[Report 1897] / Medical Officer of Health, Torquay Borough.

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Borough of Torquay.

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH,

Thirteenth Report on the Sanatorium,

Meteorological Report,

The Sanitary Inspector's Report,

AND

SCHOOL ATTENDANCE OFFICER'S REPORT

For 1897.

Borough of Torquay.

ANNUAL REPORT

OF THE

Medical Officer of Health

for 1897.

MR. MAYOR, ALDERMEN, AND COUNCILLORS,

I beg to submit my twentieth Annual Report: viz., that for 1897.

BIRTH RATE.—During the past year 461 births have taken place in the town, or a rate of 18 per 1,000. There were 259 boys and 202 girls. The Birth Rate for England and Wales in 1897 was 29·7 per 1,000.

I must again draw your attention to the steady diminution in the number of births, which is very remarkable, and of great interest. This is the smallest return for the twenty years during which I have had the honour of being your Medical Officer of Health. The average for the first decade is 596, and for the second, 507; consequently 1897 is 135 less than the average for the first period, and 46 less than that of the second. In 1878 the number was 642, which is 181 more than it is twenty years later.

DEATH RATE.—The number of deaths registered is 383, or a rate of 15 per 1,000, and which is lower than it has been for some years. The average for the first decade is 388, and for the second, 415. From 383 must be deducted 77 deaths entered as visitors and strangers, and hence the rate for 1897 will be 12 per 1,000.

The total death rate in 1896 was 17·1; in 1895, 17·8; in 1894, 16; in 1893, 17; so the past year will compare very favourably with its immediate predecessors, and the averages for twenty years. These rates are based on the census of 1891, viz., 25,500. The death rate for England and Wales in 1897 was 17·4 per 1,000.

The causes of mortality will be seen from the following table:—

Death Rate for Torquay, as required by the Local Government Board for 1897.

NAME OF DISEASE.	UNDER 5 YEARS.	OVER 5 YEARS
Small Pox	0	0
Scarlatina	0	0
Diphtheria	1	0
Membranous Croup	2	0
Typhus	0	0
Enteric	0	4
Continued Fevers	0	0
Relapsing	0	0
Puerperal	0	0
Cholera	0	0
Erysipelas	0	1
Measles	0	0
Whooping Cough	1	0
Diarrhœa and Dysentery	2	0
Rheumatic Fever	0	1
Ague	0	0
Phthisis	0	74
Bronchitis, Pneumonia, and Pleurisy	16	20
Heart disease	2	48
Influenza	0	2
Injuries	0	7
All other Diseases	55	147
	79	304
Total for 1897	383	

These figures should be compared with those of previous years, as seen in the following table :—

CAUSES OF DEATH IN TORQUAY FOR TEN YEARS.

CAUSES.	'88	'89	'90	'91	'92	'93	'94	'95	'96	'97
Small Pox	0	0	0	0	0	0	0	0	0	0
Scarlatina	0	1	0	0	0	0	1	2	1	0
Diphtheria	0	0	0	2	0	1	1	1	1	1
Membranous Croup ...	0	1	1	2	1	2	1	1	1	2
Fevers — Typhus	0	0	0	0	0	0	0	0	0	0
Fevers — Enteric or Typhoid ...	1	1	1	2	2	0	8	5	3	4
Fevers — Continued	0	0	0	0	0	0	0	0	0	0
Fevers — Relapsing	0	0	0	0	0	0	0	0	0	0
Fevers — Puerperal	0	1	0	0	0	0	0	0	0	0
Cholera	0	0	0	0	0	0	0	0	0	0
Erysipelas	1	0	0	1	0	0	0	0	0	1
Measles	12	2	1	3	8	0	0	16	9	0
Whooping Cough... ..	1	0	16	0	2	8	4	1	14	1
Diarrhœa and Dysentery	1	3	1	1	3	2	3	2	3	2
Rheumatic Fever ...	3	1	0	4	1	1	0	1	1	1
Ague	0	0	0	0	0	0	0	0	0	0
Phthisis	64	52	67	67	60	70	71	73	54	74
Bronchitis, Pleurisy, and Pneumonia	52	51	63	53	64	64	72	79	60	36
Heart Disease	39	48	36	44	38	35	43	42	49	50
Influenza	—	—	—	—	—	—	—	—	7	2
Injuries	6	10	8	9	13	17	9	14	15	7
All other Diseases ...	228	199	235	214	228	235	197	219	219	202
Total	408	370	429	402	420	435	410	456	437	383

ZYMOTIC DEATH RATE.—Eleven deaths have been caused by zymotic diseases, or a rate of ·43. This is the lowest for some years : in 1896 it was 1·29, in 1895, 1·13, in 1894, ·7. Fortunately we have escaped visitations from such unmanageable diseases as measles, and whooping cough, which have contributed so largely to our zymotic death rate during this decade.

SCARLATINA.—Twenty-six cases have been notified, all of mild type. Two were undoubtedly imported, and I have my doubts about two others.

DIPHTHERIA.—Three cases, one of which was imported, one had a fatal termination, and two were treated with antitoxin with satisfactory results.

MEMBRANOUS CROUP contributed two fatalities to the death rate. I have no reason for supposing that this disease was prevalent to any great extent.

ENTERIC FEVER.—We have had the very unusual number of eighteen cases, four of which were imported, and of these later no less than three had a fatal termination.

VISITORS.—The causes of death among visitors and strangers were as follows :—Tubercular disease of the chest, 39 ; bronchitis and pneumonia, 3 ; typhoid, 1 ; heart disease, 4 ; diarrhœa, 1 ; whooping cough, 1 ; injury, 3 ; influenza, 1 ; and all other diseases, 24 ; total, 57.

COMPARATIVE TABLE OF THE AGE AT WHICH DEATH OCCURRED.

	At all ages.	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.
1888	408	68	36	12	35	120	137
1889	370	67	25	18	28	102	130
1890	429	81	37	16	30	112	153
1891	402	55	25	19	27	105	171
1892	420	74	34	8	25	103	176
1893	435	69	25	9	28	151	153
1894	410	62	38	8	36	114	152
1895	456	75	58	13	34	141	135
1896	437	76	37	11	28	148	137
1897	383	64	15	8	27	144	125

It will be seen from the above table that fewer deaths have taken place among the extremes of life, viz., those under five years of age, and over sixty-five. The fact is, there has been very little sickness in 1897 of any sort, and this opinion is borne out by the following table, which relates of course to the poor members of the community.

RETURN OF NEW CASES OF SICKNESS MADE BY POOR LAW MEDICAL OFFICER; AND OF NEW PATIENTS RECEIVED IN THE TORBAY HOSPITAL.

Names of Diseases.		Poor Law.		Hospital In-Patients.	
		Aged under 5 yrs.	Aged 5 yrs. and up.	Aged under 5 yrs.	Aged 5 yrs. and up.
Small Pox		0	0	0	0
Scarlatina		0	0	0	0
Diphtheria		0	0	0	0
Membranous Croup		0	0	0	0
Fevers.	Typhus	0	0	0	0
	Enteric or Typhoid	0	0	0	10
	Continued	0	0	0	0
	Relapsing	0	0	0	0
	Puerperal	0	0	0	0
Cholera		0	0	0	0
Erysipelas		0	0	0	0
Measles		0	0	0	0
Injury		0	3	2	40
Other Diseases		25	174	10	220
		25	177	12	270

Total:—Poor Law, 202; Hospital, 282.

Refuse Removal and Disposal.—A most important addition to the appliances requisite for modern town accommodation is a refuse destructor, the foundation stone of which has been recently laid. For years the disposal of our ash pit refuse has been a trouble and a nuisance; and I trust that within the current year the destructor will be fully at work, and the waste substances quickly and efficiently disposed of.

