Act, which were more extensive than was anticipated, and therefore prevented the customary house-to-house inspection of a poor quarter of the town, which always formed an important part of the year's work.

HOUSE INSPECTION.

The main duty has, as usual, been the inspection of premises, either after complaint of insanitary condition, or at the request of owners or agents on re-letting or sale of houses. Twenty-four of these latter were dealt with, and nineteen others of a superior class were examined or tested after work had been done by the occupying owners.

Practically, these houses have undergone a thorough re-drainage, and putting in of improved sanitary fittings, the whole being submitted to the smoke or water tests during progress of the work and at completion, when satisfactory sanitary Reports or Certificates were granted.

In addition to these, eighty-one other houses of a smaller type were inspected, tested, and necessary improvements executed.

DETAILS OF OPERATIONS.

On analysing the record of the structural work done, I find that

- 56 New Sanitary Conveniences and Water supply were fixed.
- 62 „ Soil-pipes were fixed outside houses and ventilated.
- 103 Intercepting Traps, with fresh air inlets.
- 77 Inspection Chambers built in addition.
- 70 New Sets of House Drains were laid.
- 11 Old masonry drains were discovered and destroyed.
- 21 Yards or back premises were paved and drained.
- 10 Taps from main water pipes provided.
- 1 Cottage without sanitary conveniences condemned.
- 61 Supplies of Disinfectants were distributed.
- 17 Premises limewashed.
- 15 Ashbins or covers to manure pits supplied.
- 47 Offensive accumulations were removed.
- 7 Nuisances from keeping of animals abated.
- 39 Bedrooms, bedding, clothing, etc., were fumigated after cases of infectious and other diseases.

FUMIGATIONS.

An interesting circumstance in connection with these latter may be noted, as for the first time I have been requested to disinfect or fumigate after two cases of cancer, and some of whooping cough and measles, which are not notifiable diseases, as well as after six cases of phthisis. In only one instance was my offer declined, and that after at first consenting. I find a call in such cases more effectual than sending official forms offering these services.

SCHOOLS AND INSTITUTIONS.

The entire sanitary arrangements of two Elementary Schools were examined and tested, viz., Torre Parish School, and the Catholic School, Abbey Road, and proved sound and effective; also the School House of the latter was re-drained. I was requested by the authorities of two Charitable Institutions to act similarly with respect to the drains; I did so, but was unable to prove any defects, and I found the systems clear and in good working order. The number of smoke and other tests applied to all classes of buildings, old and new, for the year was two hundred and thirty-five.

NEW BUILDINGS.

The number of New Buildings erected or completed during the year was twenty-eight (or one more than in 1902), of which eight were in Chelston Ward. The principal erections were the fine Bank on Vaughan Parade for Lloyds' Company, and the mansion on the Pilmuir estate, both carried out thoroughly and in accordance with accepted sanitary principles and with the plans passed by the Council. There were also important additions to the Victoria and Albert Hotel; the completion of the new aisle at the Church of the Assumption; also of St. Matthew's Church, Chelston, by the erection of the Chancel and Tower.

I may remark with reference to "Pilmuir," that more than twenty visits for testing the drainage system in sections had to be made, there being probably a mile of the best stoneware pipes laid on the estate.

FACTORIES AND WORKSHOPS.

The work lately imposed on the Sanitary Department by the operation of the Factories and Workshops Act has taken up much time, no fewer than one hundred and eight being under my supervision. These have been classified under the following headings:—

- 26 Dressmakers and Milliners.
- 16 Plumbers and Painters.
- 8 Coach-builders and Cycle Works.
- 4 Cabinet-makers.
- 10 Tailors.
- 6 Laundries.
- 8 Builders and Carpenters.
- 4 Saddlers and Harness-maker and Sailmaker.
- 3 Printers.
- 4 Watchmakers and Jewellers. Also
- 19 Bakehouses.

The places are situate in the Torre, Waldon, and Chelston Wards, also in a part of the Strand Ward.

These have all been inspected as to their state of cleanliness and the condition of the sanitary arrangements; also the cubic space measured where found necessary.

Improvements have been effected, chiefly in the matter of cleanliness, the occupiers being most willing to comply in this respect. Where structural alterations were needed there was more difficulty, but gradually the requisite work is being done.

MILKSHOPS AND DAIRIES.

The Milkshops and Dairies in the same Wards have likewise been visited, they were found clean and in creditable condition ; and the Cowsheds in Cockington (seven in number), outside the Borough boundaries, were inspected, and found to have been recently cleansed and limewashed on each occasion.

COMMON LODGING HOUSES.

Visits to the Common Lodging Houses were also made, with the exception of one of those in Pimlico ; on one occasion only could exception be taken, but the matter found fault with has since been rectified.

SPECIAL REPORT.

The special Report on Twenty-five Years' Sanitary Progress in Torquay, which the Council gave me sanction to prepare, was completed in March, and was printed, published, and circulated soon afterwards.

I thank the Council for the honour done me in this matter, and beg to remain,

Mr. Mayor and Gentlemen,

Yours obediently,

CHARLES MACMAHON.

Cert. San. Inst.; Assoc. M.B.I. Pub. Health;

Chief Sanitary Inspector and Building Surveyor.

BOROUGH OF TORQUAY.

Assistant Sanitary Inspector's Report.

*To His Worship the Mayor, Aldermen, and Councillors
of the Borough of Torquay.*

GENTLEMEN,

I have the honour to lay before the Council my Sixth Annual Report for the year ending December 31st, 1903.

Seventy-eight houses and premises have been visited and inspected on complaint or by request, and twenty-one smoke and nine hydraulic tests applied to the drains in various instances.