Upton Valley Drainage.—The completion of this work is likely to benefit the inhabitants of the Upton district, in as much as they will probably be free from flooding during heavy rainfalls. This has been a judicious expenditure of public money.

Water Supply.—It has been a source of great satisfaction to me, and I believe also to you, that the "Water Question" has at last passed beyond the stage of discussion. The ratepayers have given their consent, the necessary Act of Parliament has been obtained, and the last debate taken

place on the question whether Torquay shall own and control the water shed from which it obtains its drinking supply. So far satisfactory, and it now remains to carry out this scheme, and clear away every human habitation from off the ground, and the sooner the better. The terrible distress and awful loss of life at Maidstone and King's Lynn will not have been in vain, if other towns, no better nor worse than these, consider their responsibilities, and put their own houses in order. There was a time when epidemics of water borne typhoid were unknown, because unrecognised, but the evidence now is overwhelming; and those who declined to recognise the importance of such cases as Swansea, Bangor, and Rotherham, must see that Maidstone, King's Lynn, and Paisley are convincing. So far as we are concerned, the road is quite clear; and I beg to offer you my most cordial thanks and congratulations on the progress made since my last report. I look forward to the day when I shall be able to announce that no human being lives on the Torquay Water Shed.

Milk Supply.—In my Annual Report for 1894 I drew your attention to the urgent necessity for townspeople being empowered to exercise supervision over the farms, etc., which supply them with milk: in other words, that the consumer should have control over the producer and distributor. Year by year my experience tends to convince me of the importance of this question. During the past year the following facts corroborate this view. An epidemic of Scarlatina was in full swing in a village from whence large quantities of milk, etc., were sent to Torquay. Fortunately some very intelligent farmers were on the spot, and who had large financial interest in the milk business, and they carried out all my suggestions, and saw to the exclusion of the labourers living in infected houses from attending the cows or milk. But things might have been very different, with different result. Now

for another case. I ascertained that on a farm some miles from Torquay there was Scarlatina, and that the dairy produce of this farm was sent to Torquay. I at once proceeded to the farm, and found the sick child seated in the living room common to the whole family. The farmer's wife nursed the child, and attended to the dairy; and this part of the house was separated from the living room by a door, and which was constantly being used. Here there was no attempt at isolation, and consequently it was imperative that such a contaminated supply should be stopped. This was done in respect of Torquay, but I have not the least doubt that it was sent elsewhere. Perhaps the Clifton epidemic may be of service in bringing about a change in the law. My impression is that towns should have power to ascertain from milk purveyors from whence their supplies are brought; that each farm should be inspected and licensed; and that notification of all infectious diseases should be sent to the Sanitary Authority of the district or districts where the dairy produce is consumed. Yet one other item in the matter relating to milk supply. I ascertained that in a neighbouring parish some cows were grazing in a field partially devoted to sewage farming; which means, that in this field there were some long lines of trench which received the sewage from some six or eight houses. I went at once and saw the cows, one of which was laying within a foot of a trench, and might just as well have lain on, and in the trench. I pointed out to the dairyman that it was quite within the bounds of possibility that the teats and udders of the cows might become tainted with sewage when they were lying down, and at the next milking this pollution might be conveyed to the milk. The dairyman and the owner of the field at once saw the possibility of the risk, and immediately removed the cows.

Sale of Foods and Drugs Act.—The County Police took 21 samples of milk, 10 of beer, and 6 of butter, and in one case of milk adulteration was detected and punished.

Bakehouses.—These have been inspected as usual.

Housing of the Working Classes.—This year two districts have been inspected, viz., Pimlico and Swan Street. The details of this work will appear in Mr. McMahon's report, and I need only add that these districts would not be the worse for more frequent inspections.

I append the thirteenth report of the Sanatorium, and remain,

Mr. Mayor and Gentlemen,

Your obedient servant,

PAUL Q. KARKEEK, M.R.C.S. & L.S.A.

Medical Officer of Health.

Torquay, January 18th, 1898.

Borough of Torquay.

THE MEDICAL OFFICER'S THIRTEENTH REPORT

ON

THE SANATORIUM

For the Year ending 26th March, 1897.

To the Chairman of the Sanitary Committee.

Sir,

At the close of the financial year 1895-1896 there were 17 patients in the Sanatorium; and from that date to the end of March, 1897, there were admitted 41 fresh cases; making a total of 58 patients under treatment during the year for which I now present the annual report.

All were suffering from scarlatina: 54 were discharged cured, two died, and two were in the building at the end of March, 1897; one of the two fatal cases was a child who died of tabes mesenterica, and the other was a parturient woman, and, as is usual in such cases, the end was fatal.

Two patients were visitors who came here ill and were removed from lodging houses; two were children from the family of a workman in the employ of the Town Council, but who lived out of the district; and the remainder were residents in the borough.

Two visitors were charged part of the cost of their maintenance, four were paupers and paid for by the Guardians, and thirty-five were unable to pay for their medical attendance.

All classes of the community participated in the benefits derived from the use of this hospital, independent of the advantages of isolating so many centres of infection. Patients were removed from the following families: Lodging houses, 2; hotel waiter, 1; cabmen, 5; 'bus driver, 1; tailors, 4; laundries, 5; dressmakers, 1; policemen, 1; post office officials, 1; various small tradesmen, 6; etc., etc.

The cost of working during the twelve months will be seen from the following statement of accounts:—

EXPENDITURE.

	£	s.	d.
Diet of Patients	182	2	3
Wages and Diet of Nurses	116	10	0
Laundress	54	12	0
Curator	52	0	0
Surveyor's Account	16	4	10
Tradesmen's Accounts	61	9	11
Rent, Rates, and Insurance	19	1	9
Drugs	10	19	1
Medical Fees	36	15	0
Conveyance of Patients	11	5	0
Coal, Coke, and Wood	38	9	9
Telephone, 1 year	10	10	0
	£609	19	7

RECEIPTS.

Paid by Patients	62	9	0
Deficit	547	10	7
	£609	19	7

It will be interesting to compare the cost of working in previous years with that of the past :—

Ninth Report ...	50	Patients ...	Cost,	£529	1	2	...	Deficit,	£498	5	5
Tenth ,, ...	76	,, ...	,,	740	9	8	...	,,	651	10	4
Eleventh,, ...	138	,, ...	,,	1,374	13	4	...	,,	1,257	16	2
Twelfth ,, ...	79	,, ..	,,	726	10	3	...	,,	639	6	10
Thirteenth ...	58	,, ...	,,	609	19	7	...	,,	547	10	7

Important repairs have been effected, viz.: a new kitchen range and hot water cistern, and various worn-out material has been replaced.

I have been quite satisfied with the way Mr. and Mrs. Arnall and Miss Hunt have carried out their duties ; and the plan of having a permanent laundress residing in the building has proved most satisfactory.

I remain, Sir,

Your obedient servant,

PAUL Q. KARKEEK, M.R.C.S. & L.S.A.

Medical Officer of Health.

August 10th, 1897.

BOROUGH OF TORQUAY.

METEOROLOGICAL REPORT

FOR THE YEAR 1897.

ALFRED CHANDLER, F. R. Met. Soc.,
Borough Meteorologist.

REPORT.

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

GENTLEMEN,

I have the honour to submit my Yearly Report of the Meteorological work done at the Borough Observatory, Chapel Hill, and Cary Green for 1897.

All the Instruments in use, both those belonging to the Corporation and also the Natural History Loan Instruments, with one exception, have been kept in good working order and repair throughout the Year.