Fifty-four notices were served to abate nuisances, and of these forty-five were preliminary and nine legal.

In two instances the drains from blocks of four and five houses respectively were opened and examined by the Council, under Section 41 Public Health Act.

Two hundred and forty-five visits of inspection have been made to premises where work was in progress and also one hundred and forty-four smoke and sixty-two hydraulic tests applied to the drains after alterations to same.

Upon application for Sanitary Certificates, twelve houses and premises have been examined and reported upon, and on completion of the necessary work the certificates were granted in eight cases.

In connection with this work twenty-five smoke, and seventeen hydraulic, tests were made, and thirty-five visits of inspection while work was in progress.

In connection with new buildings in that portion of the Borough assigned to me, sixty-nine smoke tests were applied to the drains of forty-seven houses and premises, and thirty-seven visits of inspection made.

Twenty-four houses were examined and certified for habitation.

During the year, a great deal of time has been occupied in connection with the inspection of premises under the new Factory and Workshop Act, the work-rooms and work places having been measured up in regard to the required cubic space per head for those working therein, and an examination of the premises in regard to the Sanitary arrangements, cleanliness, and ventilation.

This inspection includes the following :—

Description of Trade.	Number.	No. of work-rooms or work places.
Draper, Dressmaker, and Milliners ...	20	31
Cabinet-maker and Upholsterers ...	9	18
Coach-builder and Wheelwrights ...	2	4
Laundries	18	40
Bakehouses	20	20
Tailors	11	12
Builders	7	21
Plumber, Painter, and Decorators ...	7	11
Harness Maker and Saddlers ...	6	6
Printing Works	3	8
Cycle „	2	6
Dye „	1	1
Bootmakers	2	3
Corset-maker	1	1
Shoeing Smiths	2	2
Marble Masons	2	2
Wood Turner	1	1
Picture Framers	1	2
Jewellers	2	3
Photographer	1	2
Ironmonger and Iron Founder ...	1	4
Quarries	5	5
Total ...	124	203

In connection with this work, two hundred and three work places on one hundred and twenty-four different premises have been visited and examined, and forty notices were served to remedy the following defects:—

Defects			Notices.
Want of W.C. accommodation	...	...	4
„ Water supply to W.C.	...	...	4
„ Limewashing and cleansing	...	...	17
Inadequate Ventilation	...	...	2
Overcrowding	...	...	5
Drain-opening in bakehouse	...	...	2
Defective floors	...	...	6
Total			40

I have during the month of May, and again in October, made half-yearly inspections of the thirty-eight Milkshops, Dairies, and Cowsheds in my district; in several instances it was necessary to enforce limewashing and cleansing, and also in one instance to serve a notice to remedy the damp walls and defective floor of a dairy.

Also, during the months of May-June, and again during November-December, the Dairies and Cowsheds on thirty-two farms outside the Borough (and from which milk and cream are sent into the Borough) have been visited and inspected with the Medical Officer. Marked improvement in the general condition and cleanliness is shewn, and in complying with the requirements.

As usual, the premises occupied by the French onion hawkers have been visited and inspected at midnight, and during the day time: three colonies of nineteen, sixteen, and thirteen were found. Overcrowding was taking place in one instance, and this was abated.

In one instance, the front basement room on premises illegally occupied as a cellar dwelling has been closed.

Nine disinfections have been carried out where 1 typhoid, 3 scarlet fever, 3 diphtheria, and 2 small-pox cases occurred. On the day previous to my return from my holiday, the small-pox case occurred in Ellacombe and was removed, and on three successive days I attended and disinfected the room and bedding.

In connection with the other cases, the drains of four houses were examined and tested. One legal and 4 preliminary notices were served to remedy defects found.

With regard to the disinfection of rooms after cases of phthisis, as previously pointed out, this is optional with the occupiers of the houses, and although offers to disinfect were made in every instance, none accepted, many occupiers saying they had carried out the disinfection themselves.

The following comparative table for the last four years will shew the results of this work in my district :—

Year.		No. of cases.	No. of disinfections.	Refusals.
1900	...	42	20	22
1901	...	45	14	31
1902	...	25	9	16
1903	...	12	0	12
Total	...	124	43	81

Office work, as usual, has demanded a certain amount of time in connection with the keeping of the necessary books and records of work, and in correspondence.

Owing to the amount of time occupied in connection with the inspection of workshops and other work, no house-to-house inspection has been made in my district during the past twelve months.

I am, Mr. Mayor and Gentlemen,

Yours obediently,

WILLIAM B. WATSON,

Cert. San. Inst., Sanitary Inspector ;

*Inspector of New Buildings, Factory & Workshop, and
Dairies, Cowsheds, & Milkshops, etc.*

BOROUGH OF TORQUAY.

Assistant Sanitary Inspector's Report.

*To His Worship the Mayor, Aldermen, and Councillors
of the Borough of Torquay.*

GENTLEMEN,

I have the pleasure to place before you my Third Annual Report of work done in the St. Mary-Church district for the year ending 31st December, 1903.

INFECTIOUS AND OTHER DISEASES.

Nineteen premises were visited after infectious diseases were reported: of these five were typhoid, eight scarlet fever, and six were diphtheria. In seven of these houses the drains were found defective, and had to be relaid or completely overhauled. In connection with this work, seventeen rooms were disinfected; one water and twenty-nine smoke tests were applied, and sixty-nine visits to premises made.

Three deaths occurred from phthisis or consumption, and all three houses were disinfected. Last year (1902) eight rooms were disinfected after death from this disease. Two rooms also were disinfected in which patients had died of cancer.

COMPLAINTS.

Forty-nine premises were visited on receipt of written and other complaints, as to various nuisances calling for abatement under the Public Health Act.

The following summary shows the nature and extent of the works carried out to suppress the nuisances found:—

Nine defective drains were relaid or repaired.

Four choked drains were cleared.

Twelve offensive deposits were removed.

Nine nuisances arising from keeping animals were abated.
 Five dirty premises were cleansed.
 Seven w.c.'s were supplied with flush cisterns.
 Eight other nuisances were abated.

During the elimination of these nuisances fourteen smoke tests were applied, and one hundred and forty-three visits of inspection were made.

HOUSE-TO-HOUSE INSPECTION.

Thirty-one houses were inspected at Hele, and in twenty-nine instances the drains were found very defective. In two cases new drains were laid and tested. The others await the laying of the proposed new sewer through Hele, so that more fall will be obtainable for the house drains.

Twenty-two houses in Plainmoor district were inspected and the drains thereof tested. Of these, eleven were found to have defective drains, which were subsequently relaid or repaired; and eight water-closets, which were without flushing apparatus were supplied with efficient flush cisterns.

Nineteen houses in the neighbourhood of Lawes Bridge, and sixteen at Babbacombe, were inspected by the Medical Officer of Health and myself. In these cases attention was directed to cleanliness of curtilages and the efficiency of w.c. accommodation. In twenty-nine of these houses the closets were found to be well supplied with water, and in the remaining six premises earth closets were in use, on account of our sewer being more than one hundred feet from the houses.

One earth closet was re-constructed on more up-to-date lines.

NEW BUILDINGS.

During the past year seventeen new buildings have been erected, which number shews an increase of five on the previous year. In addition six other premises have been visited, in consequence of such structural alterations or additions being executed as to bring them within the term "*new building*."

Nineteen Habitation and Drainage Certificates were issued. There were fifty-four applications of the smoke test, two water tests, and sixty-three visits made in respect of New Buildings.

HOUSES VISITED BY REQUEST.

Thirty premises were visited on request of owners and occupiers. The drains of these were tested, and defects found in all but three. Eighteen were large villas or better-class houses. In many cases a detailed report was written and sent to the owner, suggesting what works should be carried out to bring the drainage and sanitary arrangements up to our standard, in order that a certificate could be granted.

In connection with this work, a total of eighty-six smoke and five water tests were applied. One hundred and thirty-two visits to premises were made, and sixteen Sanitary Certificates were issued.

Three pounds ten shillings were received in drain-testing fees.

DAIRIES AND COWSHEDS.

Twenty-six cowsheds, and thirty-three dairies and milk-shops, situated in this district were visited twice during the year. The majority of these were found in a very creditable condition and well limewashed.

In those cases where the limewashing had not been carried out, the cowsheds were visited again after calling the attention of the occupiers to this matter.

The Medical Officer of Health and I visited some twenty dairy farms situated outside the Borough, and from whence some of the milkshops in the town get their supply. These were visited twice during the year. Attention was directed to the water supply ; to the relative position of well and sanitary conveniences ; and also to the paving, lighting, ventilation, and limewashing. It is gratifying to state that a marked improvement is noticeable in the general cleanliness since we first commenced these visits.

SLAUGHTER HOUSES.

Six of these are situated in the St. Mary-Church district. I have always found them in a satisfactory condition when inspected.

BAKEHOUSES.

Fifteen bakehouses in this locality were inspected during the year. One bakehouse was found to be re-occupied after having been empty for some two or three years. On making investigation the drainage was found defective, and the w.c. was without a flushing apparatus. The drain has since been repaired, and a new closet, with efficient water waste-preventer, has been constructed.

In another case it was also found necessary to call upon the owner to fix a flushing cistern to a water closet, and this he promptly did.

On the whole, the bakehouses were found in a very satisfactory condition, and every effort is made by the occupiers to satisfy the statutory requirements.

FACTORY AND WORKSHOPS ACT, 1901.

In the course of the past twelve months twenty-one workshops were inspected, in addition to those mentioned in last year's report. All work-rooms and workshops were measured, to ascertain whether the required amount of cubic space per worker existed. Attention was also directed to the ventilation, lighting, limewashing, and sanitary conveniences.

The following notices were issued :—

Six requiring limewashing of premises.

Six requiring the provision of new flush cisterns, or defective ones to be repaired.

The result of serving these notices was that the following improvements were effected :—

Six workshops and work-rooms were limewashed.

Five new flush cisterns were fixed to closets that were without means of flushing.

Two defective flush cisterns were repaired.

I am, Mr. Mayor and Gentlemen,

Yours obediently,

H. RUSSELL SMITH,

*Cert. San. Inst. ; Sanitary Inspector,
Inspector of New Buildings, Workshops,
and Dairies and Cowsheds.*

BOROUGH OF TORQUAY.



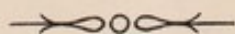
Meteorological Report

FOR THE YEAR 1903.

FREDK. MARCH, F.R. Met. Soc., M.P.S.,
Borough Meteorologist.

*The Borough Observatory,
February 1st, 1904.*

METEOROLOGICAL REPORT.



*To the Worshipful the Mayor, Aldermen, and Councillors
of the Borough of Torquay.*

GENTLEMEN,

I have the honour to submit the appended Report upon work done at the Borough Meteorological Stations during the year 1903.

The instruments have been maintained throughout the year in good working order; an old maximum thermometer, that by lapse of time had become inaccurate, was replaced by a new one in the spring. The Sunshine Recorders continue to give satisfactory results in their new position.