The Instrument referred to, as being the exception, is the Campbell-Stokes Sunshine Recorder, which is discovered to have been working with a large focal error, causing a decrease in the results obtained. This serious error is now remedied. I feel it is a matter for congratulation that the Standard Instrument used by me at this Observatory for the past 10 years has been the Photographic method, and not the more generally used and older Lens-burning Instrument, which has now been found at so many Observatories, including, I believe, Greenwich, to have been working for years past with a wrong focus, wrong quality of glass, and wrong weight and size of the lens. I have referred to this matter more particularly in the Report under the head of "Instruments," but it

should be stated here that the error in our Instrument was discovered owing to a Paper read by a German Meteorologist, Hërr Konig, on the comparison results of the two Instruments in use here, which I have published in the Meteorological Record, and to whose Paper Mr. R. H. Scott, of the Meteorological Office, called my attention.

The Anemometer which, by reason of its complicated gear work, requires extra care and attention to keep it in continuous working order, I have with the help of the Gardener taken down twice during the year and cleaned and oiled. It has been running smoothly throughout the year, with the exception of a short period subsequent to the gale of December 29th, the enormous pressures on that occasion having injured the Cup Spindle, which was displaced out of the true perpendicular; but this I remedied as soon as possible.

The railing in of the Instrument ground on Cary Green having been completed during the year, I have procured one of Hicks's Grass Minimum Thermometers, with the improved Mica scale for reading, this being the new pattern recommended to me by Mr. C. E. Peek, F.R.A.S., of Rousdon Observatory, as giving the most satisfactory and reliable results.

This was an important Instrument to obtain, as hitherto these absolutely lowest temperatures have been taken at Chapel Hill only, where the readings are generally lower than those on Cary Green.

Besides the usual work of reading twice daily all the Instruments in my charge, and the much heavier duty of working up the figures so obtained and distributing them, I have sent the Weather Telegrams daily throughout the

year to the following Newspapers, which publish them on the following morning, some under the heading "Weather at the South, Torquay;" others as "Weather at the Seaside Health Resorts."

The list of the Newspapers which publish the daily Weather Telegrams is as follows:—

Newcastle Chronicle
Glasgow Daily Mail
Sheffield Daily Telegraph
Yorkshire Post
Liverpool Daily Post
Bradford Observer
Bristol Times and Mirror
The Liverpool Journal of Commerce
The Manchester Journal of Commerce
Birmingham Daily Post
Birmingham Daily Gazette

The Daily Reports have also been sent by my Messenger to Mr. C. H. Chandler for publication in the *London Standard*, the *Daily Chronicle*, and the *Western Morning News*; to Mr. W. Thomas for the *Western Daily Mercury* and *Herald*; and Weekly and Monthly to Mr. Brierley for the *Torquay Directory*; to Mr. Grogan for the *Torquay Times*; and to Mr. Tuckett for the *Devon County Standard.*

The Weekly, Monthly, and Yearly Reports have been supplied regularly to the Royal Meteorological Society for publication in their Official Record of all Meteorologcal Stations working under the Society's supervision and inspection; to the Meterological Office, which has for many years published our Sunshine Report in its "Weekly Weather Report of the British Isles and the whole of Europe"; to Mr. Symons in his excellent and much read little paper, the *Meteorological Magazine*" and his wonderful treatise, "British Rainfall."

Our Observations are also published with others relating to the County of Devon under the heading "Climate of Devon Report," in the Transactions of the Devonshire Association.

As in previous years, I have specially prepared a report every Saturday during the Winter Months which I send to Paris for the Travel Editor of the "Queen" Newspaper, and which he publishes by the side of the Continental Health Resorts Weather Reports every week in that widely read Newspaper.

In connection with this fashionable Newspaper, which has a special page in its crowded columns, for giving advice to correspondents seeking a suitable or permanent temporary residence during the Winter and Summer Months, as to Climate, Hotels, Boarding and Lodging Houses, and Residences, I think it would be most helpful if the great advantages of Torquay as a Residence could be continuously Advertised in the "Queen." I have been able occasionally to assist the Travel Editor by information with regard to questions addressed to him by those seeking a first-class English Health Resort, and if in connection with Advertising, a Bureau of Information could be established, it would put this special department on a business-like basis. Mr. Drewett, the Travel Editor of the "Queen," has been good enough, knowing as he does from practical experience the special features, not only of our Climate, but of our Town's beautiful situation, to give advice to our great advantage. I append one such published quite recently :—

"To Town Clerk, Torquay, with Mr. Drewett's Compliments. Proof of Extract in *The Queen*, sent by the Travel Editor of *The Queen* Newspaper, London.

(Reply.) *Jan. 1st, 1898.*

'BIARRITZ, SOUTHPORT, OR TORQUAY FOR EARLY MONTHS ("Traveller").—The first is described to "B.K.M.," only one remark more being called forth by you. *It is not damp.* It pours with

rain there, but dries at once, as on all that west coast from Finisterre southwards, but particularly when you reach the pine woods of Loire Inférièure which continue through the departments of Vendée, Charente Inf., Gironde, Landes and Basses Pyrenées, with but occasional breaks. (2) Of Southport, it may be honestly said that it is one of the best arranged and maintained towns in England; in autumn, winter, and spring an excellent residential place for those who cannot get out of the country to a better. Torquay is more suited to invalids, or simply those who wish to avoid extreme cold, than for very robust persons. It can hardly be called "bracing," though in certain parts of the town it possesses tonic air, especially on the Downs and St. Mary-Church. (And it has the wonderfully bracing Highlands of Dartmoor and Exmoor on its N. and N.W. side, within the compass of a few miles.) But *Torquay* town proper is too sheltered to be very bracing. ***Yet what would England do without such a Town and Climate!***—Ed.'"

During the Year the Correspondence has been, as usual, fairly large. Applications having been made to me from the Medical Profession and intending Visitors and Residents with regard to the Climate of Torquay, which I have readily given to the best of my ability, and besides the Correspondence thereon I have distributed the special Reports to Visitors at the Observatory, the Medical Profession, and to every Official and Private Meteorological Observer who makes application to me.

For the Official Borough Meteorologists, I send to, and receive from them, Weekly, Monthly, and Yearly Reports at Plymouth, Falmouth, Scilly Isles, Penzance, Guernsey, Southport, Scarborough. Ilfracombe, Cheltenham, Eastbourne, and Birmingham, and my thanks are due to all these Observers for their courtesy.

I have also, early in the Year, received a personal visit from Major E. R. Kenyon, R.E., Engineer Superintendant of H.M. Dockyard, Devonport, to whom at his request I made a special Report on the Mean Annual Rainfall, the wettest and driest Years, and heaviest daily and hourly falls

of Rain in Torquay and the Torbay District for the past 21 years. This I was able to do with the help of Mr. Glyde, late of Babbacombe, and also from the valuable Observations on Rainfall made by the late Mr. Pengelly. At the request also of Mr. W. F. Denning, F.R.A.S., I sent, as in former years, a Report on the Temperatures of Torquay for insertion in Whitaker's Almanack.

I have continued my Secretarial work on behalf of the Climate of Devon Committee of the Devonshire Association; but owing to a serious breakdown of health, caused by overwork, and a long illness ensuing throughout the Summer, I was unable to do as much in that connection as I desired; but Mr. Ingham, your Waterworks Engineer, is now very kindly giving me assistance in this work, as well with the figures, as in his special department of the Observations on the Rainfall of Devon. Throughout this long illness, I am glad to say that, I was able, with the assistance of Mr. E. Candish, whom I had trained as my Deputy, to keep the daily necessary work at the Observatory, as well as I could expect under the circumstances, continuously and accurately carried out; but it left for me, on my recovery to health, a very large arrear of computing work to be brought into line.

The usual daily Reports have, with the assistance of Mr. Councillor Charles Shapley, every day, throughout the year, been placed on the Strand and at the Natural History Museum, and the same also have been sent to the principal Hotels and Boarding Houses in the town.