Observations have been taken twice daily, at 9 a.m. (local time), for publication locally, and between 4 and 5 p.m. for the Press. The morning readings have been forwarded in full detail to the Royal Meteorological Society, and a weekly return of bright sunshine has been made to the Meteorological Office. Statistics have also been sent to the Directors of the Rainfall Organization. A weekly weather report has been published regularly in the "Torquay Directory" and "Exeter Gazette," and a monthly report in the "Torquay Directory," "Western Morning News," and "Western Daily Mercury." During periods of exceptional weather, notes and figures have been supplied to the local Press, and when, as is usually the case, the exception has been in favour of Torquay, efforts had been made to secure publication in largely circulated London papers, not always with the success that appears to attend the efforts of other towns.

A telegraphic report upon the day's weather has been furnished to the following papers: London—"Daily Telegraph" (past year only, the managers in the summer declining further free insertions), "Daily Chronicle," "Standard," "Daily News" (summer only), "Morning Leader" (summer only), "Daily Mail" (through local correspondent when asked for), "Daily Express" (not often used, and no reply to letters of enquiry), "Liverpool Post" and "Journal of Commerce," "Manchester Guardian," "Newcastle Chronicle," "Bristol Mercury," "Sheffield Independent," "Leeds Mercury," "Yorkshire Observer" (summer only), Birmingham "Daily Post" (summer only), "Western Morning News," and "Western Daily Mercury."

The arrangement has been continued, under which the evening report is posted, for exhibition the following day, in a specially constructed frame, to 23 Stations and Receiving Offices on the Great Western system. Ten of these frames are exhibited in various parts of London, and the others are placed in such important centres as Liverpool, Manchester, Birmingham, and Cardiff.

I am, Gentlemen,

Your obedient Servant,

FREDERICK MARCH.

OBSERVATORY AND INSTRUMENTS.

The Observatory is organised and maintained by the Town Council, and is under the supervision of the Royal Meteorological Society.

The several Barometers, Thermometers, and Rain Gauges have been verified at Kew Observatory, and regularly examined by a representative from the Royal Meteorological Society. Readings are all corrected for instrumental errors.

The Hygrometrical Results are deduced from the daily morning readings of the Dry and Wet Bulb Thermometers by means of Glaisher's Tables.

The averages for Sunshine are the result of 15 years', for Temperature and Rainfall of 27 years', and for Pressure of 19 years' observations.

The following are the instruments and appliances in regular use, those marked with an asterisk being the property of the Torquay Natural History Society, and lent by them to the town:—

* The **Barometer** is a Fortin Standard, and is read twice daily, at 9 a.m. (local time) and at about 5 p.m. All readings are reduced to 32° F. and mean sea level, and are thus comparable with all readings similarly reduced.

* An **Aneroidograph**, by Richard Freres, gives in graphic manner the alternations of pressure.

There are two double louvred **Stevenson's Screens**, each containing **Dry** and **Wet Bulb**, and **Maximum** and **Minimum Thermometers**. The instruments are of Casella's make, and are so placed that the bulbs of the hygrometer are four feet above the level of the grass. One of these sets has been working throughout the year at Cary Green, where the official temperatures for the Royal Meteorological Society have been taken; the other in the Princess Gardens.

A third ***Stevenson's Screen**, also double louvred, has been in position in the Princess Gardens, and has held a ***Thermograph**, or Self-recording Thermometer, and an **Ozonometer**.

* **Solar Radiation Thermometers**, black bulb in vacuo and bright bulb in vacuo, are contained in a stand of their own, placed in the Princess Gardens.

The **Grass Minimum** is by Hicks, and is placed on grass in the Princess Gardens about an inch above the ground. The readings have been far more satisfactory since its removal to this site.

The **Rain Gauges** are of copper, by Casella, and of Snowdon pattern. They are placed, one on Cary Green, one in the Princess Gardens, with the upper edge 12 inches above the level of the ground.

The **Sunshine Recorders** are placed upon the covered shelter at the southern end of the Pier deck.

They are—

(1). A Curtis' Improved Campbell-Stokes instrument, fitted with a $3\frac{1}{2}$ -inch spherical lens of crown glass, and working on the principle of the burning-glass.

(2). A Twin Jordan Photographic Recorder, which works by the differentiation in colour effected by bright sunlight on specially prepared chemical paper.

BAROMETRIC PRESSURE

In inches and thousandths.

Reduced to 32° F. and Sea Level.

1903.	<i>Mean</i> of Month.	Difference from <i>Mean</i> of Month.	Highest Reading.	Lowest Reading.	Extreme Range of Pressure.
January	29.985	- 0.065	30.524	29.302	1.225
February	30.172	+ 0.174	30.656	29.439	1.217
March	29.856	- 0.103	30.405	29.093	1.312
April	29.927	+ 0.051	30.466	29.284	1.182
May	29.873	- 0.103	30.394	29.240	1.154
June.....	30.026	+ 0.017	30.412	29.549	0.863
July	29.969	- 0.026	30.343	29.573	0.770
August.....	29.897	- 0.074	30.282	29.328	0.954
September	30.017	+ 0.061	30.516	29.609	0.907
October	29.695	- 0.268	30.125	29.188	0.937
November	30.108	+ 0.168	30.483	29.271	1.212
December	29.694	- 0.294	30.215	28.973	1.242
Year	29.935	- 0.036	30.656 Feb. 10th	28.973 Dec. 13th	1.683

REMARKS.

The mean barometric reading for the year was 29·935, being 0·047 below the mean of 1902, and 0·036 below the average of 19 years.

The highest reading was 30·656 on February 10th, and the lowest 28·973 on December 13th. The extreme range of pressure was 1·683.

In view of the exceptional character of the weather of 1903, the following table, which covers the returns of nine years, may be of interest:—

Year.	Mean Height of Barometer.	Difference from Average.	Highest Reading.	Lowest Reading.	Rainfall.
1895.....	29·937	— 0·041	30·629	28·869	34"·37
1896.....	30·057	+ 0·079	30·896	28·541	26"·82
1897.....	29·987	+ 0·009	30·688	29·089	36"·28
1898.....	30·002	+ 0·024	30·683	28·640	27"·62
1899.....	30·002	+ 0·024	30·738	28·426	34"·90
1900.....	29·952	— 0·028	30·696	29·013	33"·09
1901.....	29·990	+ 0·012	30·618	28·973	32"·82
1902.....	29·982	+ 0·003	30·911	28·941	30"·22
1903.....	29·935	— 0·036	30·656	28·973	41"·15

SHADE TEMPERATURES.

Taken at 9 a.m. (Local Time).

1903.	Maximum <i>mean.</i>	Minimum <i>mean.</i>	Max. & Min. <i>mean.</i>	Difference from Average.	Range <i>mean.</i>	Highest.	Date.	Lowest.	Date.
	°	°	°	°	°	°		°	
Jan. ...	48·2	41·4	44·8	− 2·6	6·8	54·9	5th	30·0	13th & 14th
Feb. ...	51·3	43·7	47·5	+ 4·6	8·2	57·1	9th	34·6	2nd
March ...	52·5	42·8	47·7	+ 3·8	9·7	57·9	22nd	36·0	11th
April ...	53·0	41·2	47·1	− 1·1	11·8	57·8	11th	32·0	17th
May ...	59·4	48·2	53·8	+ 0·7	11·2	71·3	31st	40·3	13th
June ...	62·0	51·1	56·6	− 2·2	10·9	76·2	1st	43·5	22nd
July ...	67·3	55·2	61·3	− 0·4	12·1	76·2	10th	48·3	14th
Aug. ...	65·4	54·4	59·9	− 1·7	11·0	70·1	8th	47·5	22nd
Sept. ...	62·9	53·5	58·2	− 0·1	9·4	71·9	1st	42·2	15th
Oct. ...	58·5	49·8	54·2	+ 2·4	8·7	63·8	3rd	40·9	29th
Nov. ...	52·8	44·8	48·8	+ 1·4	8·0	58·7	1st	33·4	30th
Dec. ...	46·7	39·3	43·0	− 0·5	7·4	53·0	7th	29·9	1st
Year	56·7	47·1	51·9	+ 0·8	9·6	76·2	June 1st July 10th	29·9	Dec. 1st

REMARKS.

The temperature figures for the year again bear witness to the equability of the climate of Torquay. The highest temperature recorded was $76\cdot2^{\circ}$ on June 1st and July 10th. In June a temperature of 80° was reached or exceeded in nearly every district of Great Britain, the highest being 86° at Geddes-ton, in the Eastern district; and the same remark applies to the July readings, when an extreme of 87° was recorded at Loughborough. In July 32 stations of the Meteorological office reported maxima of 80° and over. The difference between a temperature of 76° and 87° on the hottest day of the year will be appreciated by all, without mention of the abundant shelter that Torquay offers, where, on the hottest day, walks may be found where not a ray of sunlight penetrates the leafy canopy the trees afford.

As it is still a current article of belief in London and all parts of the country that Torquay is swelteringly hot in the summer, visitors coming prepared for little short of incineration, the following table is re-printed from last year's Meteorological Report. The figures are taken from the official record of the Royal Meteorological Society, and refer to the year 1901;—

EXTREME TEMPERATURES.

		MAXIMUM.			MINIMUM.		
		July	Aug.	Sept.	Jan.	Feb.	March.
TORQUAY	..	78·6	77·6	68·1	22·5	25·5	25·5
Bath	..	87·5	81·0	71·8	21·8	19·5	22·1
Bournemouth ..	..	79·8	79·6	67·4	15·2	24·2	23·5
Brighton	..	81·7	83·9	69·0	23·7	23·1	25·9
Buxton	..	87·1	77·3	68·4	23·5	8·9	16·9
Cheltenham ..	..	89·0	81·4	70·6	22·1	11·3	18·2
Eastbourne ..	..	83·5	78·4	70·4	25·0	22·7	26·4
Guernsey	..	84·0	77·7	71·5	26·6	27·0	29·2
Llandudno	..	89·5	76·5	71·0	25·0	25·5	27·5
Margate	..	80·1	79·1	73·0	24·7	16·7	28·6
Norwood	..	87·0	82·7	75·5	21·5	19·8	23·4
Regent's Park ..	..	86·8	83·0	75·5	22·0	19·5	24·8
Southport	..	88·4	76·7	70·2	19·1	21·0	22·5
Tunbridge Wells ..	..	88·0	80·7	73·6	20·4	19·9	23·2
Wakefield	..	86·8	80·4	71·4	21·2	20·2	24·2

REMARKS ON SHADE TEMPERATURE—(continued).

The lowest reading was 29.9° on December 1st. The summary of meteorological observations for this month is not to hand at the time of writing, but a comparison can be made for the month of January, when our lowest reading was practically the same, 30.0° . In this month no fewer than 21 stations in England (not Great Britain) report minima of 20° and under, including Newton Reigny, 12.0° ; Harrogate, 13° ; Bawtry and Churchstoke and Durham, 14° ; Hereford, 16° ; Cambridge, 17° ; York, 19° ; and Bath, 20° . The difference between a shade temperature of 2° of frost and one of from 12° to 20° of frost will be still more readily appreciated. The lowest British reading in January was 1° at Braemar.

Further convincing evidence of the equability of the climate of Torquay is furnished by the following table, which has been prepared from a White Paper published by the Meteorological office. The figures for Torquay are for the 25 years ending in 1900; the figures in the return are for a period of 30 years, 1871—1900, but this difference could not appreciably affect the result.