I have the pleasure again of informing the Council of the great and ready help rendered to me by Mr. Shapley, as also by his nephew (Mr. B. Shapley), in twice daily reading the Instruments on Cary Green and sending to me by my

messenger the daily figures so obtained. My very hearty thanks are due to them for their valuable voluntary aid, so willingly and ungrudgingly given. And I beg also to tender my thanks to the Council of the Torquay Natural History Society for the generous loan of their collection of Standard Meteorological Instruments, which are in constant use at this Observatory.

I am, Gentlemen,
Your obedient Servant,
ALFRED CHANDLER, F. R. Met. Soc.

Borough Meteorological Observatory,
Chapel Hill,
February 1st, 1898.

THE OBSERVATORY.

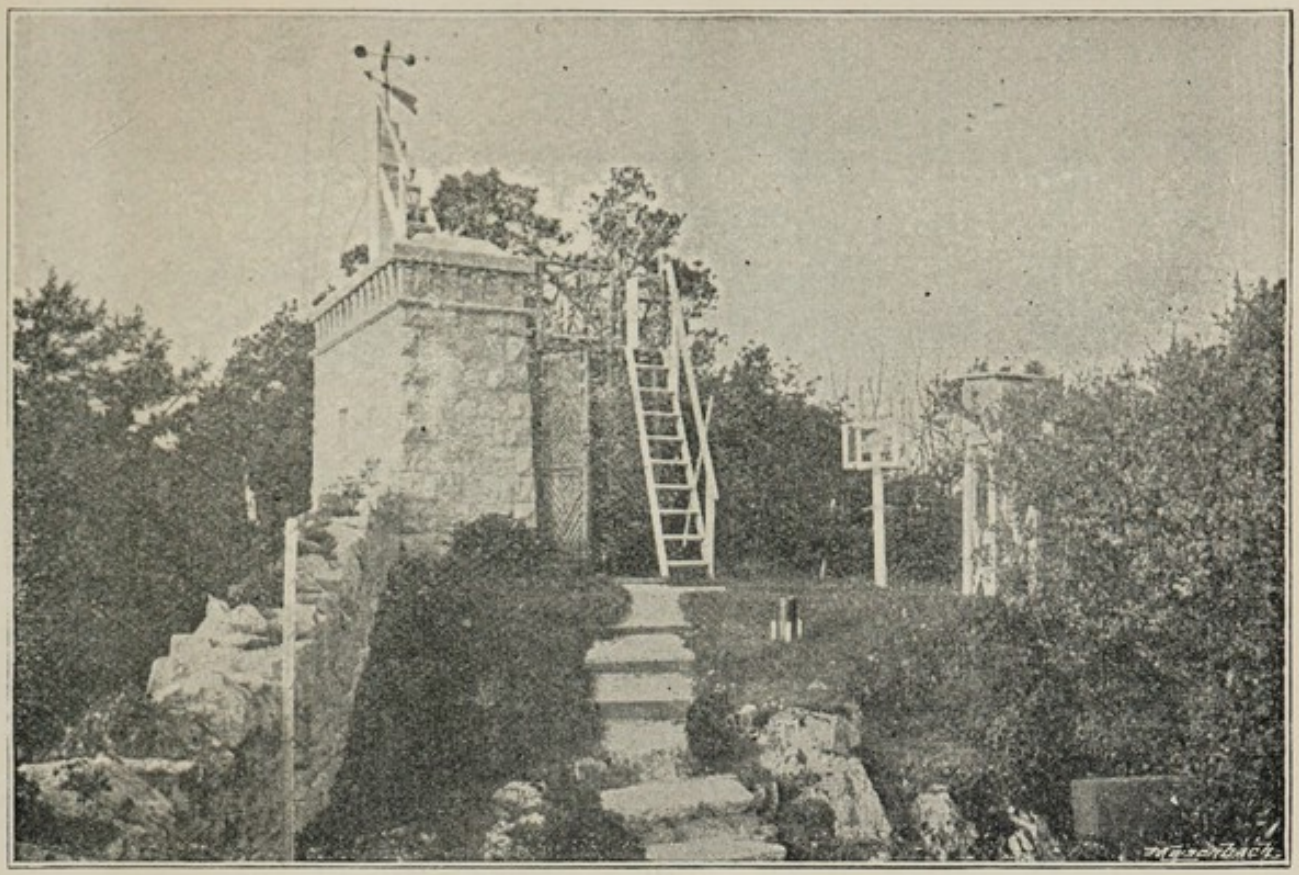
POSITION AND BUILDING.

The Observatory is built on limestone rock at the summit of the quarry, and at the back or N. side of the old ruined Chapel; about ¾ mile from the sea, overlooking Torbay and the English Channel. The ground level is 276 ft., and the top of the building 286 ft. above mean sea level. The part of the building immediately under the Sunshine Instruments is built of solid limestone to prevent vibration. This was designed in 1888 by Mr. J. Hall, Assoc. M. Inst. C.E., and the last addition, with the erection of the Anemometer and a larger computing room for the Observer, early in 1894 by Mr. H. A. Garrett, Assoc. M. Inst. C.E.

Through a slight error in the foundations of the original buildings, the Observatory is not quite true astronomical N. and S., but the instruments are all fixed in a true direction.

The latitude is 50°29′ N., and the longitude 3°32′ W. = to 14 minutes after Greenwich Mean Time.

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



Chapel Hill Observatory, from the South.

Chapel Hill Observatory, from the North.

THE INSTRUMENTS.

SUNSHINE RECORDERS.

These are (1) a Jordan Photographic Twin Instrument, which has been in use here for 10 years, and is used as the Standard Instrument; (2) A Campbell-Stokes Lens-burning Instrument, with Professor Stokes's zodiacal card holder. The Photographic Instrument is on the S. and the Campbell-Stokes on the N. side of the tower. The Campbell-Stokes is the older of the two instruments, and in its original form was invented by Mr. J. F. Campbell; but in its present form, with its zodiacal frame, and in the patterns for use in different latitudes, it has been much improved by Professor Stokes, F.R.S., the Greenwich and Kew Observers, and Messrs. Beckley, Casella, and Negretti and Zambra. There is at the present time much discussion amongst Meteorologists as to the exactitude of the two instruments, which give a difference of sunshine duration of from 5 to 16 per cent., the Jordan Instrument always giving in the monthly totals the larger amount; but occasionally in the daily totals less than the Campbell-Stokes Instrument.

It is alleged that the Campbell-Stokes measure only bright sunshine, and that the Jordan measures sunlight as well as sunshine; but from the work done here for the past 10 years with the Photographic Instrument no trace of measured sunlight has been on the charts, after they have

been immersed in water, face upwards, according to the instructions issued to Observers by the Royal Meteorological Society.

The Photographic Instrument is more troublesome than the Campbell-Stokes Instrument, but taking the different states of the atmosphere into consideration all the year round, it is the more accurate and sensitive Instrument of the two.

With regard to the alleged discrepancy in the results of two Instruments it has been lately discovered that the solid glass balls of many of the Campbell-Stokes Recorders have been supplied of flint glass, "made in Germany," at a cheap rate, which contained a large amount of lead, and of these lenses some give a considerably reduced amount of sunshine burnt on the card, and some would not work at all.

The proper lens to be used should be of Crown Glass, and all those used by the Meteorological Office are of this discription, made of uniform quality, weight, and size, by the Messrs. Chance, of Birmingham. Also, unfortunately, the focus error has been a cause of very much trouble, and the Campbell-Stokes Instrument used at this Observatory, whilst it is accurate in regard to quality of glass, weight, and size, has been working for the past 5 years, unknown to the Observer, with a considerable focal error; this has now been remedied; but the results from this Instrument for the period named are absolutely wrong, having, through the focus error, given too low a record, hence the great difference of results between the two Instruments.

The Photographic (Jordan) Sunshine Recorder (improved type), which fortunately has been the standard Instrument used at this Observatory for the past 10 years, has given the more accurate amount of Sunshine recorded here.