	Scarborough	York	Yarmouth	Cambridge	Birmingham	Hereford	Oxford	Hastings	Blackpool	Liverpool	Llandudno	London	Torquay 1876—1900.
Maximum—													
Jan. to March ..	44.0	45.2	43.0	46.5	44.0	46.3	45.8	45.0	44.7	45.0	46.7	46.6	48.0
Apl. „ June....	55.9	54.6	55.6	62.7	58.7	61.7	61.2	58.5	58.7	58.4	58.5	62.9	59.9
July „ Sept. ..	63.7	66.7	65.0	70.0	65.5	68.3	68.1	66.4	64.7	64.4	65.1	70.5	67.0
Oct. „ Dec.	48.1	48.5	48.4	49.9	47.9	49.5	49.4	50.4	49.0	48.8	50.7	50.4	52.5
Minimum—													
Jan. to March ..	35.0	33.1	34.2	32.2	34.4	33.8	34.1	36.2	34.5	35.8	37.3	34.5	38.0
Apl. „ June....	44.1	41.1	45.3	42.7	43.8	43.2	44.2	46.0	43.7	45.6	45.8	45.1	46.9
July „ Sept. ..	51.8	50.4	53.7	50.7	51.5	50.1	51.8	54.4	52.0	53.2	53.4	52.5	53.9
Oct. „ Dec.	39.3	37.0	39.4	36.4	38.4	37.4	38.0	41.1	38.9	40.2	41.7	38.6	42.5
Mean—													
Jan. to March ..	39.5	39.2	38.6	39.3	39.2	40.1	40.0	40.6	39.6	40.4	42.0	40.6	43.0
Apl. „ June....	49.9	47.9	50.5	52.7	51.3	52.5	52.7	52.3	51.2	52.0	52.2	54.0	53.4
July „ Sept. ..	57.8	58.6	59.4	60.3	58.5	59.2	59.9	60.4	58.3	58.8	59.3	61.5	60.5
Oct. „ Dec.	43.7	42.8	43.9	43.1	43.2	43.5	43.7	45.8	44.0	44.5	46.2	44.5	47.5

DURATION OF BRIGHT SUNSHINE

In hours and tenths of an hour,

As recorded by the Jordan Photographic Twin Instrument.

1903.	Total Bright Sunshine.	Difference from Camp- bell-Stokes' Record.	Greatest Amount in one day.	Date.	Sunless Days.
January	38·8	— 4·5	6·6	23rd	16
February	72·4	— 6·0	7·8	18th	9
March	142·8	+ 9·7	9·8	16th	4
April	177·0	— 3·6	11·7	18th&24th	4
May	219·2	— 2·1	14·2	24th	1
June.....	209·3	— 6·6	14·1	4th	4
July	232·3	— 4·7	14·1	1st	2
August.....	189·2	— 7·1	12·5	7th	3
September.....	154·6	— 0·6	11·1	7th	1
October	89·5	— 11·8	9·3	3rd	6
November	80·9	— 11·7	7·6	3rd	7
December	39·1	— 5·5	5·2	2nd & 5th	18
Year.....	1645·1	— 54·5	14·2	May 24th	75

(For Campbell-Stokes' Record see p. 62.)

RAINFALL

In inches and hundredths.

1903.		Total Amount.	Difference from Average.	Wet Days.	Mean Wet Day Rainfall.	Greatest fall in 24 hours.	Date
January ...	*C. G.	4.03	+0.80	19	0.17	1.19	4th
"	†P. G.	4.03					
February ...	C. G.	2.61	-0.08	14	0.19	0.63	27th
"	P. G.	2.64					
March	C. G.	4.24	+1.71	23	0.18	0.72	1st
"	P. G.	4.15					
April	C. G.	1.34	-1.07	9	0.15	0.33	29th & 30th
"	P. G.	1.32					
May	C. G.	3.15	+1.19	16	0.20	0.69	2nd
"	P. G.	3.05					
June	C. G.	1.88	-1.34	14	0.13	0.54	19th
"	P. G.	2.00					25th
July	C. G.	3.62	+1.27	15	0.24	0.80	25th
"	P. G.	3.43					
August	C. G.	3.41	+0.77	14	0.24	0.82	18th
"	P. G.	3.37					
September	C. G.	3.28	+0.89	14	0.23	0.64	24th
"	P. G.	3.31					
October ...	C. G.	6.95	+3.01	28	0.25	0.69	14th
"	P. G.	6.92					
November	C. G.	1.44	-2.37	12	0.12	0.73	27th
"	P. G.	1.43					
December	C. G.	5.20	+1.35	20	0.26	1.14	12th
"	P. G.	4.81					
Year	C. G.	41.15	+6.14	198	0.21	1.19	Jan. 4th
"	P. G.	40.46					

* Cary Green.

† Princess Gardens.

REMARKS.

The total rainfall for the year amounted to 41·15 inches at Cary Green, and 40·46 inches in the Princess Gardens. The Cary Green rainfall is 20 % above the average of 27 years, and 29 % above the average of the last 10 years. The rainfall throughout the country was much above the average. The largest excesses were recorded in London, Hitchin, and Hartley Wintney, where they ranged from 13 to 15 inches, equivalent to 60 per cent. on the mean. The mean excess throughout England was probably about 28 %. The rainfall in London and the Thames basin generally seems to have been quite unprecedented, but in Torquay a heavier fall—43"·23—was recorded so recently as 1894.

The wettest month was October, with a total of 6"·95 and 28 days on which rain fell. In March there were 23 wet days, and in December 20; but it must be remembered that, in meteorological language, a fall of one-hundredth of an inch constitutes a wet day, and the term is applied, for instance, to a day on which a long spell of bright sunshine of some hours' duration is preceded by a smart shower that may not have lasted ten minutes.

In April and June the rainfall was considerably below the average. It is a noteworthy fact that the total rainfall for June was about one-half of what fell in London on the three days, 13th to 15th, and one third of the London rainfall for the month. Of the first 14 days of the next month 12 were dry, so that the wet season did not set in here until the middle of July. The rainfall for the next two months was distinctly above the average, and October was terribly wet. November, on the other hand, was singularly dry, with 18 days on which the rainfall, if any, did not exceed 0·05 inch.

The number of rainy days was 198, which is 33 more than the previous year, and considerably above the average. The heaviest fall was 1·19 inches on January 4th.

Other West country towns report totals as under:—

Bude, 42·27 inches	Tavistock, 63·73 inches
Yelverton, 71·50 inches	Liskeard, 66·62 inches.

HUMIDITY, CLOUD, OZONE, AND WIND.

1903.	HUMIDITY.			CLOUD <i>mean</i> 1 to 10.	OZONE. Per centage of possible.			WIND. Prevailing Quarters.
	Dry Bulb <i>mean.</i>	Wet Bulb <i>mean.</i>	Relative Humidity.		<i>Mean</i> Daily Amount.	Greatest Daily Amount	Least Daily Amount.	
	°	°	%		%	%	%	
January	44·6	42·7	85	7	68	95	10	W. & E.
February	47·4	44·9	83	7	67	90	40	W. & S.W.
March ...	48·3	45·3	79	6	63	85	35	W. & S.
April ...	48·7	44·3	71	6	52	85	30	W.
May	55·1	50·7	73	6	52	75	20	E. & W.
June.....	57·3	52·9	74	5	50	80	30	E. & S.E.
July	62·7	57·7	72	6	45	90	10	S.
August...	61·3	57·1	76	6	49	70	20	W.
Sept. ...	59·2	55·6	78	6	45	75	15	W.
October	55·4	52·4	81	6	56	90	30	W.
Nov.	48·6	46·0	81	6	49	85	10	W.
Dec.	43·0	41·2	86	7	38	70	10	E., W. & N.W.
Year...	52·6	49·2	78	6	53	95	10	W. & S.

REMARKS.

The mean daily amount of Cloud, estimated from eye observation, where clear sky = 0, and entirely overcast = 10, was 6.

The ozone test papers and scale used are Moffat's, and the principle on which the instrument works is the liberation of iodine by the action of ozone upon iodide of potassium contained in the paper, and the action of this free iodine upon starch, in solution of which the paper has also been soaked. This is only a rough test, but it is the same for all stations, and is approximately correct.

The mean daily amount of Ozone was 53% of the possible, with a maximum of 95% and a minimum of 10% of the possible.

It will be noticed with interest that in the winter months the prevailing winds were westerly.

The mean Humidity of the air, as taken by Mason's Hygrometer, was 78. As this figure is frequently misunderstood, it may be well to state that it is a percentage figure, and indicates the proportion of possible moisture, 100 standing for complete saturation. "Watery vapour is always to be found in the atmosphere; its presence is constant, but its proportion variable. It may perhaps be said that the air of England contains on an average something like 1½ per cent. of aqueous vapour" (*Huxley's Physiography*). It is a percentage of this percentage that is indicated by this figure.

The following table, compiled from Mr. Baxendell's Report (1902) to the Southport Corporation, shows that the air of Torquay is distinctly dry comparatively, and not humid, as is generally supposed:—

MEAN HUMIDITY TABLE.

	..	..	%		..	..	..	%
TORQUAY	..	..	78	Bath	..	..	..	78
Southport ..	..	..	83	Ilfracombe ..	..	..	..	82
Douglas ..	..	..	85	Tunbridge Wells ..	..	..	..	80
Morecambe ..	..	..	80	Folkestone ..	..	..	..	82
Harrogate ..	..	..	82	Bude ..	..	..	..	88
Llandudno ..	..	..	78	St. Leonard's ..	..	..	..	82
Buxton ..	..	..	83	Brighton ..	..	..	..	83
Malvern ..	..	..	80	Worthing ..	..	..	..	83
Cheltenham ..	..	..	84	Eastbourne ..	..	..	..	82
Clacton ..	..	..	83	Bournemouth ..	..	..	..	80
Margate ..	..	..	83	Ryde ..	..	..	..	80
Scilly ..	..	..	85	Weymouth ..	..	..	..	81
Guernsey ..	..	..	84	Newquay ..	..	..	..	86
Manchester ..	..	..	80	Falmouth ..	..	..	..	82
LONDON (Greenwich)	..	..	80					

SOLAR AND TERRESTRIAL RADIATION.

Month.	SOLAR.			ON GRASS.				
	Max. <i>Mean</i>	Highest.	Date.	Max. Solar Radiation.	Minimum <i>mean</i> .	Lowest.	Date.	Number of Days at 32° and below.
	°	°		°	°	•		
Jan.	63·6	84·2	29th	15·4	36·1	23·5	13th	10
Feb.	77·8	97·2	19th	26·5	39·3	28·0	3rd	5
March....	91·0	104·9	22nd	38·5	38·0	28·5	11th	4
April	94·2	106·2	6th	41·2	36·7	26·8	17th	8
May	96·5	111·4	30th	37·1	44·9	35·8	13th	0
June.....	102·7	115·6	27th	40·7	49·2	42·7	4th	0
July	107·6	123·3	9th	40·3	52·7	43·8	7th	0
Aug.	106·5	118·1	31st	41·1	51·4	42·9	22nd	0
Sept.	107·3	119·8	1st	44·4	50·6	39·5	15th	0
Oct.	93·1	114·4	4th	34·6	46·6	35·7	31st	0
Nov.....	80·4	97·7	1st	27·6	38·9	29·2	20th&28th	4
Dec.	60·9	80·7	7th	14·2	34·3	25·1	3rd	12
Year	90·1	123·3	July 9th	33·5	43·2	23·5	Jan. 13th	43

REMARKS.