It is, however, to be stated that in this Instrument also a slight difficulty has arisen, but now remedied, in the discovery that a difference in the quality of the Chemicals used in the manufacture of the exposure plates, give a difference in the results of the Observations.

Meteorologists are much indebted to Mr. R. H. Scott, F.R.S., Secretary of the Meteorological Council, and to Mr. Joseph Baxendell, F.R. Met. Soc, Meteorological Observer for the Borough of Southport, tor the discovery of these errors and for applying the remedy to ensure more accuracy and similarity in the results of these important Observations.

These Meteorological Instruments of comparatively recent introduction, now so universally used, which are also Sun Dials, as well for the measurement of time as for the amount of the daily duration of Sunshine, and are, I think, a means of accurate instrumental measurement of the mean daily amount of Cloud, these Instruments, are yet open to great improvement, not so much as to the type of pattern of Instrument but in more accurate uniformity amongst Observers, and doubtless will in the future be made as exact in measurement and definition as are the Telescope, the Spectroscope, the Barometer and Thermometer.

With regard to the capability of these Instruments as measurers of the mean amount of Cloud, which ought certainly to be a more accurate method than Eye Observations, with the errors arising from "personal equation," I have ventured to give on the last page of this Report a small table of figures of comparison, based on the simple method of reckoning as Cloud that which remains per centum of the amount of Sunshine actually recorded by the Instrument, as against the possible Sunshine which would be recorded were the sky continuously clear throughout the period of the day

when the Sun is above the horizon. The comparison Eye Observations of Cloud there given is the daily mean of three Observations made at 9 a.m., at Noon, and at 4 p.m., and I hope to give this table of figures annually, so that after a period of five years or more we may see whether this statement can be verified.

(This table of figures will be furnished on application being made to the Observer.)

ANEMOMETER.

The Anemometer, for registering the velocity and direction of the wind and the time of its various changes is a Robinson embossing, self-recording instrument by Casella. The general principle of this instrument is the invention of Dr. Robinson, of Armagh, in which four hemispherical cups of five inches diameter, fixed on twelve-inch arms, revolve with the pressure of the wind. The very ingenious registering parts of the instruments and also the vane are new, and were designed by Mr. Beckley, of Kew Observatory, and Mr. Casella. The force-and-die principle of embossing is the means of registration here adopted. The paper employed for receiving the hourly velocity and direction marks is blue in colour and formed of narrow strips, rolled round a small attached roller, from which it is drawn and embossed on one edge by the action of the rollers, which are divided to represent miles, figured at every five miles of horizontal wind velocity. The clock raises the hammer, which falls once in every hour, impressing the other edge of lhe paper with an arrow, whose movements correspond with the larger one driven by the wind, and this shows its exact direction at every hour of time. The rate of speed is also shown during each preceding hour by the distance travelled over the paper between each

successive imprint of the arrow. The projection under the large arrow (outside) contains metal balls which firmly support the top and aid in giving freedom of action to the vane. The square box (outside) is of cast iron, and contains the stronger portion of the wheelwork, and chains from this gear-work act on the velocity rollers and the arrow attached to the clockwork below. From these automatic hourly observations are obtained the velocity of the wind, its direction and estimated force, but the latter is not very reliable, and, to make the instrument complete, an automatic pressure plate should be added, as in Osler's Anemometer, which shows the maximum push or thrust of the wind in pounds weight on the square foot, and the time when such maximum pressure takes place, the speed of the wind at the same time being recorded by the Robinson Cups.

BAROMETERS.

The Standard Barometer is one of Negretti and Zambra's Mercurial Instruments, on the Fortin adjusting principle. The mercurial reservoir is 279 ft. above mean sea level. The instrument is read twice daily, with the Vernier index, and the readings are reduced to mean sea level and 32° Fahr.

The self-recording Aneroid Barometer is placed by its side for purposes of comparison.

THERMOMETERS AND SCREENS.

The Shade Thermometers, by Casella, consist of a mercurial Maximum, a spirit Minimum, a Dry and Wet Bulb Thermometers for hygrometrical measurements. The screen containing these instruments is a Stevenson's double louvre, placed over glass, with the bulbs of the Thermometers 4 ft. from the ground.

An exact duplicate of these instruments and screen is at Cary Green (12 ft. above mean sea level).

The Solar Thermometers, by Negretti and Zambra, are a black bulb and a bright bulb in vacuo instruments, both mercurial, and both registering the maximum temperature in the sun, the difference in reading between the two instruments being a measure of the amount of solar radiation.

The Grass Thermometers are Hicks's spirit Minimum Instruments, placed on grass about one inch above the level of the ground, the Instrument at Cary Green having the new Mica scale for reading.

The Richard Self-Recording Thermometer is placed in a Stevenson's screen, and shows approximately the time when the highest and lowest temperature takes place. It is most useful for purposes of comparison, and it is wonderfully accurate when its construction is considered; but it cannot be so exact and sensitive as the mercurial or spirit Thermometer, depending as it does upon the lengthening and shortening of a metal plate, as the temperature varies, acting on a crank lever connected to an arm carrying a pen, which writes the curve of temperature on the chart on the clock cylinder.

All the Thermometers are degree marked on the stem, verified at Kew Observatory, and are read with their errors corrected.

RAINGAUGE.

The Raingauges at Cary Green and Chapel Hill are 5 inches in diameter, placed 1 ft. above the level of the ground. They are the Snowdon pattern, with a deep rim for the measurement of snow.

OZONOMETER.

This is Dr. Moffat's pattern, which consists of strips of paper prepared with Iodide of Potassium and Starch; these papers are suspended in a copper box with a double covering of fine wire gauze, so as to allow of the free access of air to the suspended papers, protected from the direct rays of the sun, and also from rain. The papers, when affected by Ozone, are tinged with various shades of brown, the intensity of which is measured by a scale of ten gradations of colour.

AVERAGES.

The averages of Sunshine are for ten years' Observations. Those of Temperature, Rainfall, and the Barometer are for twenty-one years, being the means of Mr. E. Glyde's Babbacombe Observations and the Cary Green and Chapel Hill Observations.

TIME OF READING.

All the Instruments are read twice daily, at 9 a.m. local time = 9.14 G.M.T., and 4 p.m. local time = 4.14 G.M.T., the instruments at Cary Green being read by Mr. C. Shapley, F.R. Met. Soc.

INDEX.

N.B.—The following figures may be taken as the most accurate Record obtainable in the present unsatisfactory stage of development of these Instruments of the duration of Sunshine at this Observatory; the Instrumental Errors, which are certainly large, and the use of two widely different pattern of Instruments, being, and are likely to remain for another generation of Observers, a warmly disputed quantity.

SUNSHINE.

The Jordan Photographic Twin Instrument Sunshine Recorder,

The Standard Instrument for Ten years at this Observatory. *(See remarks pp. 25-28.)*

1897.	Possible Sunshine.	Actual Sunshine.	Percentage Actual of Possible.	Morning Sunshine.	Afternoon Sunshine.	Difference from Average.	Greatest Daily Amount of Sunshine.	Percentage Actual of Possible	Date.	Days on which Sun Shone.	Sunless Days.
	H. M.	H. M.	%	H. M.	H. M.	H. M.	H. M.	%			
January ...	260. 0	59. 55	23 ·0	32. 05	27. 50	− 7. 30	7. 30	84 ·0	27th	19	12
February ...	276. 0	52. 0	18 ·8	24. 20	27. 40	−26. 45	6. 50	66 ·8	20th	17	11
March	364. 0	136. 50	37 ·6	73. 40	63. 10	− 8. 30	10. 5	79 ·3	30th	31	0
April	410. 0	139. 35	34 ·0	67. 35	72. 0	−43. 55	11. 20	82 ·9	15th	26	4
May	475. 0	247. 30	49 ·4	118. 5	129. 25	+18. 10	14. 15	91 ·6	20th	29	2
June.....	486. 0	239. 10	49 ·2	108. 35	130. 35	+ 2. 25	14. 35	89 ·8	12th	28	2
July	487. 0	246. 25	50 ·6	113. 55	132. 30	+56. 35	14. 10	89 ·3	13th	30	1
August.....	443. 0	217. 35	49 ·1	101. 30	116. 5	+27. 35	13. 45	89 ·9	2nd	29	2
September..	373. 0	156. 35	41 ·9	81. 15	75. 20	+ 1. 15	11. 35	84 ·1	10th	26	4
October ...	327. 0	97. 45	29 ·9	50. 40	47 5	−18. 35	9. 50	87 ·2	4th	21	10
November ..	264. 0	33. 55	12 ·2	15. 0	18. 55	−30. 10	6. 50	80 ·0	19th	15	15
December ..	241. 0	79. 10	32 ·9	37. 40	41. 30	+27. 5	6. 15	81 ·3	23rd	21	10
Year...	4406. 0	1706. 25	38 ·7	824. 20	882. 5	−11. 15	14. 35	89 ·8	June 12th	292	73

SUNSHINE.

The Campbell-Stokes' Lens-burning Sunshine Recorder.

The figures for this Instrument are **incorrect**, owing to focus error. (*See remarks pp.* 25-28.)

The same applies to the previous 5 years' work with this Instrument.

1897.	Actual Sunshine.	Percentage Actual of Possible.	Morning Sunshine.	Afternoon Sunshine.	Greatest Daily Amount.	Date.	Days on which Sun Shone.	Sunless Days.
	H. M.	%	H. M.	H. M.	H. M.			
January ...	58. 0	22·3	30.45	27.15	7.25	27th	17	14
February ...	39.50	14·4	16.40	23.10	6.15	17th	17	11
March	102. 5	28·0	55. 5	47. 0	8.10	29th	26	5
April	110.20	26·9	52.30	57.50	11.15	18th	24	6
May	230. 5	49·4	113. 0	117. 5	14. 5	20th	29	2
June.....	210. 0	43·2	91.10	118.50	14.30	12th	27	3
July	226. 5	46·4	102.10	123.55	14. 5	13th	30	1
August.....	197.40	44·6	92.20	105.20	13.25	2nd	29	2
September..	133.50	35·9	67. 5	66.45	11. 0	10th	25	5
October ...	85.40	26·2	43.25	42.15	8.55	4th	19	12
November..	31. 0	11·7	13.10	17.50	7.10	19th	14	16
December..	63.35	26·4	30.35	33. 0	5.55	23rd	21	10
Year...	1488.10	33.8	707.55	780.15	14.30	June 12th	278	87

SHADE TEMPERATURE. Chapel Hill *(The High-Level Station).*

At 9 A.M. (Local Time).

For the description of the Instruments used, See pages 29-30.

1897.	Maximum *mean.*	Minimum *mean.*	Max. and Min. *mean.*	Range *mean.*	Highest.	Date.	Lowest.	Date.	Dry Bulb. *mean.*	Wet Bulb. *mean.*	Relative Humidity.	Cloud. Mean of three Obsns. daily.	Difference of *Mean* Temperature between High and Low-Level Stations.
	°	°	°	°	°		°		°	°	%	°	°
January ...	40·9	33·4	37·2	7·5	48·8	7th, 11th	23·0	24th	37.3	36.0	87.	7.5	1·8 higher at Cary Green
February ...	49·5	42·0	45·8	7·5	55·3	22nd	33·3	17th	45.4	44.4	92.	8.4	0·8 „ „ „
March	51·3	40·5	45·9	10·8	57·9	19th, 24th	31·7	30th	45.7	43.8	85.	7.2	0·8 „ „ „
April	51·9	41·4	46·7	10·5	63·5	28th	33·3	2nd	46.3	44.2	84.	7.3	0·8 „ „ „
May	59·6	44·0	51·8	15·6	70·5	18th	36·0	12th	51.9	48.6	78	6.0	0·5 „ „ „
June.....	67·0	52·6	59·8	14·4	79·7	24th	44·7	2nd	60.7	58.1	84.	6.5	0·3 „ „ „
July	71·3	55·0	63·2	16·3	81·7	16th	43·1	8th	63.7	60.9	83.	6.5	0·2 lower „ „
August.....	67·5	55·3	61·4	12·2	73·7	5th	50·4	25th	61.4	58.6	83.	6.6	0·8 higher „ „
September..	61·7	48·8	55·3	12·9	67·2	26th	41·9	19th	55.1	52.8	84.	6.7	0·8 „ „ „
October ...	57·8	47·9	52·9	9·9	62·9	2nd	37·9	7th	53.1	51.2	86.	7.8	1·3 „ „ „
November..	52·1	43·9	48·0	8·2	59·9	18th	34·6	16th	48.4	47.5	92.	8.9	1·4 „ „ „
December ..	48·9	40·6	44.8	8·3	57·3	16th	30·2	4th	44.6	43.1	87.	7.4	1·2 „ „ „
Year...	56·6	45·5	51·1	11·1	81·7	July 16th	23·0	Jan. 24th	51.1	49.1	86.	7.2	0·8 higher at Cary Green

SHADE TEMPERATURE. Cary Green *(The Low-Level Station).*

At 9 a.m. (Local Time).

For the description of the Instruments used, See pages 29-30.

1897.	Maximum *mean.*	Minimum *mean.*	Max. and Min. *mean.*	Difference from Average.	Range *mean.*	Highest.	Date.	Lowest.	Date.	Dry Bulb *mean.*	Wet Bulb *mean.*	Relative Humidity.	Difference from Average	Cloud *mean.*
	°	°	°	°	°	°		°		°	°	%	%	0 to 10
Jan. ...	43·0	34·9	39·0	−2·6	8·1	50·1	11th	24·0	24th	38·3	37·1	89	0	6·9
Feb. ...	50·4	42·7	46·6	+3·6	7·7	56·4	20th, 22nd	35·0	17th	46·2	44·9	89	+2	7·8
March.	51·4	41·9	46·7	+2·8	9·5	58·6	19th, 24th	35·0	5th, 30th	47·1	44·4	80	0	6·1
April..	52·3	42·7	47·5	−0·7	9.6	59·9	28th	34·3	2nd	48·3	45·4	79	0	7·4
May ...	58·9	45·6	52·3	−0·9	13·3	70·4	18th	37·0	13th	53·2	48·6	71	−5	5·4
June...	66·1	54·1	60·1	+1·2	12·0	77·0	24th	47·0	2nd, 19th	61·9	57·5	75	−1	5·0
July ...	69·2	56.8	63·0	+1·7	12·4	78·7	16th	46·0	8th	64·7	60·1	74	−2	5·3
Aug....	66·3	56·1	61·2	−0·3	10·2	72·1	5th	49·5	27th	63·3	58·7	73	−4	6·0
Sept...	61·6	50·6	56·1	−1·9	11·0	66·5	21st	42·0	19th	57·7	54·0	77	−5	5·7
Oct. ...	58·5	49·9	54·2	+3·1	8·6	62·9	2nd	40·3	7th	55·2	52·2	81	−2	5·0
Nov....	53·4	45·3	49·4	+2·3	8·1	60·3	18th	34·0	30th	50·0	47·9	85	−2	8·3
Dec. ...	50·2	41·8	46.0	+3·1	8·4	56·6	16th	32·0	3rd	46·6	43·9	79	−9	6·1
Year	56·8	46·9	51·9	Exactly Average	9·9	78.7	July 16th	24·0	Jan. 24th	52·7	49·6	79	−3	6·3

SOLAR AND GRASS TEMPERATURES.

For description of the Standard Instruments used for these Observations, See p. 30.

For the column "Mean Solar Radiation," the result is found by the difference between the Shade Mean Max. Temp. in the Screen and the absolute Mean Max. Temp. in Sun.