The mean maximum solar temperature is taken with a sensitive maximum thermometer, which has the bulb and about an inch of the stem coated with dull lamp-black. The thermometer is enclosed in a vacuum tube, and mounted four feet above the ground. The measure of solar radiation is found by subtracting the maximum reading of this instrument from the maximum of a shade thermometer.

The highest solar temperatures were registered in July, and the maximum, 123.3° , was taken on the 9th of this month. The measure of solar radiation on this day was 48° . The lowest solar temperature was 36.5° on one of a series of sunless days in December, when the shade maximum temperature was 36.3° .

The mean minimum temperature taken on the grass was above freezing point each month of the year. In January there were 10 ground frosts, in December 12—in all 43. February was a mild month, with frost on five nights only. The sharpest frost was on January 13th, when the spirit fell to 20.5° .

DURATION OF BRIGHT SUNSHINE

In hours and tenths of an hour,

As recorded by the Campbell-Stokes' Standard Instrument.

1903.	Total Bright Sunshine.	Percentage Actual of Possible.	Difference from Average.	Greatest Amount in one day.	Date.	Percentage Actual of Possible.	Sunless Days.
	Hours.	%	Hours.	Hours.		%	
January ...	43·3	16·7	— 20·0	6·2	23rd	70	16
February ...	78·4	28·4	— 3·4	8·3	18th	79	9
March	133·1	36·5	— 6·6	9·7	3rd	80	5
April	180·6	44·0	+ 0·4	12·0	14th & 18th	89	5
May	221·3	48·7	— 9·4	14·1	25th	89	1
June.....	215·9	44·4	— 15·8	14·1	4th	88	4
July	237·0	48·6	+ 1·5	14·0	10th	95	2
August.....	196·3	44·3	— 10·0	12·6	31st	94	3
September..	155·2	41·6	— 9·1	10·8	18th	82	2
October ...	101·3	30·9	— 13·5	9·3	3rd	81	6
November..	92·6	35·0	+ 29·0	7·7	3rd	81	6
December..	44·6	18·5	— 9·3	6·1	2nd	75	17
Year...	1699·6	38·6	— 66·2	14·1	May 25th & June 4.	95	76

REMARKS.

The total amount of Bright Sunshine registered by the Campbell-Stokes instrument was, in 1903, just short by 25 minutes of 1,700 hours. This amount was 79 hours in excess of that registered in 1902, but was still considerably below the average. The summer sunshine—April to September inclusive—amounted to 1206·3 hours, or 6·6 hours per day; and the winter sunshine—October to March inclusive—to 493·3 hours, or 2·9 hours per day. The sunshine for no fewer than nine of the twelve months was below the average; that of April, July, and November was above the average. November was a conspicuously bright month, with 93 hours of sunshine and 24 bright days.

June was again comparatively dull, though there were only four days in all on which no sunshine was recorded. The total of sunless days was 76, as against 75, 49, 56, 52, and 54 in the five preceding years. This is the highest aggregate of sunless days recorded in Torquay.

It will be noticed that the Campbell-Stokes' record of sunshine is 54·5 in excess of that of the Jordan Photographic Recorder. The totals obtained by the two instruments during the last five years are as under:—

			Campbell-Stokes.	Jordan.
1899	...	...	2038·9	1977·7
1900	...	...	1897·0	1857·8
1901	...	...	1876·5	1780·4
1902	...	...	1620·4	1573·4
1903	...	...	1699·6	1645·1

The excess of the Campbell-Stokes' aggregate over that of the Jordan thus amounts to 3·4 per cent. Now, the Campbell-Stokes' instrument is the one generally approved and used by meteorologists, but for 10 years bright sunshine was measured in Torquay by the Jordan instrument. This was because the Campbell-Stokes instrument then in use

possessed a faulty lens, and in consequence of refraction gave inadequate results. Since January 1st, 1899, a Campbell-Stokes' Recorder, fitted with an accurate lens, has been working side by side with the Jordan, and, as in most other stations, gives the more correct record. If the factor obtained from the above five years' totals be applied to the aggregate of sunshine in Torquay from 1889—1898, the total is increased from 17,185·2 hours to 17,769·6, and the average of the whole period—1889 to 1902—is increased from 1765·8 to 1782·8. This correction is of importance, in view of comparisons made with the sunshine records of other towns, and in view of the fact that there is, as yet, no known means of recording the full total of bright sunshine. At present, by either method, many hours each year are lost to the observer.

BRIGHT SUNSHINE, 1902.

COMPARISON WITH OTHER TOWNS AND HEALTH RESORTS.

From the Yearly Report of J. BAXENDELL, Esq., F.R. Met. Soc., the Fernley Observatory, Southport.

	Hours.		Hours.
TORQUAY	... 1620	Tunbridge Wells	... 1426
Southport ...	... 1463	Folkestone ...	... 1512
Scarborough ...	... 1268	Brighton ...	... 1582
Douglas ...	... 1488	St. Leonard's ...	... 1687
Harrogate ...	... 1444	Eastbourne ...	... 1683
Blackpool ...	... 1523	Bournemouth	no information
Llandudno ...	... 1598	Ventnor ...	... 1576
Buxton ...	... 1146	Newquay ...	... 1460
Margate ...	... 1466	Jersey ...	... 1802
Bath ...	... 1372	London ...	... 1228
Weston ...	... 1404	Manchester ...	... 937