	In Sun, Black Bulb in vacuo				On Grass			
1897.	Maximum *mean.*	*Mean* Solar Radiation.	Highest.	Date.	Minimum *mean.*	Lowest.	Date.	Number of Days at 32° and below.
	°	°	°		°	°		
January ...	60·0	19·1	83·0	21st	31·9	20·0	24th	19
February ...	74·6	25·1	97·9	26th	38·9	28·9	18th	2
March	91·2	39·9	115·0	20th	37·2	27·5	30th	5
April	94·7	42·8	111·8	2nd	39·4	30·8	2nd	2
May	104·7	45·1	115·2	19th	41·6	33·3	4th	0
June.....	112·9	45·9	127·6	5th	51·2	42·0	19th	0
July	115·0	43·7	124·6	16th	53·3	41·8	8th	0
August.....	111·0	43·5	120·5	9th	52·8	47·2	19th	0
September .	101·5	39·8	115·3	17th	45·7	38·0	19th	0
October ...	86·0	28·2	112·2	2nd, 3rd	45·7	36·8	7th	0
November...	70·2	18·1	95·4	18th	42·6	30·9	30th	1
December ..	67·8	18·9	82·0	15th	37·6	27·4	3rd, 4th	4
Year...	90·8	34·2	127·6	June 5th	43·2	20·0	Jan. 24th	33

RAINFALL. Chapel Hill *(The High-Level Station).*

The Mean of the two 5-inch Rain Guages at this Station.

1897.	Total Amount.	Difference from Average.	Wet Days, or falls of 0·01 *in.* and more.	*Mean* Wet Day Rate of Rainfall.	Greatest fall in 24 hours.	Date of Greatest Fall.
	inch	*inch*		*inch*	*inch*	
January	2·57	−0·67	16	0·16	0·66	7th
February	3·04	+0·52	18	0·17	0·88	4th
March	5·04	+2·62	21	0·24	0·95	2nd
April	3·92	+1·58	23	0·17	1·18	26th
May	1·54	−0·44	12	0·13	0·34	31st
June.....	3·43	+1·17	10	0·34	1·62	8th
July	0·76	−1·97	6	0·13	0·31	19th
August.....	3·33	+0·58	23	0·14	0·46	19th
September	3·11	+0·72	17	0·18	0·96	8th
October	1·21	−3·14	13	0·09	0·15	15th
November	1·30	−2·74	13	0·10	0·29	7th
December	5·72	+2·25	19	0·30	1·20	29th
Year.....	34·97	+0·51	191	0·18	1·62	June 8th

RAINFALL. Cary Green (The Low-Level Station).

For the description of Instrument used, See p. 30.

1897.	Total Amount.	Difference from *Average*.	Wet Days, or falls of 0·01 *in.* and more	*Mean* Wet Day Rate of Rainfall.	Greatest Fall in 24 hours.	Date of Greatest Fall.
	inch	*inch*		*inch*	*inch*	
January	2·48	−0·76	16	0·16	0·73	7th
February	2·98	+0·46	15	0·20	0·79	4th
March	5·89	+3.47	18	0·33	1·52	2nd
April	3·98	+1·64	20	0·20	1·26	26th
May	1·68	−0·30	13	0·13	0.36	31st
June.....	2·64	+0·38	9	0·29	0·91	8th
July	0·88	−1·85	6	0·15	0·33	19th
August.....	3·31	+0·56	20	0·17	0·54	30th
September	3·09	+0·70	15	0·26	0·84	8th
October	0·94	−3·41	8	0·12	0·50	15th
November	1·25	−2·79	12	0·10	0·24	14th
December	7·16	+3·69	18	0·40	2·14	29th
Year.....	36·28	+1·79	170	0·21	2·14	Dec. 29th

BAROMETER AT 9 A.M. (LOCAL TIME).

For description of the Standard Instrument used for these Observations, See p. 29.

1897.	*Mean* of Month.	Difference from *Mean* Monthly Average of 15 years.	Highest of Month.	Date.	Lowest of Month.	Date.
	inch	*inch*	*inch*		*inch*	
January	29·896	−0·163	30·518	2nd	29·236	30th
February	30·113	+0·075	30·688	22nd	29·161	2nd
March	29·718	−0·249	30·161	20th	29·089	3rd
April	29·855	−0·008	30·225	15th	29·384	3rd
May	30·007	+0·046	30·414	15th	29·307	27th
June..	30·048	+0·048	30·343	11th	29·561	18th
July	30·049	+0·073	30·330	30th	29·625	20th
August.....	29·842	−0·114	30·185	3rd	29·549	24th
September	30·042	+0·023	30·487	14th	29·606	2nd
October	30·158	+0·204	30·498	21st	29·606	16th
November	30·184	+0·258	30·687	21st	29·532	14th
December	29·927	−0·082	30·488	23rd	29·216	30th
Year.....	29·987	+0·009	30.688	Feb. 22nd	29·089	Mar. 3rd

ANEMOMETER.

For description of the Standard Instrument used for these Observations, See pages 28-29.

1897.	Total Horizontal Motion.	*Mean* Daily Velocity.	*Mean* Hourly Velocity.	Greatest Daily Velocity.	*Mean* Hourly Velocity.	Greatest Velocity in One Hour.	Date.	Time.	Direction.	
									Southerly to Westerly	Northerly to Easterly
	miles	*miles*	*miles*	*miles*	*miles*	*miles*				
January	6610	213·2	8·9	422	17·6	28	30th	4 to 5 p.m.	14	17
February	6932	247·6	10·3	661	27·5	39	25th	4 to 5 p.m.	22	6
March	11759	379·3	15·8	925	38·5	61	3rd	7 to 8 a.m.	26	5
April	7931	264·4	11·0	641	26·7	42	17th	1 to 2 p.m.	19	11
May	6114	197·2	8·2	409	17·0	26	5th	2 to 3 p.m.	20	11
June	4763	158·8	6·6	639	26·6	41	18th	9 to 10 a.m.	20	10
July	5662	182·6	7·6	419	17·5	28	25th	3 to 4 p.m.	22	9
August.....	7977	257·3	10·7	518	21·6	26	21st	2 to 3 p.m.	26	5
September ...	6291	209·7	8·7	553	23·1	33	5th	4 to 5 p.m.	19	11
October	5592	180·4	7·5	501	20·9	25	16th	3 to 4 a.m.	11	20
November ...	6621	220·7	9·2	554	23·1	34	27th	6 to 7 a.m.	13	17
December ...	10541	340·0	14·2	802	33·4	42	29th	11 to 12 noon	21	10
Year.....	86793	237·6	9·9	925	38·5	61	March 3rd	7 to 8 a.m.	233	132

OZONE.

For description of the Standard Instrument used for these Observations, See p. 31.

1897.	*Mean* Daily Amount.	Greatest Daily Amount.	Direction of Wind.	Date.	Least Daily Amount.	Direction of Wind.	Date.
	%	%			%		
January ...	47·4	85	S. to N.W.	4th, 26th	5	N. to E.	2nd, 18th, 19th
February ...	71·3	95	S. to W.	20th	40	E. to S.E.	16th
March	65·3	90	S., S.W., W.	1st, 3rd	45	S.W.toW.S.W.	21st, 27th
April	55·0	85	S. to S.S.E.	12th	30	E.N.E.	24th
May	51·0	90	W.N.W.	3rd	25	E.	15th
June	38·5	65	W.S.W. to W.	9th	15	N.N.E. to E.	28th, 30th
July	45·2	70	W.S.W. to W.	26th	20	N.W.,E.,S.S.E.	19th, 20th
August.....	59·1	90	S.W.	13th	30	E.N.E. to E.	3rd
September..	54·7	90	W.S.W., W., N.W.	3rd, 6th	5	E.S.E.to S.S.E.	28th, 29th
October ...	36·9	80	N.W.	9th	5	E.N.E., E., S.S.E.	1st, 5th, 30th
November..	40·5	85	S.W. to W.S.W.	13th	5	N.N.W.,N.E.,E.S.E.	11th, 26th
December ..	52·9	90	W.S.W. to W.	6th, 8th	5	E.S.E. to S.E.	23rd
Year...	51·5	95	Southerly to Westerly.	Feb. 20th	5	Northerly to Easterly.	Jan. 2nd, 18th, 19th. Sept. 28th, 29th. Oct. 1st, 5th, 30th. Nov. 11th, 26th. Dec. 23rd.

Borough of Torquay.

ANNUAL REPORT

OF

The Sanitary Inspector.

Sanitary Offices,
Town Hall, Torquay,
January 27th, 1898.

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

Mr. Mayor and Gentlemen,

My Twentieth Annual Report which I have the privilege to submit to the Council, will be found on perusal to maintain fully the high rate of sanitary progress which was adverted to in last year's Report, notwithstanding the fact that since July last I have been without a qualified assistant, the latter having at that time obtained an appointment in the City of Manchester.

The number of cases dealt with during the year was 614, as compared with 584 in 1896; and the district inspections were at least equal to those accomplished in that year.

These latter comprised Pimlico, where a number of the poor and nomadic population reside; Swan Street, which is now almost depopulated; and Ellacombe Road from the Primitive Methodist Chapel to Hatfield Road. I will refer later on to the particulars of the investigations made in these places.

The details of the work done have been classified in the following manner for purposes of comparison, viz. :—

238 Ordinary Houses were thoroughly examined.
121 Villas or Lodging Houses do.
125 New Conveniences were fixed.
32 Old ones put in order.
53 New Soil-pipes were erected, outside buildings.
120 New Ventilators were attached to Soil-pipes.
36 Fresh air Inlets were fixed to drains.
102 Blocked drains were cleared.
91 New Interceptors were set, and
307 Stoneware Gully Traps.
82 New Sets of House Drains were laid.
22 Masonry Drains were abolished, and
1 Cesspit.
38 Waste and Drain-pipes were cut off from drains.
21 Yards were bricked and drained.
53 Foul accumulations were removed, and
18 Pig and Fowl nuisances abated.
21 Rooms or premises were fumigated.
29 Supplies of disinfectants distributed.
27 Premises were limewashed.
114 Flushing Cisterns to Closets were provided, and
5 New Drinking Water Supplies.
19 Cisterns were cleaned and covered.
21 Overcrowding cases were abated.
3 Bedrooms were ventilated.
4 Small Tenements were closed with the consent of the owners.

These figures, added, give a total of

1344 Sanitary operations, executed in
614 Separate premises; as compared with
1639 Operations, carried out in
584 Houses during the previous, which was a record year.

The operations were fewer (though the premises visited more), because so many were not requisite in each case.

The Common Lodging Houses, Milkshops and Dairies, Slaughter House, and Marine Stores were visited from time to time, and irregularities or unsanitary conditions were rectified as soon as possible.

The sanitary arrangements of two principal Churches, of five Consumptive Homes, of the Constitutional Club, and of the Police Station, were examined and tested, and my recommendations with regard to each were, in the main. duly carried out.

The building operations as regards new houses have declined nearly 50 per cent., the number being only 28, as compared with 47 in 1896 ; but additions and enlargements of existing structures have occurred in premises in the best business parts of the town.

The smoke test was applied in 407 instances, or 42 fewer than in the previous year, and the oil test was frequently called into requisition and gave results either calling for further investigation or confirming previous tests. In cases of infectious diseases it was always used, because of its strong anti-septic properties.

The number of tenements examined in the districts which were investigated was 99 ; and 53 houses in Ellacombe Road ; and the population of the tenements was 373. Ellacombe Road is not included in this summary, as there was no apparent overcrowding. Some cases of this latter occurred in Pimlico and were dealt with, the chief requirement being the more plentiful use of the whitewash brush, the sanitary arrangements being in most cases in good working order, and as left when the district was previously examined five years ago.

The office work was quite up to that of previous years, comprising 562 letters, as compared with 570 in the previous year; 52 preliminary notices were issued, and but two legal ones, testifying once more to the general desire to carry out requisite sanitary improvements on the part of the inhabitants without any resort to further compulsory measures.

The sanitary improvements demanded after the examination of Lower Wellesley Road at the close of 1896 were properly carried out in the following spring.

I had once more the honour of being sent as a delegate by this Council to attend the Sanitary Congress held at Leeds in September last, and derived much information from the papers there read and discussed.

I beg to thank the Council for the facilities afforded me in this important matter, and remain,

Mr. Mayor and Gentlemen,

Yours obediently,

CHARLES MACMAHON, C. San. Inst.,

Sanitary Inspector and Building Surveyor.

Borough of Torquay.

SCHOOL ATTENDANCE

Annual Report

For the Year ending 31st December, 1897.

To the School Attendance Committee of the Torquay Town Council.

Gentlemen,

In presenting to you this, my Tenth Annual Report, I am glad to find by the Head Teacher's returns that the Elementary Schools of Torquay have, during the year 1897, attained the highest per centage of attendances they have ever before recorded.

The total children on the Registers and in average attendance are as follows, viz. :

Year 1897.	On Books	...	3,163
„ 1896.	„	...	3,205
		Decrease	32

1897.	In Average Attendance	2,755·9	or	87·1	per cent.
1896.	„ „	2,631·0	or	82·0	„
	Increase	129·4	or	5·1	„

During last year the numbers in the Boys' and Girls' Schools are, in each case, 49 less, and the Infants' 56 more than at the end of 1896.

The returns shew there are 922 Boys, 891 Girls, and 1,350 Infants on the school registers, and an average attendance of Boys, 837·6 or 90·8 per cent. ; Girls, 813·4 or 91·2 per cent. ; Infants, 1,104·9 or 81·8 per cent. 526 of the Infants are under five years of age.

The new schools at Upton were opened on the 30th of August last, and are greatly appreciated by parents residing in the neighbourhood. The total accommodation in the Elementary Schools in the Borough is now for 3,855 children, which, compared with the 3,163 on the books, shews there were 692 vacant places at the end of last year.

During the year 1897, 43 warnings to parents and 5 notices to employers have been served, and visits made to inquire into complaints of irregular attendances in 4,411 cases.

The School Attendance Committee held ten meetings and investigated 106 complaints. 61 summonses were issued, resulting in 39 fines, 3 committals to the Truant School, and one to the Mount Edgcumbe Training Ship. 16 Attendance Orders were granted, and two cases dismissed.

The fines were three of 5s., five of 4s., three of 3s. 6d., four of 3s., sixteen of 2s. 6d., four of 1s. 6d., and four of 1s. each. The total amount of fines were £5 7s. 6d., and the costs £15 5s.

The fines were all paid except one of 3s. and one of 1s. 6d. Proceedings to recover the penalties were ordered, but while they were in progress the defendant was committed on a charge of cruelty and neglect of his children. The School Attendance Committee thereupon decided not to further proceed in the matter.

At the end of 1897 there were two Torquay boys on board the Mount Edgcumbe Training Ship, one in the Devon and Exeter Industrial, and one in the Plymouth Truant School who have been sent to the Institutions named on the application of your Committee.

There is also chargeable to the Borough, a boy in the West of England Institution for the Blind, whose time will expire on the 29th of April next.

In concluding my Report, I should like to say that I think the satisfactory increase in attendances is largely due to the action of the Magistrates, in inflicting since February last, higher penalties than formerly.

I respectfully thank the School Attendance Committee, Magistrates, and Head Teachers for their kind support, and remain,

Gentlemen,

Your obedient servant,

G. R. STONE,

School Attendance Officer.

Dated January 18th, 1898.